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Prepared For:

City of Greenfield
Department of Planning and Development
114 Court Square
Greenfield, MA 01301

RTN 1-18869
Phase II Site Investigation Report &
Release Abatement Measure Completion
Former Lunt Silversmith
298 Federal Street, Greenfield

Prepared By:

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Massachusetts Department of Environmental Protection
Western Regional Office
436 Dwight Street, Suite 500
Springfield, Massachusetts 01103

Attn: Ms. Cynthia J. Pawloski
Section Chief
Brownfields and Enforcement

Re: **RTN 1-18869**
Phase II Comprehensive Site Assessment Report &
Release Abatement Measure Completion Report
Former Lunt Silversmith
298 Federal Street, Greenfield

O'Reilly, Talbot & Okun Associates, Inc. (OTO) has prepared the attached Phase II Comprehensive Site Assessment Report and Release Abatement Measure Completion Report for review by the Massachusetts Department of Environmental Protection. The conclusions of our report describe conceptually the Permanent Solution we intend to file for the release condition at the Site.

We request a meeting following your review of this report to discuss Site closure.

Very truly yours,
O'Reilly, Talbot & Okun Associates, Inc.

Bruce H. Nickelsen, LSP
Associate

Kevin J. O'Reilly, LSP
Principal, Reviewer

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1.0 INTRODUCTION

O'Reilly, Talbot & Okun Associates, Inc. (OTO) has prepared this Phase II Comprehensive Site Assessment Report for release conditions at the former Lunt manufacturing facility at 298 Federal Street in Greenfield, Massachusetts (the Site). A Release Abatement Measure (RAM) Completion Report for the construction RAM performed at the Site is included. A Site Locus and Site Plan are attached as Figures 1 and 2, respectively. The current disposal Site boundary is shown on Figure 2. As shown, the former Lunt buildings have been divided into separate condominiums, so that condominium A is the northeast building, and the remaining buildings are condominiums B1, B2, and C (the former "Mowry" building). For the remainder of this report the condominium units will be referred to as "Units". The "Site" does not include the northeastern building (Unit A1) where Lunt activities were limited to commercial sales and a restaurant.

This document was prepared to satisfy requirements of the Massachusetts Contingency Plan (MCP). The Site is listed with the Massachusetts Department of Environmental Protection (MassDEP) under Release Tracking Number (RTN) 1-18869. This report is subject to the Limitations in Appendix A. Copies of MassDEP's transmittal forms (BWSC-106 and BWSC-108) are provided in Appendix B.

2.0 REGULATORY HISTORY

This release was reported to MassDEP in April 2012. The release notification was for chlorinated volatile organic compounds (cVOCs - principally trichloroethylene or TCE and associated cVOCs and metals). MassDEP issued a Notice of Responsibility to Lunt Silversmiths, Inc. (Lunt) on September 27, 2012. A Phase I Report for the Site was submitted to MassDEP by Lunt on June 13, 2014. However, as part of the submittal, Lunt indicated they were in bankruptcy and could not sign the Tier Transmittal due to financial inability. The property was taken by the City of Greenfield on November 24, 2014. A Tier Transfer was filed with MassDEP showing the City of Greenfield as the new owner and an updated version of the Phase I report submitted on December 17, 2015. At that time the Site was unoccupied, so that a Tier II classification was appropriate. By letter dated June 27, 2017, MassDEP required a Tier Classification be re- submitted which was accomplished through submittal of a Phase I Report and Tier Classification on November 7, 2017. That report classified the Site as a Tier I Site since Immediate Response Actions (IRAs) were ongoing.

A number of assessment reports were prepared by OTO and others between 2012 and 2015 when remedial activities started at the Site. These reports are available at https://eeaonline.eea.state.ma.us/portal#!/search/wastesite under the Site RTN which is 1-18869. In the summer of 2015 at the request of MassDEP the United States Environmental Protection Agency (EPA) performed a Removal Action with MassDEP assistance. The Removal Action is described in Section 7.1 and a copy of the EPA's After-Action Report is attached in Appendix G.

Following the EPA Removal Action, Site redevelopment activities started. Reports prepared by OTO to support the redevelopment of the Site are listed below and available on the eDEP website:

1. October 5, 2016 IRA Plan;
2. January 11, 2017 IRA Status Report;
3. July 14, 2017 IRA Plan Modification 1 and Status Report;
4. September 5, 2017 RAM Plan (for construction);
5. November 7, 2017 Phase I Initial Site Assessment Report and Tier I Classification Report;
6. March 2, 2018 IRA Plan Modification 2, IRA Status Report and RAM Status Report;
7. September 25, 2018 IRA Status Report, RAM Plan Modification 1 and RAM Status Report;
8. April 18, 2019 IRA Completion Report, RAM Plan Modification 2 and RAM Status Report; and
9. October 31, 2019 RAM Status Report.

Site redevelopment activities were essentially complete by December 2019. The redevelopment activities were supported by an IRA and a construction RAM performed by OTO. The IRA and RAM implemented installation of Passive Exposure Pathway Mitigation Measures (PEPMMs) below Units B1 and C and construction activities associated with Site redevelopment. These are described in Sections 7.2 and 7.3 after the summary of assessment activities.

A summary of current and planned use of the Site is provided in Table 1. As shown, each of the Site Units (A-2, B-1, B-2 and C) house patients recovering from substance abuse. Unit A-1, which is not part of the Site has a business use.

3.0 GENERAL DISPOSAL SITE INFORMATION

The Site is a Limited Commercial (LC) zoned property located at 298 Federal Street in Greenfield, Massachusetts. A Site Locus is provided as Figure 1, and a Site Plan as Figure 2. The property is identified in Town of Greenfield assessor's records as parcel 95-1-UTB, and includes approximately 3.8 acres of land. Assessor's records indicate the original Site building was constructed in 1850. Multiple additions were made to the building over time. The former Lunt property was listed as having a finished area of approximately 74,280 square feet prior to demolition activities in 2015 and 2016 (footprints of demolished portions of the building are shown on Figure 2). The square footage likely includes the northeast corner building (Unit A1) not included in the Site. The current size of building footprints of the Site (not including off-Site Unit A1) is estimated at approximately 25,000 square feet. The series of interconnected buildings include one- and two-story portions constructed primarily of brick.

The property containing the Site is bounded by Norwood Street on the north, Federal Street on the east, Kenwood Street on the south, and baseball fields on the west.

Residential neighborhoods are located to the north, south, and west. Development to the east, across Federal Street, is primarily commercial.

The Site buildings are serviced by municipal water and sewer systems, and are heated by natural gas. No. 6 heating oil to heat Site buildings was formerly stored in 30,000 gallon and 10,000 gallon above-ground tanks. These tanks were removed in January 2016.

Exterior portions of the Site include paved parking and landscaped areas. Local topography is generally flat at an approximate elevation of 260 feet above mean sea level. Site topography slopes gently downward to the west, toward the Green River, which is located approximately 5,500 feet to the west. The nearest surface water body is the Connecticut River, which is located approximately 4,000 feet to the east of the Site, over a substantial topographic high.

Soils in the Site vicinity are mapped as fine glaciolacustrine deposits over a thin layer of glacial till. Mapped bedrock outcrops are located approximately 500 feet southeast of the Site. Shallow bedrock has also been reported at the gasoline station across Federal Street, immediately east of the Site. Bedrock in the area is mapped as sedimentary arkosic sandstone with interbedded siltstone.

The Site and vicinity are served by public water and sewer. Conversations with the Greenfield Board of Health did not identify private wells within 500 feet of the Site. There are no identified water supply wells within 500 feet of the Site. According to Massachusetts Geographic Information System (MassGIS) mapping, the Site is not located within a Potentially Productive Aquifer, an Interim Wellhead Protection Area (IWPA), a Zone A, or a Zone II of a public water supply well. A copy of the MassDEP Phase I Environmental Site Assessment priority resources map is attached in Appendix C. Based on this information, the Site does not lie within a current or potential drinking water source area, as defined in the MCP, and GW-1 standards are not applicable to Site groundwater. As described in Section 2 and shown on Table 1, the current and planned future use of the Site is as a commercial medical facility. As such the current applicable soil standard is S-2. Soil and groundwater sampling results described in this report will be compared to Method 1 S-1 and S-2 soil standards and GW-2 and GW-3 groundwater standards.

Specific Site information required in 310 CMR 40.0483 (1)(a) is provided below:

MassDEP Release Tracking Number	(RTN) 1-18869
Disposal Site Address	298 Federal Street, Greenfield
Latitude/Longitude	Latitude: 42° 36' 03" N Longitude: 72° 35' 43" E
Universal Transverse Mercator (UTM) Coordinates (meters)	697285 m East 4719306 m North

Disposal Site Locus Map w/radii	See Figure 1
Number of on-Site workers at the Disposal Site	Approximately 100
Estimated residential population within a half mile of the disposal Site	Greater than 1,000
Land use to the north	Residential and commercial properties
Land use to the east	Federal Street followed by commercial properties
Land use to the south	Kenwood Street followed by commercial and residential property
Land use to the west	Athletic fields (mapped as protected open space) and residences
Number of Institutions within 500 feet	The Site is an Institution
Natural Resource Areas within 500 feet	None

4.0 DISPOSAL SITE MAP

A Disposal Site Map is presented as Figure 2 and where applicable, identifies the elements listed in 310 CMR 40.0483(1)(b), including buildings and the individual Units (shown as "Unit A1" etc). Exploration locations are shown on Figure 3. Available subsurface utility mapping is provided in Appendix D. A key feature is the stormwater drain located in Kenwood Street, which intercepts groundwater leaving the Site and which is shown on Figure 5.

5.0 DISPOSAL SITE HISTORY

This section provides information required pursuant to 310 CMR 40.0483(1)(c).

5.1 OWNER/OPERATOR HISTORY

The Site has been used for industrial purposes since the early 1900s. Lunt Silversmiths was established at the Site under prior names in 1902 and manufactured sterling, silver-plate and stainless-steel flatware, holloware, and giftware. The Lunt complex gradually expanded to encompass the eastern third of the 298 Federal Street property. As described in the Introduction to this report, the property was taken by the City of Greenfield on November 24, 2014 through a deed in lieu of taxes.

5.2 OIL AND/OR HAZARDOUS MATERIAL (OHM) STORAGE HISTORY

Past industrial processes identified at the Site include cutting, stamping, degreasing, smelting, annealing, electroplating, buffing, and polishing. The use of TCE and petroleum products occurred at the Site. MassDEP records indicate up to five degreasing units and eleven cyclonic dust collectors previously operated at the Site. The locations of the degreasers are not known, with the exception of one unit which was located centrally within Unit C. Five cyclonic dust collectors were present on the Site in 2014.

The Lunt facility is listed as a former Resource Conservation and Recovery Act (RCRA) Small Quantity Generator of hazardous wastes. The facility was an Interim Status Treatment, Storage and Disposal Facility (TSDF) for RCRA hazardous wastes from 1980 through 1984, when it was reclassified as a Small Quantity Generator. The Lunt facility historically generated hazardous wastes including spent solvents, cyanide compounds, nitric acid wastes, and metal-containing wastes. Correspondence in the MassDEP file indicates the facility used TCE for degreasing between at least 1983 and 1998, and historically generated eleven to twelve drums per year of waste TCE. A 1988 inspection record in MassDEP files indicates wastes generated at the facility also included oily polishing solids, cyanide, and 1,1,1-trichloroethane.

At OTO's request, the Greenfield Fire Department reviewed records of underground storage tanks (USTs) and aboveground storage tanks (ASTs) and other records for the Site and abutting properties. The Department had no records of USTs or ASTs for the Site or for the Lunt manufacturing facility. The nearest known USTs were located at the Goly's Garage property at 286 Federal Street.

Information reviewed in the Greenfield Clerk's Office indicated licenses to store 20,000-gallons of bunker oil and 10,000-gallons of fuel oil which were issued in 1952. As noted in Section 3.0, these tanks have been removed.

5.3 ENVIRONMENTAL PERMIT AND COMPLIANCE HISTORY

Lunt Silversmiths, Inc. was a RCRA generator of hazardous wastes with the EPA ID MAD001117712 and a permitted minor source of air emissions. MassDEP files indicate minor violations of hazardous waste management and air quality regulations, and corrective action.

A MassDEP letter associated with a May 26, 2009 multimedia compliance inspection indicates there were five degreasers that used TCE on Site at the time. The degreasers were registered with MassDEP under Air Quality regulations in 310 CMR 7.18. Waste drums of TCE were identified as present in an unspecified storage area. MassDEP reviewed three years of waste manifests for this material. The letter indicates there were eleven cyclonic dust collectors, and that the dust was sold to an off-Site vendor presumably for recycling when collection units were full.

A Notice of Noncompliance (NON-WE-14-3015) was issued to Greenfield Silver, Inc. (former owner) on February 25, 2014. The NON was issued in response to a missed MCP

deadline for the submittal of either a Tier Classification Submittal or a Response Action Outcome Statement.

A June 27, 2017 letter from MassDEP to the City of Greenfield established Interim Deadlines to submit a Phase I Initial Site Investigation Report and Tier Classification. The requirements stipulated in this letter have been met.

6.0 ASSESSMENT ACTIVITIES

Assessment of environmental conditions at the Site has been performed by OTO, MassDEP and by EPA during it's Removal Action. Media evaluated have included soil and groundwater, soil gas, indoor air and storm water. The initial soil and groundwater samples were collected in 2012 and continued through 2019. Rather than discuss analytical results iteratively, we will present the results of assessment activities by media, using the tabulated summaries of analytical data from multiple sources and figures. The assessment activities resulted in remedial excavations and installation of two passive sub floor slab venting systems (referred to in MassDEP terminology as Passive Exposure Pathway Mitigation Measures or PEPMMs) below Unit B1 and C. Laboratory data collected to demonstrate effectiveness of these systems are presented after a description of the systems in Sections 7.2 and 7.3. Laboratory reports previously provided to MassDEP are not included with this report. Laboratory reports not previously provided to MassDEP are attached in Appendix E.

6.1 DOWNGRADIENT PROPERTY STATUS FILING

In 2010, the Lunt facility was identified as the likely source of TCE impacts on Goly's Garage, located at 286 Federal Street. In February 2010, Goly's submitted a Class C Response Action Outcome report to MassDEP under RTN 1-1047. That report included a Downgradient Property Status (DPS) Opinion for the TCE impacts to groundwater. Review of that report indicates the monitoring well which contained TCE (MW-6) was on the Lunt Site and across Kenwood Street from Goly's Garage, not on the Goly's Garage property.

6.2 SOIL ANALYSES

Soil analyses at the Site have been performed predominantly during four sampling events. These were:

1. During January and February 2012 and February and March 2013 by OTO as part of an environmental Site assessment conducted for the City;
2. From May through August 2015 by EPA during the Removal Action;
3. In October 2015 by OTO to evaluate an area below a former cyclonic dust collector excavated by EPA; and
4. In August 2017 by OTO to prepare the construction RAM.

These are each described below in Section 6.2.1 through 6.2.4 followed by a summary of contaminant distribution in soils in Section 12.0.

6.2.1 2012 and 2013 OTO Analyses

OTO performed the LS and MW series of soil borings and groundwater monitoring wells in January and February 2012 and in February and March 2013. Soil samples were analyzed for VOCs, petroleum hydrocarbons, polychlorinated biphenyls (PCBs), and a suite of metals. Additionally, two of the samples which exhibited elevated metals concentrations (LS-20, 1-3 feet and LS-29, 0-1 foot) were analyzed for leachable metals using the toxicity characteristic leaching procedure (TCLP). The exploration locations are shown on Figures 3, 4 and 5 and the data are summarized in Tables 2, 3, 4, and 5. Soil samples that were subsequently excavated during EPA's Removal Action are so indicated on the Tables.

6.2.2 2015 EPA DATA

The EPA performed pre removal assessment between March and July 2014 and additional assessment both before and after soil excavation from May through August 2015. Analyses of shallow soils (the upper 0.5 feet) was performed throughout the Site. The EPA sample locations are shown on Figure 3 (SS-01 through SS-10, SS-301 through SS-326, SB-100 through SB-112, and SS-Comp-01, -02 and -03). Analyses were performed for the VOCs TCE, tetrachloroethylene (PCE), lead, and arsenic using a mobile laboratory and off-Site laboratory following EPA protocols. A summary of the shallow soil sample results (0.5 feet) is shown in Table 6.

6.2.3 2015 OTO Analyses

The EPA assessment included a soil sample (top six inches) from below a former cyclonic dust collector on the north side of Unit B1 (location SS-01 on Figure 3). This sample contained 860 mg/kg of silver. Following the EPA Removal Action in 2015, it was unclear whether soil had been removed from this location by EPA. As a result, in October, 2015 OTO performed a shallow grid soil sampling program of this area. The program included nine soil samples collected from the upper six inches of soil in a grid pattern around the former cyclonic dust collector. The former location was identified by the presence of the four concrete footings for the former dust collector. The soil samples were analyzed for antimony, arsenic, lead, silver and zinc. The analyses are summarized in Table 5A.

6.2.4 2017 OTO Analyses

In August, 2017 OTO performed soil explorations in advance of redevelopment activities at the Site. Previous Site redevelopment activities focused on interior building renovations, but the August 2017 explorations were performed prior to soil regrading and were incorporated into a RAM Plan to support the redevelopment. The explorations consisted of shallow hand auger samples from zero to two feet below grade and shallow borings to five feet. The exploration locations are shown on Figure 3. The figure showing only these explorations which accompanied the RAM Plan submittal is attached in Appendix H. The

hand auger locations are labeled HA-1 through HA-15 and the soil borings are labeled SB-1 through SB-7. The soil samples were screened for VOCs and analyzed for the metal's antimony, arsenic, lead and silver. The results of these analyses are summarized in Tables 7 and 8.

6.2.5 Summary of Soil Assessment

The primary contaminants of concern (COCs) in Site soils (as shown in the referenced tables) are the metals antimony, arsenic, lead and silver, and the chlorinated solvent TCE. The pre-remediation concentrations of these contaminants are shown on Tables 5 through 8. Most of the locations with elevated metals concentrations were located in shallow soils in five locations which were subsequently excavated as discussed in Section 7.0. A discussion of the distribution of contaminants in Site soils is contained in Section 12.0.

6.3 GROUNDWATER ANALYSES

Groundwater sampling was performed at the Site in 2012, 2013, 2016, 2018 and 2019. Each of these sampling rounds were performed by OTO using low flow sampling methods. The groundwater samples were analyzed for VOCs, petroleum hydrocarbons, dissolved metals and cyanide at Spectrum Analytical (now Eurofins Spectrum Analytical) and Contest Laboratory. The monitoring well locations are shown on Figure 3 (on-Site locations) and Figure 5 (showing the Site and downgradient area). These data are summarized in Tables 9, 10 and 11. Monitoring wells MW-6, MW-7, LS-10, LS-19, LS-20, LS-21, LS-22, LS-23 and LS-24 were sampled in 2012. OTO conducted assessment of potential off-Site VOC impacts in the residential neighborhood south of the Site in 2013. This entailed the installation of 17 additional monitoring wells (MW-100 through MW-116) in Davis Street, Forest Street, and Kenwood Street. Each of these monitoring wells, along with a number of the on-Site monitoring wells were sampled in 2013 and the results are included in Table 9.

In 2016, nine one-inch diameter shallow groundwater monitoring wells were installed by OTO in the basement of Unit B1 (LWP-100 through LWP-108) and sampled for VOCs. Groundwater from a sump in the northern basement of Unit B1 was also sampled. These results are summarized in Table 12.

In 2018 and 2019, additional sampling and analysis for VOCs was performed of the LS and MW series monitoring wells on-Site and immediately downgradient in and adjacent to Kenwood Street, and these data are included in Table 9. Laboratory reports are attached in Appendix E.

6.3.1 Summary of Groundwater Assessment

The primary COCs in Site groundwater are TCE and associated chlorinated cVOCs. A discussion of the distribution of contaminants in Site groundwater is contained in Section 12.0.

6.4 STORMWATER SYSTEM SAMPLING AND ANALYSIS

Numerous subsurface utility lines are present in Kenwood Street, as shown on Figure 5. The location of the storm water sewer was derived from a plan provided by the Greenfield Department of Public Works (DPW) attached in Appendix D. The DPW plan shows the storm sewer in Kenwood Street to be vitreous clay (VC) pipe. Vitreous clay pipe is typically comprised of approximate four-foot lengths with unsealed joints, allowing groundwater to infiltrate the sewer if it is installed below the groundwater table. This has been demonstrated to be the case at the Site. Table 13 includes depth to groundwater in monitoring wells and depth to the water surface adjacent catch basins. Typically, the depth to the water in the storm sewer is on the order of two to three feet deeper than groundwater in adjacent monitoring wells, indicating that the storm sewer is acting as a discharge point for the groundwater.

The discharge point of the storm sewer based on a plan provided by the Greenfield DPW is a location at the Green River approximately 1.5 miles southwest of the Site as shown on Figure 6. Select catch basins in Kenwood Street, along the length of the storm sewer and the out fall were sampled for VOCs in 2012, 2013 and 2019. Results of these analyses are summarized in Table 14 and shown on Figure 6. These data indicate the TCE impacted groundwater at the Site is discharging to the storm sewer in Kenwood Street and following the sewer towards the Green River, with concentrations of TCE decreasing with increasing distance from the Site. No TCE was detected at the outfall.

6.5 ON-SITE SUBSLAB SOIL GAS ASSESSMENT

Based on the presence of cVOCs in Site soil and groundwater, we performed a soil gas survey to assess the potential for vapors below the Site building slabs to migrate into indoor air. The soil gas assessment was performed on January 26, January 27, and March 15, 2012. We installed 13 permanent soil gas points, shown on Figure 3 as SG-1 through SG-13. Soil gas points SG-6, SG-7, SG-8 and SG-9 were located within buildings subsequently demolished for Site redevelopment. As shown, five of the points (SG-1 through SG-5) were placed in Unit C, in the vicinity of a former degreaser in that building. Each of the soil gas points was screened with a photoionization detector (PID). Readings collected from each of the soil gas points are summarized in Table 15. As shown, soil gas probes located in the vicinity of the degreaser in Unit C (SG-1 through SG-5) exhibited PID readings ranging from 0.4 to 21.6 parts per million by volume (ppmv). Total VOC readings were 1 ppmv or lower at the remaining soil gas probe locations.

Based on screening results and the locations of soil gas probes relative to features of interest (such as the former degreaser), six soil gas samples (SG-4, SG-6, SG-7, SG-9, SG-10 and SG-11) were selected for laboratory analysis by EPA Method TO-15 The laboratory results are summarized on Table 16. These data indicate that elevated concentrations of TCE were present in soil gas below Units B and C. Each of these buildings subsequently had PEPMMs installed below the floor as described in Section 7.2 and 7.3.

6.6 PRE-REDEVELOPMENT INDOOR AIR ASSESSMENT

Before redevelopment activities were initiated in Site buildings, indoor air samples were collected from Units B1, B2 and C. Unit B1 was sampled on January 26, 2012 and Unit C was sampled on October 27, 2016. These were "grab" samples collected into Summa canisters over two hours for Unit B1 and four hours for Unit C in the vacant buildings. The samples were analyzed for EPA TO-15 parameters at Spectrum for Unit B and ConTest for Unit C. The sample results are summarized in Table 17. These data indicated TCE in indoor air at concentrations which exceed commercial/industrial Threshold Values in both Units B1 and C.

6.7 DOWNGRADIENT INDOOR AIR ASSESSMENT

Two rounds of indoor air assessment were conducted in residential homes south of the property on Kenwood and Davis Streets and Forest Avenue by MassDEP and EPA. These homes are located in a downgradient direction from the Lunt property and are shown on Figure 5. The residences to be sampled were chosen based on the presence of TCE in groundwater north of Kenwood Street and in the stormwater sewer.

Between January 10 and 11, 2013 indoor air samples were collected from ten residences on Kenwood Street and Forest Drive by MassDEP. The samples were collected during worst case winter heating conditions. Each sample was collected over an approximately 24-hour period into a stainless-steel Summa canister. The samples were analyzed for cVOCs. The houses which were tested are shown on Figure 5 and listed on Table 18. Analytical results are summarized on Table 18. Occasional detections of non-Site related constituents were reported, as is common due to household products. TCE was detected in the basement air of 20 and 22 Kenwood Street at concentrations above the residential indoor air threshold values (RTVs), as shown on Table 18.The other cVOCs detected above RTVs were not associated with the Site release and were detected at higher concentrations on the first floor than in the basement indicating a source from inside the residence, not from the Site.

The EPA undertook response actions at the Site in the spring of 2014. This work included the sampling of indoor air and sub-slab soil gas in seven residences along Kenwood Street, Davis Street, and Forest Street, and a limited sub-surface investigation program. The conclusion of EPA's work was that there is no concern of cVOC exposure at these homes. While EPA retested some of the homes previously tested by MassDEP in 2013, they also evaluated residences which had not been previously tested[1]. The residences which were evaluated by EPA are shown on Figure 5 and included 20 and 22 Kenwood Street where MassDEP detected TCE in basement air in 2013. EPA's assessment identified trace concentrations of benzene, ethylbenzene, and other non-target VOCs, but concluded that there were no concentrations of cVOCs associated with the Site. The

[1] MassDEP tested 14, 20, 22, 28, 38, 42, 44 and 44 Kenwood Street, 37 and 45 Forest Avenue, while USEPA tested 12, 14, 20 and 22 Kenwood Street, 15/17 Forest Avenue, 313/315 and 317 Davis Street.

indoor air results were made available in May 2014 on MassDEP's eDEP electronic filing system, under the Site RTN (1-18869).

7.0 SITE REMEDIATION

Remediation has been performed as part of the EPA's Removal Action and under OTO's IRA and RAM Plans. These have consisted of:

1. Excavation of soil from two "Grid Excavation" areas by EPA shown on Figure 4 along with the soils from below the cyclonic dust collectors around the Site;
2. Installation of a Passive Exposure Pathway Mitigation Measure (PEPMM) under Unit B1;
3. Installation of a PEPMM under Unit C; and
4. Excavation of soil from below the former vapor degreaser in Unit C.

These are described below.

7.1 EPA REMOVAL ACTION

Five areas with elevated concentrations of TCE and/or metals in soil were excavated as part of the EPA removal program in Summer 2015 and are shown on Figure 4. A total of 1,358 tons of soil was removed from these areas and disposed off-Site. A copy of EPA's After-Action Report is attached in Appendix G. Two of the excavation locations were the so-called grid excavation areas (west grid and south grid) and three were excavations below the former cyclonic dust collectors (shown on Figure 4). Soils in both the south grid (and west grid (excavation areas locally contained soils with elevated concentrations of metals and cVOCs. The two grid excavation areas were excavated to depths of between two and four feet below grade by EPA.
EPA also excavated soils from beneath the cyclonic units on the west end of Unit C (OTO sample LS-29 and EPA sample SS-06), soils below a former northern cyclonic unit (EPA soil sample SS-01), and soils below the central courtyard cyclonic unit (EPA soil samples SS-301, SS-304, SS-325, and SS-326). The depth of excavation below the former cyclonic units was not documented, however post excavation sampling by OTO indicates concentrations of metals in these locations below the MassDEP Method 1 S-2 standard.

Results of the EPA soils analysis in the upper six inches at the Site and at the base of the two grid excavations to depths of between two and five feet are tabulated in Tables 19 and 20. As shown in Table 19, following the excavation the Site wide average concentrations for soil in the upper six inches indicated no exceedance of the S-1/GW-2 standard for TCE, PCE, lead, arsenic or silver. EPA's soil testing from the base of the excavation are tabulated in Table 20. In summary:

- The average concentration for TCE in the soils at the base of the west grid excavation location is approximately 3,000 ug/kg, approximately 10 times the Method 1 S-1 and S-2/GW-2 standard of 300 ug/kg;

- The average concentrations for PCE, lead and arsenic are less than the Method 1 S-1 standard at the base of the west grid location;
- At the south grid excavation location, the average concentrations for lead and arsenic exceed the S-1 and S-2/GW-2 Method 1 standard by a factor of two to three at the base of the excavation, from two to four feet below grade; and
- The post excavation average concentration for TCE at the base of the southern grid excavation, from two to four feet below grade is approximately 8,000 ug/kg, over twenty times the Method 1 S-1/GW-2 standard of 300 ug/kg.

The excavations were backfilled so that the exceedances do not represent a current direct contact exposure pathway.

7.2 PASSIVE EXPOSURE PATHWAY MITIGATION MEASURE (PEPMM) AT UNIT B1

The description of the release requiring the IRA at Unit B1, the description of the PEPMM installation, monitoring data and demonstration of effectiveness are included in the IRA Completion report submitted to MassDEP on April 16, 2019. The IRA condition was due to detection of TCE in indoor air in a building which included patient stays of up to several weeks in August 2016 at a concentration which exceeded the residential Imminent Hazard concentration. This was interpreted as a potential Imminent Hazard condition requiring a two-hour notification. IRA activities performed until completion of the PEPMM consisted of continued ventilation of the basement and periodic air testing while construction of the PEPMM was completed. Due to concerns over the shallow groundwater table at the Site, the PEPPM was constructed by placing an approximate six-inch layer of crushed stone over the entire basement floor, covered with a membrane and concrete pavement with six-inch diameter vent pipe up through the first and second floors to ventilation points on the roof. The original design is included in the July, 2017 IRA Plan Modification Report. The installation was completed in January 2018, and the March 2018 IRA Plan Modification and Status Report included the final design for the PEPMM.

Indoor air monitoring to demonstrate the effectiveness of the PEPMM started on February 16, 2018, approximately two weeks after installation was complete and ventilation of the basement was stopped. The indoor air monitoring included four rounds with two rounds performed during Winter heating conditions (February 2018 and 2019) and one round each in the Spring/Summer (June 2018) and Fall (October 2018) as stipulated in MassDEP guidance on vapor intrusion[2]. Results of the four rounds of indoor air monitoring are shown in Tables 21A and 21B along with indoor air collected prior to the PEPMM installation. The IRA Completion report submitted in April 2019 included Exposure Point Calculations (EPCs) which indicated that an Imminent Hazard condition for residential use is <u>not</u> present at the Unit B1. Insertion of the EPCs into the residential long-term inhalation risk short forms also indicated a condition of No Significant Risk for inhalation.

[2] MassDEP Policy #WSC-16-435, Vapor Intrusion Guidance: Site Assessment, Mitigation and Closure, October 14, 2016.

7.3 PEPMM AT CONDOMINIUM UNIT C

In July, 2017 OTO submitted a design for a venting system below the floor of Unit C. The original design was included in our July 14, 2017 IRA Plan Modification 1 and modified in our March 2, 2018 IRA Plan Modification 2, IRA Status Report and RAM Status Report. The design entailed a central trench running the length of the building, with three vent pipes, each arranged to vent one third of the building. Due to changes in the proposed build out of the building, certain design changes were made which included replacing the four-inch diameter sub-slab pipe with six-inch diameter pipe exiting at two locations above the second story roof in the March 2018 submittal. Installation of the venting system below the ground floor of Unit C was completed on March 11, 2019. Previous combined IRA/RAM Plan and Status reports included discussion of the Unit C PEPMM in the IRA. However, since the IRA for Unit B1 was closed in April, 2019, no IRA condition is associated with Unit C, and the IRA at the Site had been closed, monitoring was completed under the ongoing RAM.

Indoor air sampling to demonstrate the effectiveness of the PEPMM at Unit C started on March 21, 2019, approximately two weeks after installation was complete and the building HVAC system was operational. Four sampling rounds were completed (March, June, September and December) with two rounds performed during winter heating conditions and one round each in the Spring/Summer (June) and fall (September) as stipulated in MassDEP guidance on vapor intrusion. Results of the four rounds of indoor air monitoring are shown in Table 22 along with a sample collected in October 2016 prior to the start of construction in this building. As shown, each of the sampling rounds indicates TCE concentrations below the MassDEP Commercial/Industrial Threshold Value. Insertion of the EPCs for Unit C into the residential long-term inhalation risk short forms also indicated a condition of No Significant Risk for inhalation.

A RAM Completion Report for the PEPMM installation in Unit C and the construction activities at the Site is included in Section 8.0 of this report.

7.4 UNIT C SOIL EXCAVATION

As described in the October 2019 RAM Status Report, approximately 90 cubic yards (62 tons) of TCE impacted soil excavated from below the former vapor degreaser in Unit C and was transported off-Site under a hazardous waste manifest in June 2019. A copy of the manifest was attached to that report. The soil was disposed at Wayne Disposal, Inc., in Belleville, Michigan. A not to exceed volume of 100 cubic yards for this soil was included in the March 2018 IRA Plan Modification Two, IRA Status and RAM Status Report.

8.0 RELEASE ABATEMENT MEASURE COMPLETION REPORT

The initial RAM Plan was submitted to MassDEP in September 2017 to facilitate redevelopment of the Site. Periodic RAM Status Reports and two RAM Plan modifications have been submitted as described in Section 2.0. Section 310 CMR 40.0446(4) of the MCP indicates that RAM Completion Reports shall consist of the following items:

1. A description of the release, Site conditions and surrounding receptors;
2. A description of the work completed, including work undertaken in response to conditions imposed by MassDEP;
3. Investigatory and monitoring data obtained during implementation of the RAM;
4. A statement of findings and conclusions of the RAM;
5. Details and documentation regarding management of remediation waste; and
6. A description of any ongoing activities related to the RAM to be conducted at the Site.

The RAM was initiated for the following reasons:

1. To provide information on how the soils excavated at the Site were to be managed during the Site redevelopment; and
2. To provide a plan for the installation of and demonstration of the effectiveness of the PEPMM installed below the ground floor of Unit C.

The description of the Site release, Site conditions and surrounding receptors is included in earlier sections of this report. The RAM Plan provided recommendations on how excavated soils were to be managed. The only soil disposed off-site during the RAM was approximately 90 cubic yards of soil excavated from below the former vapor degreaser in Unit C as described in Section 7.4. As described in the September 2018 IRA Status Report, RAM Plan Modification 1 and RAM Status Report, approximately 750 cubic yards of unimpacted soil from the excavation to install the stormwater recharge system in the former lawn area on the eastern portion of the Site was reused at the MassDEP release location identified by release tracking number (RTN) 1-15133, addressed as 365, 385-401 Liberty Street in Springfield. Pre-characterization of this soil prior to off-Site transportation indicated reuse was appropriate as described in that September 2018 report.

The PEPMM installed below the ground floor of Unit C was constructed as designed without significant changes from the revised plan included with the March 2, 2018 submittal, therefore no “as-built” plan has been prepared. Demonstration of the effectiveness of the PEPMM was described in Section 7.3 and indoor air sampling data is shown on Table 22. Results of the indoor air sampling will be incorporated into the Risk Characterization summarized in Section 14.0 and attached in Appendix J. We note that MassDEP guidance on TCE in indoor air quotes the EPA as recommending an indoor air guideline for residential settings of 2 ug/m^3, and states that at or below this level there is no significant risk of health effects. For workplace settings the guideline is 8 ug/m^3. As shown in Table 22, TCE was the only VOC detected in Unit C after installation of the PEPMM and no concentrations exceeded 2 ug/m^3.

Given the above information, we consider the RAM at the Site to be complete. Copies of photographs of the completed property are attached in Appendix K. A copy of the MassDEP transmittal form (BWSC106) indicating submittal of the RAM Completion Statement is attached in Appendix B.

9.0 SITE HYDROGEOLOGIC CHARACTERISTICS

The groundwater flow direction was assessed using depth to water table measurements in groundwater monitoring wells combined with elevation survey data as summarized in Table 13. The elevations are relative to mean sea level and the datum provided by the Greenfield DPW. Based on several rounds of gauging conducted during field work in 2012 and 2013, the general groundwater flow direction at the Disposal Site is towards the southwest. Groundwater contours incorporating March 21, 2013 data are shown on Figure 3. Table 13 also includes measured depths to groundwater in monitoring wells sampled in 2018 and 2019 and depths to water in the catch basins and the invert depths in some of the catch basins.

9.1 SITE DRAINAGE

Local topography is generally flat at an approximate elevation of 260 feet above mean sea level. Site topography slopes gently downward to the west, toward the Green River, which is located approximately 5,500 feet to the west. The nearest surface water body is the Connecticut River, which is located approximately 4,000 feet to the east of the Site. Based on our observations at the Site and on utility plans provided by the Town of Greenfield (see Appendix D) storm water at the Site flows into storm drains on the north side of Kenwood Street, and ultimately discharges to the Green River approximately 1.5 miles southwest of the Site. Cross sections of the Kenwood Street storm sewer indicate the invert of the sewer is six to seven feet below grade. Measurements in the field of depths to the invert in catch basins support these depths. Review of depth to groundwater data from on-Site monitoring wells immediately adjacent to the storm water sewer (from east to west: MW-6, LS-20, MW-100, MW-102, and MW-105) indicate a depth to groundwater of two to three feet in these monitoring wells (Table 13) so that the groundwater in these monitoring wells is likely three to four feet higher than the sewer, allowing the groundwater to infiltrate through the vitreous clay pipe joints. This is also shown by the groundwater contours which indicate an artificial depression of the water table in the vicinity of the storm drain, and by the detection of TCE in the storm water drain line, as described in Section 6.4.

9.2 SITE GEOLOGY AND HYDROGEOLOGY

Soils in the Site vicinity are mapped as fine glaciolacustrine deposits over till. Mapped bedrock outcrops are located approximately 500 feet southeast of the Site. Shallow bedrock has also been reported at the gasoline station across Federal Street, immediately east of the Site. Bedrock in the area is mapped as arkose sandstone interbedded with siltstone.

Review of the boring/monitoring well installation logs (Appendix F) indicate bedrock is likely at depths of five to ten feet (LS-18, LS-20 and MW-101) in the eastern portion of the Site, but drops to depths of approximately 30 feet below ground surface towards the west (monitoring wells MW-102, 103, 104, 105, 106, 109, 110, 111, 112, 113, and 114 hit no refusal to 30 feet below ground surface, while monitoring wells MW-107 108, 115 and 116 hit refusal, likely on bedrock, at depths of approximately 25 feet below ground surface) .

The stratigraphy was found to be two to seven feet of fill, followed by silty sand or clayey silt, followed by two to five feet of glacial till above bedrock. Depth to groundwater across the Site has been measured to vary between two and five feet below ground surface (Table 13).

Hydraulic conductivities were assessed during Phase II investigations using steady state discharge and drawdown data collected from low flow sampling of monitoring wells MW-101, MW-103, MW-104, MW-106 and MW-111, sampled in September, 2019[3]. With the exception of MW-101, each of the sampled monitoring wells recharged too slowly to establish a static drawdown at the approximate groundwater pumping limit of the peristaltic pump being used (approximately 100 ml/minute). The calculated hydraulic conductivities for each of the monitoring wells, other than MW-101, are therefore "less than" values as summarized below.

Well	Date	K (cm/sec)	K (ft/day)
MW-101	9/26/2019	0.00066 (6.6E-04)	1.9
MW-103	9/26/2019	< 0.000079 (7.9E-05)	< 0.2
MW-104	9/26/2019	< 0.000053 (5.3E-05)	< 0.15
MW-106	9/26/2019	< 0.000065 (6.5E-05)	<0.18
MW-111	9/26/2019	< 0.00015 (1.5E-04)	<0.4

The hydraulic conductivity of MW-101 is significantly greater than the other four monitoring wells and likely not indicative of the subsurface conditions. The remaining four monitoring wells all indicate hydraulic conductivities of less than 0.4 feet/day. Silty sands such as are described at the Site are expected to exhibit a hydraulic conductivity on the order of 0.1 feet/day[4] which is the value we will use going forward.

From Figure 3, a hydraulic gradient of 0.025 ft/ft is calculated (4 ft/160 ft = 0.025 ft/ft). The average groundwater pore velocity can be calculated using a form of Darcy's law:

$V = ki/n$

where: V = average groundwater velocity
i = hydraulic gradient
n = porosity
k = horizontal hydraulic conductivity

Based on an estimated horizontal conductivity of 0.1 feet per day, a hydraulic gradient of 0.025 feet/foot, and an estimated porosity of 0.3, the average groundwater velocity through the silty sands above bedrock at the Site is estimated to be approximately 0.008 feet per day or on the order of 3 feet per year. We believe this groundwater flow velocity is conservative and the actual groundwater velocity is likely higher.

[3] Robbins,G.A, et. al., 2009, Determining hydraulic conductivity using pumping data from low flow sampling", Ground Water, Vol. 47, No. 2.
[4] Heath, R.C., 1983 "Basic Groundwater Hydrology", USGS Water Supply Paper 2220.

There are two main source areas for the TCE plume which discharges to the storm sewer, both of which were excavated to the extent considered feasible by EPA in 2015. These are the west grid and south grid excavation areas. Depth to bedrock where the groundwater plume from the south grid discharges to the storm sewer is approximately 10 feet and approximately 30 feet where the west grid plume discharges to the sewer. Concentrations of TCE in Site groundwater is indicative of the possible presence of dense non-aqueous phase liquid (DNAPL)[5]. The referenced EPA study indicates that a likelihood for chlorinated solvent DNAPL is indicated if groundwater concentrations exceed one percent of the solubility of the solvent. The solubility of TCE is listed as 1,100 mg/l. TCE has been detected in groundwater from monitoring wells in the west grid plume at concentrations exceeding one percent of this solubility (11 mg/l or 11,000 ug/l). Concentrations exceeding one percent have not been detected in groundwater from the south grid excavation plume.

As discussed in Section 9.1, the Kenwood Street storm sewer protrudes into the groundwater table approximately two feet. The groundwater flowing towards the stormwater sewer likely contains dissolved TCE to the depth of bedrock, below the invert depth of the storm sewer. The reason the TCE plume does not flow under the storm sewer is depicted graphically in diagrams from USGS Water Supply Paper 2220[4] (Appendix I). The storm sewer likely behaves as a stream since it is comprised of vitreous clay pipe with unsealed joints. Upgradient groundwater and to a lesser extent downgradient groundwater discharges to the storm sewer. The groundwater from depths below the storm drain invert containing TCE likely flows upward to discharge to the storm sewer rather than passing under it, so it does not impact the downgradient residential neighborhood.

10.0 DATA REPRESENTATIVENESS AND USEABILITY EVALUATION

As shown on Figures 3, 4, and 5, soil borings, groundwater monitoring wells and soil gas monitoring points have been extensive throughout the Site in both the source area and downgradient, including off-Site downgradient locations in Norwood Street and the residential neighborhood south of the Site. Discharge of impacted groundwater to the storm sewer system has been evaluated through sampling of the sewer to its discharge point in the Green River.

In addition, groundwater monitoring has been performed starting in 2012 through December 2019. The release conditions at the Site have likely been present for decades, and we have not observed significant changes in plume delineation. Variability was observed in the storm sewer samples and some adjacent monitoring wells, likely attributable to varying storm water flow. The extent of the release has been well defined and we see no significant data gaps.

Indoor air sampling was performed following installation of the two passive sub slab venting systems (PEPMM's). The sampling program followed MassDEP guidance on

[5] "Site Characterization Technologies for DNAPL Investigations" September 2004, US EPA, EPA 542-R-04-017.

demonstration of effectiveness for these types of systems and we see no significant data gaps in the indoor air monitoring program.

As required by 310 CMR 40.1056, a data quality assessment has been performed to document that the data relied upon is scientifically valid, defensible and of a sufficient level of precision, accuracy and completeness to support the Permanent Solution. This evaluation was based upon a review of results for soil, groundwater, storm water, soil gas and indoor air analyses and focused on:

- Holding times;
- Laboratory blanks;
- Laboratory control samples;
- Laboratory duplicates;
- Matrix spike recoveries; and
- Surrogate spike recoveries.

In performing this evaluation, we focused on the laboratory analyses performed for OTO at Spectrum and ConTest Laboratories between 2013 and 2019 and the EPA data collected in 2015. The samples collected by OTO were analyzed using MassDEP Compendium of Analytical Methods (CAM), and have presumptive certainty of approval. The EPA data were analyzed following EPA protocols. In general, we find that the samples were analyzed within specified holding times and were delivered to the laboratory at temperatures within the acceptable temperature range of 2 to 6 degrees Celsius (for soil and groundwater), or on ice on the day of collection, indicating that the samples were in the process of cooling down to the desired temperature when delivered to the laboratory. Laboratory method blanks analyzed with samples were free from contamination. Laboratory control sample (LCS) recoveries were within acceptance limits for the compounds of concern (COCs), which were cVOCs and metals. Laboratory control sample duplicate (LCSD) results compared well (low relative percent differences or RPD) indicating acceptable laboratory precision for the COCs at the Site.

Surrogate spikes are compounds added to each sample to evaluate sample-specific effects. Surrogates are evaluated based on their percent recovery (%R) which is optimally 100%, indicating the lab detected the entire amount of spike added to the sample. Generally, surrogate %Rs were within acceptance limits indicating good accuracy for each of the analyses. Based on the above information, the data are found to be of acceptable accuracy and precision, and are usable for project purposes.

11.0 ENVIRONMENTAL FATE AND TRANSPORT

The Phase II evaluation of the fate and transport of oil and/or hazardous materials at the Site is required to:

1. Evaluate the fate and transport characteristics of the oil and/or hazardous materials identified at the Site;

2. Identify and characterize existing and potential migration pathways for this material; and
3. Evaluate the potential for vapors of the material to impact indoor air of occupied structures.

11.1 FATE AND TRANSPORT

The contaminants of concern (COCs) at the Site are metals antimony, arsenic, lead and silver in soil, and the chlorinated solvent TCE in soil and groundwater and potentially indoor air. No significant concentrations of petroleum hydrocarbons have been detected in Site media. Metals are relatively insoluble as shown by the lack of detection of dissolved metals concentrations in Site groundwater. Metals in soils do not degrade appreciatively over time. The potential transport mechanism for the metals in soil would be physical movement through excavation. TCE in soil and groundwater is not expected to degrade significantly over time absent remedial efforts to encourage in-situ degradation. TCE will migrate with groundwater as shown by the TCE migrating to the Norwood Street storm sewer and is expected to present a potential vapor intrusion risk as has occurred at condominium units B1 and C.

11.2 MIGRATION PATHWAYS

Migration pathways for COCs at the Site are groundwater migration of TCE potentially following utility lines and vapor intrusion. These pathways have been evaluated through the storm sewer sampling and the sampling program performed in the residential neighborhood south of the Site. Off-Site migration of DNAPL is expected to be limited by the presence of glacial till over bedrock, which has been found to be at least five feet thick (monitoring wells MW-115 and MW-116).

11.3 VAPOR MIGRATION POTENTIAL

As described in Section 11.2, the potential vapor migration pathways have been evaluated at the Site and we are not aware of unexplored pathways of concern.

12.0 NATURE AND EXTENT OF OIL/HAZARDOUS MATERIALS

Two conditions which exceed MCP standards were identified at the Site. These are:

- Chlorinated volatile organic compounds (cVOCs - primarily TCE) in soil and groundwater; and
- Metals in shallow soil, primarily near the former cyclonic dust collectors.

The nature and extent of impacts are discussed in the following sections, by contaminant and medium.

12.1 CHLORINATED VOCS

12.1.1 Soil

Elevated concentrations of cVOCs remain in soil following the EPA excavations at the west grid and south grid areas. These two areas were excavated to depths of between two and four feet below grade by EPA in 2015 as described in Section 7.1. A total of 1,358 tons of soil was removed from these two areas and disposed off-Site. Each of the locations where cVOC have been detected in soil at concentrations above the Method 1 S-2/GW-2 standard were either in the western grid excavated area (LS-24) or the associated groundwater plume (LS-14, LS-17 or LS-19), or in the southern grid excavated area (LS-20 and MW-100).

As summarized in Table 20 and Section 7.1, for the two grid excavation areas:

- The average concentration for TCE in the soils from two to three feet below grade at the base of the western grid excavation location is approximately 3,000 ug/kg, approximately 10 times the Method 1 S-1 and S-2/GW-2 standard of 300 ug/kg; and
- The post excavation average concentration for TCE at the base of the southern grid excavation, from two to four feet below grade is approximately 8,000 ug/kg, over twenty times the Method 1 S-1 and S-2/GW-2 standard of 300 ug/kg.

Soils downgradient of the west grid excavation within the groundwater table (locations LS-14, LS-17, LS-19, MW-104 and MW-105) from depths of six to 12 feet below grade also contained TCE at concentrations above the Method 1 standards.

Based on the results of shallow soil sampling (either 0-0.5 feet or 0-1 feet) performed by EPA and OTO, we do not believe that there are Site soils within the upper one foot which are impacted with cVOCs remaining at the Site. cVOC impacted soils remain at depths of two to four feet at the two excavated areas.

12.1.2 Groundwater

Elevated concentrations of cVOCs were detected in Site groundwater, sourced from the west grid and south grid excavation areas. Concentrations of the principle cVOC (which is TCE) in groundwater downgradient of these two areas are above the Method 1 GW-2 standard and in some cases above the GW-3 standard. cVOCs present at lower concentrations in groundwater include tetrachloroethylene (PCE), cis-1,2-Dichloroethylene (DCE), and vinyl chloride. Groundwater below Unit B1 in eight of the nine ("LWP") monitoring wells installed below this building exceeded the GW-2 standard. The estimated lateral extent of the cVOC plume with TCE concentrations in groundwater at or potentially above the Method 1 GW-2 standard is shown on Figure 5. This plume is intercepted by the storm sewer system in Kenwood Street. Impacted groundwater emanating from the south grid excavation area is also intercepted by the storm water system.

The Site is not located in a current or potential drinking water source area. The primary exposure route of concern is intrusion of vapors volatilizing from groundwater. Assessments by MassDEP and EPA have not identified evidence of significant vapor intrusion related to the Disposal Site at downgradient residential properties. This exposure pathway at the Site has been eliminated through installation of the PEPMM's within Site buildings.

12.1.3 Surface Water

The plume of cVOCs in groundwater is intercepted by the Kenwood Street storm drain. The TCE concentration measured in catch basins CB-1 and CB-2 at times exceeds the MassDEP benchmark used for protection of aquatic organisms in surface water. There is the potential for Site-related cVOCs to be discharged to a surface water body (the Green River), at the storm drain outfall, which is approximately 1.5-miles further down the line. Sampling at the outfall did not identify cVOCs in water at the outfall. Conditions at the outfall may vary depending on the amount of rainfall and on the water table elevation. However the concentrations of TCE detected in the storm water in the sewer by the time it leaves the Site vicinity (as shown by the CB-9 data on Figure 6) is several orders of magnitude below the benchmark (or none detect) and are therefore unlikely to exceed the benchmark, due to dilution effects and volatilization of the VOCs along the length of the drain line.

12.1.4 Vapor Intrusion

cVOC concentrations in groundwater exceed MassDEP GW-2 standards in the vicinity of residences along Kenwood Street and Davis Street. Based on indoor air sampling at selected residences by MassDEP and EPA, in conjunction with soil gas analysis by EPA, vapor intrusion at off-Site residences does not appear to pose a significant risk. On-Site vapor intrusion has been controlled through installation of the PEPMMs.

12.2 METALS

Based on the EPA Site wide shallow soil sampling in 2015, OTO's soil sampling of the top six inches below the northern cyclonic unit in 2015 and OTO's soil sampling of the upper two feet in 2017 to prepare the RAM Plan to support redevelopment, the Site wide average for metals meets the S-1/GW-2 standard in the upper one foot of soil with three exceptions: Soils located below pavement in the southeast portion of the Site identified during the RAM explorations (SB-4 and SB-5) exhibited elevated antimony, lead and silver concentrations; soils below the former northern cyclonic dust collector (SS-01 on Table 6, which is a pre-excavation sample and samples in Table 5A after excavation) which exhibited elevated lead and silver; and the area between Units B1/B2 and C (SS-302, SS-311, SS-320 on Table 6 and HA-01, HA-3, HA-8 on Table 7 and SB-4 and SB-5 on Table 8) which exhibited elevated lead, silver and antimony. Locations SB-4 and SB-5 are paved as is the area between Units B1/B2 and C.

At the southern grid location, the average concentration for lead and arsenic exceed the S-1 and S-2/GW-2 Method 1 standard by a factor of two to three at the base of the excavation, from two to four feet below grade.

Data collected by OTO (Table 8) and data collected by EPA indicate deeper soils are not impacted by metals, with the exception of soils in the south grid excavation area, as discussed above.

Dissolved metals in Site groundwater are not a COC as shown by the lack of elevated metals concentrations in groundwater from Site monitoring wells (Table 11).

13.0 CONCEPTUAL SITE MODEL

A Conceptual Site Model (CSM) is a Site-specific description of how contaminants entered the environment, how contaminants have been and may be transported within the environment, and routes of exposure to human and environmental receptors, that provides a dynamic framework for assessing Site characteristics and risk, identifying and addressing data gaps and managing uncertainty, eliminating or controlling contaminant sources, developing and conducting response action strategies, and evaluating whether those strategies have been effective in achieving desired endpoints. At Sites where light nonaqueous phase liquid (LNAPL) is or may be present, this includes an assessment of LNAPL in subsurface strata. At this Site petroleum constituents are not a COC so the presence or migration of LNAPL is not a concern.

Site investigations have identified two release conditions at the Site that stem from former Site manufacturing operations. These are cVOCs (primarily TCE) in soil and groundwater and metals (arsenic, antimony, silver and lead) in shallow soil. The most highly impacted soils were excavated as part of an EPA removal program in 2015. Excavations were primarily in two areas, termed the west grid and south grid areas. Metals impacted soils below former cyclonic dust collectors were also excavated.

Excavation of the most highly contaminated surficial soils has resulted in an average concentration of metals in the upper one foot of soil which is less than the Method 1 S-1/ GW-2 and GW-3 standard, with three exceptions: Soils located below pavement in the southeast portion of the Site identified during the RAM explorations (SB-4 and SB-5) exhibited elevated antimony, lead and silver concentrations; soils below the former northern cyclonic dust collector (SS-01) which exhibited elevated lead and silver; and the area between condominium units B1/B2 and C (HA-01, HA-03 and HA-08) which exhibited elevated lead, silver and antimony. The average concentration for TCE in the soils from two to three feet below grade at the base of the west grid excavation location is approximately 3,000 ug/kg, approximately 10 times the Method 1 S-1 and S-2/GW-2 standard of 300 ug/kg. The post excavation average concentration for TCE at the base of the south grid excavation, from two to four feet below grade is approximately 8,000 ug/kg, over twenty times the Method 1 S-1 and S-2/GW-2 standard of 300 ug/kg. Lead and arsenic concentrations were also above the S-2 standard at the south grid post excavation.

A cVOC groundwater plume sourced from the Site is intercepted by the storm sewer in Kenwood Street, which limited southerly migration into the residential properties south of Kenwood Street. Indoor air testing by MassDEP and EPA is consistent with plume migration data, as indoor air testing has indicated residences south of Kenwood Street are not impacted. Sampling the storm sewer water indicates the TCE is intercepted but dissipates prior to the discharge point of the sewer at the Green River.

Two passive sub-slab venting systems (Passive Exposure Pathway Mitigation Measures or PEPMM's) were constructed at the Site below the buildings at condominium units B1 and C to control cVOC vapor intrusion. Indoor air monitoring to demonstrate the effectiveness of these systems indicate a condition of No Significant Risk for residential long-term inhalation risk. This is conservative, since the Site is a commercial medical facility.

The manufacturing history and remedial activities associated with Site redevelopment have resulted in a property with surficial soils (the top two feet) which generally meet Method 1 S-1 standards. However, elevated metals and cVOCs are present in fill and soils in places below this depth. Groundwater associated with the Site contains concentrations of cVOCs which present a potential vapor intrusion risk if additional Site development were to be performed without taking this condition into account.

14.0 SUMMARY OF RISK CHARACTERIZATION

A Method 3 Risk Characterization (including human health, environmental, public welfare and safety components) was performed for the Site at 298 Federal Street in Greenfield. The risk characterization was completed in accordance with the MCP 310 CMR 40.0000 and applicable MassDEP guidance and is summarized in this section and contained in Appendix J to this report.

The risk characterization assumed that as part of a future Permanent Solution, Site use would be restricted by a Notice of Activity and Use Limitation (AUL) to non-residential activities, similar to the current medical uses by adults. Children would be present at a low frequency and low intensity, but the Site would not be used as a residence, school, daycare or playground. The soils therefore meet the definition for S-2 soils. Exposure Point Concentrations (EPCs) were developed for Site soils, groundwater and indoor air and incorporated into the risk characterization. Potential exposure to storm water containing TCE in the Kenwood Street sewer by construction workers was qualitatively evaluated.

The Method 3 Risk Characterization concluded that a condition of NSR was not concluded for unrestricted Site use and an AUL was required. In addition to limiting current and future Site use to non-residential, the AUL would require that the passive sub slab venting systems (the Passive Exposure Pathway Mitigation Measures or PEPMMs) below Site buildings be maintained, that a health and safety plan and soil management plan be developed by an LSP prior to construction which involves soil excavation below paved

areas and that if new building construction occurs on the Site, the building construction will include a system to control potential vapor migration into the building.

It was the conclusion of each portion of the risk characterization (human health, environmental, public welfare and public safety) that a condition of No Significant Risk has been reached under current and future conditions for Site visitors, workers and utility/construction workers. These conclusions of the risk characterization are contingent upon limitations to Site use through recording an AUL for the Site.

The proposed AUL would be incorporated into the final Permanent Solution with Conditions (PSC) statement and would:

1. Limit current and future use to non-residential;
2. Require maintenance of building conditions that ensure a condition of No Significant Risk;
3. Maintains the integrity of the PEPMMs;
4. Ensures any future building construction incorporates measures to evaluated the potential for and control of potential vapor intrusion; and
5. Requires any future disturbance of soils below the pavement to be performed under a Soil Management Plan and Health and Safety Plan.

15.0 FEASIBILITY EVALUATION

As required in 310 CMR 40.1056(2)(g), a Permanent Solution would be required to evaluate the feasibility of reaching or approaching background. The contaminants of concern at the Site consist of metals (antimony, arsenic, lead and silver) and cVOCs (principally TCE) in soils and cVOCs (TCE) in groundwater. In evaluating the feasibility of reaching or approaching background conditions, we refer to the MassDEP guidance policy on feasibility evaluations[6]. That policy indicates that it is MassDEP's position that achieving or approaching background can be deemed infeasible for persistent contaminants in soils with lower exposure potential (i.e. S-2 and S-3 soil categories). This is the case at the Site since metals such as lead and arsenic and cVOCs such as TCE are classified as persistent contaminants in the policy.

With respect to the TCE contamination in Site groundwater, the referenced guidance policy indicates that the TCE is a persistent contaminant, and as such, requires a Site-specific evaluation of the feasibility of achieving or approaching background. To be considered to have approached background, the concentration of the dissolved chlorinated solvents in each exposure point (monitoring well) would need to be reduced to ½ the applicable GW-2 standard. The guidance indicates that it is assumed that at least one remedial action alternative exists to achieve or approach background, and the only

[6] MassDEP policy WSC-04-160 "Conducting Feasibility Evaluations Under the MCP"

remaining issue is whether the costs of implementing this alternative is justified by the benefits. For the Site, the most cost-effective remedial solution would be an in-situ method. Since groundwater below both buildings with passive sub-slab venting systems contain TCE at concentrations above the GW-2 standard, any remediation which entails excavations under these permanent structures would be categorically infeasible.

The MassDEP feasibility policy indicates that it will be considered to be feasible to approach background if the additional costs to remediate beyond No Significant Risk (NSR) to approach background are less than 20 percent of the cost to remediate to No Significant Risk. The release condition at the Site will achieve NSR upon implementation of the notice of Activity and Use Limitation as described in Section 14.0.

The contractor who redeveloped the Site (Vass Builders LLC of Springfield, Massachusetts) has provided an estimate of the cost for environmental aspects of the Site redevelopment (installation and testing the PEPMMs, excavation and disposal of the soils from below the condominium unit C vapor degreaser) which is attached in Appendix L. As shown, these costs were $907,000.

To evaluate a cost to achieve background conditions at the Site we contacted Regenesis, a nationally recognized leader in in-situ remediation methods. Regenesis provided a cost estimate to remediate the entire Site through in-situ injections using an emulsifying agent, biologic enhanced reductive dichlorination and abiotic in-situ chemical reduction. With permission, the estimate is attached in Appendix L. The estimate includes a number of assumptions. These include a treatment area of approximately two acres using over 900 injection points at 10 foot centers at a cost of over two million dollars. The Regenesis estimate also includes a cost to perform a similar injection program along the southern property boundary as a barrier to impede the TCE plume from entering the sewer, at an estimated cost of over $400,000. These costs do not include report preparation fees and there is risk that a single injection would not achieve the desired effect. In any case, the cost to achieve background conditions would be well above 20% of the cost to achieve No Significant Risk.

16.0 PROPOSED PERMANENT SOLUTION WITH CONDITIONS STATEMENT

Response actions were taken at the former Lunt Silversmiths property located at 298 Federal Street in Greenfield to address releases of cVOCs (primarily trichloroethylene or TCE) and metals. Release response activities have consisted of the assessment of the chemical constituents in soil, groundwater, soil gas and indoor air followed by remediation. Remedial activities consisted of excavation of the most heavily impacted soils and installation of two passive sub slab venting systems (PEPMM's) below two of the occupied Site buildings.

Based on a Method 3 Risk Characterization, Site conditions have been found to pose No Significant Risk to human health, welfare, safety or the environment as defined in the Massachusetts Contingency Plan (MCP), subject to the restrictions in use as described in the proposed Activity and Use Limitation (AUL), summarized in Section 14.0. In our

opinion, conditions at the Site are consistent with a Permanent Solution with Conditions (PSC). This conclusion is based on the achievement of a condition of No Significant Risk subject to the limitations of future Site use as described in the AUL. The boundaries of the Disposal Site subject to the proposed PSC and the AUL are shown on Figure 2.

If future redevelopment and/or construction activities occur within the boundaries of the Disposal Site and involve excavation and relocation of Site soils, then proper soil management would be required as described in the proposed AUL, subject to a soil management plan and LSP oversight.

The MCP requires that certain public officials be notified of submittal of this report and Site conditions. Copies of public notification letters are attached in Appendix M.

TABLES

Table 1 - Current and Planned Site Use - October, 2019

Unit	*Program*	*Tenant*	*Program Description*	*Duration*	*Clients*
A1	Dept. Transitional Assistance	DTA*	Business use	Day use only	35
A2/B2	Crisis Team	CSO**	Staff take walk-ins for crisis evaluations	Day use only	Varies
A2/B2	Intensive Outpatient Program	CSO	Support groups for public and residents	Day use only	Varies
A2/B2	Respite	CSO	Emergency services short-stay program for people experiencing mental health disorders	3-10 days	12
B1	Franklin Recovery Center	BHN***	Medically assisted detox	7 days	32
B1	Northern Hope Center	BHN	Clinical stabilization program (post-detox)	17-25 days	32
C	Unity Place	BHN	Enhanced residential program for people experiencing co-occurring substance use and mental health disorders	90 days	16
C	Connections	BHN	Residential program for individuals diagnosed with substance use as a diversion to incarceration	90 days	32

* DTA is Department of Transitional Assistance
**CSO is Clinical Support Options
***BHN is Behavioral Health Network

Table 2
Soil Analytical Results
Volatile Organic Compounds (VOCs)
Concentrations in mg/kg
298 Federal Street
Greenfield, MA

Sample No.:	LS-14	LS-17	LS-19	LS-20	LS-24		LS-27	LS-30	MW-100	MW-101	MW-102	MW-103	MW-104	MW-105	MW-106	MW-108	MW-109	MW-113	Method 1 Standards						UCLs
Depth (feet):	6-8	6-8	7-9	1-3	0-4	6-8	0-2	6-8	7.5-10	10-12.5	10-12.5	10-12.5	10-12.5	5-7.5	2.5-5	5-7.5	7.5-10	5-7.5	S-1 / GW-2	S-1 / GW-3	S-2 / GW-2	S-2 GW-3	S-3 GW-2	S-3 GW-3	
Date Collected:	1/11/12	1/11/12	1/12/12	1/12/12	2/21/12	2/21/12	2/21/12	2/21/12	3/1/13	3/1/13	3/1/13	3/1/13	3/1/13	3/1/13	3/1/13	3/1/13	3/1/13	3/1/13							
PID Reading (ppmv):	53	24	55	1.3	24	55	11	4.6	8.4	0.3	1.3	0.4	417	6.9	0.3	0.1	0.1	0.1	NS	NS	NS	NS	NS	NS	NS
Acetone	< 0.069	0.092	< 0.086	< 24.5	< 30	< 0.92	< 0.93	< 0.86	<0.15	<0.074	<0.18	<0.096	<0.11	<0.11	<0.084	<0.18	<0.07	<0.069	50	400	50	400	50	400	10,000
cis-1,2-Dichloroethylene	< 0.007	**0.301**	**8.81**	**15.3**	< 3	< 0.092	< 0.093	< 0.086	<0.15	<0.074	<0.18	<0.096	<0.11	**1.5**	<0.084	<0.18	<0.07	<0.069	0.1	100	0.1	500	0.4	500	5,000
trans-1,2-Dichloroethylene	< 0.007	< 0.009	0.052	< 2.45	< 3	< 0.092	< 0.093	< 0.086	<0.15	<0.074	<0.18	<0.096	<0.11	<0.11	<0.084	<0.18	<0.07	<0.069	1	500	1	1,000	1	3,000	10,000
Tetrachloroethylene	0.278	0.203	3.57	< 2.45	**29.4**	2.02	< 0.093	< 0.086	<0.15	<0.074	<0.18	<0.096	<0.11	<0.11	<0.084	<0.18	<0.07	<0.069	10	30	10	200	10	1,000	10,000
Trichloroethylene	**2.18**	**4.36**	**43.1**	**128**	**167**	**7.74**	< 0.093	< 0.086	**0.46**	0.099	<0.18	0.099	**1.4**	**0.68**	<0.084	<0.18	<0.07	<0.069	0.3	30	0.3	60	0.3	60	600
Vinyl Chloride	< 0.007	0.038	< 0.009	< 2.45	< 3	< 0.092	< 0.093	< 0.086	<0.15	<0.074	<0.18	<0.096	<0.11	<0.11	<0.084	<0.18	<0.07	<0.069	0.7	1	0.7	7	0.7	60	600
				Excavated																					

NOTES:
1. Concentrations in milligrams per kilogram (mg/kg, or parts per million) on a dry weight basis. Samples shown shaded were subsequently excavated.
2. "<" indicates not detected; value is sample-specific quantitation limit.
3. MCP Method 1 soil standards from 310 CMR 40.0975(6).
4. "NS" = No standard.
5. Values shown in **bold** exceed Method 1 standards.
6. "PID"=Photoionization detector soil headspace measurement in parts per million by volume.
7. Only analytes detected in at least one sample are shown; refer to laboratory reports for full analyte listing.
8. Bolded values indicated concentrations that exceed the Method 1 Standards.
9. Locations subsequently excavated are shown shaded.

Table 3
Soil Analytical Results
Volatile and Extractable Petroleum Hydrocarbons (VPH/EPH)
Concentrations in mg/kg
298 Federal Street
Greenfield, MA

										EXCAVATED												
Sample No.:	**LS-6**	**LS-7**	**LS-8**	**LS-9**	**LS-11**	**LS-14**	**LS-15**	**LS-17**	**LS-19**	**LS-24**		**LS-27**		**LS-30**	**Transformer**	**Method 1 Standards**						**UCLs**
Depth (feet):	4-6	2-4	4-6	5-6	4-6	6-8	4-6	6-8	7-9	0-4	6-8	0-2	6-8	6-8	0-1	**S-1 / GW-2**	**S-1 / GW-3**	**S-2 / GW-2**	**S-2 GW-3**	**S-3 GW-2**	**S-3 GW-3**	
Date Collected:	1/11/12	1/11/12	1/11/12	1/11/12	1/11/12	1/11/12	1/11/12	1/11/12	1/12/12	2/21/12	2/21/12	2/21/12	2/21/12	2/21/12	3/15/12							
PID Reading (ppmv):	0	7.2	0	159	0	53	0	24	55	24	55	11	0.4	4.6	4.6	NA	NA	NA	NA	NA	NA	NA
VPH Fractions																						
C5-C8 Aliphatics	---	---	---	21.6	---	< 1.5	---	2.41	16.4	---	---	---	---	4.87	---	100	100	500	500	500	500	5,000
C9-C12 Aliphatics	---	---	---	153	---	< 0.5	---	< 0.59	< 0.74	---	---	---	---	19.5	---	1,000	1,000	3,000	3,000	5,000	5,000	20,000
C9-C10 Aromatics	---	---	---	54	---	< 0.5	---	< 0.59	< 0.74	---	---	---	---	5.82	---	100	100	500	500	500	500	5,000
VPH Target Compounds																						
Benzene	---	---	---	< 0.5	---	< 0.1	---	< 0.1	< 0.1	---	---	---	---	< 0.09	---	40	40	200	200	400	1,000	10,000
Ethylbenzene	---	---	---	< 0.5	---	< 0.1	---	< 0.1	< 0.1	---	---	---	---	< 0.09	---	500	500	1,000	1,000	1,000	3,000	10,000
Methyl tert-butyl ether	---	---	---	< 0.5	---	< 0.1	---	< 0.1	< 0.1	---	---	---	---	< 0.09	---	100	100	100	500	100	500	5,000
Naphthalene	---	---	---	< 0.5	---	< 0.1	---	< 0.1	< 0.1	---	---	---	---	< 0.09	---	20	500	20	1,000	20	3,000	10,000
Toluene	---	---	---	< 0.5	---	< 0.1	---	< 0.1	< 0.1	---	---	---	---	< 0.09	---	500	500	1,000	1,000	2,000	3,000	10,000
Xylenes (total)	---	---	---	< 1.5	---	< 0.3	---	< 0.3	< 0.3	---	---	---	---	< 0.29	---	100	500	300	1,000	300	3,000	10,000
EPH Fractions																						
C9-C18 Aliphatics	< 13	< 12	< 12	981	< 12	< 12	< 12	< 13	< 13	38	< 12	< 11	< 13	< 11	< 12	1,000	1,000	3,000	3,000	5,000	5,000	20,000
C19-C36 Aliphatics	< 13	< 12	< 12	< 13	< 12	< 12	< 12	< 13	< 13	44	< 12	< 11	< 13	< 11	< 12	3,000	3,000	5,000	5,000	5,000	5,000	20,000
C11-C22 Aromatics	< 13	< 12	< 12	104	< 12	< 12	< 12	< 13	< 13	48	< 12	< 11	< 13	< 11	< 12	1,000	1,000	3,000	3,000	5,000	5,000	10,000
EPH Target Compounds																						
Naphthalene	< 0.42	< 0.38	< 0.40	< 0.42	< 0.39	< 0.40	< 0.40	< 0.42	< 0.43	< 0.38	< 0.41	< 0.38	< 0.43	< 0.38	< 0.39	20	500	40	1,000	40	3,000	10,000
2-Methylnaphthalene	< 0.42	< 0.38	< 0.40	< 0.42	< 0.39	< 0.40	< 0.40	< 0.42	< 0.43	< 0.38	< 0.41	< 0.38	< 0.43	< 0.38	< 0.39	80	300	80	500	80	500	5,000
Acenaphthylene	< 0.42	< 0.38	< 0.40	< 0.42	< 0.39	< 0.40	< 0.40	< 0.42	< 0.43	< 0.38	< 0.41	< 0.38	< 0.43	< 0.38	< 0.39	600	10	600	10	600	10	10,000
Acenaphthene	< 0.42	< 0.38	< 0.40	< 0.42	< 0.39	< 0.40	< 0.40	< 0.42	< 0.43	< 0.38	< 0.41	< 0.38	< 0.43	< 0.38	< 0.39	1,000	1,000	3,000	3,000	5,000	5,000	10,000
Fluorene	< 0.42	< 0.38	< 0.40	< 0.42	< 0.39	< 0.40	< 0.40	< 0.42	< 0.43	< 0.38	< 0.41	< 0.38	< 0.43	< 0.38	< 0.39	1,000	1,000	3,000	3,000	5,000	5,000	10,000
Phenanthrene	< 0.42	< 0.38	< 0.40	< 0.42	< 0.39	< 0.40	< 0.40	< 0.42	< 0.43	< 0.38	< 0.41	< 0.38	< 0.43	< 0.38	< 0.39	500	500	1,000	1,000	3,000	3,000	10,000
Anthracene	< 0.42	< 0.38	< 0.40	< 0.42	< 0.39	< 0.40	< 0.40	< 0.42	< 0.43	< 0.38	< 0.41	< 0.38	< 0.43	< 0.38	< 0.39	1,000	1,000	3,000	3,000	5,000	5,000	10,000
Fluoranthene	< 0.42	< 0.38	< 0.40	< 0.42	< 0.39	< 0.40	< 0.40	< 0.42	< 0.43	0.48	< 0.41	< 0.38	< 0.43	< 0.38	< 0.39	1,000	1,000	3,000	3,000	5,000	5,000	10,000
Pyrene	< 0.42	< 0.38	< 0.40	< 0.42	< 0.39	< 0.40	< 0.40	< 0.42	< 0.43	0.38	< 0.41	< 0.38	< 0.43	< 0.38	< 0.39	1,000	1,000	3,000	3,000	5,000	5,000	10,000
Benzo(a)anthracene	< 0.42	< 0.38	< 0.40	< 0.42	< 0.39	< 0.40	< 0.40	< 0.42	< 0.43	< 0.38	< 0.41	< 0.38	< 0.43	< 0.38	< 0.39	7	7	40	40	300	300	3,000
Chrysene	< 0.42	< 0.38	< 0.40	< 0.42	< 0.39	< 0.40	< 0.40	< 0.42	< 0.43	0.54	< 0.41	< 0.38	< 0.43	< 0.38	< 0.39	70	70	400	400	3,000	3,000	10000
Benzo(b)fluoranthene	< 0.42	< 0.38	< 0.40	< 0.42	< 0.39	< 0.40	< 0.40	< 0.42	< 0.43	0.49	< 0.41	< 0.38	< 0.43	< 0.38	< 0.39	7	7	40	40	300	300	3,000
Benzo(k)fluoranthene	< 0.42	< 0.38	< 0.40	< 0.42	< 0.39	< 0.40	< 0.40	< 0.42	< 0.43	< 0.38	< 0.41	< 0.38	< 0.43	< 0.38	< 0.39	70	70	400	400	3,000	3,000	10,000
Benzo(a)pyrene	< 0.42	< 0.38	< 0.40	< 0.42	< 0.39	< 0.40	< 0.40	< 0.42	< 0.43	< 0.38	< 0.41	< 0.38	< 0.43	< 0.38	< 0.39	2	2	4	4	30	30	300
Indeno(1,2,3-cd)pyrene	< 0.42	< 0.38	< 0.40	< 0.42	< 0.39	< 0.40	< 0.40	< 0.42	< 0.43	< 0.38	< 0.41	< 0.38	< 0.43	< 0.38	< 0.39	7	7	40	40	300	300	3,000
Dibenzo(a,h)anthracene	< 0.42	< 0.38	< 0.40	< 0.42	< 0.39	< 0.40	< 0.40	< 0.42	< 0.43	< 0.38	< 0.41	< 0.38	< 0.43	< 0.38	< 0.39	0.7	0.7	4	4	30	30	300
Benzo(g,h,i)perylene	< 0.42	< 0.38	< 0.40	< 0.42	< 0.39	< 0.40	< 0.40	< 0.42	< 0.43	0.38	< 0.41	< 0.38	< 0.43	< 0.38	< 0.39	1,000	1,000	3,000	3,000	5,000	5,000	10,000

NOTES:
1. Concentrations in mg/kg (parts per million) on a dry weight basis. Samples shown shaded were subsequently excavated.
2. "<" indicates not detected; value is sample-specific quantitation limit.
3. MCP Method 1 soil standards from 310 CMR 40.0975(6).
4. "PID"=Photoionization detector soil headspace measurement in parts per million by volume.
5. "---" indicates not analyzed for this parameter.
6. Locations subsequently excavated are shown shaded.

Table 4
Soil Analytical Results
Polychlorinated Biphenyls (PCBs)
Concentrations in mg/kg
298 Federal Street
Greenfield, MA

Sample No.:	LS-14	LS-15	Transformer	Method 1 Standards	
Depth (feet):	0-2	0-2	0-1	S-1 / GW-2	S-1 / GW-3
Date Collected:	1/11/12	1/11/12	3/15/12		
PCBs (total)	< 0.022	< 0.023	< 0.024	1	1

NOTES:
1. Concentrations in mg/kg (parts per million) on a dry weight basis.
2. "<" indicates not detected; value is sample-specific quantitation limit.
3. MCP Method 1 soil standards from 310 CMR 40.0975(6).

Table 5
Soil Analytical Results: Manufacturing Area
Inorganic Analytes
Concentrations in mg/kg
298 Federal Street

Greenfield, MA

			Excavated			Excavated				
Sample No.:	**LS-14**	**LS-15**	**LS-20**	**LS-24**	**LS-27**	**LS-29**		**MassDEP**	**MassDEP**	**S-1 /**
Depth (feet):	0-2	0-2	1-3	0-4	0-2	0-1	1-2	**Natural Soil**	**Ash Fill**	**GW-2,3**
Date Collected:	1/11/12	1/11/12	1/12/12	2/21/12	2/21/12	2/21/12	2/21/12	**Background**	**Background**	**Standard**
Aluminum	8,220	9,410	4,700	6,180	8,120	12,900	5,290	10,000	10,000	NS
Antimony	< 4.9	< 5.5	**113**	5.28	< 5.4	10.5	9.3	1	7	20
Arsenic	3.16	6.02	**37.5**	16.5	3.0	7.6	6.03	20	20	20
Barium	18.2	34.8	83.9	50.7	7.1	179	42.6	50	50	1,000
Beryllium	< 0.49	< 0.55	< 0.54	< 0.49	< 0.54	< 0.56	< 0.54	0.4	0.9	90
Cadmium	1.26	6.96	< 0.54	1.03	< 0.54	1.28	< 0.54	2	3	70
Calcium	323	931	2,250	1,240	767	1,200	737	NA	NA	NS
Chromium (VI or total)*	13	15.9	12.5	46.4	11.2	22.3	8.65	30	40	100
Cobalt	3.97	4.63	4.86	6.24	3.2	9.9	3.55	4	4	NS
Copper	85	97.7	344	139	5.2	**1,770**	321	40	200	NS
Iron	14,400	16,400	25,700	33,400	14,700	24,300	9,750	20,000	20,000	NS
Lead	25.8	50.7	**3,760**	**272**	4.9	**494**	**512**	100	600	200
Magnesium	1,960	2,330	2,000	2,170	2,190	4,510	1,590	5,000	5,000	NS
Manganese	126	191	239	145	89	373	139	300	300	NS
Mercury	0.18	0.22	0.33	1.43	< 0.03	0.26	0.11	0.3	1	20
Nickel	77.8	53.2	14.8	20.6	9.6	29.3	11	20	30	600
Potassium	422	424	842	470	375	2,090	844	NA	NA	NS
Selenium	< 1.5	< 1.6	< 2.7	< 1.5	< 1.6	< 1.7	< 1.6	0.5	1	400
Silver	36	**101**	33.4	91.7	< 1.6	**195**	**109**	0.6	5	100
Sodium	25	28.5	152	53	57	72.5	48.8	NA	NA	NS
Thallium	< 2.9	< 3.3	< 3.2	< 3.7	< 3.2	< 3.4	< 3.2	0.6	5	8
Vanadium	18	36	28	24	15	51	19	30	30	400
Zinc	47	83	57	73	22	1,810	166	100	300	1,000

NOTES:
1. Concentrations in milligrams per kilogram (mg/kg, or parts per million) on a dry weight basis. Samples shown shaded were subsequently exc
2. "<" indicates not detected; value is sample-specific quantitation limit.
3. MCP Method 1 soil standards from 310 CMR 40.0975(6).
4. Background values from MassDEP "Technical Update: Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil", May 23,

* Per the 4/06 MCP, chromium is assumed to be hexavalent unless testing is done to prove otherwise.
5. Locations subsequently excavated are shown shaded.

Table 5A
Soil Analytical Results - Below Former North Cyclone
Inorganic Analytes
Concentrations in mg/kg
298 Federal Street
Greenfield, MA

Sample No.:	S1	S2	S3	S4	S5	S6	S7	S8	S9	Average	MassDEP	S-1 /	S-2 /	S-3 /
Depth (feet):	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	Conc	Natural Soil	GW-2,3	GW-2,3	GW-2,3
Date Collected:	10/26/2015	10/26/2015	10/26/15	10/26/15	10/26/15	10/26/15	10/26/15	10/26/15	10/26/15		Background	Standard	Standard	Standard
Antimony	4.7	4	3.1	5.2	3.4	4.9	4.8	4.4	4.3	4	1	20	30	30
Arsenic	10	6.4	7.3	6.2	4.7	5.4	5.3	< *3*	3.7	6	20	20	20	50
Lead	110	110	14	200	24	**460**	110	**290**	120	160	100	200	600	600
Silver	**180**	**190**	**190**	**180**	**180**	**190**	**210**	**230**	**210**	196	0.6	100	200	200

NOTES:
1. Concentrations in milligrams per kilogram (mg/kg, or parts per million) on a dry weight basis.
2. Concentrations shown in "<" indicates not detected; value is sample-specific quantitation limit.
3. MCP Method 1 soil standards from 310 CMR 40.0975(6).
4. Values shown in **bold** exceed Method 1 standards.

Table 6							
Pre-Excavation Site Wide Samples from top 0.5 feet by EPA							
	Sample	**TCE (ug/kg)**	**PCE(ug/kg)**	**Pb (mg/kg)**	**As(mg/kg)**	**Ag (mg/kg)**	**Comments**
	SS-301	*20*	*10*	**700**	*23*	*	excavated
	SS-302	*20*	*10*	**320**	19	*	
	ss-303	6	*10*	69	**36**	*	excavated
	SS-304	*20*	*10*	**1,000**	*23*	*	excavated
	SS-305	*20*	*10*	97	*18*	*	
	SS-306	**630**	*10*	66	*8*	*	excavated
	SS-307	*20*	*10*	**1,200**	**53**	*	excavated
	SS-308	**59,000**	6,800	**1,100**	**43**	*	excavated
	SS-309	**4,500**	450	150	13	*	excavated
	SS-311	230	16	**230**	*13*	*	
	SS-312	*20*	*10*	100	*8*	*	
	SS-313	27	*10*	180	*12*	*	
	SS-314	*20*	*10*	87	*9*	*	
	SS-315	*20*	*10*	200	*12*	*	
	SS-316	*20*	*10*	50	*7*	*	
	SS-317	140	59	100	*8*	*	
	SS-318	6	*10*	150	12	*	
	SS-319	*20*	*10*	65	8	*	
	SS-320	*20*	*10*	**490**	*17*	*	
	SS-321	*20*	*10*	140	11	*	
	SS-322	*20*	*10*	44	*7*	*	
	SS-323	*20*	*10*	150	*10*	*	
	SS-324	*20*	*10*	60	*7*	*	
	SS-325	*20*	*10*	**280**	*14*	*	excavated
	SS-326	*20*	*10*	**2,600**	**55**	*	excavated
	SS-01	*100*	*100*	32	*5*	860	excavated
	SS-02	*70*	*70*	25	*5*	26	
	SS-03	*84*	*84*	36	*5*	18	
	SS-04	*75*	*75*	130	9	130	
	SS-05	*83*	*83*	48	*5*	22	
	SS-06	*57*	*57*	**730**	*10*	1,400	excavated
	SS-07	*65*	*65*	24	*6*	60	
	SS-08	*75*	*75*	130	*6*	68	
	SS-09	110	*82*	**310**	*8*	270	excavated
	SS-10	*120*	*120*	140	*6*	50	
Averages		**1,878**	238	**321**	15	**290**	
Sample results shown in *italics* indicates the result is the analytical detection limit (non-detect)							
S-1GW-2		300	10,000	200	20	100	
S-1GW-3		300	10,000	200	20	100	
S-2GW-2		300	10,000	600	20	200	
S-2GW-3		60,000	200,000	600	20	200	
Red = Mobil lab analyses							
Black = North Chelmsford Laboratory Analyses							
* Silver not analyzed in all samples							

Notes:

1. Soil samples collected between May and August 2015. Samples shown in red were analyzed in EPA's Office of Environmental Measurement and Evaluation (OEME) mobil laboratory. Samples shown in black were analyzed in EPA's OEME laboratory in North Chelmsford, MA. Analyses by GC/MS for VOCs and XRF for metals.

Table 7
Shallow Soil Analytical Results for Construction RAM
Inorganic Analytes
Concentrations in mg/kg
Former Lunt Property
Greenfield, MA

Sample No.:	**HA-01**	**HA-1-N-13.5'**	**HA-02**	**HA-03**	**HA-3-N-12'**	**HA-04**	**HA-05**	**HA-06**	**HA-07**	**HA-08**	**S-1 / GW-2,3 Standard**	**S-2 / GW-2,3 Standard**	**S-3 / GW-2,3 Standard**
Depth (feet):	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2			
Date Collected:	8/3/17	8/11/17	8/3/17	8/3/17	8/11/17	8/3/17	8/3/17	8/3/17	8/3/17	8/3/17			
Antimony	ND (2.7)	ND (2.6)	ND (2.7)	ND (2.7)	ND (2.7)	ND (2.6)	ND (2.7)	ND (2.6)	ND (2.7)	**33**	20	30	30
Arsenic	7.1	8.6	6.3	4.6	**26**	4.3	6.1	5.8	3.1	6.0	20	20	50
Lead	53	**350**	94	200	170	23	110	96	5.5	**710**	200	600	600
Silver	**120**	**110**	37	76	82	19	55	84	0.56	**140**	100	200	200

Sample No.:	**HA-8-E-27'**	**HA-8-S-12'**	**HA-8-W-23'**	**HA-09**	**HA-10**	**HA-11**	**HA-12**	**HA-13**	**HA-14**	**HA-15**	**S-1 / GW-2,3 Standard**	**S-2 / GW-2,3 Standard**	**S-3 / GW-2,3 Standard**
Depth (feet):	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2			
Date Collected:	8/11/17	8/11/17	8/11/17	8/3/17	8/3/17	8/3/17	8/3/17	8/3/17	8/3/17	8/3/17			
Antimony	**ND (2.7)**	ND (2.8)	ND (2.8)	ND (2.7)	ND (2.6)	ND (2.6)	ND (2.9)	ND (3.0)	ND (2.8)	ND (2.7)	20	30	30
Arsenic	4.8	2.9	4.4	4.4	6.4	6.7	4.0	4.3	5.0	5.0	20	20	50
Lead	82	54	97	120	85	89	37	32	95	49	200	600	600
Silver	56	47	86	62	43	43	16	11	31	18	100	200	200

NOTES:
1. Concentrations in milligrams per kilogram (mg/kg, or parts per million) on a dry weight basis.
2. "<" indicates not detected; value is sample-specific quantitation limit.
3. MCP Method 1 soil standards from 310 CMR 40.0975(6).
4. Background values from MassDEP "Technical Update: Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil", May 23, 2002.
5. Values shown in **bold** exceed Method 1 S-1 standards.
6. "NA" = Not applicable or not available. "NS" indicates no standard.
7. "---" indicates not analyzed for this parameter.

Table 8
Soil Boring Analytical Results from Construction RAM
Inorganic Analytes
Concentrations in mg/kg
Former Lunt Property
Greenfield, MA

Sample No.:	**SB-1**		**SB-2**		**SB-3**		**SB-4 - paved**		**S-1 / GW-2,3 Standard**	**S-2 / GW-2,3 Standard**	**S-3 / GW-2,3 Standard**	**UCLs**
Depth (feet):	0-2	2-5	0-2	2-5	0-2	2-5	0-2	2-4				
Date Collected:	8/11/17	8/11/17	8/11/17	8/11/17	8/11/17	8/11/17	8/11/17	8/11/17				
Antimony	ND (2.6)	ND (2.9)	ND (2.6)	ND (3.1)	ND (3.0)	ND (2.9)	**23**	ND (2.9)	20	30	30	300
Arsenic	ND (2.6)	ND (2.9)	ND (2.6)	ND (3.1)	4.9	ND (2.9)	20	3.6	20	20	50	500
Lead	3.7	18	9.6	11	44	2.9	**950**	5.1	200	600	600	6,000
Silver	ND (0.52)	15	2.6	1.8	2.4	ND (0.57)	**170**	ND (0.58)	100	200	200	2,000

Sample No.:	**SB-5 - Paved**		**SB-6**		**SB-7**		---	---	**S-1 / GW-2,3 Standard**	**S-2 / GW-2,3 Standard**	**S-3 / GW-2,3 Standard**	**UCLs**
Depth (feet):	0-2	2-4	0-2	2-5	0-2	2-5	---	---				
Date Collected:	8/11/17	8/11/17	8/11/17	8/11/17	8/11/17	8/11/17	---	---				
Antimony	**31**	ND (2.6)	ND (3.0)	ND (3.0)	ND (2.5)	ND (2.8)	---	---	20	30	30	300
Arsenic	8.5	ND (2.6)	ND (3.0)	ND (3.0)	ND (2.5)	4.1	---	---	20	20	50	500
Lead	**1,700**	4.3	30	3.9	15	7.4	---	---	200	600	600	6,000
Silver	**160**	ND (0.53)	9.8	ND (0.59)	5.7	ND (0.56)	---	---	100	200	200	2,000

NOTES:
1. Concentrations in milligrams per kilogram (mg/kg, or parts per million) on a dry weight basis.
2. "ND" indicates not detected with the method detection limit in parentheses.
3. MCP Method 1 soil standards from 310 CMR 40.0975(6).
4. Background values from MassDEP "Technical Update: Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil", May 23, 2002.
5. Values shown in **bold** exceed Method 1 standards.
6. "NA" = Not applicable or not available. "NS" indicates no standard.
7. "---" indicates no sample in this data column.

Table 9 (1 of 3)
Groundwater Analytical Results
Volatile Organic Compounds (VOCs)
Concentrations in ug/l
298 Federal Street
Greenfield, MA

Well No.:	**LS-10**	**LS-19**			~~**LS-20**~~		**LS-21**		**LS-22**			**LS-23**			**LS-24**		**GW-2**	**GW-3**	
Sample Date:	1/19/12	1/19/12	3/13/13	10/24/19	1/19/12	8/9/18	2/28/12	3/13/13	2/28/12	3/13/13	9/26/19	2/28/12	3/13/13	9/26/19	2/28/12	3/13/13	**Standard**	**Standard**	**UCLs**
Acetone	< 10	< 20,000	<100	<10	< 50	<10	< 10	--	35	--	--	72	--	---	10	--	50,000	50,000	100,000
2-Butanone (MEK)	< 10	< 20,000	<100	NA	< 50	<10	25	--	120	--	--	300	--	---	10	--	50,000	50,000	100,000
n-Butylbenzene	< 10	< 20,000	<100	NA	< 5	<1	< 1	--	< 1	--	--	< 1	--	---	3.4	--	NS	NS	10,000*
sec-Butylbenzene	< 10	< 20,000	<100	NA	< 5	<1	< 1	--	< 1	--	--	< 1	--	---	5.6	--	NS	NS	10,000*
1,1-Dichloroethane	< 10	< 20,000	<100	<10	< 5	<1	< 1	<1	< 1	<1	<1	< 1	< 1	<1	1.2	<250	2,000	20,000	100,000
1,1-Dichloroethylene	< 10	< 20,000	<100	<10	< 5	<1	< 1	<1	< 1	<1	<1	< 1	< 1	<1	3.6	<250	80	30,000	100,000
cis-1,2-Dichloroethylene	< 10	**6,340**	**76**	**1,200**	**24**	**23**	< 1	< 1	< 1	< 1	< 1	< 1	< 1	<1	18	<250	20	50,000	100,000
trans-1,2-Dichloroethylene	< 10	< 20,000	<100	13	< 5	1.9	< 1	<1	< 1	<1	<1	< 1	< 1	<1	1	<250	80	50,000	100,000
Naphthalene	< 10	< 20,000	<100	NA	< 5	<2	< 1	--	< 1	--	--	< 1	--	---	1	--	700	20,000	100,000
Tetrachloroethylene	< 10	**6,400**	**210**	**400**	< 5	<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	<1	**1,630**	**2,300**	50	30,000	100,000
Tetrahydrofuran	< 10	< 4,000	<100	NA	< 10	<2	33	--	150	--	--	400	--	---	< 2	--	NS	NS	NS
1,1,1-Trichloroethane	< 10	< 20,000	<100	<10	< 5	<1	< 1	<1	< 1	<1	<1	< 1	< 1	<1	81	<250	4,000	20,000	100,000
Trichloroethylene	< 10	**107,000**	**3,400**	**2,700**	0.199	**180**	< 1	< 1	< 1	< 1	5.4	< 1	< 1	<1	**17,200**	**18,000**	5	5,000	50,000
1,2,4-Trimethylbenzene	< 10	< 20,000	<100	NA	< 5	<1	< 1	--	< 1	--	--	< 1	--	---	2.2	--	NS	NS	10,000*
Vinyl Chloride	< 10	< 20,000	<100	<20	< 5	<2	< 1	<2	< 1	<2	<2	< 1	<2	<2	< 1	<500	2	50,000	100,000

NOTES:
1. Concentrations in micrograms per liter (ug/l, or parts per billion).
3. RCGW = Reportable concentration for groundwater, from 310 CMR 40.1600.
3. MCP Method 1 groundwater standards from 310 CMR 40.0974(2).
4. UCLs = Upper Concentration Limits, from 310 CMR 40.0996(7). "*" indicates a default UCL, not a chemical specific value, per 310 CMR 40.0996(8)(a).
5. **Bold** indicates values exceeds applicable Reportable Concentration.
6. "--" = Not analyzed for this parameter.
7. "NS" = No standard available.

* MW-6 results should be used with caution, as they may be low biased due to well conidtion (no cap; open to water intrusion; material settled around screen) at start of project.

8. Destroyed Wells are shown as "~~Strike through~~"

Table 9 (2 of 3)
Groundwater Analytical Results
Volatile Organic Compounds (VOCs)
Concentrations in ug/l
298 Federal Street
Greenfield, MA

Well No.:	**MW-3**	**MW-5**	**MW-6***			**MW-9**	**~~MW-100~~**	**MW-101**			**MW-102**		**MW-103**			**GW-2**	**GW-3**
Sample Date:	3/13/13	3/13/13	1/19/12	2/28/12	3/13/13	3/13/13	3/12/13	3/12/13	9/26/19	12/26/19	3/12/13	8/9/18	3/12/13	9/26/19	12/26/19	**Standard**	**Standard**
1,1-Dichloroethylene	<1	<1	< 1	<5	<1	<1	<2	<20	<10	<50	<1	<1	<4	<4	<1	80	30,000
cis-1,2-Dichloroethylene	<1	<1	**23**	**186**	< 1	<1	**20**	**45**	**68**	**130**	3.5	4.2	**280**	**460**	**56**	20	50,000
trans-1,2-Dichloroethylene	<1	<1	2	6.7	<1	<1	<2	<20	<10	<50	<1	<1	<4	**160**	20	80	50,000
Tetrachloroethylene	< 1	< 1	< 1	19	< 1	8.9	<2	<20	<10	<50	<1	<1	<4	<4	<1	50	30,000
Trichloroethylene	< 1	< 1	**8.8**	**232**	< 1	1.3	**150**	**1,000**	**1,000**	**3,400**	4.5	**15**	**27**	<4	<1	5	5,000
Vinyl Chloride	< 1	< 1	1.4	**47**	<2	<1	<4	<40	<20	<100	**3.4**	<2	<8	<8	<2	2	50,000

NOTES:
1. Concentrations in micrograms per liter (ug/l, or parts per billion).
3. RCGW = Reportable concentration for groundwater, from 310 CMR 40.1600.
3. MCP Method 1 groundwater standards from 310 CMR 40.0974(2).
4. UCLs = Upper Concentration Limits, from 310 CMR 40.0996(7). "*" indicates a default UCL, not a chemical specific value, per 310 CMR 40.0996(8)(a).
5. **Bold** indicates values exceeds applicable Reportable Concentration.
6. "--" = Not analyzed for this parameter.
7. "NS" = No standard available.

* MW-6 results should be used with caution, as they may be low biased due to well conidtion (no cap; open to water intrusion; material settled around screen) at start of project.

8. Destroyed Wells are shown as "~~Strike through~~"

Table 9 (3 of 3)
Groundwater Analytical Results
Volatile Organic Compounds (VOCs)
Concentrations in ug/l
298 Federal Street
Greenfield, MA

Well No.:	**MW-104**			**~~MW-105~~**	**MW-106**			**MW-107**	**MW-108**	**MW-109**	**MW-110**	**MW-111**			**MW-112**	**MW-113**	**MW-114**	**MW-115**	**MW-116**	**GW-2**	**GW-3**
Sample Date:	3/12/13	8/9/18	9/26/19	3/12/13	3/12/13	9/26/19	12/26/19	3/12/13	3/12/13	3/12/13	3/12/13	3/12/13	9/27/19	12/26/19	3/12/13	3/12/13	3/12/13	3/12/13	3/12/13	**Standard**	**Standard**
1,1-Dichloroethylene	<200	2	<400	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	80	30,000
cis-1,2-Dichloroethylene	<200	**180**	**5,500**	8.3	<1	<1	<1	<1	<1	<1	<1	8.1	<1	<1	<1	<1	<1	<1	<1	20	50,000
trans-1,2-Dichloroethylene	<200	4.6	<400	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	80	50,000
Tetrachloroethylene	<200	15	<400	<1	<1	<1	<1	<1	<1	<1	<1	1.4	<1	<1	<1	<1	<1	<1	<1	50	30,000
Trichloroethylene	**19,000**	**890**	**45,000**	**59**	<1	<1	<1	<1	<1	1.8	<1	**43**	<1	<1	<1	<1	<1	<1	<1	5	5,000
Vinyl Chloride	<400	**9.8**	<800	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	2	50,000

NOTES:
1. Concentrations in micrograms per liter (ug/l, or parts per billion).
2. "<" indicates not detected; value is quantitation limit.
3. MCP Method 1 groundwater standards from 310 CMR 40.0974(2).
4. UCLs = Upper Concentration Limits, from 310 CMR 40.0996(7). "*" indicates a default UCL, not a chemical specific value, per 310 CMR 40.0996(8)(a).
5. **Bold** indicates values exceeds applicable Reportable Concentration.
6. "--" = Not analyzed for this parameter.
7. "NS" = No standard available.
8. Distroyed Wells are shown as "~~Strike through~~"

Table 10
Groundwater Analytical Results
Volatile and Extractable Petroleum Hydrocarbons (VPH/EPH)
Concentrations in mg/l
298 Federal Street
Greenfield, MA

Well No.:	LS-10	LS-20	LS-24	Sump	GW-2	GW-3
Sample Date:	1/19/12	1/19/12	2/28/12	2/28/12	Standard	Standard
VPH Fractions						
C5-C8 Aliphatics	< 0.075	---	**3.65***	< 0.075	3	50
C9-C12 Aliphatics	< 0.025	---	0.20	< 0.025	5	50
C9-C10 Aromatics	< 0.025	---	0.082	< 0.025	7	50
VPH Target Compounds						
Benzene	< 0.005	---	< 0.005	< 0.005	2	10
Ethylbenzene	< 0.005	---	< 0.005	< 0.005	20	5
Methyl tert-butyl ether	< 0.005	---	< 0.005	< 0.005	50	50
Naphthalene	< 0.005	---	< 0.005	< 0.005	1	20
Toluene	< 0.005	---	< 0.005	< 0.005	50	40
Xylenes (total)	< 0.015	---	< 0.015	< 0.015	9	5
EPH Fractions						
C9-C18 Aliphatics	< 0.11	< 0.11	< 0.12	---	5	50
C19-C36 Aliphatics	< 0.11	< 0.11	< 0.12	---	NA	50
C11-C22 Aromatics	< 0.11	< 0.11	< 0.12	---	50	5
EPH Target Compounds						
Naphthalene	< 0.005	< 0.005	< 0.006	---	1	20
2-Methylnaphthalene	< 0.005	< 0.005	< 0.006	---	2	20
Acenaphthylene	< 0.005	< 0.005	< 0.006	---	10	0.04
Acenaphthene	< 0.005	< 0.005	< 0.006	---	NA	6
Fluorene	< 0.005	< 0.005	< 0.006	---	NA	0.04
Phenanthrene	< 0.005	< 0.005	< 0.006	---	NA	10
Anthracene	< 0.005	< 0.005	< 0.006	---	NA	0.03
Fluoranthene	< 0.005	< 0.005	< 0.006	---	NA	0.2
Pyrene	< 0.005	< 0.005	< 0.006	---	NA	0.02
Benzo(a)anthracene	< 0.005	< 0.005	< 0.006	---	NA	1
Chrysene	< 0.005	< 0.005	< 0.006	---	NA	0.07
Benzo(b)fluoranthene	< 0.005	< 0.005	< 0.006	---	NA	0.4
Benzo(k)fluoranthene	< 0.005	< 0.005	< 0.006	---	NA	0.1
Benzo(a)pyrene	< 0.005	< 0.005	< 0.006	---	NA	0.5
Indeno(1,2,3-cd)pyrene	< 0.005	< 0.005	< 0.006	---	NA	0.1
Dibenzo(a,h)anthracene	< 0.005	< 0.005	< 0.006	---	NA	0.04
Benzo(g,h,i)perylene	< 0.005	< 0.005	< 0.006	---	NA	0.02

NOTES:
1. Concentrations in milligrams per liter (mg/l, or parts per million).
2. "<" indicates not detected; value is quantitation limit.
3. MCP Method 1 groundwater standards from 310 CMR 40.0974.
4. "--" = Not analyzed for this parameter.
5. **Bold** indicates values exceeds applicable Reportable Concentration.
6. "NA" = Not applicable.

* Likely false positive due to chlorinated VOCs; lab noted single peak in quantitation range.

Table 11
Groundwater Analytical Results
Inorganic Analytes
Concentrations in mg/l
298 Federal Street
Greenfield, MA

Well No.:	LS-19	LS-20	LS-24	MW-6		MW-7	GW-2	GW-3
Sample Date:	3/15/12	1/19/12	2/28/12	1/19/12	2/28/12	1/19/12	**Standard**	**Standard**
Metals								
Antimony	---	---	< 0.006	---	0.026	---	NA	8
Arsenic	0.025	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	NA	0.9
Barium	0.088	0.080	0.031	0.056	0.020	0.048	NA	50
Beryllium	---	---	< 0.002	---	< 0.002	---	NA	0.2
Cadmium	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	NA	0.004
Chromium (VI or total)*	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	NA	0.3
Copper	---	---	< 0.005	---	0.010	---	NA	NS
Lead	< 0.0075	< 0.0075	< 0.0075	< 0.0075	0.0075	< 0.0075	NA	0.01
Mercury	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	NA	0.02
Nickel	---	---	< 0.005	---	< 0.005	---	NA	0.2
Selenium	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	NA	0.1
Silver	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	NA	0.007
Thallium	---	---	< 0.005	---	< 0.005	---	NA	3
Zinc	---	---	0.0061	---	0.040	---	NA	0.9
Cyanide (total)	---	< 0.005	---	< 0.005	0.017	< 0.005	NA	0.03

NOTES:
1. Concentrations in milligrams per liter (mg/l, or parts per million).
2. "<" indicates not detected; value is quantitation limit.
3. MCP Method 1 groundwater standards from 310 CMR 40.0974.

* Per the 4/06 MCP, chromium is assumed to be hexavalent unless testing is done to prove otherwise.

Table 12
Basement Groundwater Analytical Results
Volatile Organic Compounds (VOCs)
Concentrations in ug/l
Former Lunt Silversmiths
Greenfield, MA

Well No.:	LWP-100		LWP-101	LWP-102	LWP-103	LWP-104	LWP-105	LWP-106	LWP-107	LWP-108	Sump-1	GW-2	GW-3	
Sample Date:	**8/18/16**	**9/15/16**	**9/15/16**	**9/15/16**	**9/15/16**	**9/15/16**	**9/15/16**	**9/15/16**	**9/15/16**	**9/15/16**	**9/15/16**	**Standard**	**Standard**	**UCLs**
1,1-Dichloroethylene	<1.0	<1.0	<1,000	<1.0	<1.0	<1.0	1.2	<1.0	2	<1.0	<1.0	80	30,000	100,000
cis-1,2-Dichloroethylene	1.7	3.7	<1,000	5.6	**20**	<1.0	**31**	16	5.8	2.4	<1.0	20	50,000	100,000
trans-1,2-Dichloroethylene	<1.0	<1.0	<1,000	14	48	<1.0	1.4	<1.0	1.7	<1.0	<1.0	80	50,000	100,000
Tetrachloroethylene	<1.0	<1.0	**3,200**	2	1.5	<1.0	7.6	<1.0	12	<1.0	<1.0	50	30,000	100,000
Toluene	5.5	<1.0	<1,000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	50,000	40,000	100,000
Trichloroethylene	<1.0	2.2	**250,000**	**28**	**22**	**18**	**510**	**24**	**2,200**	**15**	2.6	5	5,000	50,000

NOTES:
1. Concentrations in micrograms per liter (ug/l, or parts per billion).
2. "<" indicates not detected; value is quantitation limit.
3. MCP Method 1 groundwater standards from 310 CMR 40.0974(2).
4. UCLs = Upper Concentration Limits, from 310 CMR 40.0996(7).
5. Values shown in **bold** exceed Method 1 standards.
6. "--" = Not analyzed for this parameter.
7. "NS" = No standard available.

* Default UCL, not a chemical specific value, per 310 CMR 40.0996(8)(a).

Table 13
Monitoring Well Survey and Groundwater Elevation Data
298 Federal Street
Greenfield, Massachusetts

Monitoring Well or Location ID Elevation (feet)	Date	Depth to Water (feet)	Groundwater or Stormwater Elevation (feet)	Comments
LS-10	January 19, 2012	5.06	263.45	
268.51*	March 15, 2012	4.76	263.75	
	March 11, 2013	3.92	264.59	
LS-19	January 19, 2012	4.53	257.45	
261.98*	March 15, 2012	4.31	257.67	
	March 11, 2013	4.16	257.82	
	October 24, 2019	4.25	257.73	
LS-20	January 19, 2012	3.40	259.07	
262.47*	March 15, 2012	3.91	258.56	
	March 11, 2013	3.16	259.31	
	August 9, 2018	3.35	259.12	
LS-21	March 15, 2012	2.25	259.19	
261.44*	March 11, 2013	--	--	
LS-22	March 15, 2012	3.30	258.59	
261.89*	March 11, 2013	2.47	259.42	
	September 26, 2019	4.76	256.59	
LS-23	March 15, 2012	3.70	258.40	
262.10	March 11, 2013	3.31	258.79	
	September 26, 2019	5.30	256.80	
LS-24	March 15, 2012	5.02	262.96	
267.98	March 11, 2013	5.00	262.98	
MW-1	March 11, 2013	4.99	259.54	
264.53				
MW-2	March 11, 2013	Dry	--	Dry @ 3.35
NS				Surface Elevation 265.14
MW-3	March 11, 2013	0.80	--	
NS				Surface Elevation 265.59
MW-5	March 11, 2013	2.62	261.04	
263.66				
MW-6	January 19, 2012	2.06	261.26	
263.32	March 15, 2012	2.90	260.42	
	March 11, 2013	2.68	260.64	
MW-9	March 11, 2013	3.24	260.17	
263.41				
MW-10	March 11, 2013	2.40	262.13	
264.53				
MW-100	March 11, 2013	3.15	259.32	
262.47				
MW-101	March 11, 2013	3.40	259.08	
262.48	September 26, 2019	4.54	257.94	
	December 26, 2019	3.54	258.94	
MW-102	March 11, 2013	1.58	259.63	
261.21	May 23, 2017	2.36	258.85	
	August 9, 2018	2.10	259.11	
MW-103	March 11, 2013	3.46	257.66	
261.12	September 26, 2019	4.38	256.74	
	December 26, 2019	3.86	257.26	
MW-104	March 11, 2013	4.89	257.04	
261.93	May 23, 2017	4.61	257.32	
	August 9, 2018	2.97	258.96	
	September 26, 2019	4.60	257.33	
MW-105	March 11, 2013	3.31	256.94	
260.25				
MW-106	March 11, 2013	4.35	255.58	
259.93	September 26, 2019	4.25	255.68	
	December 26, 2019	4.04	255.89	

Table 13
Monitoring Well Survey and Groundwater Elevation Data
298 Federal Street
Greenfield, Massachusetts

Monitoring Well or Location ID Elevation (feet)	Date	Depth to Water (feet)	Groundwater or Stormwater Elevation (feet)	Comments
MW-107	March 11, 2013	3.12	256.73	
259.85				
MW-108	March 11, 2013	3.91	255.03	
258.94				
MW-109	March 11, 2013	4.05	--	
NS				
MW-110	March 11, 2013	4.44	251.37	
255.81				
MW-111	March 11, 2013	4.54	248.57	
253.11	September 27, 2019	4.83	248.28	
	December 26, 2019	4.57	248.54	
MW-112	March 11, 2013	4.70	246.07	
250.77				
MW-113	March 11, 2013	5.10	249.90	
255.00				
MW-114	March 11, 2013	5.63	251.22	
256.85				
MW-115	March 11, 2013	5.00	247.18	
252.18				
MW-116	March 11, 2013	3.90	250.00	
253.90				
CB-0	March 11, 2013	4.04	259.62	Catch Basin
263.66				
CB-1N	March 11, 2013	5.81	255.02	Catch Basin
260.83	January 2, 2020	5.66	255.17	Tot.Depth = 5.92, Elev. 254.91
CB-1S	March 11, 2013	4.10	256.93	Catch Basin
261.03	September 27, 2019	4.30	256.73	Tot. Depth = 5.17, Elev. 255.86
	January 2, 2020	4.16	256.87	
CB-2N	March 11, 2013	5.99	253.49	Catch Basin
259.48	December 26, 2019	5.88	253.60	Tot.Depth =6.17, Elev. 253.31
CB-2S	March 11, 2013	3.84	255.40	Catch Basin
259.24	September 27, 2019	4.21	255.03	Tot.Depth =4.75, Elev. 254.49
	December 26, 2019	4.33	254.91	
CB-3N	March 11, 2013	5.95	252.08	Catch Basin
258.03				
CB-3S	March 11, 2013	3.65	254.19	Catch Basin
257.84				
CB-4N	March 11, 2013	5.62	252.35	Catch Basin
257.97				
CB-5N	March 11, 2013	5.16	251.34	Catch Basin
256.50				
CB-5S	March 11, 2013	3.30	252.94	Catch Basin
256.24	September 27, 2019	3.80	252.44	
CB-6N	March 11, 2013	4.06	250.31	Catch Basin
254.37				
CB-6S	March 11, 2013	3.47	250.79	Catch Basin
254.26				

1. Surveyed elevations are equivalent to feet above mean sea level.
2. Measurements made from top of monitoring well PVC casings using an electronic water level indicator.
3. Measurements made from top of steel grate at catch basins using an electronic water level indicator.
4. "--" means not gauged
5. * elevation data was calculated from a historical survey
6. "NS" means not surveyed

Table 14
Catch Basin and Outfall Water Analytical Results
Volatile Organic Compounds (VOCs)
Concentrations in ug/l
298 Federal Street
Greenfield, MA

Well No.:	**CB-1N**				**CB-1S**				**CB-2N**				**CB-2S**			**CB-5N**		**CB-5S**		**CB-9**			**CB-12**	**OF-1**	**OF-2**	**GW-2**	**GW-3**	**Surface Water**
Sample Date:	3/15/12	3/11/13	10/24/19	12/26/19	3/11/13	9/27/19	10/24/19	12/26/19	3/15/12	1/10/13	3/11/13	12/26/19	3/11/13	9/27/19	12/26/19	1/10/13	3/11/13	3/11/13	9/27/19	1/10/13	9/27/19	12/26/19	1/10/13	4/11/12	4/11/12	**Standard**	**Standard**	**Benchmark**
1,1-Dichloroethane	<5	<1	<2	<1	<1	1.8	3.1	<2	<10	<20	<10	<5	<1	<10	<1	<2	<2	<1	<2	<1	<1	<1	<1	<1	<1	2,000	8,000	990
1,1-Dichloroethylene	<5	<1	<2	<1	<1	1.0	3.1	<2	<10	<20	<10	<5	<1	<10	<1	<2	<2	<1	<2	<1	<1	<1	<1	<1	<1	80	30,000	1,200
cis-1,2-Dichloroethylene	31	9.5	30	12	2.1	**56**	**120**	10	**158**	**240**	**100**	**290**	2	<10	<1	52	19	1.2	<2	<1	<1	<1	<1	<1	<1	20	50,000	14,000
trans-1,2-Dichloroethylene	<5	1.3	2.9	<1	<1	2.3	4.4	<2	<10	<20	<10	<5	<1	<10	<1	<2	<2	<1	<2	<1	<1	<1	<1	<1	<1	80	50,000	22,000
Tetrachloroethylene	<5	<1	8.2	<1	<1	<1	7	<2	17	<20	12	11	<1	<10	<1	6	3.6	<1	<2	<1	<1	<1	<1	<1	<1	50	30,000	1,100
1,1,1-Trichloroethane	<5	<1	5.2	1.2	<1	5.0	12.0	<2	<10	<20	<10	<5	<1	<10	<1	<2	<2	<1	<2	<1	<1	<1	<1	<1	<1	4,000	20,000	900
Trichloroethylene	**115**	**57**	**250**	**43**	<1	**120**	**390**	**6.3**	**581**	**700**	**470**	**430**	**12**	<10	1.4	**170**	**110**	4.5	3.2	3	1.1	<1	1.5	<1	<1	5	5,000	190
Vinyl Chloride	<5	<2	<4	<2	<2	**2.1**	**4.2**	<4	<10	<40	<20	<10	<2	<20	<2	<4	<4	<2	<4	<2	<2	<2	<2	<1	<1	2	50,000	41,000

NOTES:
1. Concentrations in micrograms per liter (ug/l, or parts per billion).
2. "<" indicates not detected; value is quantitation limit.
3. Groundwater standards (GW-2/GW-3) are not strictly applicable to water in catch basin; shown for comparative purposes.
4. The surface water benchmarks are toxicity-based surface water concentrations used by MassDEP in developing GW-3 groundwater standards. These values are based on toxicity to aquatic life.
5. Bold font and shading indicates result exceeds groundwater standard and/or surface water benchmark value.

Table 15
Soil Gas Photoionization Detector Screening Results
298 Federal Street
Greenfield, Massachusetts

Sample Location	PID Reading (ppmv)	Selected for Lab Analysis
SG-1	16.7	
SG-2	11.3	
SG-3	0.4	
SG-4	21.6	*
SG-5	0.8	
SG-6	0.0	*
SG-7	0.0	*
SG-8	0.0	
SG-9	0.4	*
SG-10	0.0	*
SG-11	0.0	*
SG-12	0.0	
SG-13	0.0	

NOTES:
1. "PID" = Photoionization detector screening reading from PID equipped with 11.8 eV lamp, calibrated to read in benzene equivalents in parts per million by volume (ppmv).
2. Measurements performed by OTO on January 26-27, 2012.
3. Minimum detection limit approximately 0.1 ppmv.

Table 16
Soil Gas Analytical Results
Concentrations in ug/m^3
298 Federal Street
Greenfield, Massachusetts

Sample ID:	SG-4	SG-6	SG-7	SG-9	SG-10	SG-11	Maximum soil Gas Concentration	Residential Sub-Slab Screening Values	Commercial/ Industrial Sub-Slab Screening Values
PID (ppmv):	21.6	0	0	0.4	0	0			
Sample Date:	1/26/12	3/15/12	3/15/12	1/26/12	1/27/12	1/27/12			
Volatile Organic Compounds									
Acetone	390	34	26	120	40	55	390	6,400	50,000
Benzene	< 31	< 3.2	< 3.2	< 5.1	1.1	0.61	1.05	160	800
Carbon Disulfide	< 69	< 3.1	< 3.1	< 12	1.2	< 1.2	1.2	NA	NA
Dichlorodifluoromethane (Freon 12)	< 97	< 4.9	< 4.9	< 16	3.0	2.8	3	NA	NA
cis-1,2-Dichloroethylene	< 38	< 4.0	< 4.0	12	< 0.65	< 0.65	12	56	370
Ethanol	< 45	480	490	< 7.6	15	9.5	490	NA	NA
Ethylbenzene	< 50	< 4.3	< 4.3	< 8.4	< 0.85	1.0	1.04	520	62,000
4-Ethyltoluene	< 69	< 4.9	< 4.9	13	2.5	3.0	13	NA	NA
Hexane	< 45	14	10	< 7.7	1.1	< 0.77	14	NA	NA
Isopropanol	58	89	104	13	27	9.7	104	NA	NA
Methyl ethyl ketone (MEK)	< 63	12	21	< 11	2.1	1.8	21	850	310,000
Methylene Chloride	< 92	6.2	< 3.5	< 15	< 1.5	< 1.5	6.2	NA	NA
Tetrachloroethylene	< 81	< 6.8	< 6.8	20	5.5	3.5	20	98	290
Tetrahydrofuran	< 39	< 3.0	5.5	< 6.5	< 0.65	< 0.65	5.5	NA	NA
Toluene	< 42	< 3.8	7.2	< 7.1	7.4	4.3	7.4	3,800	310,000
1,1,1-Trichloroethane	**280**	< 5.5	< 5.5	41	7.9	6.7	**280**	210	310,000
Trichloroethylene	**20,000**	< 5.4	< 5.4	**4,100**	**170**	**66**	**20,000**	28	120
Trichlorofluoromethane (Freon 11)	< 150	< 5.6	< 5.6	< 25	16	21	21	NA	NA
1,2,4-Trimethylbenzene	< 49	< 4.9	< 4.9	35	8.1	3.9	35	NA	NA
1,3,5-Trimethylbenzene	< 86	< 4.9	< 4.9	15	3.2	2.1	15	NA	NA
total Xylenes	< 206	< 8.6	< 8.6	< 34	4.4	5.6	5.6	1,400	6,200

NOTES:

1. Only analytes detected are shown on the table. Refer to laboratory reports for full listing of analytical parameters.
2. Concentrations in micrograms per cubic meter (ug/m3).
3. "PID" = Photoionization detector screening reading from PID equipped with 11.8 eV lamp (January) or 10.6 eV lamp (March), calibrated to read in benzene equivalents.
4. "<" = Not detected; value is quantitation limit.
5. Sub-Slab Soil Gas Screening Values from MassDEP Policy #WSC-16-435, Vapor Intrusion Guidance.
6. '"NA" indicates no value available.
7. **Bold** indicates measured concentration exceeds the commercial/industrial soil gas screening value.

Table 17
Indoor Air Analytical Results (On-Site)
Concentrations in ug/m^3
298 Federal Street
Greenfield, Massachusetts

Sample ID	IA-1	IA-2	IA-3	IA-4	Mowry Bldg	Residential Indoor Air Threshold Values (TV_r)	Commercial/ Industrial Indoor Air Threshold Values ($TV_{c/i}$)
Building	Condominium Unit B1				Condo C		
Sample Location	Office	Basement near settling tanks	Basement SW corner	Basement north central	Pre construction center of Bldg		
Sample Date	1/26/12	1/26/12	1/26/12	1/26/12	10/27/16		
Volatile Organic Compounds							
Acetone	8.2	5.8	8.3	< 1.1	9.9	91	710
Benzene	1.8	0.89	< 0.51	1.4	0.51	2.3	11
Chloromethane	< 0.77	< 0.77	1.3	1.8	0.94	NA	NA
Dichlorodifluoromethane (Freon 12)	3.2	3.2	3.4	3.5	0.65	NA	NA
cis-1,2-Dichloroethylene	< 0.65	< 0.65	**2.6**	< 0.65	0.15	0.8	5.3
Ethanol	9.5	2.5	7.0	7.8	6.4	NA	NA
Hexane	1.5	1.7	< 0.77	1.6	0.2	NA	NA
Isopropanol	1.9	1.5	2.0	3.0	< 3.4	NA	NA
Tetrachloroethylene	**1.6**	**2.2**	**4.4**	< 1.4	<0.24	1.4	4.1
Toluene	3.0	1.2	< 0.71	2.1	0.89	54	4,400
Trichloroethylene	< 0.96	**5.6**	**2.3**	**8.1**	**4.8**	0.4	1.8
Trichlorofluoromethane (Freon 11)	13	7.9	4.7	9.8	1.2	NA	NA

NOTES:
1. Only analytes detected are shown on the table. Refer to lab reports for full listing of analytical parameters.
2. Concentrations in micrograms per cubic meter (ug/m3).
3. "<" = Not detected; value is quantitation limit.
4. Indoor Air Threshold Values from MassDEP Vapor Intrusion Guidance, WSC#-16-435.
5. '"NA" indicates no threshold value available.
6. Shading indicates measured concentration exceeds the commercial/industrial indoor air Threshold Value.

Table 18
Downgradient Indoor Air Analytical Results
Concentrations in ug/m^3
Vicinity of Former Lunt Facility
Greenfield, Massachusetts

Address:	**37 Forest**		**45 Forest**		**14 Kenwood**			**20 Kenwood**		**22 Kenwood**		**Residential Indoor Air Threshold Values (TV_r)**
Location:	Basement	1st Floor	Basement	1st Floor	Basement	1st Floor	Outdoor	Basement	1st Floor	Basement	1st Floor	
Sample Date:	1/11/13	1/11/13	1/11/13	1/11/13	1/11/13	1/11/13	1/11/13	1/11/13	1/11/13	1/11/13	1/11/13	
Chloromethane	1.32	1.28	1.26	1.61	1.14	1.26	1.32	1.61	1.49	1.18	1.34	NA
1,2-Dichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.09
Methylene Chloride	2.43	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	1.81	3.68	< 1.5	< 1.5	11
1,1,1-Trichloroethane	**3.82**	**4.42**	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	3.0
Trichloroethylene	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	**1.5**	< 0.96	**1.02**	< 0.96	0.4

NOTES:
1. Concentrations in micrograms per cubic meter (ug/m3).
2. "<" = Constituent was not detected; value is quantitation limit.
3. Indoor Air Threshold Values from MassDEP Interim Final Vapor Intrusion Guidance, WSC#-11-435, December 2011.
4. '"NA" indicates no threshold value available.
5. At OTO"s request, these analytical data were re-reported to minimum detection limits instead of reporting limits on March 26, 2013.

Table 18 (continued)
Downgradient Indoor Air Analytical Results
Concentrations in ug/m^3
Vicinity of Former Lunt Facility
Greenfield, Massachusetts

Address:	**28 Kenwood**		**38 Kenwood**		**42 Kenwood**		**44 Kenwood**		**46 Kenwood**		**Residential Indoor Air Threshold Values (TV_r)**
Location:	Basement	1st Floor	Basement	1st Floor	Basement	1st Floor	Basement	1st Floor	Basement	1st Floor	
Sample Date:	1/11/13	1/11/13	1/11/13	1/11/13	1/11/13	1/11/13	1/11/13	1/11/13	1/11/13	1/11/13	
Chloromethane	1.22	1.47	1.36	1.55	1.34	1.76	1.20	1.34	1.38	2.11	NA
1,2-Dichloroethane	< 1.0	**1.98**	< 1.0	**1.09**	< 1.0	**3.36**	< 1.0	< 1.0	< 1.0	< 1.0	0.09
Methylene Chloride	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	11
1,1,1-Trichloroethane	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	3.0
Trichloroethylene	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	0.4

NOTES:

1. Concentrations in micrograms per cubic meter (ug/m3).
2. "<" = Constituent was not detected; value is quantitation limit.
3. Indoor Air Threshold Values from MassDEP Interim Final Vapor Intrusion Guidance, WSC#-11-435, December 2011.
4. '"NA" indicates no threshold value available.
5. At OTO"s request, these analytical data were re-reported to minimum detection limits instead of reporting limits on March 26, 2013.

Table 19							
Post-Excavation Site Wide Average in Top 6 inches Using EPA Data							
Following Excavation of SS-01, SS-06, SS-09, SS-301,303, 304, 307, 308, 309, 325 &326							
	Sample	**TCE (ug/kg)**	**PCE(ug/kg)**	**Pb (mg/kg)**	**As(mg/kg)**	**Ag (mg/kg)**	
	SS-302	*20*	*10*	320	19	*	
	SS-305	*20*	*10*	97	18	*	
	SS-311	230	16	230	13	*	
	SS-312	*20*	*10*	100	8	*	
	SS-313	27	*10*	180	12	*	
	SS-314	*20*	*10*	87	9	*	
	SS-315	*20*	*10*	200	12	*	
	SS-316	*20*	*10*	50	7	*	
	SS-317	140	59	100	8	*	
	SS-318	6	*10*	150	12	*	
	SS-319	*20*	*10*	65	8	*	
	SS-320	*20*	*10*	490	17	*	
	SS-321	*20*	*10*	140	11	*	
	SS-322	*20*	*10*	44	7	*	
	SS-323	*20*	*10*	150	10	*	
	SS-324	*20*	*10*	60	7	*	
	SS-01	*100*	*100*	160	6	196	
	SS-02	*70*	*70*	25	5	26	
	SS-03	*84*	*84*	36	5	18	
	SS-04	*75*	*75*	130	9	130	
	SS-05	*83*	*83*	48	5	22	
	SS-07	*65*	*65*	24	6	60	
	SS-08	*75*	*75*	130	6	68	
	SS-10	*120*	*120*	140	6	50	
Averages		55	37	132	9	71	
S-1GW-2		300	10,000	200	20	100	
S-1GW-3		300	10,000	200	20	100	
S-2GW-2		300	10,000	600	20	200	
S-2GW-3		60,000	200,000	600	20	200	

Note: SS-01 values for Pb, AS, and Ag derived from 10/26/15 sampling by OTO, Table 14, Phase 1

Red = Mobil lab analyses

Black = North Chelmsford Laboratory Analyses

* Silver not analyzed in all samples

Sample results shown in italics were non-detected at that detection limit.

Table 20						
West Grid After Excavation Data 2-5 feet						
	West Grid					
	Sample	**Depth(ft)**	**TCE (ug/kg)**	**PCE(ug/kg)**	**Pb (mg/kg)**	**As(mg/kg)**
	Grid-01	5	120	50	21	*5*
	Grid-02	5	6,300	2,200	15	*5*
	Grid-03	2	4,600	1,300	73	17
	Grid-04	2	860	380	110	*9*
	Grid-05	3	870	240	21	34
	Grid-06	3	7,400	1,900	26	*14*
	Grid-07	3	6,300	520	66	18
	Grid-08	2	*20*	10	62	12
Average 2-3			**3,342**	725	60	17
(doesn't include 5')						
South Grid After Exc. Data 2-4 feet						
	South Grid					
	Sample	**Depth(ft)**	**TCE (ug/kg)**	**PCE(ug/kg)**	**Pb (mg/kg)**	**As(mg/kg)**
	Grid-09	2(utility)	14,000	170	330	21
	Grid-10	4	620	*35*	20	6
	Grid-11	2(utility)	26,000	350	2,600	100
	Grid-12	2(utility)	57,000	350	2,000	100
	Grid-13	4	3,600	65	3,070	110
	Grid-14	4	5,800	93	766	49
	Grid-15	2	7,300	8	1,160	65
	Grid-16	4	130	*35*	50	29
	Grid-17	2	310	*35*	135	35
	Grid-18	2	19	*35*	1,360	63
	Grid-19	2	270	*35*	924	54
	Grid-19.5	2	8,400	*35*	710	*22*
	Grid-20-B	2	120	*35*	815	*23*
	Grid-20.5	2	150	*35*	5,800	330
	Grid-21	2	100	*35*	182	*11*
Average 2-4			**8,255**	90	**1,328**	**68**
S-1GW-2			300	10,000	200	20
S-1GW-3			300	10,000	200	20
S-2GW-2			300	10,000	600	20
S-2GW-3			60,000	200,000	600	20
Samples analyzed in EPA's Office of Environmental Measurement and Evaluation						
(OEME).						

Table 21A
Condominium B1 1st and 2nd Floor Indoor Air Analytical Results (On-Site)
Concentrations in ug/m^3
298 Federal Street
Greenfield, Massachusetts

Sample ID	IA-5						IA-6								IA-7				Residential Indoor Air Threshold Values (TV_r)	Commercial/ Industrial Indoor Air Threshold Values (TV_{ci})
Sample Location	1st Floor Office Rm. 152						1st Floor Office Rm 108								1st Floor Jan. Closet Rm. 126					
			PEPMM OPERATIONAL								PEPMM OPERATIONAL					PEPMM OPERATIONAL				
Sample Date	7/21/16	1/19/18	2/16/18	6/8/18	10/30/18	2/28/19	7/21/16	8/19/16	3/2/17	1/19/18	2/16/18	6/8/18	10/30/18	2/28/19	7/21/16	6/8/18	10/30/18	NA		
Volatile Organic Compounds																				
1,1-Dichloroethylene	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	0.22	<0.14	<0.14	<0.14	NA	0.8	180
cis-1,2-Dichloroethylene	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	NA	0.8	5.3
trans-1,2-Dichloroethylene	0.23	<0.14	<0.14	<0.14	<0.14	0.16	**1.3**	**1.5**	**<0.14**	<0.14	0.16	0.47	0.14	0.23	<0.14	<0.14	<0.14	NA	0.8	53
Tetrachloroethylene	<0.24	<0.24	0.32	<0.24	<0.24	0.3	0.88	<0.24	0.33	0.27	0.46	0.25	0.29	0.43	0.29	<0.24	<0.24	NA	1.4	4.1
Trichloroethylene	**0.85**	0.31	**0.54**	**0.63**	**0.53**	**0.59**	**8.7**	**2.8**	**4.5**	**1.5**	**2.2**	**1.5**	**2.9**	**1.9**	**2.0**	**0.64**	<0.19	NA	0.4	1.8
Vinyl Chloride	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	NA	0.27	1.3

Sample ID	IA-8								IA-9						IA-10	IA-11			Residential Indoor Air Threshold Values (TV_r)	Commercial/ Industrial Indoor Air Threshold Values (TV_{ci})
Sample Location	1st Floor Nurse Sta. Rm. 156								2nd Floor IT Rm. 235						1st Floor Resd. Rm. 161	1st Fl. Resd. Rm.134				
					PEPMM OPERATIONAL						PEPMM OPERATIONAL					PEPMM OPERATIONAL				
Sample Date	7/21/16	8/19/16	3/2/17	1/19/18	2/16/18	6/8/18	10/30/18	2/28/19	7/21/16	1/19/18	2/16/18	6/8/18	10/30/18	2/28/19	9/7/16	6/8/18	10/30/18	2/28/19		
Volatile Organic Compounds																				
1,1-Dichloroethylene	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	0.8	180
cis-1,2-Dichloroethylene	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	0.8	5.3
trans-1,2-Dichloroethylene	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	0.16	0.29	<0.14	<0.14	<0.14	<0.14	0.16	<0.14	<0.14	<0.14	0.17	0.8	53
Tetrachloroethylene	0.29	0.63	<0.24	<0.24	0.35	<0.24	<0.24	0.34	0.26	<0.24	0.39	<0.24	<0.24	0.32	<0.24	<0.24	<0.24	0.35	1.4	4.1
Trichloroethylene	**2.1**	**1.7**	**4.70**	**0.49**	**0.96**	**0.72**	**0.87**	**1.10**	**2.1**	**0.72**	**1.3**	**0.69**	**1.1**	**1.5**	**0.79**	**0.42**	**0.79**	**0.75**	0.4	1.8
Vinyl Chloride	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	0.27	1.3

NOTES:
1. Only analytes detected are shown on the table for 1/26/12 samples. Refer to lab reports for full listing of analytical parameters. Samples collected 7/21/16 and after analyzed by TO-15 for only the 6 analytes shown.
2. Concentrations in micrograms per cubic meter (ug/m3).
3. "<" = Not detected; value is quantitation limit. "--" indicates no analysis was performed.
4. Indoor Air Threshold Values from MassDEP Vapor Intrusion Guidance, WSC#-16-435, October 2016.
5. '"NA" indicates no threshold value available.
6. Bold indicates measured concentration exceeds the residential Threshold Value.
7. Janary 26, 2012 air samples collected prior to building renovations.
8. July 21, 2016 air samples collected after building renovations were completed, and basement windows had been sealed as part of the renovation.
9. August 19, 2016 air samples collected after two former basement windows in the western end of the basement had been reopend and two window fans had operated for one week.
10. September 7, 2016 air sample collected in an unoccupied 1st floor residential room with door closed for 24 hours after window fans in basement had operated since August 10, 2016.
11. March 2, 2017 Indoor air samples collected during "worst case" winter heating conditions, with the outside air temperatures in the 3O's degrees F during the day, droping to 20 degrees F at night. The basement ventilation fans were continuing to operate during sample collection.
12. The January 18-19, 2018 indoor air samples were collected under 'worst case" winter heating conditions with the PEPMM and the concrete cap in place, but the vent pipes were capped. Outdoor temperatures ranged from 12 to 29 degrees F.
13. The February 15-16, 2018 indoor air samples were collected under winter heating conditions with the PEPMM operating and the concrete cap in place. Outdoor temperatures ranged from 32 to 47 degrees F.
14. The June 7-8, 2018 indoor air samples were collected under summer HVAC conditions with the PEPMM operating and the concrete cap in place. Outdoor temperatures ranged from the upper 60's during the day, down into the 50's at night.
15. The October 29-30, 2018 indoor air samples were collected during Fall heating conditions with the PEPMM operating and the concrete cap in place. The weather conditions on 10/29/18 were rainy with temperatures in the 40's, clearing overnight with temperatures into the 30's (no frost) with 10/30/18 conditions sunny and windy with temperatures in the 40's.
16. The February 27-28, 2019 indoor air samples were collected during Winter heating conditions with the PEPMM operating and the concrete cap in place. The weather conditions on 2/27/19 were 13 degrees in the morning, rising to 22 degrees during the day, droping to 17 degrees overnight, and rising to 32 degrees on 2/28/19.

Table 21B
Condominium B1 Basement Indoor Air Analytical Results (On-Site)
Concentrations in ug/m^3
298 Federal Street
Greenfield, Massachusetts

Sample ID	**IA-2**			**IA-3**								**IA-4**					**Residential Indoor Air Threshold Values (TV_r)**	**Commercial/ Industrial Indoor Air Threshold Values (TV_{cli})**
Sample Location	Basement near settling tanks			Basement SW corner								Basement north central						
			PEPMM					PEPMM OPERATIONAL								PEPMM		
Sample Date	1/26/12	7/21/16	2/28/19	1/26/12	7/21/16	8/19/16	1/19/18	2/16/18	6/8/18	10/30/18	2/28/19	1/26/12	7/21/16	8/19/16	1/19/18	2/16/18		
Volatile Organic Compounds																		
1,1-Dichloroethylene	<1.48	<0.14	0.2	<1.48	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<1.48	<0.14	<0.14	<0.14	<0.14	0.8	180
cis-1,2-Dichloroethylene	< 0.65	<0.14	0.37	**2.6**	**0.73**	<0.14	**2.5**	<0.14	<0.14	<0.14	<0.14	< 0.65	<0.14	<0.14	0.6	<0.14	0.8	5.3
trans-1,2-Dichloroethylene	<0.84	0.4	0.19	<0.84	0.5	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.84	<0.14	0.24	<0.14	<0.14	0.8	53
Tetrachloroethylene	**2.2**	**0.6**	0.34	**4.4**	**19**	**3**	**3.4**	0.6	0.24	0.57	0.37	< 1.4	1.3	0.5	0.26	0.45	1.4	4.1
Trichloroethylene	**5.6**	**7.1**	**1.1**	**2.3**	**140**	**35**	**60**	**2.5**	**1.6**	**3.1**	**0.84**	**8.1**	**15**	**14**	**5.2**	**1.4**	0.4	1.8
Vinyl Chloride	<1.01	<0.09	<0.09	<1.01	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<1.01	<0.09	<0.09	<0.09	<0.09	0.27	1.3

NOTES:
1. Only analytes detected are shown on the table for 1/26/12 samples. Refer to lab reports for full listing of analytical parameters. Samples collected 7/21/16 and after analyzed by TO-15 for only the 6 analytes shown.
2. Concentrations in micrograms per cubic meter (ug/m3).
3. "<" = Not detected; value is quantitation limit.
4. Indoor Air Threshold Values from MassDEP Vapor Intrusion Guidance, WSC#-16-435, October 2016.
5. '"NA" indicates no threshold value available.
6. Bold indicates measured concentration exceeds the residential Threshold Value.
7. Janary 26, 2012 air samples collected prior to building renovations.
8. July 21, 2016 air samples collected after building renovations were completed, and basement windows had been sealed as part of the renovation.
9. August 19, 2016 air samples collected after two former basement windows in the western end of the basement had been reopend and two window fans had operated for one week.
10. September 7, 2016 air sample collected in an unoccupied 1st floor residential room with door closed for 24 hours after window fans in basement had operated since August 10, 2016.
11. March 2, 2017 Indoor air samples collected during "worst case" winter heating conditions, with the outside air temperatures in the 3O's degrees F during the day, droping to 20 degrees F at night. The basement ventilation fans were continuing to operate during sample collection.
12. The January 18-19, 2018 indoor air samples were collected under 'worst case" winter heating conditions with the PEPMM and the concrete cap in place, but the vent pipes were capped. Outdoor temperatures ranged from 12 to 29 degrees F.
13. The February 15-16, 2018 indoor air samples were collected under winter heating conditions with the PEPMM operating and the concrete cap in place. Outdoor temperatures ranged from 32 to 47 degrees F.
14. The June 7-8, 2018 indoor air samples were collected under summer HVAC conditions with the PEPMM operating and the concrete cap in place. Outdoor temperatures ranged from the upper 60's during the day, down into the 50's at night.
15. The October 29-30, 2018 indoor air samples were collected during Fall heating conditions with the PEPMM operating and the concrete cap in place. The weather conditions on 10/29/18 were rainy with temperatures in the 40's, clearing overnight with temperatures into the 30's (no frost) with 10/30/18 conditions sunny and windy with temperatures in the 40's.
16. The February 27-28, 2019 indoor air samples were collected during Winter heating conditions with the PEPMM operating and the concrete cap in place. The weather conditions on 2/27/19 were 13 degrees in the morning, rising to 22 degrees during the day, droping to 17 degrees overnight, and rising to 32 degrees on 2/28/19.

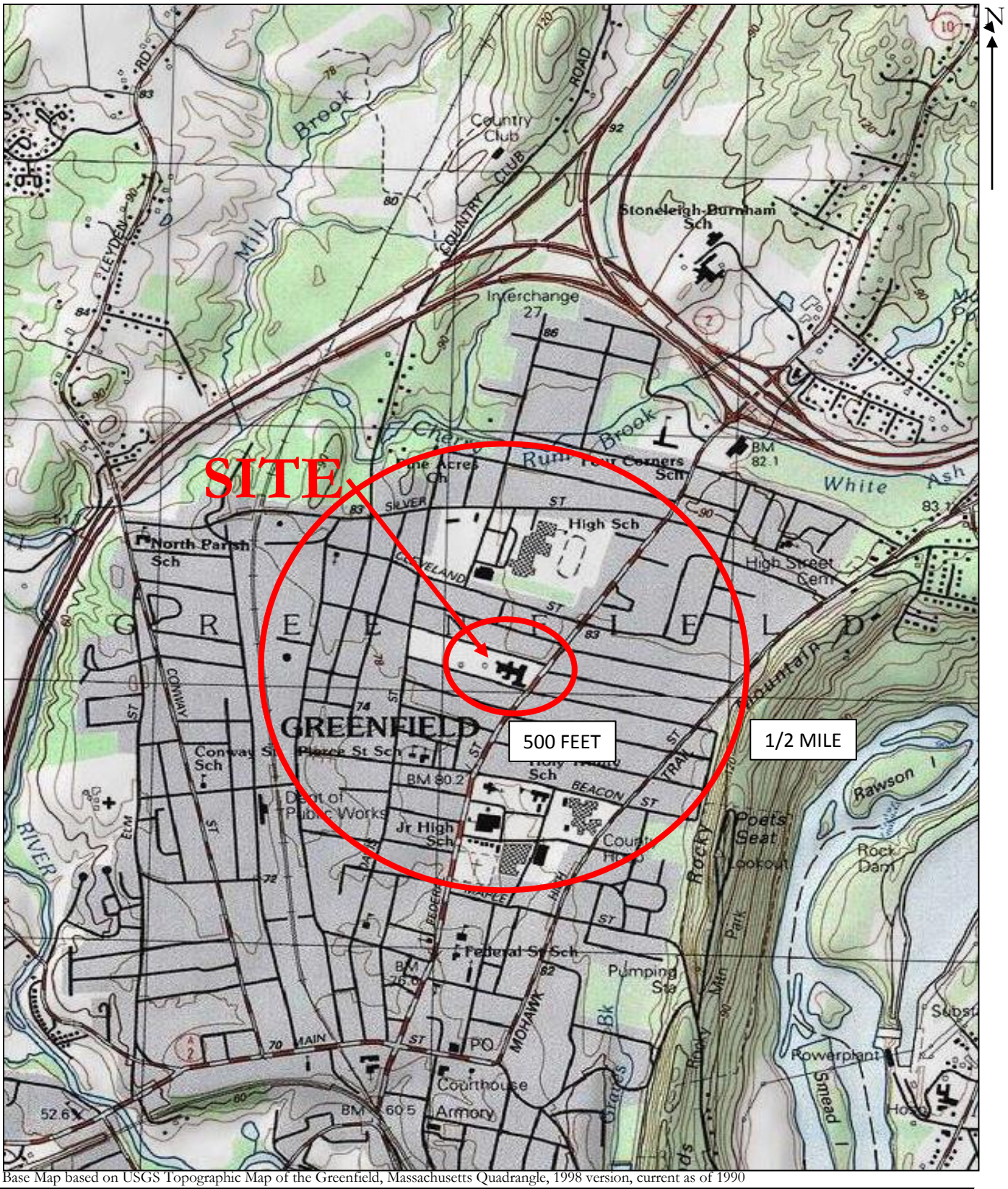
Table 22
Indoor Air Analytical Results
Concentrations in ug/m^3
Condominium Unit C Building at 298 Federal Street
Greenfield, Massachusetts

Sample ID	Grab Sample	IA-101				IA-102				IA-104			IA-203				Residential Indoor Air Threshold Values (TV_r)	Commercial/ Industrial Indoor Air Threshold Values (TV_{ci})
Sample Location		Condominium Unit C Building 1st Floor											2nd Floor					
		PEPMM OPERATIONAL											PEPMM OPERATIONAL					
Sample Date	10/27/16	3/21/19	6/20/19	9/27/19	12/13/19	3/21/19	6/20/19	9/27/19	12/13/19	6/20/19	9/27/19	12/13/19	3/21/19	6/20/19	9/27/19	12/13/19		
Volatile Organic Compounds																		
1,1-Dichloroethylene	0.6	<0.14	<0.14	<0.14	<0.14	<0.16	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	0.8	180
cis-1,2-Dichloroethylene	0.15	<0.14	<0.14	<0.14	<0.14	<0.16	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	0.8	5.3
trans-1,2-Dichloroethylene	<0.14	<0.14	<0.14	<0.14	<0.14	<0.16	0.2	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	0.8	53
Tetrachloroethylene	<0.24	<0.24	<0.24	<0.24	<0.24	<0.27	<0.24	0.37	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	0.49	<0.24	1.4	4.1
Trichloroethylene	**4.8**	0.85	1.4	0.48	1.4	0.63	1.5	0.52	1.6	1.4	0.49	1.5	1.00	0.41	0.97	0.56	0.4	1.8
Vinyl Chloride	<0.09	<0.09	<0.09	<0.09	<0.09	<0.1	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	0.27	1.3

NOTES:

1. Only analytes shown were analyzed for the 3/21, 6/20, 9/27, and 12/13/2019 samples. The 10/27/16 included all TO-15 analytes prior to construction activities. Refer to lab report for full analyte listing.
2. Concentrations in micrograms per cubic meter (ug/m3).
3. "<" = Not detected; value is quantitation limit.
4. Indoor Air Threshold Values from MassDEP Vapor Intrusion Guidance, WSC#-16-435, October 2016.
5. **Bold** = measured concentration exceeds the commercial/industrial indoor air Threshold Value.
6. The 10/27/16 sample was collected over a four hour period prior to construction activities commencing.
7. The 3/21/19 samples were collected over a 24 hour period in the finished building prior to occupancy during winter heating conditions. The PEPMM had been operational since 3/11/2019. Overnight temperatures were below freezing with daytime temperatures rising into the 40's.
8. The 6/20/19 samples were collected over a 24 hour period in the finished building prior to occupancy with the air condition system operating. The second floor was ready for occupancy and the first floor was having minor finishing work performed. The weather was high 60's to low 70's with rain showers.
9. The 9/27/19 samples were collected over a 24 hour period. The second floor (sample IA-203) and west end of the first floor (IA-104) was finished and fully occupied and in use with the HVAC system operating. The rest of the first floor (samples IA-101 and IA-102) was finished with the HVAC system operating but unoccupied. The weather was 50 to 70 degrees during the day with rain showers, dropping into the 40's overnight.

FIGURES



Base Map based on USGS Topographic Map of the Greenfield, Massachusetts Quadrangle, 1998 version, current as of 1990

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.	**SITE LOCUS** **298 FEDERAL STREET** **GREENFIELD, MASSACHUSETTS**
Job No. 2693-01-01	DATE: OCTOBER, 2017 **FIGURE NO.: 1**

NORWOOD STREET

UNIT A1

UNIT A2

SUMP

UNIT B1

UNIT B2

FORMER
1 STORY
BUILDING

FORMER
1 STORY
BUILDING

FORMER 1-STORY
BUILDING

FORMER
1-STORY
BUILDING

UNIT C

ELEVATOR &
MACHINE ROOM

FEDERAL STREET

CB

CB-2N

CB-1N

CB-0

KENWOOD STREET

CB-2S

CB-1S

NOTES:
1. BASE MAP PROVIDED TO OTO IN ELECTRONIC FORMAT; ORIGINAL PLAN ENTITLED "EXISTING CONDITIONS" BY THE BERKSHIRE DESIGN GROUP, INC. (DATED SEPTEMBER, 2015).
2. SAMPLE LOCATIONS ARE SHOW ACCORDING TO TAPED MEASUREMENTS TAKEN FROM EXISTING SITE FEATURES.
3. ALL DATA IS TO BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD(S) USED IN THE DEVELOPMENT OF THIS PLAN.

LEGEND:

- CB — CATCH BASIN
- BASEMENT AREAS
- APPROXIMATE PROPERTY BOUNDARY
- APPROXIMATE SITE BOUNDARY

SCALE IN FEET
1" = 50'
0' 25' 50' 100'

DRAWN BY: CRL
DATE: AUGUST 2017
REV.: OCTOBER 2019/CDA
DESIGNED BY: BHN
CHECKED BY: BHN

O'Reilly, Talbot & Okun
ENGINEERING ASSOCIATES
293 Bridge Street, Suite 500 Springfield, MA 01103 413.788.6222
www.OTO-ENV.com

298 FEDERAL STREET
GREENFIELD, MASSACHUSETTS

SITE PLAN

PROJECT No.
J2693-01-02

FIGURE No.
2

O:\J2600\2693 401 Liberty LLC - Lunt\01-03 Mowry Building\Figures\J2693-01-02 298 Federal Street 2016.dwg

NORWOOD STREET

KENWOOD STREET

FEDERAL STREET

UNIT A1

UNIT A2

UNIT B1

UNIT B2

UNIT C

FORMER 1 STORY BUILDING

FORMER 1-STORY BUILDING

ELEVATOR & MACHINE ROOM

LS-6 LS-7 LS-8 LS-9 LS-10 LS-11 LS-12 LS-13 LS-14 LS-15 LS-16 LS-17 LS-18 LS-19 LS-20 LS-22 LS-23 LS-24 LS-27 LS-29 LS-30

264.4 263.0 257.8 257.0 259.4 258.8 259.3

SS-01 SS-02 SS-03 SS-04 SS-05 SS-06 SS-07 SS-08 SS-09 SS-10 SS-11 SS-COMP-01 SS-COMP-02 SS-COMP-03 SS-301 SS-303 SS-304 SS-305 SS-306 SS-307 SS-308 SS-309 SS-311 SS-312 SS-313 SS-314 SS-315 SS-316 SS-317 SS-318 SS-319 SS-320 SS-321 SS-322 SS-323 SS-324 SS-325 SS-326

SUMP

IA-1 IA-2 (B) IA-3 (B) IA-4 IA-4 (B) IA-5 (1) IA-6 (1) IA-7 (1) IA-8 (1) IA-9 (2) IA-10 (1) IA-101 (1) IA-102 (1) IA-203 (2)

LWP-100 LWP-101 LWP-102 LWP-103 LWP-104 LWP-105 LWP-106 LWP-107 LWP-108

HA-1 HA-1-N-12' HA-2 HA-3 HA-3-N-13.5' HA-4 HA-5 HA-6 HA-7 HA-8 HA-8-E-27' HA-8-S-12' HA-8-W-23' HA-9 HA-10 HA-11 HA-12 HA-13 HA-14 HA-15

SG-1 SG-2 SG-3 SG-4 SG-5 SG-6 SG-7 SG-8 SG-9 SG-10 SG-11 SG-12 SG-13

SB-1 SB-2 SB-3 SB-4 SB-5 SB-6 SB-7 SB-100 SB-101 SB-102 SB-103 SB-104 SB-105 SB-106 SB-107 SB-108 SB-109 SB-110 SB-111 SB-112

MW-100 MW-101 MW-102 MW-103 MW-104 MW-105 MW-106 MW-5 MW-6

259.3 259.0 259.6 257.7 256.9 255.6 261.0 260.6

CB CB-0 CB-1N CB-1S CB-2N CB-2S

262 260 258

LEGEND:

- MONITORING WELL LOCATIONS (EXTERIOR)
- MONITORING WELL LOCATIONS (INTERIOR BASEMENT)
- INDOOR AIR SAMPLE LOCATION (B = BASEMENT, 1 = FIRST FLOOR, 2 = SECOND FLOOR)
- BASEMENT AREAS
- 259.0 GROUNDWATER ELEVATION (BASED ON MARCH 21, 2013 ELEVATION MONITORING)
- 260 GROUNDWATER CONTOUR (BASED ON MARCH 21, 2013 ELEVATION MONITORING)
- APPROXIMATE PROPERTY BOUNDARY
- APPROXIMATE SITE BOUNDARY
- EPA SOIL SAMPLE LOCATIONS
- SOIL BORING LOCATIONS
- SOIL GAS SAMPLE LOCATIONS
- CB CATCH BASIN

NOTES:

1. BASE MAP PROVIDED TO OTO IN ELECTRONIC FORMAT; ORIGINAL PLAN ENTITLED "EXISTING CONDITIONS" BY THE BERKSHIRE DESIGN GROUP, INC. (DATED SEPTEMBER, 2015).
2. SAMPLE LOCATIONS ARE SHOW ACCORDING TO TAPED MEASUREMENTS TAKEN FROM EXISTING SITE FEATURES.
3. ALL DATA IS TO BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD(S) USED IN THE DEVELOPMENT OF THIS PLAN.

SCALE IN FEET
1" = 50'
0' 25' 50' 100'

DRAWN BY: CRL
DATE: AUGUST 2017
REV.: OCTOBER 2019/CDA
DESIGNED BY: BHN
CHECKED BY: BHN

O'Reilly, Talbot & Okun
ENGINEERING ASSOCIATES
293 Bridge Street, Suite 500 Springfield, MA 01103 413.788.6222
www.OTO-ENV.com

298 FEDERAL STREET
GREENFIELD, MASSACHUSETTS

SITE EXPLORATIONS

PROJECT No.
J2693-01-02

FIGURE No.
3

C:\J2600\2693-401 Liberty LLC - Lunt\01-03 Mowry Building\Figures\J2693-01-02 298 Federal Street 2019.dwg

NORWOOD STREET

KENWOOD STREET

FEDERAL STREET

UNIT A1

UNIT A2

UNIT B1

UNIT B2

UNIT C

WEST GRID EXCAVATION AREA

NORTH CYCLONE EXCAVATION

CYCLONE EXCAVATION

CYCLONE EXCAVATION

TCE DEGREASER EXCAVATION

SOUTH GRID EXCAVATION AREA

FORMER 1 STORY BUILDING

FORMER 1 STORY BUILDING

FORMER 1-STORY BUILDING

FORMER 1-STORY BUILDING

ELEVATOR & MACHINE ROOM

SUMP

G1 G2 G3 G4 G5 G6 G7 G8

G9 G10 G11 G12 G13 G14 G15 G16 G17 G18 G19 G19.5 G20 G20.5 G21

LS-10 LS-24 LS-19 LS-22 LS-23 LS-20

IA-5 (1) IA-2 (B) IA-9 (2) IA-4 (B) IA-10 (1) IA-8 (1) IA-7 (1) IA-6 (1) IA-3 (B) IA-1 IA-4 IA-101 (1) IA-203 (2) IA-102 (1)

LWP-108 LWP-107 LWP-104 LWP-105 LWP-100 LWP-103 LWP-106 LWP-101 LWP-102

MW-105 MW-104 MW-102 MW-100 MW-6 MW-106 MW-103 MW-101 MW-5

CB CB-2N CB-1N CB-0 CB-2S CB-1S

LEGEND:

- CB — CATCH BASIN
- MONITORING WELL LOCATIONS (EXTERIOR)
- MONITORING WELL LOCATIONS (INTERIOR BASEMENT)
- INDOOR AIR SAMPLE LOCATION (B = BASEMENT, 1 = FIRST FLOOR, 2 = SECOND FLOOR)
- BASEMENT AREAS
- G21 — EXCAVATION GRID AREAS (G21 INDICATES GRID 21)
- CYCLONE OR TCE EXCAVATION AREAS
- APPROXIMATE PROPERTY BOUNDARY

NOTES:

1. BASE MAP PROVIDED TO OTO IN ELECTRONIC FORMAT; ORIGINAL PLAN ENTITLED "EXISTING CONDITIONS" BY THE BERKSHIRE DESIGN GROUP, INC. (DATED SEPTEMBER, 2015).
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3. ALL DATA IS TO BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD(S) USED IN THE DEVELOPMENT OF THIS PLAN.

SCALE IN FEET
1" = 50'
0' 25' 50' 100'

DRAWN BY: CRL
DATE: AUGUST 2017
REV.: MARCH 2020/CDA

DESIGNED BY: BHN
CHECKED BY: BHN

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298 FEDERAL STREET
GREENFIELD, MASSACHUSETTS

EXCAVATION AREAS

PROJECT No.
J2693-01-02

FIGURE No.
4

\\10.0.0.10\Data\J2600\2693 401 Liberty LLC - Lunt\01-03 Mowry Building\Figures\J2693-01-02 298 Federal Street 2016.dwg

LIMITS OF METHOD 1 GW-2 EXCEEDANCE IN GROUNDWATER

NORWOOD STREET

KENWOOD STREET

DAVIS STREET

FOREST AVENUE

FEDERAL STREET

317

313-315

46

44

45

43

42

38

37

28

22

20

14

12

15-17

UNIT A1

UNIT A2

UNIT B1

UNIT B2

UNIT C

FORMER 1 STORY BUILDING

FORMER 1-STORY BUILDING

MW-111	
03/12/13	43
09/27/19	<1
12/26/19	<1

MW-110	
03/12/13	<1

CB-5N	
01/10/13	170
03/11/13	110

CB-5S	
03/11/13	4.5
09/27/19	3.2

MW-109	
03/12/13	1.3

MW-108	
03/12/13	<1

MW-112	
03/12/13	<1

MW-113	
03/12/13	<1

MW-114	
03/12/13	<1

MW-115	
03/12/13	<1

MW-116	
03/12/13	<1

MW-107	
03/12/13	<1

MW-106	
03/12/13	<1
09/26/19	<1
12/26/19	<1

CB-2S	
03/11/13	12
09/27/19	<10
12/26/19	1.4

LS-22	
02/28/12	<1
03/13/13	<1
09/26/19	5.4

MW-103	
03/12/13	27
09/26/19	<4
12/26/19	<1

LS-23	
03/12/13	<1
09/26/19	<1
12/26/19	<1

CB-1S	
03/11/12	<1
09/27/19	120
10/24/19	390
12/26/19	6.3

MW-9	
03/13/13	<1

MW-101	
03/12/13	1,000
09/26/19	1,000
12/28/19	3,400

LS-20	
01/19/12	0.199
08/09/18	180

MW-5	
03/13/13	<1

MW-3	
03/13/13	<1

MW-6	
01/19/12	8.8
02/28/12	232
03/13/13	<1

MW-100	
03/13/13	150

CB-1N	
03/15/12	115
03/11/13	57
10/24/19	250
12/26/19	43

MW-102	
03/12/13	4.5
08/09/19	15

MW-104	
03/12/13	19,000
08/09/18	890
09/26/19	45,000

LS-19	
07/19/12	107,000
03/13/13	3,400
10/24/19	2,700

CB-2N	
03/15/12	581
01/10/13	700
03/11/13	470
12/28/19	430

LS-24	
02/28/12	17,200
03/13/13	18,000

LS-10	
01/19/12	<10

LS-21	
02/28/12	<1
03/13/13	<1

MW-105	
03/12/13	59

NOTES:

1. BASE MAP PROVIDED TO OTO IN ELECTRONIC FORMAT; ORIGINAL PLAN ENTITLED "EXISTING CONDITIONS" BY THE BERKSHIRE DESIGN GROUP, INC. (DATED SEPTEMBER, 2015).
2. SAMPLE LOCATIONS ARE SHOW ACCORDING TO TAPED MEASUREMENTS TAKEN FROM EXISTING SITE FEATURES.
3. ALL DATA IS TO BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD(S) USED IN THE DEVELOPMENT OF THIS PLAN.

LEGEND:

- APPROXIMATE PROPERTY BOUNDARY
- APPROXIMATE SITE BOUNDARY
- APPROXIMATE KENWOOD STREET DRAIN UTILITY LINES AND FLOW DIRECTION
- CB-0 ■ CATCH BASIN LOCATION WITH DESIGNATION
- MW-3 ◆ MONITORING WELL LOCATION WITH DESIGNATION
- MW-3 | 03/13/13 | <1 — SAMPLE LOCATION, WITH DATE AND TCE CONCENTRATION (MICROGRAMS PER LITER, OR PARTS PER BILLION)
- LIMITS OF METHOD 1 GW-2 EXCEEDANCE IN GROUNDWATER
- 12 RESIDENTIAL ADDRESS NUMBER
- EPA RESIDENTIAL INDOOR AIR TESTING LOCATIONS
- OTO RESIDENTIAL INDOOR AIR TESTING LOCATIONS
- BOTH OTO AND EPA RESIDENTIAL INDOOR AIR TESTING LOCATIONS

SCALE
1" = 60'
0 30' 60' 120'

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- ENVIRONMENTAL (MCP) CONSULTING
- GEOTECHNICAL ENGINEERING
- ASBESTOS CONSULTING & MANAGEMENT
- RISK ASSESSMENT
- INDUSTRIAL HYGIENE

PROJECT TITLE:
298 FEDERAL STREET

GREENFIELD, MASSACHUSETTS

SCALE: 1" = 60'
PROJ. NO: J2693-01-02
DRAWN: CDA
CHECKED: BHN
DATE: 02/06/2020
REV:

DRAWING TITLE:
TCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS AND CATCH BASINS

DRAWING NO.: 5

\\10.0.0.10\Data\J2600\2693 401 Liberty LLC - Lunt\01-02 Frmer Lunt Silversmith 298 Federal St Greenfield MA - Environmental Srvs\CAD\J2693-01-02 F5 and F6 - Figures with GIS and other Imagery - March 2020.dwg

CB-2N	
03/15/12	581
01/10/13	700
03/11/13	470
12/26/19	430

CB-5N	
01/10/13	170
03/11/13	110

CB-1N	
03/15/12	115
03/11/13	57
10/24/19	250
12/26/19	43

CB-9	
01/10/13	3
09/27/19	1.1
12/26/19	<1

CB-5S	
03/11/13	4.5
09/27/19	3.2

CB-2S	
03/11/13	12
09/27/19	<10
12/26/19	1.4

CB-1S	
03/11/12	<1
09/27/19	120
10/24/19	390
12/26/19	6.3

CB-12	
01/10/13	1.5

OF-1 & OF-2	
01/10/13	<1

LEGEND:

- APPROXIMATE SITE BOUNDARY
- CB-0 — CATCH BASIN LOCATION WITH DESIGNATION
- MW-3 / 03/13/13 / <1 — SAMPLE LOCATION, WITH DATE AND TCE CONCENTRATION (MICROGRAMS PER LITER, OR PARTS PER BILLION)
- DRAIN LINE AND FLOW DIRECTION

SCALE
1" = 250'
0 125' 250' 500'

O'Reilly, Talbot & Okun
ENGINEERING ASSOCIATES
293 Bridge Street, Suite 500 Springfield, MA 01103 413.788.6222
www.OTO-ENV.com

NOTES:

1. BASE MAP PROVIDED TO OTO IN ELECTRONIC FORMAT BY GREENFIELD DEPARTMENT OF PUBLIC WORKS.
2. CATCH BASIN AND SAMPLE LOCATIONS ARE SHOW ACCORDING TO TAPED MEASUREMENTS TAKEN FROM EXISTING SITE FEATURES.
3. ALL DATA IS TO BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD(S) USED IN THE DEVELOPMENT OF THIS PLAN.

PROJECT TITLE:
298 FEDERAL STREET

ADDRESS
GREENFIELD, MASSACHUSETTS

DRAWING TITLE:
TCE CONCENTRATIONS:
CATCH BASIN & OUTFALL DATA

SCALE: 1" = 250'
PROJ. NO: J2693-01-02
DRAWN: CDA
CHECKED: BHN
DATE: 02/06/2020

DRAWING NO.: 6

APPENDIX A

LIMITATIONS

1. The observations presented in this report were made under the conditions described herein. The conclusions presented in this report were based solely upon the services described in the report and not on scientific tasks or procedures beyond the scope of the project or the time and budgetary constraints imposed by the client.

2. In preparing the report, O'Reilly, Talbot & Okun Associates, Inc. relied on certain information provided by state and local officials and other parties referenced herein, and on information contained in the files of state or local regulatory agencies. Although there may have been some degree of overlap in the information provided by these sources, O'Reilly, Talbot & Okun Associates, Inc. did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this assessment.

3. Unless otherwise specified in the Report, we did not perform testing or analyses to determine the presence or concentration of asbestos or polychlorinated biphenyls (PCBs) at the Site or in the environment at the Site.

4. This Report assesses the physical characteristics of the subject site with respect to the presence of oil or hazardous material (OHM) in soil or groundwater at the Site, and to assess risks associated with detected OHM, within the meaning of the Massachusetts Contingency Plan, 310 CMR 40.0000. No specific attempt was made to check on the compliance of present or past owners or operators of the Site with federal, state, or local laws and regulations, environmental or otherwise.

5. Risk assessment was performed in accordance with generally accepted practices of government agencies and other consultants conducting similar characterizations. The findings of the risk characterization are dependent on numerous assumptions and uncertainties inherent in the risk assessment process. Therefore, the findings of the risk assessment should not be interpreted as an absolute characterization of actual risks, but as general indicators highlighting potential sources of risk at the Site. Although the range of uncertainty in the risk characterization has not (and can not) be quantified, the use of conservative assumptions throughout the process would be expected to err on the side of protection of human health and the environment.

6. Where analytical data or information regarding site environmental conditions was unavailable or limited, we render no opinion as to risks due to oil and/or hazardous materials in those portions of the Site, or to oil and/or hazardous materials not tested.

7. Our report was prepared for the exclusive benefit of the client. The report and its conclusions are not extended to third parties or future property owners. We acknowledge copies of our report may be submitted to Massachusetts Department of Environmental Protection for Massachusetts Contingency Plan compliance purposes.

APPENDIX B

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC 106 12

Release Tracking Number
1 - 18869

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

A. SITE LOCATION:

1. Site Name/Location Aid: FORMER LUNT SILVERSMITH, INC.
2. Street Address: 298 FEDERAL STREET
3. City/Town: GREENFIELD 4. Zip Code: 013010000

☑ 5. Check here if the disposal site that is the source of the release is Tier Classified. Check the current Tier Classification Category.

☑ a. Tier I ☐ b. Tier ID ☐ c. Tier II

B. THIS FORM IS BEING USED TO: (check all that apply)

1. List Submittal Date of Initial RAM Plan (if previously submitted): 9/5/2017 (mm/dd/yyyy)

☐ 2. Submit an **Initial Release Abatement Measure (RAM) Plan**.

☐ a. Check here if the RAM is being conducted as part of the construction of a permanent structure. If checked, you must specify what type of permanent structure is to be erected in or in the immediate vicinity of the area where the RAM is to be conducted.

b. Specify type of permanent structure: (check all that apply) ☐ i. School ☐ ii. Residential ☐ iii. Commercial ☐ iv. Industrial ☐ v. Other Specify: _____

☐ 3. Submit a **Modified RAM Plan** of a previously submitted RAM Plan.

☐ 4. Submit a **RAM Status Report**.

☐ 5. Submit a **Remedial Monitoring Report**. (This report can only be submitted through eDEP, concurrent with a RAM Status Report.)

a. Type of Report: (check one) ☐ i. Initial Report ☐ ii. Interim Report ☐ iii. Final Report

b. Frequency of Submittal:

☐ i. A Remedial Monitoring Report(s) submitted every six months, concurrent with a RAM Status Report.
☐ ii. A Remedial Monitoring Report(s) submitted annually, concurrent with a RAM Status Report.

c. Number of Remedial Systems and/or Monitoring Programs: _____

A separate BWSC106A, RAM Remedial Monitoring Report, must be filled out for each Remedial System and/or Monitoring Program addressed by this transmittal form.

☑ 6. Submit a **RAM Completion Statement**.

☐ 7. Submit a **Revised RAM Completion Statement**.

8. Provide Additional RTNs:

☐ a. Check here if this RAM Submittal covers additional Release Tracking Numbers (RTNs). RTNs that have been previously linked to a Primary Tier Classified RTN do not need to be listed here. This section is intended to allow a RAM to cover more than one unclassified RTN and not show permanent linkage to a Primary Tier Classified RTN.

b. Provide the additional Release Tracking Number(s) covered by this RAM Submittal. ☐ - ☐ ☐ - ☐

☐ 9. Include in the **RAM Plan** or **Modified RAM Plan** a **Plan for the Application of Remedial Additives** near a sensitive receptor, pursuant to 310 CMR 40.0046(3).

(All sections of this transmittal form must be filled out unless otherwise noted above)

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM
Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

C. RELEASE OR THREAT OF RELEASE CONDITIONS THAT WARRANT RAM:

1. Media Impacted and Receptors Affected: (check all that apply)

☐ a. Paved Surface ☐ b. Basement ☐ c. School
☐ d. Public Water Supply ☐ e. Surface Water ☐ f. Zone 2 ☐ g. Private Well ☐ h. Residence ☑ i. Soil
☑ j. Ground Water ☐ k. Sediments ☐ l. Wetland ☐ m. Storm Drain ☑ n. Indoor Air ☐ o. Air
☐ p. Soil Gas ☑ q. Sub-Slab Soil Gas ☐ r. Critical Exposure Pathway ☐ s. NAPL ☐ t. Unknown
☐ u. Others Specify:

2. Sources of the Release or TOR: (check all that apply)

☐ a. Transformer ☐ b. Fuel Tank ☐ c. Pipe
☐ d. OHM Delivery ☐ e. AST ☐ f. Drums ☐ g. Tanker Truck ☐ h. Hose ☐ i. Line
☐ j. UST Describe: ☐ k. Vehicle ☐ l. Boat/Vessel
☐ m. Unknown ☑ n. Other: HISTORIC OPERATIONS

3. Type of Release or TOR: (check all that apply)

☐ a. Dumping ☐ b. Fire ☐ c. AST Removal ☐ d. Overfill
☐ e. Rupture ☐ f. Vehicle Accident ☐ g. Leak ☐ h. Spill ☐ i. Test Failure ☐ j. TOR Only
☐ k. UST Removal Describe:
☑ l. Unknown ☐ m. Other:

4. Identify Oils and Hazardous Materials Released: (check all that apply)

☐ a. Oils ☑ b. Chlorinated Solvents
☑ c. Heavy Metals ☐ d. Others Specify:

D. DESCRIPTION OF RESPONSE ACTIONS: (check all that apply, for volumes list cumulative amounts)

☐ 1. Assessment and/or Monitoring Only
☐ 2. Temporary Covers or Caps
☐ 3. Deployment of Absorbent or Containment Materials
☐ 4. Temporary Water Supplies
☐ 5. Structure Venting System/HVAC Modification System
☐ 6. Temporary Evacuation or Relocation of Residents
☐ 7. Product or NAPL Recovery
☐ 8. Fencing and Sign Posting
☐ 9. Groundwater Treatment Systems
☐ 10. Soil Vapor Extraction
☐ 11. Remedial Additives
☐ 12. Air Sparging
☐ 13. Active Exposure Pathway Mitigation System
☑ 14. Passive Exposure Pathway Mitigation System
☐ 15. Monitored Natural Attenuation
☐ 16. In-Situ Chemical Oxidation

D. DESCRIPTION OF RESPONSE ACTIONS (cont.): (check all that apply, for volumes list cumulative amounts)

☑ 17. Excavation of Contaminated Soils

☑ a. Re-use, Recycling or Treatment ☐ i. On Site Estimated volume in cubic yards

☑ ii. Off Site Estimated volume in cubic yards 90

iia. Receiving Facility: WAYNE DISPOSAL Town: BELLEVILLE State: M

iib. Receiving Facility: Town: State:

iii. Describe: CONSTRUCTION OF PEPMM, SITE REDEVELOPMENT, EXCAVATION AND DISPOSAL OF TCE IMPACTED SOILS FROM BELOW VAPOR DEGREASER

☐ b. Store ☐ i. On Site Estimated volume in cubic yards

☐ ii. Off Site Estimated volume in cubic yards

iia. Receiving Facility: Town: State:

iib. Receiving Facility: Town: State:

☐ c. Landfill ☐ i. Cover Estimated volume in cubic yards

Receiving Facility: Town: State:

☐ ii. Disposal Estimated volume in cubic yards

Receiving Facility: Town: State:

☐ 18. Removal of Drums, Tanks or Containers:

a. Describe Quantity and Amount:

b. Receiving Facility: Town: State:

c. Receiving Facility: Town: State:

☐ 19. Removal of Other Contaminated Media:

a. Specify Type and Volume:

b. Receiving Facility: Town: State:

c. Receiving Facility: Town: State:

☐ 20. Other Response Actions:

Describe:

☐ 21. Use of Innovative Technologies:

Describe:

E. LSP SIGNATURE AND STAMP :

I attest under the pains and penalties of perjury that I have personally examined and am familiar with this transmittal form, including any and all documents accompanying this submittal. In my professional opinion and judgment based upon application of (i) the standard of care in 309 CMR 4.02(1), (ii) the applicable provisions of 309 CMR 4.02(2) and (3), and 309 CMR 4.03(2), and (iii) the provisions of 309 CMR 4.03(3), to the best of my knowledge, information and belief,

> if Section B of this form indicates that a **Release Abatement Measure Plan** is being submitted, the response action(s) that is (are) the subject of this submittal (i) has (have) been developed in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> if Section B of this form indicates that a **Release Abatement Measure Status Report** and/or **Remedial Monitoring Report** is being submitted, the response action(s) that is (are) the subject of this submittal (i) is (are) being implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) comply (ies) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> if Section B of this form indicates that a **Release Abatement Measure Completion Statement** is being submitted, the response action(s) that is (are) the subject of this submittal (i) has (have) been developed and implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal:

I am aware that significant penalties may result, including, but not limited to, possible fines and imprisonment, if I submit information which I know to be false, inaccurate or materially incomplete.

1. LSP #:	9000				
2. First Name:	BRUCE	3. Last Name:	NICKELSEN		
4. Telephone:	5083666409	5. Ext.:		6. Email:	
7. Signature:					
8. Date:	(mm/dd/yyyy)	9. LSP Stamp:			

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM
Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

F. PERSON UNDERTAKING RAM:

1. Check all that apply: ☐ a. change in contact name ☐ b. change of address ☐ c. change in the person undertaking response actions

2. Name of Organization: TOWN OF GREENFIELD

3. Contact First Name: ERIC 4. Last Name: TWAROG

5. Street: 14 COURT SQ 6. Title:

7. City/Town: GREENFIELD 8. State: MA 9. ZIP Code: 013013547

10. Telephone: 11. Ext.: 12. Email: ERICT@GREENFIELD-MA

G. RELATIONSHIP TO RELEASE OR THREAT OF RELEASE OF PERSON UNDERTAKING RAM:

☑ Check here to change relationship

☐ 1. RP or PRP ☐ a. Owner ☐ b. Operator ☐ c. Generator ☐ d. Transporter ☐ e. Other RP or PRP Specify:

☑ 2. Fiduciary, Secured Lender or Municipality with Exempt Status (as defined by M.G.L. c. 21E, s. 2)

☐ 3. Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s. 5(j))

☐ 4. Any Other Person Undertaking RAM Specify Relationship:

H. REQUIRED ATTACHMENT AND SUBMITTALS:

☐ 1. Check here if any Remediation Waste, generated as a result of this RAM, will be stored, treated, managed, recycled or reused at the site following submission of the RAM Completion Statement. You must submit a Phase IV Remedy Implementation Plan along with the appropriate transmittal form (BWSC108).

☐ 2. Check here if the Response Action(s) on which this opinion is based, if any, are (were) subject to any order(s), permit(s) and/or approval(s) issued by DEP or EPA. If the box is checked, you MUST attach a statement identifying the applicable provisions thereof.

☐ 3. Check here to certify that the Chief Municipal Officer and the Local Board of Health have been notified of the implementation of a Release Abatement Measure.

☐ 4. Check here if any non-updatable information provided on this form is incorrect, e.g. Release Address/Location Aid. Send corrections to bwsc.edep@state.ma.us.

☐ 5. If a RAM Compliance Fee is required for this RAM, check here to certify that a RAM Compliance Fee was submitted to DEP, P. O. Box 4062, Boston, MA 02211.

☑ 6. Check here to certify that the LSP Opinion containing the material facts, data, and other information is attached.

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

I. CERTIFICATION OF PERSON UNDERTAKING RAM:

1. I, _____ , attest under the pains and penalties of perjury (i) that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this transmittal form, (ii) that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material information contained in this submittal is, to the best of my knowledge and belief, true, accurate and complete, and (iii) that I am fully authorized to make this attestation on behalf of the entity legally responsible for this submittal. I/the person or entity on whose behalf this submittal is made am/is aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

2. By: _____ 3. Title: _____

(Signature)

4. For: TOWN OF GREENFIELD 5. Date: _____

(Name of person or entity recorded in Section F) (mm/dd/yyyy)

☐ 6. Check here if the address of the person providing certification is different from address recorded in Section F.

7. Street: _____

8. City/Town: _____ 9. State: _____ 10. ZIP Code: _____

11. Telephone: _____ 12. Ext.: _____ 13. Email: _____

YOU ARE SUBJECT TO AN ANNUAL COMPLIANCE ASSURANCE FEE OF UP TO $10,000 PER BILLABLE YEAR FOR THIS DISPOSAL SITE. YOU MUST LEGIBLY COMPLETE ALL RELEVANT SECTIONS OF THIS FORM OR DEP MAY RETURN THE DOCUMENT AS INCOMPLETE. IF YOU SUBMIT AN INCOMPLETE FORM, YOU MAY BE PENALIZED FOR MISSING A REQUIRED DEADLINE

Date Stamp (DEP USE ONLY:)

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC 108

Release Tracking Number
1 - 18869

COMPREHENSIVE RESPONSE ACTION TRANSMITTAL FORM & PHASE I COMPLETION STATEMENT

Pursuant to 310 CMR 40.0484 (Subpart D) and 40.0800 (Subpart H)

A. SITE LOCATION:

1. Site Name: FORMER LUNT SILVERSMITH, INC.

2. Street Address: 298 FEDERAL STREET

3. City/Town: GREENFIELD 4. ZIP Code: 013010000

☑ 5. Check here if the disposal site that is the source of the release is Tier Classified. Check the current Tier Classification Category:

☑ a. Tier I ☐ b. Tier ID ☐ c. Tier II

B. THIS FORM IS BEING USED TO: (check all that apply)

☐ 1. Submit a **Phase I Completion Statement,** pursuant to 310 CMR 40.0484.

☐ 2. Submit a **Revised Phase I Completion Statement,** pursuant to 310 CMR 40.0484.

☐ 3. Submit a **Phase II Scope of Work,** pursuant to 310 CMR 40.0834.

☐ 4. Submit an **interim Phase II Report.** This report does not satisfy the response action deadline requirements in 310 CMR 40.0500.

☑ 5. Submit a **final Phase II Report and Completion Statement,** pursuant to 310 CMR 40.0836.

☐ 6. Submit a **Revised Phase II Report and Completion Statement,** pursuant to 310 CMR 40.0836.

☐ 7. Submit a **Phase III Remedial Action Plan and Completion Statement,** pursuant to 310 CMR 40.0862.

☐ 8. Submit a **Revised Phase III Remedial Action Plan and Completion Statement,** pursuant to 310 CMR 40.0862.

☐ 9. Submit a **Phase IV Remedy Implementation Plan,** pursuant to 310 CMR 40.0874.

☐ 10. Submit a **Modified Phase IV Remedy Implementation Plan,** pursuant to 310 CMR 40.0874.

☐ 11. Submit an **As-Built Construction Report,** pursuant to 310 CMR 40.0875.

☐ 12. Submit a **Phase IV Status Report,** pursuant to 310 CMR 40.0877.

☐ 13. Submit a **Phase IV Completion Statement,** pursuant to 310 CMR 40.0878 and 40.0879.

Specify the outcome of Phase IV activities: (check one)

☐ a. Phase V Operation, Maintenance or Monitoring of the Comprehensive Remedial Action is necessary to achieve a Permanent or Temporary Solution.

☐ b. The requirements of a Permanent Solution have been met. A completed Permanent Solution Statement and Report (BWSC104) will be submitted to DEP.

☐ c. The requirements of a Temporary Solution have been met. A completed Temporary Solution Statement and Report (BWSC104) will be submitted to DEP.

B. THIS FORM IS BEING USED TO (cont.): (check all that apply)

☐ 14. Submit a **Revised Phase IV Completion Statement,** pursuant to 310 CMR 40.0878 and 40.0879.

☐ 15. Submit a **Phase V Status Report,** pursuant to 310 CMR 40.0892.

☐ 16. Submit a **Remedial Monitoring Report.** (This report can only be submitted through eDEP.)

a. Type of Report: (check one) ☐ i. Initial Report ☐ ii. Interim Report ☐ iii. Final Report

b. Frequency of Submittal: (check all that apply)

☐ i. A Remedial Monitoring Report(s) submitted monthly to address an Imminent Hazard.

☐ ii. A Remedial Monitoring Report(s) submitted monthly to address a Condition of Substantial Release Migration.

☐ iii. A Remedial Monitoring Report(s) submitted every six months, concurrent with a Status Report.

☐ iv. A Remedial Monitoring Report(s) submitted annually, concurrent with a Status Report.

c. Status of Site: (check one) ☐ i. Phase IV ☐ ii. Phase V ☐ iii. Remedy Operation Status ☐ iv. Temporary Solution

d. Number of Remedial Systems and/or Monitoring Programs: _____

A separate BWSC108A, CRA Remedial Monitoring Report, must be filled out for each Remedial System and/or Monitoring Program addressed by this transmittal form.

☐ 17. Submit a **Remedy Operation Status,** pursuant to 310 CMR 40.0893.

☐ 18. Submit a **Status Report to maintain a Remedy Operation Status,** pursuant to 310 CMR 40.0893(2).

☐ 19. Submit a **Transfer and/or a Modification of Persons Maintaining a Remedy Operation Status (ROS),** pursuant to 310 CMR 40.0893(5) (check one, or both, if applicable).

☐ a. Submit a Transfer of Persons Maintaining an ROS (the transferee should be the person listed in Section D, "Person Undertaking Response Actions").

☐ b. Submit a Modification of Persons Maintaining an ROS (the primary representative should be the person listed in Section D, "Person Undertaking Response Actions").

c. Number of Persons Maintaining an ROS not including the primary representative: _____

☐ 20. Submit a **Termination of a Remedy Operation Status,** pursuant to 310 CMR 40.0893(6).(check one)

☐ a. Submit a notice indicating ROS performance standards have not been met. A plan and timetable pursuant to 310 CMR 40.0893(6)(b) for resuming the ROS are attached.

☐ b. Submit a notice of Termination of ROS.

☐ 21. Submit a **Phase V Completion Statement,** pursuant to 310 CMR 40.0894.

Specify the outcome of Phase V activities: (check one)

☐ a. The requirements of a Permanent Solution have been met. A completed Permanent Solution Statement and Report (BWSC104) will be submitted to DEP.

☐ b. The requirements for a Temporary Solution have been met. A completed Temporary Solution Statement and Report (BWSC104) will be submitted to DEP.

☐ 22. Submit a **Revised Phase V Completion Statement,** pursuant to 310 CMR 40.0894.

☐ 23. Submit a **Temporary Solution Status Report,** pursuant to 310 CMR 40.0898.

☐ 24. Submit a **Plan for the Application of Remedial Additives** near a sensitive receptor, pursuant to 310 CMR 40.0046(3).

a. Status of Site: (check one)

☐ i. Phase IV ☐ ii. Phase V ☐ iii. Remedy Operation Status ☐ iv. Temporary Solution

C. LSP SIGNATURE AND STAMP:

I attest under the pains and penalties of perjury that I have personally examined and am familiar with this transmittal form, including any and all documents accompanying this submittal. In my professional opinion and judgment based upon application of (i) the standard of care in 309 CMR 4.02(1), (ii) the applicable provisions of 309 CMR 4.02(2) and (3), and 309 CMR 4.03(2), and (iii) the provisions of 309 CMR 4.03(3), to the best of my knowledge, information and belief,

> *if Section B indicates that a* ***Phase I, Phase II, Phase III, Phase IV or Phase V Completion Statement*** *and/or a* ***Termination of a Remedy Operation Status*** *is being submitted*, the response action(s) that is (are) the subject of this submittal (i) has (have) been developed and implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> *if Section B indicates that a* ***Phase II Scope of Work*** *or a* ***Phase IV Remedy Implementation Plan*** *is being submitted,* the response action(s) that is (are) the subject of this submittal (i) has (have) been developed in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> *if Section B indicates that an* ***As-Built Construction Report,*** *a* ***Remedy Operation Status,*** *a* ***Phase IV, Phase V or Temporary Solution Status Report,*** *a* ***Status Report to Maintain a Remedy Operation Status,*** *a* ***Transfer or Modification of Persons Maintaining a Remedy Operation Status*** *and/or a* ***Remedial Monitoring Report*** *is being submitted,* the response action(s) that is (are) the subject of this submittal (i) is (are) being implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal.

I am aware that significant penalties may result, including, but not limited to, possible fines and imprisonment, if I submit information which I know to be false, inaccurate or materially incomplete.

1. LSP#: 9000

2. First Name: BRUCE 3. Last Name: NICKELSEN

4. Telephone: 5083666409 5. Ext.: 6. Email:

7. Signature:

8. Date: (mm/dd/yyyy) 9. LSP Stamp:

COMPREHENSIVE RESPONSE ACTION TRANSMITTAL FORM & PHASE I COMPLETION STATEMENT

Pursuant to 310 CMR 40.0484 (Subpart D) and 40.0800 (Subpart H)

D. PERSON UNDERTAKING RESPONSE ACTIONS:

1. Check all that apply: ☐ a. change in contact name ☐ b. change of address ☐ c. change in the person undertaking response actions

2. Name of Organization: TOWN OF GREENFIELD

3. Contact First Name: ERIC 4. Last Name: TWAROG

5. Street: 14 COURT SQ 6. Title:

7. City/Town: GREENFIELD 8. State: MA 9. ZIP Code: 013013547

10. Telephone: 11. Ext: 12. Email: ERICT@GREENFIELD-MA.GOV

E. RELATIONSHIP TO SITE OF PERSON UNDERTAKING RESPONSE ACTIONS: ☑ Check here to change relationship

☐ 1. RP or PRP ☐ a. Owner ☐ b. Operator ☐ c. Generator ☐ d. Transporter

☐ e. Other RP or PRP Specify:

☑ 2. Fiduciary, Secured Lender or Municipality with Exempt Status (as defined by M.G.L. c. 21E, s. 2)

☐ 3. Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s. 5(j))

☐ 4. Any Other Person Undertaking Response Actions Specify Relationship:

F. REQUIRED ATTACHMENT AND SUBMITTALS:

☐ 1. Check here if the Response Action(s) on which this opinion is based, if any, are (were) subject to any order(s), permit(s) and/or approval(s) issued by DEP or EPA. If the box is checked, you MUST attach a statement identifying the applicable provisions thereof.

☑ 2. Check here to certify that the Chief Municipal Officer and the Local Board of Health have been notified of the submittal of any Phase Reports to DEP.

☐ 3. Check here to certify that the Chief Municipal Officer and the Local Board of Health have been notified of the availability of a Phase III Remedial Action Plan.

☐ 4. Check here to certify that the Chief Municipal Officer and the Local Board of Health have been notified of the availability of a Phase IV Remedy Implementation Plan.

☐ 5. Check here to certify that the Chief Municipal Officer and the Local Board of Health have been notified of any field work involving the implementation of a Phase IV Remedial Action.

☐ 6. If submitting a Transfer of a Remedy Operation Status (as per 310 CMR 40.0893(5)), check here to certify that a statement detailing the compliance history for the person making this submittal (transferee) is attached.

☐ 7. If submitting a Modification of a Remedy Operation Status (as per 310 CMR 40.0893(5)), check here to certify that a statement detailing the compliance history for each new person making this submittal is attached.

☐ 8. Check here if any non-updatable information provided on this form is incorrect, e.g. Release Address/Location Aid. Send corrections to: BWSC.eDEP@state.ma.us.

☑ 9. Check here to certify that the LSP Opinion containing the material facts, data, and other information is attached.

G. CERTIFICATION OF PERSON UNDERTAKING RESPONSE ACTIONS:

1. I, _____, attest under the pains and penalties of perjury (i) that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this transmittal form, (ii) that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material information contained in this submittal is, to the best of my knowledge and belief, true, accurate and complete, and (iii) that I am fully authorized to make this attestation on behalf of the entity legally responsible for this submittal. I/the person or entity on whose behalf this submittal is made am/is aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

>*if Section B indicates that this is a* **Modification of a Remedy Operation Status (ROS),** I attest under the pains and penalties of perjury that I am fully authorized to act on behalf of all persons performing response actions under the ROS as stated in 310 CMR 40.0893(5)(d) to receive oral and written correspondence from MassDEP with respect to performance of response actions under the ROS, and to receive a statement of fee amount as per 4.03(3).

I understand that any material received by the Primary Representative from MassDEP shall be deemed received by all the persons performing response actions under the ROS, and I am aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate or incomplete information.

2. By: _____ (Signature) 3. Title: _____

4. For: TOWN OF GREENFIELD (Name of person or entity recorded in Section D) 5. Date: _____ (mm/dd/yyyy)

☐ 6. Check here if the address of the person providing certification is different from address recorded in Section D.

7. Street: _____

8. City/Town: _____ 9. State: _____ 10. ZIP Code: _____

11. Telephone: _____ 12. Ext.: _____ 13. Email: _____

YOU ARE SUBJECT TO AN ANNUAL COMPLIANCE ASSURANCE FEE OF UP TO $10,000 PER BILLABLE YEAR FOR THIS DISPOSAL SITE. YOU MUST LEGIBLY COMPLETE ALL RELEVANT SECTIONS OF THIS FORM OR DEP MAY RETURN THE DOCUMENT AS INCOMPLETE. IF YOU SUBMIT AN INCOMPLETE FORM, YOU MAY BE PENALIZED FOR MISSING A REQUIRED DEADLINE.

Date Stamp (DEP USE ONLY:)

APPENDIX C

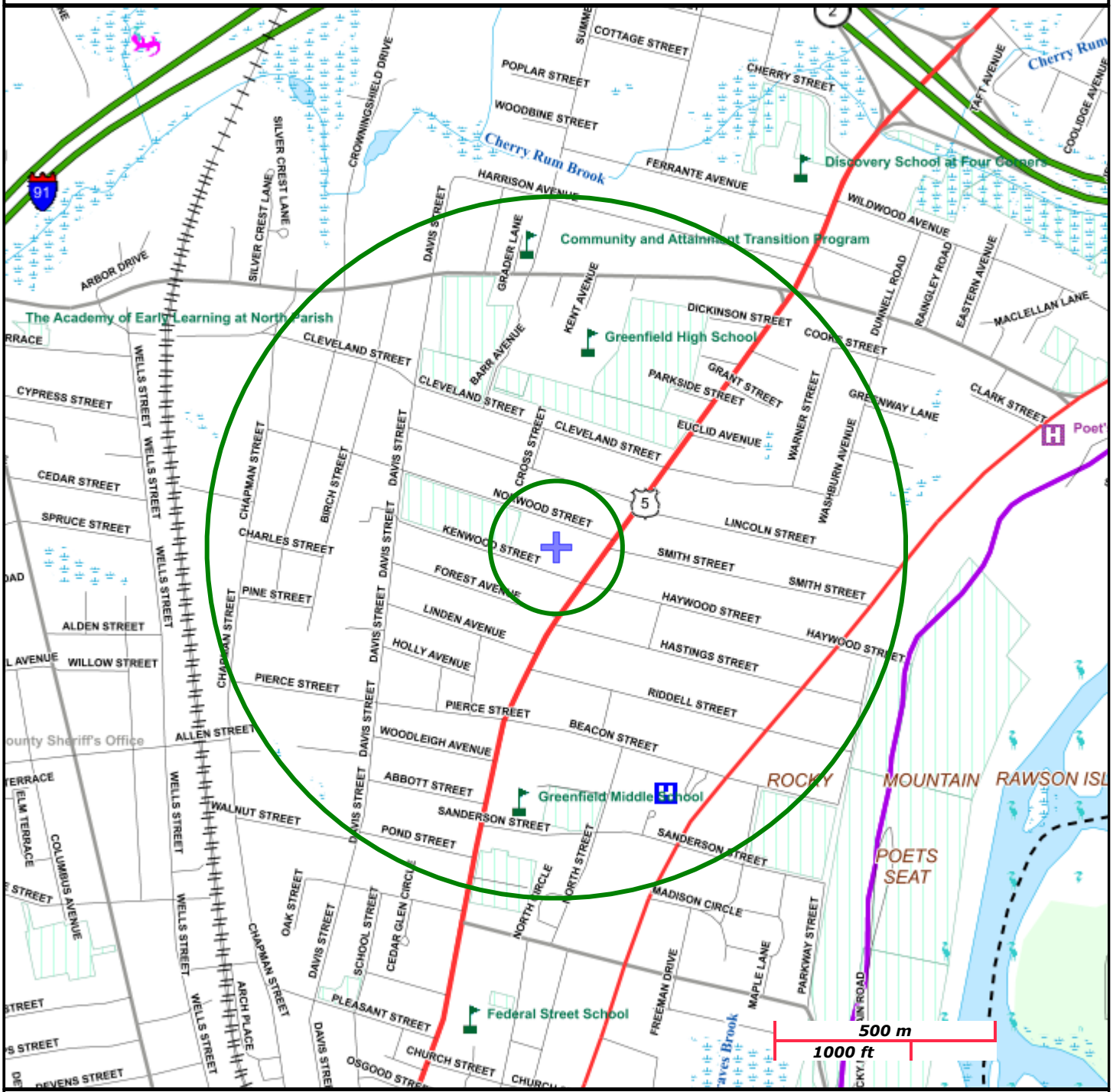
MassDEP - Bureau of Waste Site Cleanup

Phase 1 Site Assessment Map: 500 feet & 0.5 Mile Radii

Site Information:
FORMER LUNT SILVERSMITHS
298 FEDERAL STREET GREENFIELD, MA
1-000018869
NAD83 UTM Meters:
4719306mN , 697266mE (Zone: 18)
January 14, 2020

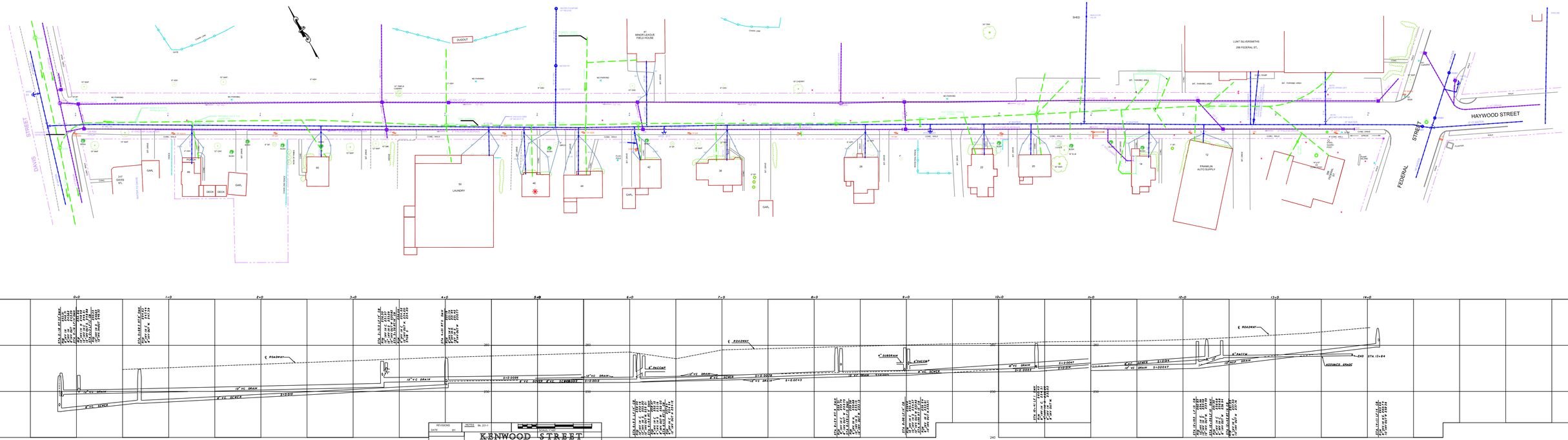
The information shown is the best available at the date of printing. However, it may be incomplete. The responsible party and LSP are ultimately responsible for ascertaining the true conditions surrounding the site. Metadata for data layers shown on this map can be found at: https://www.mass.gov/orgs/massgis-bureau-of-geographic-information.

MassDEP
Commonwealth of Massachusetts
Department of Environmental Protection



Roads: Limited Access, Divided, Other Hwy, Major Road, Minor Road, Track, Trail
Boundaries: Town, County, DEP Region; Train; Powerline; Pipeline; Aqueduct
Basins: Major, PWS; Streams: Perennial, Intermittent, Man Made Shore, Dam
Aquifers: Medium Yield, High Yield, EPA Sole Source
Non Potential Drinking Water Source Area: Medium, High (Yield)
PWS Protection Areas: Zone II, IWPA, Zone A
Hydrography: Open Water, PWS Reservoir, Tidal Flat
Wetlands: Freshwater, Saltwater, Cranberry Bog
FEMA 100yr Floodplain; Protected Open Space; ACEC
Est. Rare Wetland Wildlife Hab; Vernal Pool: Cert., Potential
Solid Waste Landfill; PWS: Com.GW,SW, Emerg., Non-Com.

APPENDIX D



REVISIONS		NOTES Bk. 321-1			
DATE	BY				
Designed by					
Checked by		DEPARTMENT OF PUBLIC WORKS		DATE 7/2/73	SHEET OF 1 3
ROAD by BJ/JC		GREENFIELD, MASSACHUSETTS			

CONSTRUCTION

KENWOOD STREET

DAVIS STREET TO #46

APPENDIX E

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

December 19, 2019

Bruce Nickelsen
OTO Associates
293 Bridge St. Suite 500
Springfield, MA 01103

Project Location: Greenfield, MA
Client Job Number:
Project Number: 2693-02-01
Laboratory Work Order Number: 19L0629

Enclosed are results of analyses for samples received by the laboratory on December 13, 2019. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jessica L. Hoffman
Project Manager

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B248634 10

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

OTO Associates
293 Bridge St. Suite 500
Springfield, MA 01103
ATTN: Bruce Nickelsen

REPORT DATE: 12/19/2019

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 2693-02-01

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 19L0629

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Greenfield, MA

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
IA-101	19L0629-01	Indoor air		EPA TO-15	
IA-102	19L0629-02	Indoor air		EPA TO-15	
IA-104	19L0629-03	Indoor air		EPA TO-15	
IA-203	19L0629-04	Indoor air		EPA TO-15	

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Lisa A. Worthington
Technical Representative

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

ANALYTICAL RESULTS

Project Location: Greenfield, MA
Date Received: 12/13/2019
Field Sample #: IA-101
Sample ID: 19L0629-01
Sample Matrix: Indoor air
Sampled: 12/13/2019 13:10

Sample Description/Location:
Sub Description/Location:
Canister ID: 1848
Canister Size: 6 liter
Flow Controller ID: 3095
Sample Type: 24 hr

Work Order: 19L0629
Initial Vacuum(in Hg): -30
Final Vacuum(in Hg): -6
Receipt Vacuum(in Hg): -7.2
Flow Controller Type: Fixed-Orifice
Flow Controller Calibration
RPD Pre and Post-Sampling: <20%

EPA TO-15

	ppbv			ug/m3			Date/Time	
Analyte	**Results**	**RL**	**Flag/Qual**	**Results**	**RL**	**Dilution**	**Analyzed**	**Analyst**
1,1-Dichloroethylene	ND	0.035		ND	0.14	0.698	12/17/19 0:43	BRF
cis-1,2-Dichloroethylene	ND	0.035		ND	0.14	0.698	12/17/19 0:43	BRF
trans-1,2-Dichloroethylene	ND	0.035		ND	0.14	0.698	12/17/19 0:43	BRF
Tetrachloroethylene	ND	0.035		ND	0.24	0.698	12/17/19 0:43	BRF
Trichloroethylene	0.27	0.035		1.4	0.19	0.698	12/17/19 0:43	BRF
Vinyl Chloride	ND	0.035		ND	0.089	0.698	12/17/19 0:43	BRF

Surrogates	% Recovery	% REC Limits	
4-Bromofluorobenzene (1)	106	70-130	12/17/19 0:43

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

ANALYTICAL RESULTS

Project Location: Greenfield, MA
Date Received: 12/13/2019
Field Sample #: IA-102
Sample ID: 19L0629-02
Sample Matrix: Indoor air
Sampled: 12/13/2019 13:35

Sample Description/Location:
Sub Description/Location:
Canister ID: 2033
Canister Size: 6 liter
Flow Controller ID: 3290
Sample Type: 24 hr

Work Order: 19L0629
Initial Vacuum(in Hg): -30
Final Vacuum(in Hg): -10
Receipt Vacuum(in Hg): -8.6
Flow Controller Type: Fixed-Orifice
Flow Controller Calibration
RPD Pre and Post-Sampling: <20%

EPA TO-15

	ppbv			ug/m3			Date/Time	
Analyte	**Results**	**RL**	**Flag/Qual**	**Results**	**RL**	**Dilution**	**Analyzed**	**Analyst**
1,1-Dichloroethylene	ND	0.035		ND	0.14	0.698	12/17/19 1:15	BRF
cis-1,2-Dichloroethylene	ND	0.035		ND	0.14	0.698	12/17/19 1:15	BRF
trans-1,2-Dichloroethylene	ND	0.035		ND	0.14	0.698	12/17/19 1:15	BRF
Tetrachloroethylene	ND	0.035		ND	0.24	0.698	12/17/19 1:15	BRF
Trichloroethylene	0.30	0.035		1.6	0.19	0.698	12/17/19 1:15	BRF
Vinyl Chloride	ND	0.035		ND	0.089	0.698	12/17/19 1:15	BRF

Surrogates	% Recovery	% REC Limits	
4-Bromofluorobenzene (1)	106	70-130	12/17/19 1:15

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

ANALYTICAL RESULTS

Project Location: Greenfield, MA
Date Received: 12/13/2019
Field Sample #: IA-104
Sample ID: 19L0629-03
Sample Matrix: Indoor air
Sampled: 12/13/2019 13:10

Sample Description/Location:
Sub Description/Location:
Canister ID: 2171
Canister Size: 6 liter
Flow Controller ID: 3681
Sample Type: 24 hr

Work Order: 19L0629
Initial Vacuum(in Hg): -30
Final Vacuum(in Hg): -7
Receipt Vacuum(in Hg): -7.8
Flow Controller Type: Fixed-Orifice
Flow Controller Calibration
RPD Pre and Post-Sampling: <20%

EPA TO-15

	ppbv			ug/m3			Date/Time	
Analyte	**Results**	**RL**	**Flag/Qual**	**Results**	**RL**	**Dilution**	**Analyzed**	**Analyst**
1,1-Dichloroethylene	ND	0.035		ND	0.14	0.698	12/17/19 1:46	BRF
cis-1,2-Dichloroethylene	ND	0.035		ND	0.14	0.698	12/17/19 1:46	BRF
trans-1,2-Dichloroethylene	ND	0.035		ND	0.14	0.698	12/17/19 1:46	BRF
Tetrachloroethylene	ND	0.035		ND	0.24	0.698	12/17/19 1:46	BRF
Trichloroethylene	0.27	0.035		1.5	0.19	0.698	12/17/19 1:46	BRF
Vinyl Chloride	ND	0.035		ND	0.089	0.698	12/17/19 1:46	BRF

Surrogates	% Recovery	% REC Limits	
4-Bromofluorobenzene (1)	108	70-130	12/17/19 1:46

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

ANALYTICAL RESULTS

Project Location: Greenfield, MA
Date Received: 12/13/2019
Field Sample #: IA-203
Sample ID: 19L0629-04
Sample Matrix: Indoor air
Sampled: 12/13/2019 13:15

Sample Description/Location:
Sub Description/Location:
Canister ID: 1864
Canister Size: 6 liter
Flow Controller ID: 3517
Sample Type: 24 hr

Work Order: 19L0629
Initial Vacuum(in Hg): -30
Final Vacuum(in Hg): -7
Receipt Vacuum(in Hg): -7.5
Flow Controller Type: Fixed-Orifice
Flow Controller Calibration
RPD Pre and Post-Sampling: <20%

EPA TO-15

Analyte	ppbv Results	ppbv RL	Flag/Qual	ug/m3 Results	ug/m3 RL	Dilution	Date/Time Analyzed	Analyst
1,1-Dichloroethylene	ND	0.035		ND	0.14	0.698	12/17/19 2:17	BRF
cis-1,2-Dichloroethylene	ND	0.035		ND	0.14	0.698	12/17/19 2:17	BRF
trans-1,2-Dichloroethylene	ND	0.035		ND	0.14	0.698	12/17/19 2:17	BRF
Tetrachloroethylene	ND	0.035		ND	0.24	0.698	12/17/19 2:17	BRF
Trichloroethylene	0.10	0.035		0.56	0.19	0.698	12/17/19 2:17	BRF
Vinyl Chloride	ND	0.035		ND	0.089	0.698	12/17/19 2:17	BRF

Surrogates	% Recovery	% REC Limits	
4-Bromofluorobenzene (1)	109	70-130	12/17/19 2:17

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Sample Extraction Data

Prep Method: TO-15 Prep-EPA TO-15

Lab Number [Field ID]	Batch	Pressure Dilution	Pre Dilution	Pre-Dil Initial mL	Pre-Dil Final mL	Default Injection mL	Actual Injection mL	Date
19L0629-01 [IA-101]	B248634	1.5	1	N/A	1000	200	430	12/16/19
19L0629-02 [IA-102]	B248634	1.5	1	N/A	1000	200	430	12/16/19
19L0629-03 [IA-104]	B248634	1.5	1	N/A	1000	200	430	12/16/19
19L0629-04 [IA-203]	B248634	1.5	1	N/A	1000	200	430	12/16/19

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL

Air Toxics by EPA Compendium Methods - Quality Control

Analyte	ppbv Results	ppbv RL	ug/m3 Results	ug/m3 RL	Spike Level ppbv	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag/Qual
Batch B248634 - TO-15 Prep											
Blank (B248634-BLK1)					Prepared & Analyzed: 12/16/19						
1,1-Dichloroethylene	ND	0.020									
cis-1,2-Dichloroethylene	ND	0.020									
trans-1,2-Dichloroethylene	ND	0.020									
Tetrachloroethylene	ND	0.020									
Trichloroethylene	ND	0.020									
Vinyl Chloride	ND	0.020									
Surrogate: 4-Bromofluorobenzene (1)	*8.57*				*8.00*		*107*	*70-130*			
LCS (B248634-BS1)					Prepared & Analyzed: 12/16/19						
1,1-Dichloroethylene	3.77				5.00		75.3	70-130			
cis-1,2-Dichloroethylene	4.37				5.00		87.4	70-130			
trans-1,2-Dichloroethylene	4.59				5.00		91.8	70-130			
Tetrachloroethylene	4.89				5.00		97.8	70-130			
Trichloroethylene	4.54				5.00		90.9	70-130			
Vinyl Chloride	5.38				5.00		108	70-130			
Surrogate: 4-Bromofluorobenzene (1)	*8.83*				*8.00*		*110*	*70-130*			
Duplicate (B248634-DUP1)		**Source: 19L0629-04**			Prepared: 12/16/19 Analyzed: 12/17/19						
1,1-Dichloroethylene	ND	0.035	ND	0.14		ND				25	
cis-1,2-Dichloroethylene	ND	0.035	ND	0.14		ND				25	
trans-1,2-Dichloroethylene	ND	0.035	ND	0.14		ND				25	
Tetrachloroethylene	0.027	0.035	0.18	0.24		0.027			2.60	25	
Trichloroethylene	0.11	0.035	0.59	0.19		0.10			5.86	25	
Vinyl Chloride	ND	0.035	ND	0.089		ND				25	
Surrogate: 4-Bromofluorobenzene (1)	*8.53*				*8.00*		*107*	*70-130*			

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level

Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.

No results have been blank subtracted unless specified in the case narrative section.

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

INTERNAL STANDARD AREA AND RT SUMMARY

EPA TO-15

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Initial Cal Check (S041441-ICV1)			Lab File ID: J1923422.D			Analyzed: 08/23/19 04:53			
Bromochloromethane (1)	166753	2.876	168350	2.879	99	60 - 140	-0.0030	+/-0.50	
1,4-Difluorobenzene (1)	694806	3.481	701289	3.481	99	60 - 140	0.0000	+/-0.50	
Chlorobenzene-d5 (1)	615559	5.06	623972	5.063	99	60 - 140	-0.0030	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY

EPA TO-15

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (S043904-CCV1)			Lab File ID: J1935004.D			Analyzed: 12/16/19 11:55			
Bromochloromethane (1)	151097	2.879	168350	2.879	90	60 - 140	0.0000	+/-0.50	
1,4-Difluorobenzene (1)	624625	3.48	701289	3.481	89	60 - 140	-0.0010	+/-0.50	
Chlorobenzene-d5 (1)	550229	5.059	623972	5.063	88	60 - 140	-0.0040	+/-0.50	
IA-101 (19L0629-01)			Lab File ID: J1935029.D			Analyzed: 12/17/19 00:43			
Bromochloromethane (1)	178925	2.869	151097	2.879	118	60 - 140	-0.0100	+/-0.50	
1,4-Difluorobenzene (1)	692889	3.474	624625	3.48	111	60 - 140	-0.0060	+/-0.50	
Chlorobenzene-d5 (1)	627721	5.059	550229	5.059	114	60 - 140	0.0000	+/-0.50	
IA-102 (19L0629-02)			Lab File ID: J1935030.D			Analyzed: 12/17/19 01:15			
Bromochloromethane (1)	180099	2.87	151097	2.879	119	60 - 140	-0.0090	+/-0.50	
1,4-Difluorobenzene (1)	708163	3.475	624625	3.48	113	60 - 140	-0.0050	+/-0.50	
Chlorobenzene-d5 (1)	634411	5.057	550229	5.059	115	60 - 140	-0.0020	+/-0.50	
IA-104 (19L0629-03)			Lab File ID: J1935031.D			Analyzed: 12/17/19 01:46			
Bromochloromethane (1)	180342	2.87	151097	2.879	119	60 - 140	-0.0090	+/-0.50	
1,4-Difluorobenzene (1)	699528	3.475	624625	3.48	112	60 - 140	-0.0050	+/-0.50	
Chlorobenzene-d5 (1)	634333	5.057	550229	5.059	115	60 - 140	-0.0020	+/-0.50	
IA-203 (19L0629-04)			Lab File ID: J1935032.D			Analyzed: 12/17/19 02:17			
Bromochloromethane (1)	180470	2.87	151097	2.879	119	60 - 140	-0.0090	+/-0.50	
1,4-Difluorobenzene (1)	696062	3.475	624625	3.48	111	60 - 140	-0.0050	+/-0.50	
Chlorobenzene-d5 (1)	624910	5.06	550229	5.059	114	60 - 140	0.0010	+/-0.50	

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CONTINUING CALIBRATION CHECK

EPA TO-15

S043904-CCV1

COMPOUND	TYPE	CONC. (ppbv)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
1,1-Dichloroethylene	A	5.00	3.91	1.129874	0.8827707		-21.9	30
cis-1,2-Dichloroethylene	A	5.00	4.41	1.027857	0.9061199		-11.8	30
trans-1,2-Dichloroethylene	A	5.00	4.58	1.067159	0.9783067		-8.3	30
Tetrachloroethylene	A	5.00	5.06	0.5166003	0.5229444		1.2	30
Trichloroethylene	A	5.00	4.59	0.3075005	0.2825068		-8.1	30
Vinyl Chloride	A	5.00	5.42	0.6677488	0.7231805		8.3	30

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
EPA TO-15 in Air	
1,1-Dichloroethylene	AIHA,FL,NJ,NY,ME,NH,VA
cis-1,2-Dichloroethylene	AIHA,FL,NY,ME,NH,VA
trans-1,2-Dichloroethylene	AIHA,NJ,NY,ME,NH,VA
Tetrachloroethylene	AIHA,FL,NJ,NY,ME,NH,VA
Trichloroethylene	AIHA,FL,NJ,NY,ME,NH,VA
Vinyl Chloride	AIHA,FL,NJ,NY,ME,NH,VA

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC - ISO17025:2017	100033	03/1/2022
MA	Massachusetts DEP	M-MA100	06/30/2020
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2021
NY	New York State Department of Health	10899 NELAP	04/1/2020
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2020
RI	Rhode Island Department of Health	LAO00112	12/30/2019
NC	North Carolina Div. of Water Quality	652	12/31/2020
NJ	New Jersey DEP	MA007 NELAP	06/30/2020
FL	Florida Department of Health	E871027 NELAP	06/30/2020
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2020
ME	State of Maine	2011028	06/9/2021
VA	Commonwealth of Virginia	460217	12/14/2020
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2020
VT-DW	Vermont Department of Health Drinking Water	VT-255716	06/12/2020
NC-DW	North Carolina Department of Health	25703	07/31/2020
PA	Commonwealth of Pennsylvania DEP	68-05812	06/30/2020

con-test ANALYTICAL LABORATORY

1960629

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http://www.contestlabs.com

Doc #378 Rev 1_03242017

CHAIN OF CUSTODY RECORD (AIR)

39 Spruce Street
East Longmeadow, MA 01028

Page 1 of 1

JLH

Company Name: OTO

Address: 243 Bridge St

Phone:

Project Name: Farmer Lunt

Project Location: Greenfield, MA

Project Number: 26983-02-01

Project Manager: Bruce Nickelsen

Con-Test Quote Name/Number:

Invoice Recipient:

Sampled By: PLS

Requested Turnaround Time
7-Day ☐ 10-Day ☐
Due Date:

Rush Approval Required
1-Day ☐ 3-Day ☐
2-Day ☐ 4-Day ☐

Data Delivery
Format: PDF ☒ EXCEL ☒
Other:
CLP Like Data Pkg Required: ☐
Email To: nickelsen@oto-inv.com
Suares@oto-inv.com
Fax To #:

ANALYSIS REQUESTED

Lab Use	Client Use	Collection Data		Duration	Flow Rate	Matrix	Volume	ANALYSIS REQUESTED				" Hg			Please fill out completely, sign, date and retain the yellow copy for your records	
Con-Test Work Order#	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	Total Minutes Sampled	☐ m³/min ☐ L/min	Code	☐ Liters ☐ m³	TO-15 Conc List *				Initial Pressure	Final Pressure	Lab Receipt Pressure	Summa Can ID	Flow Controller ID
01	IA-101	12/12/19 1330	12/13/19 1310					A				-30	-9	-12	1848	3095
02	IA-102	12/12/19 1330	12/13/19 1335					P				-30	-10	-8.5	2033	3270
03	IA-104	12/12/19 1326	12/13/19 1316					X				-30	-7	-7.5	2171	3681
04	IA-203	12/12/19 1335	12/13/19 1315					P				-30	-7	-7.5	1844	3517

Summa canisters and flow controllers must be returned within 15 days of receipt or rental fees will apply

For summa canister and flow controller information please refer to Con-Test's Air Media Agreement

Comments: see list attached.

Please use the following codes to indicate possible sample concentration within the Conc Code column above:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Matrix Codes:
SG = SOIL GAS
IA = INDOOR AIR
AMB = AMBIENT
SS = SUB SLAB
D = DUP
BL = BLANK
O = Other_____

Relinquished by: (signature)	Date/Time:
	12/13/19 1434
Received by: (signature)	Date/Time:
	12/13/19 1434
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Detection Limit Requirements
MA: CW-1/2/3
RCP:
Other:

Special Requirements
☒ MA MCP Required
MCP Certification Form Required
☐ CT RCP Required
RCP Certification Form Required
☐ Other

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NELAC and AIHA-LAP, LLC Accredited

Project Entity
☐ Government ☐ Municipality ☐ MWRA ☐ WRTA
☐ Federal ☐ 21 J ☐ School
☐ City ☐ Brownfield ☐ MBTA

Other
☐ Chromatogram
☐ AIHA-LAP, LLC

PCB ONLY
☐ Soxhlet
☐ Non Soxhlet

Table of Contents

con-test® ANALYTICAL LABORATORY

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

ANALYTICAL RESULTS

Project Location: Greenfield, MA
Date Received: 9/27/2019
Field Sample #: IA-104
Sample ID: 19I1500-01
Sample Matrix: Indoor air
Sampled: 9/27/2019 08:49

Sample Description/Location:
Sub Description/Location:
Canister ID:
Canister Size: 6 liter
Flow Controller ID: 3344
Sample Type: 24 hr

Work Order: 19I1500
Initial Vacuum(in Hg):
Final Vacuum(in Hg):
Receipt Vacuum(in Hg): -9.0
Flow Controller Type: Fixed-Orifice
Flow Controller Calibration
RPD Pre and Post-Sampling: <20%

EPA TO-15

	ppbv			ug/m3			Date/Time	
Analyte	**Results**	**RL**	**Flag/Qual**	**Results**	**RL**	**Dilution**	**Analyzed**	**Analyst**
1,1-Dichloroethylene	ND	0.035		ND	0.14	0.702	10/3/19 22:42	BRF
cis-1,2-Dichloroethylene	ND	0.035		ND	0.14	0.702	10/3/19 22:42	BRF
trans-1,2-Dichloroethylene	ND	0.035		ND	0.14	0.702	10/3/19 22:42	BRF
Tetrachloroethylene	ND	0.035		ND	0.24	0.702	10/3/19 22:42	BRF
Trichloroethylene	0.091	0.035		0.49	0.19	0.702	10/3/19 22:42	BRF
Vinyl Chloride	ND	0.035		ND	0.090	0.702	10/3/19 22:42	BRF

Surrogates	% Recovery	% REC Limits	
4-Bromofluorobenzene (1)	121	70-130	10/3/19 22:42

TO-15 = CVOC 1-15A

CVOC

VOC Halogenated

I Have Not Confirmed Sample Container Numbers With Lab Staff Before Relinquishing Over Samples_____

con-test® ANALYTICAL LABORATORY

Doc# 278 Rev 6 2017

Air Media Sample Receipt Checklist - (Rejection Criteria Listing - Using Acceptance Policy) Any False Statement will be brought to the attention of the Client - State True or False

Client OTO

Received By	RLF	Date	12/13/19	Time	1434		
How were the samples received?	In Cooler		On Ice		No Ice		
	In Box	T	Ambient		Melted Ice		
Were samples within Temperature Compliance? 2-6°C	By Gun #		Actual Temp -				
	By Blank #	NA	Actual Temp -				
Was Custody Seal Intact?	NA	Were Samples Tampered with?	NA				
Was COC Relinquished ?	T	Does Chain Agree With Samples?	T				
Are there any loose caps/valves on any samples?	F						
Is COC in ink/ Legible?	T						
Did COC Include all Pertinent Information?	Client	T	Analysis	T	Sampler Name	T	
	Project	T	ID's	T	Collection Dates/Times	T	
Are Sample Labels filled out and legible?	T						
Are there Rushes?	F	Who was notified?					
Samples are received within holding time?	T						
Proper Media Used?	T	Individually Certified Cans?	F				
Are there Trip Blanks?	F	Is there enough Volume?	T				

Containers:	#	Size	Regulator	Duration	Accessories:			
Summa Cans	4	6L	4	24hr	Nut/Ferrule		IC Train	
Tedlar Bags					Tubing			
TO-17 Tubes					T-Connector		Shipping Charges	
Radiello					Syringe			
Pufs/TO-11s					Tedlar			

Can #'s					Reg #'s				
1848					3495				
2033					3290				
2171					3681				
1864					3517				
Unused Media					**Pufs/TO-17's**				

Comments:

Air Sampling Media Certificate of Analysis

Date Analyzed: 12/4/2019 **Batch #:** 19CC847

Certification Type: *Batch Certified* ☑ *Individual Certified* ☐

Media Type: *Summa Canister* ☑ *Flow Controllers* ☐

Media IDs: BC1848 BC2033

Note:Two ID's grouped together, for example BC2136/BC3145, represents matched pairs of certified summa canisters and flow controllers.

Units: PPBv

<0.80	Propene	<0.04	Vinyl acetate	<0.02	Dibromchloromethane
<0.02	Dichlorodifluoromethane	<0.20	Hexane	<0.02	1,2-Dibromomethane
<0.04	Chloromethane	<0.02	Ethyl acetate	<0.02	Tetrachloroethylene
<0.02	Freon 114	<0.02	Chloroform	<0.02	Chlorobenzene
<0.02	Vinyl chloride	<0.02	Tetrahydrofuran	<0.02	Ethylbenzene
<0.02	1.3-Butadiene	<0.02	1,2-Dichloroethane	<0.04	m,p-Xylenes
<0.02	Bromomethane	<0.02	1,1,1-Trichloroethane	<0.02	Bromoform
<0.02	Chloroethane	<0.02	Benzene	<0.02	Styrene
<0.08	Acrolein	<0.02	Carbon Tetrachloride	<0.02	o-Xylene
<0.80	Acetone	<0.02	Cyclohexane	<0.02	1,1,2,2-Tetrachloroethane
<0.20	Trichlorofluoromethane	<0.02	1,2-Dichloropropane	<0.02	4-Ethyltoluene
<0.80	Ethanol	<0.02	Bromodichloromethane	<0.02	1,3,5-Trimethylbenzene
<0.02	1,1-Dichloroethylene	<0.02	Trichloroethylene	<0.02	1,2,4-Trimethylbenzene
<0.20	Methylene chloride	<0.02	1,4-Dioxane	<0.02	1,3-Dichlorobenzene
<0.20	Freon 113	<0.02	Methylmethacrylate	<0.02	Benzyl chloride
<0.2	Carbon disulfide	<0.02	Heptane	<0.02	1,4-Dichlorobenzene
<0.02	t-1,2-Dichloroethylene	<0.02	MIBK	<0.02	1,2-Dichlorobenzene
<0.02	1,1-Dichloroethane	<0.02	c-1,3-Dichloropropylene	<0.04	1,2,4-Trichlorobenzene
<0.02	MTBE	<0.02	t-1,3-Dichloropropylene	<0.02	Naphthalene
<0.80	IPA	<0.02	1,1,2-Trichloroethylene	<0.02	Hexachlorobutadiene
<0.20	2-Butanone (MEK)	<0.02	Toluene		
<0.02	c-1,2-Dichloroethylene	<0.02	2-Hexanone (MBK)		

Special Notes:

Analyst Initials/Date: BRF 12/18/2019

Air Sampling Media Certificate of Analysis

Date Analyzed: 12/5/2019 **Batch #:** 19CC853

Certification Type: *Batch Certified* ☑ *Individual Certified* ☐

Media Type: *Summa Canister* ☑ *Flow Controllers* ☐

Media IDs: BC2171 BC1864

Note:Two ID's grouped together, for example BC2136/BC3145, represents matched pairs of certified summa canisters and flow controllers.

Units: PPBv

<0.80	Propene	<0.04	Vinyl acetate	<0.02	Dibromchloromethane
<0.02	Dichlorodifluoromethane	<0.20	Hexane	<0.02	1,2-Dibromomethane
<0.04	Chloromethane	<0.02	Ethyl acetate	<0.02	Tetrachloroethylene
<0.02	Freon 114	<0.02	Chloroform	<0.02	Chlorobenzene
<0.02	Vinyl chloride	<0.02	Tetrahydrofuran	<0.02	Ethylbenzene
<0.02	1.3-Butadiene	<0.02	1,2-Dichloroethane	<0.04	m,p-Xylenes
<0.02	Bromomethane	<0.02	1,1,1-Trichloroethane	<0.02	Bromoform
<0.02	Chloroethane	<0.02	Benzene	<0.02	Styrene
<0.08	Acrolein	<0.02	Carbon Tetrachloride	<0.02	o-Xylene
<0.80	Acetone	<0.02	Cyclohexane	<0.02	1,1,2,2-Tetrachloroethane
<0.20	Trichlorofluoromethane	<0.02	1,2-Dichloropropane	<0.02	4-Ethyltoluene
<0.80	Ethanol	<0.02	Bromodichloromethane	<0.02	1,3,5-Trimethylbenzene
<0.02	1,1-Dichloroethylene	<0.02	Trichloroethylene	<0.02	1,2,4-Trimethylbenzene
<0.20	Methylene chloride	<0.02	1,4-Dioxane	<0.02	1,3-Dichlorobenzene
<0.20	Freon 113	<0.02	Methylmethacrylate	<0.02	Benzyl chloride
<0.2	Carbon disulfide	<0.02	Heptane	<0.02	1,4-Dichlorobenzene
<0.02	t-1,2-Dichloroethylene	<0.02	MIBK	<0.02	1,2-Dichlorobenzene
<0.02	1,1-Dichloroethane	<0.02	c-1,3-Dichloropropylene	<0.04	1,2,4-Trichlorobenzene
<0.02	MTBE	<0.02	t-1,3-Dichloropropylene	<0.02	Naphthalene
<0.80	IPA	<0.02	1,1,2-Trichloroethylene	<0.02	Hexachlorobutadiene
<0.20	2-Butanone (MEK)	<0.02	Toluene		
<0.02	c-1,2-Dichloroethylene	<0.02	2-Hexanone (MBK)		

Special Notes:

Analyst Initials/Date: BRF 12/18/2019

MADEP MCP Analytical Method Report Certification Form

Laboratory Name: Con-Test Analytical Laboratory	Project #: 19L0629
Project Location: Greenfield, MA	RTN:

This Form provides certifications for the following data set: [list Laboratory Sample ID Number(s)]

19L0629-01 thru 19L0629-04

Matrices: Air

CAM Protocol (check all that below)

8260 VOC CAM II A ( )	7470/7471 Hg CAM IIIB ( )	MassDEP VPH CAM IV A ( )	8082 PCB CAM V A ( )	9014 Total Cyanide/PAC CAM VI A ( )	6860 Perchlorate CAM VIII B ( )
8270 SVOC CAM II B ( )	7010 Metals CAM III C ( )	MassDEP VPH CAM IV C ( )	8081 Pesticides CAM V B ( )	7196 Hex Cr CAM VI B ( )	MassDEP APH CAM IX A ( )
6010 Metals CAM III A ( )	6020 Metals CAM III D ( )	MassDEP EPH CAM IV B ( )	8151 Herbicides CAM V C ( )	8330 Explosives CAM VIII A ( )	TO-15 VOC CAM IX B (X)

Affirmative response to Questions A throughF is required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	☑ Yes	☐ No[1]
B	Were the analytical method(s) and all associated QC requirements specificed in the selected CAM protocol(s) followed?	☑ Yes	☐ No[1]
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	☑ Yes	☐ No[1]
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, Quality Assurance and Quality Control Guidlines for the Acquisition and Reporting of Analytical Data?	☑ Yes	☐ No[1]
E a	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	☐ Yes	☐ No[1]
E b	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	☐ Yes	☑ No[1]
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all No responses to Qestions A through E)?	☑ Yes	☐ No[1]

A response to questions G, H and I below is required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	☑ Yes	☐ No[1]

<u>Data User Note:</u> Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.

H	Were all QC perfomance standards specified in the CAM protocol(s) achieved?	☑ Yes	☐ No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	☐ Yes	☑ No[1]

[1] *All Negative responses must be addressed in an attached Environmental Laboratory case narrative.*

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: Lisa Worthington Position: Technical Representative

Printed Name: Lisa A. Worthington Date: 12/19/19

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

January 2, 2020

Bruce Nickelsen
OTO Associates
293 Bridge St. Suite 500
Springfield, MA 01103

Project Location: GREENFIELD MA
Client Job Number:
Project Number: 2693-02-01
Laboratory Work Order Number: 19L1106

Enclosed are results of analyses for samples received by the laboratory on December 27, 2019. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jessica L. Hoffman
Project Manager

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

OTO Associates
293 Bridge St. Suite 500
Springfield, MA 01103
ATTN: Bruce Nickelsen

REPORT DATE: 1/2/2020

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 2693-02-01

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 19L1106

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: GREENFIELD MA

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
MW-101	19L1106-01	Ground Water		SW-846 8260C-D	
MW-103	19L1106-02	Ground Water		SW-846 8260C-D	
MW-106	19L1106-03	Ground Water		SW-846 8260C-D	
MW-111	19L1106-04	Ground Water		SW-846 8260C-D	
CB-1N	19L1106-05	Ground Water		SW-846 8260C-D	
CB-1S	19L1106-06	Ground Water		SW-846 8260C-D	
CB-2N	19L1106-07	Ground Water		SW-846 8260C-D	
CB-2S	19L1106-08	Ground Water		SW-846 8260C-D	
CB-9	19L1106-09	Ground Water		SW-846 8260C-D	

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

For method 8260 only a select list was requested and reported.

SW-846 8260C-D

Qualifications:

L-02

Laboratory fortified blank/laboratory control sample recovery and duplicate recoveries outside of control limits. Data validation is not affected since all results are "not detected" for associated samples in this batch and bias is on the high side.

Analyte & Samples(s) Qualified:

Vinyl Chloride

B249194-BS1, B249194-BSD1

L-07

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.

Analyte & Samples(s) Qualified:

Hexachlorobutadiene

B249194-BS1

RL-05

Elevated reporting limit due to high concentration of target compounds. MA CAM reporting limit not met.

Analyte & Samples(s) Qualified:

19L1106-01[MW-101], 19L1106-07[CB-2N]

RL-07

Elevated reporting limit based on lowest point in calibration.
MA CAM reporting limit not met.

Analyte & Samples(s) Qualified:

Methylene Chloride

19L1106-02[MW-103], 19L1106-03[MW-106], 19L1106-04[MW-111], 19L1106-05[CB-1N], 19L1106-08[CB-2S], 19L1106-09[CB-9]

RL-14

Elevated reporting limit due to foaming sample matrix. MA CAM reporting limit not met.

Analyte & Samples(s) Qualified:

19L1106-06[CB-1S]

V-20

Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

Analyte & Samples(s) Qualified:

Hexachlorobutadiene

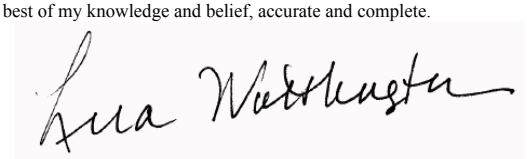
B249194-BS1, B249194-BSD1, S044231-CCV1

Vinyl Chloride

B249194-BS1, B249194-BSD1, S044231-CCV1

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The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Lisa A. Worthington
Technical Representative

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: GREENFIELD MA | Sample Description: | Work Order: 19L1106

Date Received: 12/27/2019

Field Sample #: MW-101 | Sampled: 12/26/2019 10:55

Sample ID: 19L1106-01

Sample Matrix: Ground Water

Sample Flags: RL-05

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Bromochloromethane	ND	50	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
Bromodichloromethane	ND	50	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
Carbon Tetrachloride	ND	50	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
Chlorobenzene	ND	50	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
Chlorodibromomethane	ND	25	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
Chloroethane	ND	100	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
Chloroform	ND	100	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
Chloromethane	ND	100	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
2-Chlorotoluene	ND	50	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
4-Chlorotoluene	ND	50	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	100	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
1,2-Dibromoethane (EDB)	ND	25	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
Dibromomethane	ND	50	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
1,2-Dichlorobenzene	ND	50	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
1,3-Dichlorobenzene	ND	50	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
1,4-Dichlorobenzene	ND	50	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
Dichlorodifluoromethane (Freon 12)	ND	100	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
1,1-Dichloroethane	ND	50	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
1,2-Dichloroethane	ND	50	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
1,1-Dichloroethylene	ND	50	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
cis-1,2-Dichloroethylene	130	50	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
trans-1,2-Dichloroethylene	ND	50	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
1,2-Dichloropropane	ND	50	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
1,3-Dichloropropane	ND	25	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
2,2-Dichloropropane	ND	50	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
1,1-Dichloropropene	ND	100	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
cis-1,3-Dichloropropene	ND	20	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
trans-1,3-Dichloropropene	ND	20	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
Hexachlorobutadiene	ND	30	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
Methylene Chloride	ND	250	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
1,1,1,2-Tetrachloroethane	ND	50	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
1,1,2,2-Tetrachloroethane	ND	25	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
Tetrachloroethylene	ND	50	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
1,2,3-Trichlorobenzene	ND	100	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
1,2,4-Trichlorobenzene	ND	50	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
1,1,1-Trichloroethane	ND	50	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
1,1,2-Trichloroethane	ND	50	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
Trichloroethylene	3400	50	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
Trichlorofluoromethane (Freon 11)	ND	100	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
1,2,3-Trichloropropane	ND	100	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF
Vinyl Chloride	ND	100	µg/L	50		SW-846 8260C-D	12/30/19	12/30/19 17:26	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	94.4	70-130		12/30/19 17:26
Toluene-d8	98.4	70-130		12/30/19 17:26

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: GREENFIELD MA | Sample Description: | Work Order: 19L1106

Date Received: 12/27/2019

Field Sample #: MW-101 | Sampled: 12/26/2019 10:55

Sample ID: 19L1106-01

Sample Matrix: Ground Water

Sample Flags: RL-05

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Surrogates		**% Recovery**	**Recovery Limits**		**Flag/Qual**				
4-Bromofluorobenzene		95.7	70-130					12/30/19 17:26	

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Project Location: GREENFIELD MA | Sample Description: | Work Order: 19L1106

Date Received: 12/27/2019

Field Sample #: MW-103 | Sampled: 12/26/2019 11:40

Sample ID: 19L1106-02

Sample Matrix: Ground Water

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Bromochloromethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
Bromodichloromethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
Carbon Tetrachloride	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
Chlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
Chlorodibromomethane	ND	0.50	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
Chloroethane	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
Chloroform	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
Chloromethane	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
2-Chlorotoluene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
4-Chlorotoluene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
1,2-Dibromoethane (EDB)	ND	0.50	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
Dibromomethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
1,2-Dichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
1,3-Dichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
1,4-Dichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
Dichlorodifluoromethane (Freon 12)	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
1,1-Dichloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
1,2-Dichloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
1,1-Dichloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
cis-1,2-Dichloroethylene	56	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
trans-1,2-Dichloroethylene	20	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
1,2-Dichloropropane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
1,3-Dichloropropane	ND	0.50	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
2,2-Dichloropropane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
1,1-Dichloropropene	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
cis-1,3-Dichloropropene	ND	0.40	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
trans-1,3-Dichloropropene	ND	0.40	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
Hexachlorobutadiene	ND	0.60	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
Methylene Chloride	ND	5.0	µg/L	1	RL-07	SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
1,1,1,2-Tetrachloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
1,1,2,2-Tetrachloroethane	ND	0.50	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
Tetrachloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
1,2,3-Trichlorobenzene	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
1,2,4-Trichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
1,1,1-Trichloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
1,1,2-Trichloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
Trichloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
Trichlorofluoromethane (Freon 11)	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
1,2,3-Trichloropropane	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF
Vinyl Chloride	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:58	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	93.2	70-130		12/30/19 16:58
Toluene-d8	96.9	70-130		12/30/19 16:58

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: GREENFIELD MA | Sample Description: | Work Order: 19L1106

Date Received: 12/27/2019

Field Sample #: MW-103 | Sampled: 12/26/2019 11:40

Sample ID: 19L1106-02

Sample Matrix: Ground Water

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Surrogates		**% Recovery**	**Recovery Limits**		**Flag/Qual**				
4-Bromofluorobenzene		96.1	70-130					12/30/19 16:58	

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Project Location: GREENFIELD MA | Sample Description: | Work Order: 19L1106

Date Received: 12/27/2019

Field Sample #: MW-106 | Sampled: 12/26/2019 12:40

Sample ID: 19L1106-03

Sample Matrix: Ground Water

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Bromochloromethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
Bromodichloromethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
Carbon Tetrachloride	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
Chlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
Chlorodibromomethane	ND	0.50	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
Chloroethane	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
Chloroform	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
Chloromethane	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
2-Chlorotoluene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
4-Chlorotoluene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
1,2-Dibromoethane (EDB)	ND	0.50	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
Dibromomethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
1,2-Dichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
1,3-Dichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
1,4-Dichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
Dichlorodifluoromethane (Freon 12)	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
1,1-Dichloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
1,2-Dichloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
1,1-Dichloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
cis-1,2-Dichloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
trans-1,2-Dichloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
1,2-Dichloropropane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
1,3-Dichloropropane	ND	0.50	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
2,2-Dichloropropane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
1,1-Dichloropropene	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
cis-1,3-Dichloropropene	ND	0.40	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
trans-1,3-Dichloropropene	ND	0.40	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
Hexachlorobutadiene	ND	0.60	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
Methylene Chloride	ND	5.0	µg/L	1	RL-07	SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
1,1,1,2-Tetrachloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
1,1,2,2-Tetrachloroethane	ND	0.50	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
Tetrachloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
1,2,3-Trichlorobenzene	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
1,2,4-Trichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
1,1,1-Trichloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
1,1,2-Trichloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
Trichloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
Trichlorofluoromethane (Freon 11)	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
1,2,3-Trichloropropane	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF
Vinyl Chloride	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:04	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	99.8	70-130		12/30/19 14:04
Toluene-d8	100	70-130		12/30/19 14:04

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: GREENFIELD MA | Sample Description: | Work Order: 19L1106

Date Received: 12/27/2019

Field Sample #: MW-106 | Sampled: 12/26/2019 12:40

Sample ID: 19L1106-03

Sample Matrix: Ground Water

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Surrogates		**% Recovery**	**Recovery Limits**		**Flag/Qual**				
4-Bromofluorobenzene		97.5	70-130					12/30/19 14:04	

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: GREENFIELD MA | Sample Description: | Work Order: 19L1106

Date Received: 12/27/2019

Field Sample #: MW-111 | Sampled: 12/26/2019 13:20

Sample ID: 19L1106-04

Sample Matrix: Ground Water

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Bromochloromethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
Bromodichloromethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
Carbon Tetrachloride	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
Chlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
Chlorodibromomethane	ND	0.50	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
Chloroethane	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
Chloroform	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
Chloromethane	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
2-Chlorotoluene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
4-Chlorotoluene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
1,2-Dibromoethane (EDB)	ND	0.50	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
Dibromomethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
1,2-Dichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
1,3-Dichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
1,4-Dichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
Dichlorodifluoromethane (Freon 12)	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
1,1-Dichloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
1,2-Dichloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
1,1-Dichloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
cis-1,2-Dichloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
trans-1,2-Dichloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
1,2-Dichloropropane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
1,3-Dichloropropane	ND	0.50	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
2,2-Dichloropropane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
1,1-Dichloropropene	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
cis-1,3-Dichloropropene	ND	0.40	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
trans-1,3-Dichloropropene	ND	0.40	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
Hexachlorobutadiene	ND	0.60	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
Methylene Chloride	ND	5.0	µg/L	1	RL-07	SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
1,1,1,2-Tetrachloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
1,1,2,2-Tetrachloroethane	ND	0.50	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
Tetrachloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
1,2,3-Trichlorobenzene	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
1,2,4-Trichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
1,1,1-Trichloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
1,1,2-Trichloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
Trichloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
Trichlorofluoromethane (Freon 11)	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
1,2,3-Trichloropropane	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF
Vinyl Chloride	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 14:33	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	99.1	70-130		12/30/19 14:33
Toluene-d8	98.0	70-130		12/30/19 14:33

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: GREENFIELD MA | Sample Description: | Work Order: 19L1106

Date Received: 12/27/2019

Field Sample #: MW-111 | Sampled: 12/26/2019 13:20

Sample ID: 19L1106-04

Sample Matrix: Ground Water

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Surrogates		**% Recovery**	**Recovery Limits**		**Flag/Qual**				
4-Bromofluorobenzene		94.5	70-130					12/30/19 14:33	

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: GREENFIELD MA | Sample Description: | Work Order: 19L1106

Date Received: 12/27/2019

Field Sample #: CB-1N | Sampled: 12/26/2019 10:05

Sample ID: 19L1106-05

Sample Matrix: Ground Water

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Bromochloromethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
Bromodichloromethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
Carbon Tetrachloride	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
Chlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
Chlorodibromomethane	ND	0.50	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
Chloroethane	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
Chloroform	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
Chloromethane	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
2-Chlorotoluene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
4-Chlorotoluene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
1,2-Dibromoethane (EDB)	ND	0.50	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
Dibromomethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
1,2-Dichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
1,3-Dichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
1,4-Dichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
Dichlorodifluoromethane (Freon 12)	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
1,1-Dichloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
1,2-Dichloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
1,1-Dichloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
cis-1,2-Dichloroethylene	12	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
trans-1,2-Dichloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
1,2-Dichloropropane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
1,3-Dichloropropane	ND	0.50	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
2,2-Dichloropropane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
1,1-Dichloropropene	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
cis-1,3-Dichloropropene	ND	0.40	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
trans-1,3-Dichloropropene	ND	0.40	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
Hexachlorobutadiene	ND	0.60	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
Methylene Chloride	ND	5.0	µg/L	1	RL-07	SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
1,1,1,2-Tetrachloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
1,1,2,2-Tetrachloroethane	ND	0.50	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
Tetrachloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
1,2,3-Trichlorobenzene	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
1,2,4-Trichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
1,1,1-Trichloroethane	1.2	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
1,1,2-Trichloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
Trichloroethylene	43	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
Trichlorofluoromethane (Freon 11)	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
1,2,3-Trichloropropane	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF
Vinyl Chloride	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:29	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	92.8	70-130		12/30/19 16:29
Toluene-d8	96.8	70-130		12/30/19 16:29

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: GREENFIELD MA | Sample Description: | Work Order: 19L1106

Date Received: 12/27/2019

Field Sample #: CB-1N | Sampled: 12/26/2019 10:05

Sample ID: 19L1106-05

Sample Matrix: Ground Water

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Surrogates		**% Recovery**	**Recovery Limits**		**Flag/Qual**				
4-Bromofluorobenzene		97.6	70-130					12/30/19 16:29	

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: GREENFIELD MA | Sample Description: | Work Order: 19L1106

Date Received: 12/27/2019

Field Sample #: CB-1S | Sampled: 12/26/2019 10:00

Sample ID: 19L1106-06

Sample Matrix: Ground Water

Sample Flags: RL-14

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Bromochloromethane	ND	2.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
Bromodichloromethane	ND	2.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
Carbon Tetrachloride	ND	2.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
Chlorobenzene	ND	2.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
Chlorodibromomethane	ND	1.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
Chloroethane	ND	4.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
Chloroform	ND	4.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
Chloromethane	ND	4.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
2-Chlorotoluene	ND	2.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
4-Chlorotoluene	ND	2.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	4.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
1,2-Dibromoethane (EDB)	ND	1.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
Dibromomethane	ND	2.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
1,2-Dichlorobenzene	ND	2.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
1,3-Dichlorobenzene	ND	2.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
1,4-Dichlorobenzene	ND	2.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
Dichlorodifluoromethane (Freon 12)	ND	4.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
1,1-Dichloroethane	ND	2.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
1,2-Dichloroethane	ND	2.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
1,1-Dichloroethylene	ND	2.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
cis-1,2-Dichloroethylene	10	2.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
trans-1,2-Dichloroethylene	ND	2.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
1,2-Dichloropropane	ND	2.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
1,3-Dichloropropane	ND	1.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
2,2-Dichloropropane	ND	2.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
1,1-Dichloropropene	ND	4.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
cis-1,3-Dichloropropene	ND	0.80	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
trans-1,3-Dichloropropene	ND	0.80	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
Hexachlorobutadiene	ND	1.2	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
Methylene Chloride	ND	10	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
1,1,1,2-Tetrachloroethane	ND	2.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
1,1,2,2-Tetrachloroethane	ND	1.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
Tetrachloroethylene	ND	2.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
1,2,3-Trichlorobenzene	ND	4.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
1,2,4-Trichlorobenzene	ND	2.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
1,1,1-Trichloroethane	ND	2.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
1,1,2-Trichloroethane	ND	2.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
Trichloroethylene	6.3	2.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
Trichlorofluoromethane (Freon 11)	ND	4.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
1,2,3-Trichloropropane	ND	4.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF
Vinyl Chloride	ND	4.0	µg/L	2		SW-846 8260C-D	12/30/19	12/30/19 15:02	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	96.0	70-130		12/30/19 15:02
Toluene-d8	96.4	70-130		12/30/19 15:02

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: GREENFIELD MA | Sample Description: | Work Order: 19L1106

Date Received: 12/27/2019

Field Sample #: CB-1S | Sampled: 12/26/2019 10:00

Sample ID: 19L1106-06

Sample Matrix: Ground Water

Sample Flags: RL-14

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Surrogates		**% Recovery**	**Recovery Limits**		**Flag/Qual**				
4-Bromofluorobenzene		94.0	70-130					12/30/19 15:02	

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: GREENFIELD MA | Sample Description: | Work Order: 19L1106

Date Received: 12/27/2019

Field Sample #: CB-2N | Sampled: 12/26/2019 12:10

Sample ID: 19L1106-07

Sample Matrix: Ground Water

Sample Flags: RL-05

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Bromochloromethane	ND	5.0	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
Bromodichloromethane	ND	5.0	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
Carbon Tetrachloride	ND	5.0	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
Chlorobenzene	ND	5.0	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
Chlorodibromomethane	ND	2.5	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
Chloroethane	ND	10	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
Chloroform	ND	10	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
Chloromethane	ND	10	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
2-Chlorotoluene	ND	5.0	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
4-Chlorotoluene	ND	5.0	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	10	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
1,2-Dibromoethane (EDB)	ND	2.5	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
Dibromomethane	ND	5.0	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
1,2-Dichlorobenzene	ND	5.0	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
1,3-Dichlorobenzene	ND	5.0	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
1,4-Dichlorobenzene	ND	5.0	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
Dichlorodifluoromethane (Freon 12)	ND	10	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
1,1-Dichloroethane	ND	5.0	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
1,2-Dichloroethane	ND	5.0	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
1,1-Dichloroethylene	ND	5.0	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
cis-1,2-Dichloroethylene	290	5.0	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
trans-1,2-Dichloroethylene	ND	5.0	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
1,2-Dichloropropane	ND	5.0	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
1,3-Dichloropropane	ND	2.5	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
2,2-Dichloropropane	ND	5.0	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
1,1-Dichloropropene	ND	10	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
cis-1,3-Dichloropropene	ND	2.0	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
trans-1,3-Dichloropropene	ND	2.0	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
Hexachlorobutadiene	ND	3.0	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
Methylene Chloride	ND	25	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
1,1,1,2-Tetrachloroethane	ND	5.0	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
1,1,2,2-Tetrachloroethane	ND	2.5	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
Tetrachloroethylene	11	5.0	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
1,2,3-Trichlorobenzene	ND	10	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
1,2,4-Trichlorobenzene	ND	5.0	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
1,1,1-Trichloroethane	ND	5.0	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
1,1,2-Trichloroethane	ND	5.0	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
Trichloroethylene	430	5.0	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
Trichlorofluoromethane (Freon 11)	ND	10	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
1,2,3-Trichloropropane	ND	10	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF
Vinyl Chloride	ND	10	µg/L	5		SW-846 8260C-D	12/30/19	12/30/19 17:55	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	96.1	70-130		12/30/19 17:55
Toluene-d8	97.1	70-130		12/30/19 17:55

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: GREENFIELD MA | Sample Description: | Work Order: 19L1106

Date Received: 12/27/2019

Field Sample #: CB-2N | Sampled: 12/26/2019 12:10

Sample ID: 19L1106-07

Sample Matrix: Ground Water

Sample Flags: RL-05

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Surrogates		**% Recovery**	**Recovery Limits**		**Flag/Qual**				
4-Bromofluorobenzene		100	70-130					12/30/19 17:55	

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: GREENFIELD MA | Sample Description: | Work Order: 19L1106

Date Received: 12/27/2019

Field Sample #: CB-2S | Sampled: 12/26/2019 02:00

Sample ID: 19L1106-08

Sample Matrix: Ground Water

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Bromochloromethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
Bromodichloromethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
Carbon Tetrachloride	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
Chlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
Chlorodibromomethane	ND	0.50	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
Chloroethane	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
Chloroform	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
Chloromethane	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
2-Chlorotoluene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
4-Chlorotoluene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
1,2-Dibromoethane (EDB)	ND	0.50	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
Dibromomethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
1,2-Dichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
1,3-Dichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
1,4-Dichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
Dichlorodifluoromethane (Freon 12)	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
1,1-Dichloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
1,2-Dichloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
1,1-Dichloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
cis-1,2-Dichloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
trans-1,2-Dichloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
1,2-Dichloropropane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
1,3-Dichloropropane	ND	0.50	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
2,2-Dichloropropane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
1,1-Dichloropropene	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
cis-1,3-Dichloropropene	ND	0.40	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
trans-1,3-Dichloropropene	ND	0.40	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
Hexachlorobutadiene	ND	0.60	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
Methylene Chloride	ND	5.0	µg/L	1	RL-07	SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
1,1,1,2-Tetrachloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
1,1,2,2-Tetrachloroethane	ND	0.50	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
Tetrachloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
1,2,3-Trichlorobenzene	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
1,2,4-Trichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
1,1,1-Trichloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
1,1,2-Trichloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
Trichloroethylene	1.4	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
Trichlorofluoromethane (Freon 11)	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
1,2,3-Trichloropropane	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF
Vinyl Chloride	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 15:31	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	95.8	70-130		12/30/19 15:31
Toluene-d8	96.1	70-130		12/30/19 15:31

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: GREENFIELD MA | Sample Description: | Work Order: 19L1106

Date Received: 12/27/2019

Field Sample #: CB-2S | Sampled: 12/26/2019 02:00

Sample ID: 19L1106-08

Sample Matrix: Ground Water

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Surrogates		**% Recovery**	**Recovery Limits**		**Flag/Qual**				
4-Bromofluorobenzene		99.2	70-130					12/30/19 15:31	

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: GREENFIELD MA | Sample Description: | Work Order: 19L1106

Date Received: 12/27/2019

Field Sample #: CB-9 | Sampled: 12/26/2019 13:30

Sample ID: 19L1106-09

Sample Matrix: Ground Water

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Bromochloromethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
Bromodichloromethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
Carbon Tetrachloride	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
Chlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
Chlorodibromomethane	ND	0.50	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
Chloroethane	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
Chloroform	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
Chloromethane	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
2-Chlorotoluene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
4-Chlorotoluene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
1,2-Dibromoethane (EDB)	ND	0.50	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
Dibromomethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
1,2-Dichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
1,3-Dichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
1,4-Dichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
Dichlorodifluoromethane (Freon 12)	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
1,1-Dichloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
1,2-Dichloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
1,1-Dichloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
cis-1,2-Dichloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
trans-1,2-Dichloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
1,2-Dichloropropane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
1,3-Dichloropropane	ND	0.50	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
2,2-Dichloropropane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
1,1-Dichloropropene	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
cis-1,3-Dichloropropene	ND	0.40	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
trans-1,3-Dichloropropene	ND	0.40	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
Hexachlorobutadiene	ND	0.60	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
Methylene Chloride	ND	5.0	µg/L	1	RL-07	SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
1,1,1,2-Tetrachloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
1,1,2,2-Tetrachloroethane	ND	0.50	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
Tetrachloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
1,2,3-Trichlorobenzene	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
1,2,4-Trichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
1,1,1-Trichloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
1,1,2-Trichloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
Trichloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
Trichlorofluoromethane (Freon 11)	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
1,2,3-Trichloropropane	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF
Vinyl Chloride	ND	2.0	µg/L	1		SW-846 8260C-D	12/30/19	12/30/19 16:00	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	94.0	70-130		12/30/19 16:00
Toluene-d8	97.9	70-130		12/30/19 16:00

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Project Location: GREENFIELD MA | Sample Description: | Work Order: 19L1106

Date Received: 12/27/2019

Field Sample #: CB-9 | Sampled: 12/26/2019 13:30

Sample ID: 19L1106-09

Sample Matrix: Ground Water

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Surrogates		**% Recovery**	**Recovery Limits**		**Flag/Qual**				
4-Bromofluorobenzene		97.7	70-130					12/30/19 16:00	

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Sample Extraction Data

Prep Method: SW-846 5030B-SW-846 8260C-D

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
19L1106-01 [MW-101]	B249194	0.1	5.00	12/30/19
19L1106-02 [MW-103]	B249194	5	5.00	12/30/19
19L1106-03 [MW-106]	B249194	5	5.00	12/30/19
19L1106-04 [MW-111]	B249194	5	5.00	12/30/19
19L1106-05 [CB-1N]	B249194	5	5.00	12/30/19
19L1106-06 [CB-1S]	B249194	2.5	5.00	12/30/19
19L1106-07 [CB-2N]	B249194	1	5.00	12/30/19
19L1106-08 [CB-2S]	B249194	5	5.00	12/30/19
19L1106-09 [CB-9]	B249194	5	5.00	12/30/19

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B249194 - SW-846 5030B										
Blank (B249194-BLK1)				Prepared & Analyzed: 12/30/19						
Bromochloromethane	ND	1.0	µg/L							
Bromodichloromethane	ND	1.0	µg/L							
Carbon Tetrachloride	ND	1.0	µg/L							
Chlorobenzene	ND	1.0	µg/L							
Chlorodibromomethane	ND	0.50	µg/L							
Chloroethane	ND	2.0	µg/L							
Chloroform	ND	2.0	µg/L							
Chloromethane	ND	2.0	µg/L							
2-Chlorotoluene	ND	1.0	µg/L							
4-Chlorotoluene	ND	1.0	µg/L							
1,2-Dibromo-3-chloropropane (DBCP)	ND	2.0	µg/L							
1,2-Dibromoethane (EDB)	ND	0.50	µg/L							
Dibromomethane	ND	1.0	µg/L							
1,2-Dichlorobenzene	ND	1.0	µg/L							
1,3-Dichlorobenzene	ND	1.0	µg/L							
1,4-Dichlorobenzene	ND	1.0	µg/L							
Dichlorodifluoromethane (Freon 12)	ND	2.0	µg/L							
1,1-Dichloroethane	ND	1.0	µg/L							
1,2-Dichloroethane	ND	1.0	µg/L							
1,1-Dichloroethylene	ND	1.0	µg/L							
cis-1,2-Dichloroethylene	ND	1.0	µg/L							
trans-1,2-Dichloroethylene	ND	1.0	µg/L							
1,2-Dichloropropane	ND	1.0	µg/L							
1,3-Dichloropropane	ND	0.50	µg/L							
2,2-Dichloropropane	ND	1.0	µg/L							
1,1-Dichloropropene	ND	2.0	µg/L							
cis-1,3-Dichloropropene	ND	0.40	µg/L							
trans-1,3-Dichloropropene	ND	0.40	µg/L							
Hexachlorobutadiene	ND	0.60	µg/L							
Methylene Chloride	ND	5.0	µg/L							
1,1,1,2-Tetrachloroethane	ND	1.0	µg/L							
1,1,2,2-Tetrachloroethane	ND	0.50	µg/L							
Tetrachloroethylene	ND	1.0	µg/L							
1,2,3-Trichlorobenzene	ND	2.0	µg/L							
1,2,4-Trichlorobenzene	ND	1.0	µg/L							
1,1,1-Trichloroethane	ND	1.0	µg/L							
1,1,2-Trichloroethane	ND	1.0	µg/L							
Trichloroethylene	ND	1.0	µg/L							
Trichlorofluoromethane (Freon 11)	ND	2.0	µg/L							
1,2,3-Trichloropropane	ND	2.0	µg/L							
Vinyl Chloride	ND	2.0	µg/L							
Surrogate: 1,2-Dichloroethane-d4	*23.6*		µg/L	25.0		94.4	70-130			
Surrogate: Toluene-d8	*24.9*		µg/L	25.0		99.6	70-130			
Surrogate: 4-Bromofluorobenzene	*23.9*		µg/L	25.0		95.5	70-130			

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes	
Batch B249194 - SW-846 5030B												
LCS (B249194-BS1)				Prepared & Analyzed: 12/30/19								
Bromochloromethane	9.73	1.0	µg/L	10.0		97.3		70-130				
Bromodichloromethane	10.4	1.0	µg/L	10.0		104		70-130				
Carbon Tetrachloride	10.2	1.0	µg/L	10.0		102		70-130				
Chlorobenzene	10.7	1.0	µg/L	10.0		107		70-130				
Chlorodibromomethane	10.8	0.50	µg/L	10.0		108		70-130				
Chloroethane	9.70	2.0	µg/L	10.0		97.0		70-130				
Chloroform	9.01	2.0	µg/L	10.0		90.1		70-130				
Chloromethane	9.50	2.0	µg/L	10.0		95.0		40-160				†
2-Chlorotoluene	10.4	1.0	µg/L	10.0		104		70-130				
4-Chlorotoluene	11.5	1.0	µg/L	10.0		115		70-130				
1,2-Dibromo-3-chloropropane (DBCP)	11.0	2.0	µg/L	10.0		110		70-130				
1,2-Dibromoethane (EDB)	10.4	0.50	µg/L	10.0		104		70-130				
Dibromomethane	9.75	1.0	µg/L	10.0		97.5		70-130				
1,2-Dichlorobenzene	10.7	1.0	µg/L	10.0		107		70-130				
1,3-Dichlorobenzene	11.1	1.0	µg/L	10.0		111		70-130				
1,4-Dichlorobenzene	11.0	1.0	µg/L	10.0		110		70-130				
Dichlorodifluoromethane (Freon 12)	8.82	2.0	µg/L	10.0		88.2		40-160				†
1,1-Dichloroethane	9.08	1.0	µg/L	10.0		90.8		70-130				
1,2-Dichloroethane	10.8	1.0	µg/L	10.0		108		70-130				
1,1-Dichloroethylene	10.8	1.0	µg/L	10.0		108		70-130				
cis-1,2-Dichloroethylene	9.22	1.0	µg/L	10.0		92.2		70-130				
trans-1,2-Dichloroethylene	9.41	1.0	µg/L	10.0		94.1		70-130				
1,2-Dichloropropane	10.1	1.0	µg/L	10.0		101		70-130				
1,3-Dichloropropane	10.0	0.50	µg/L	10.0		100		70-130				
2,2-Dichloropropane	11.2	1.0	µg/L	10.0		112		70-130				
1,1-Dichloropropene	9.46	2.0	µg/L	10.0		94.6		70-130				
cis-1,3-Dichloropropene	10.9	0.40	µg/L	10.0		109		70-130				
trans-1,3-Dichloropropene	10.5	0.40	µg/L	10.0		105		70-130				
Hexachlorobutadiene	13.7	0.60	µg/L	10.0		**137**	*	70-130			L-07, V-20	
Methylene Chloride	10.0	5.0	µg/L	10.0		100		70-130				
1,1,1,2-Tetrachloroethane	11.7	1.0	µg/L	10.0		117		70-130				
1,1,2,2-Tetrachloroethane	12.0	0.50	µg/L	10.0		120		70-130				
Tetrachloroethylene	11.3	1.0	µg/L	10.0		113		70-130				
1,2,3-Trichlorobenzene	12.1	2.0	µg/L	10.0		121		70-130				
1,2,4-Trichlorobenzene	12.1	1.0	µg/L	10.0		121		70-130				
1,1,1-Trichloroethane	10.1	1.0	µg/L	10.0		101		70-130				
1,1,2-Trichloroethane	10.1	1.0	µg/L	10.0		101		70-130				
Trichloroethylene	10.2	1.0	µg/L	10.0		102		70-130				
Trichlorofluoromethane (Freon 11)	10.7	2.0	µg/L	10.0		107		70-130				
1,2,3-Trichloropropane	11.7	2.0	µg/L	10.0		117		70-130				
Vinyl Chloride	34.8	2.0	µg/L	10.0		**348**	*	70-130			L-02, V-20	
Surrogate: 1,2-Dichloroethane-d4	*24.3*		µg/L	25.0		97.3		70-130				
Surrogate: Toluene-d8	*24.4*		µg/L	25.0		97.4		70-130				
Surrogate: 4-Bromofluorobenzene	*24.8*		µg/L	25.0		99.3		70-130				

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes	
Batch B249194 - SW-846 5030B												
LCS Dup (B249194-BSD1)				Prepared & Analyzed: 12/30/19								
Bromochloromethane	9.65	1.0	µg/L	10.0		96.5		70-130	0.826	20		
Bromodichloromethane	10.8	1.0	µg/L	10.0		108		70-130	3.60	20		
Carbon Tetrachloride	10.2	1.0	µg/L	10.0		102		70-130	0.785	20		
Chlorobenzene	10.6	1.0	µg/L	10.0		106		70-130	1.32	20		
Chlorodibromomethane	10.6	0.50	µg/L	10.0		106		70-130	2.62	20		
Chloroethane	8.92	2.0	µg/L	10.0		89.2		70-130	8.38	20		
Chloroform	8.85	2.0	µg/L	10.0		88.5		70-130	1.79	20		
Chloromethane	9.58	2.0	µg/L	10.0		95.8		40-160	0.839	20		†
2-Chlorotoluene	9.81	1.0	µg/L	10.0		98.1		70-130	5.93	20		
4-Chlorotoluene	10.9	1.0	µg/L	10.0		109		70-130	4.90	20		
1,2-Dibromo-3-chloropropane (DBCP)	10.4	2.0	µg/L	10.0		104		70-130	5.89	20		
1,2-Dibromoethane (EDB)	10.0	0.50	µg/L	10.0		100		70-130	3.23	20		
Dibromomethane	9.85	1.0	µg/L	10.0		98.5		70-130	1.02	20		
1,2-Dichlorobenzene	10.6	1.0	µg/L	10.0		106		70-130	0.750	20		
1,3-Dichlorobenzene	10.7	1.0	µg/L	10.0		107		70-130	3.58	20		
1,4-Dichlorobenzene	10.6	1.0	µg/L	10.0		106		70-130	3.53	20		
Dichlorodifluoromethane (Freon 12)	8.48	2.0	µg/L	10.0		84.8		40-160	3.93	20		†
1,1-Dichloroethane	9.02	1.0	µg/L	10.0		90.2		70-130	0.663	20		
1,2-Dichloroethane	10.4	1.0	µg/L	10.0		104		70-130	3.21	20		
1,1-Dichloroethylene	10.3	1.0	µg/L	10.0		103		70-130	5.01	20		
cis-1,2-Dichloroethylene	9.33	1.0	µg/L	10.0		93.3		70-130	1.19	20		
trans-1,2-Dichloroethylene	9.52	1.0	µg/L	10.0		95.2		70-130	1.16	20		
1,2-Dichloropropane	9.95	1.0	µg/L	10.0		99.5		70-130	1.30	20		
1,3-Dichloropropane	9.84	0.50	µg/L	10.0		98.4		70-130	1.61	20		
2,2-Dichloropropane	10.6	1.0	µg/L	10.0		106		70-130	5.44	20		
1,1-Dichloropropene	9.34	2.0	µg/L	10.0		93.4		70-130	1.28	20		
cis-1,3-Dichloropropene	10.7	0.40	µg/L	10.0		107		70-130	2.13	20		
trans-1,3-Dichloropropene	10.7	0.40	µg/L	10.0		107		70-130	1.60	20		
Hexachlorobutadiene	12.9	0.60	µg/L	10.0		129		70-130	5.41	20	V-20	
Methylene Chloride	10.1	5.0	µg/L	10.0		101		70-130	0.794	20		
1,1,1,2-Tetrachloroethane	11.6	1.0	µg/L	10.0		116		70-130	1.03	20		
1,1,2,2-Tetrachloroethane	10.7	0.50	µg/L	10.0		107		70-130	11.3	20		
Tetrachloroethylene	11.2	1.0	µg/L	10.0		112		70-130	1.42	20		
1,2,3-Trichlorobenzene	10.8	2.0	µg/L	10.0		108		70-130	10.7	20		
1,2,4-Trichlorobenzene	11.3	1.0	µg/L	10.0		113		70-130	6.32	20		
1,1,1-Trichloroethane	10.0	1.0	µg/L	10.0		100		70-130	1.19	20		
1,1,2-Trichloroethane	9.65	1.0	µg/L	10.0		96.5		70-130	4.56	20		
Trichloroethylene	10.0	1.0	µg/L	10.0		100		70-130	1.68	20		
Trichlorofluoromethane (Freon 11)	10.6	2.0	µg/L	10.0		106		70-130	1.41	20		
1,2,3-Trichloropropane	10.8	2.0	µg/L	10.0		108		70-130	8.53	20		
Vinyl Chloride	34.2	2.0	µg/L	10.0		**342**	*	70-130	1.71	20	L-02, V-20	
Surrogate: 1,2-Dichloroethane-d4	*24.2*		µg/L	25.0		96.9		70-130				
Surrogate: Toluene-d8	*24.0*		µg/L	25.0		96.0		70-130				
Surrogate: 4-Bromofluorobenzene	*24.5*		µg/L	25.0		97.8		70-130				

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
L-02	Laboratory fortified blank/laboratory control sample recovery and duplicate recoveries outside of control limits. Data validation is not affected since all results are "not detected" for associated samples in this batch and bias is on the high side.
L-07	Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.
RL-05	Elevated reporting limit due to high concentration of target compounds. MA CAM reporting limit not met.
RL-07	Elevated reporting limit based on lowest point in calibration. MA CAM reporting limit not met.
RL-14	Elevated reporting limit due to foaming sample matrix. MA CAM reporting limit not met.
V-20	Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260C-D in Water	
Bromochloromethane	CT,NH,NY,ME
Bromodichloromethane	CT,NH,NY,ME
Carbon Tetrachloride	CT,NH,NY,ME
Chlorobenzene	CT,NH,NY,ME
Chlorodibromomethane	CT,NH,NY,ME
Chloroethane	CT,NH,NY,ME
Chloroform	CT,NH,NY,ME
Chloromethane	CT,NH,NY,ME
2-Chlorotoluene	CT,NH,NY,ME
4-Chlorotoluene	CT,NH,NY,ME
1,2-Dibromo-3-chloropropane (DBCP)	NY
1,2-Dibromoethane (EDB)	NY
Dibromomethane	CT,NH,NY,ME
1,2-Dichlorobenzene	CT,NH,NY,ME
1,3-Dichlorobenzene	CT,NH,NY,ME
1,4-Dichlorobenzene	CT,NH,NY,ME
Dichlorodifluoromethane (Freon 12)	CT,NH,NY,ME
1,1-Dichloroethane	CT,NH,NY,ME
1,2-Dichloroethane	CT,NH,NY,ME
1,1-Dichloroethylene	CT,NH,NY,ME
cis-1,2-Dichloroethylene	NY,ME
trans-1,2-Dichloroethylene	CT,NH,NY,ME
1,2-Dichloropropane	CT,NH,NY,ME
1,3-Dichloropropane	CT,NY,ME
2,2-Dichloropropane	CT,NH,NY,ME
1,1-Dichloropropene	CT,NH,NY,ME
cis-1,3-Dichloropropene	CT,NH,NY,ME
trans-1,3-Dichloropropene	CT,NH,NY,ME
Hexachlorobutadiene	CT,NH,NY,ME
Methylene Chloride	CT,NH,NY,ME
1,1,1,2-Tetrachloroethane	CT,NH,NY,ME
1,1,2,2-Tetrachloroethane	CT,NH,NY,ME
Tetrachloroethylene	CT,NH,NY,ME
1,2,3-Trichlorobenzene	CT,NH,NY,ME
1,2,4-Trichlorobenzene	CT,NH,NY,ME
1,1,1-Trichloroethane	CT,NH,NY,ME
1,1,2-Trichloroethane	CT,NH,NY,ME
Trichloroethylene	CT,NH,NY,ME
Trichlorofluoromethane (Freon 11)	CT,NH,NY,ME
1,2,3-Trichloropropane	CT,NH,NY,ME
Vinyl Chloride	CT,NH,NY,ME

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The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC - ISO17025:2017	100033	03/1/2022
MA	Massachusetts DEP	M-MA100	06/30/2020
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2021
NY	New York State Department of Health	10899 NELAP	04/1/2020
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2020
RI	Rhode Island Department of Health	LAO00112	12/30/2019
NC	North Carolina Div. of Water Quality	652	12/31/2020
NJ	New Jersey DEP	MA007 NELAP	06/30/2020
FL	Florida Department of Health	E871027 NELAP	06/30/2020
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2020
ME	State of Maine	2011028	06/9/2021
VA	Commonwealth of Virginia	460217	12/14/2020
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2020
VT-DW	Vermont Department of Health Drinking Water	VT-255716	06/12/2020
NC-DW	North Carolina Department of Health	25703	07/31/2020
PA	Commonwealth of Pennsylvania DEP	68-05812	06/30/2020

JLH 19L1106

con-test ANALYTICAL LABORATORY

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http://www.contestlabs.com

CHAIN OF CUSTODY RECORD

39 Spruce Street
East Longmeadow, MA 01028

Doc # 381 Rev 2_06262019

Page 1 of 1

Company Name: OTO
Address: 293 Bridge
Phone:
Project Name: Former Lunt
Project Location: Greenfield
Project Number: 2695-02-01
Project Manager: Bruce Nickelsen
Con-Test Quote Name/Number:
Invoice Recipient:
Sampled By: ELS

Turnaround Time:
7-Day ☐ 10-Day ☐
PFAS 10-Day (std) ☐ Due Date: 5-Day

Rush/Approval Required:
1-Day ☐ 3-Day ☐
2-Day ☐ 4-Day ☐

Preserved Bottle Samples:
○ Field Filtered
○ Lab to Filter

Dissolved Bottle Samples:
○ Field Filtered
○ Lab to Filter

Data Delivery:
Format: PDF ☑ EXCEL ☑
Other:
CLP Like Data Pkg Required: ☐
Email To: nickelsen@oto-env.com, suares@oto-env.com
Fax To #:

ANALYSIS REQUESTED

Con-Test Work Order#	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	COMP/GRAB	[1] Matrix Code	Conc Code	VIALS	GLASS	PLASTIC	BACTERIA	ENCORE	VOC Halogenated
1	MW-101	12/26/19	1055	G	GW	U	X					2
2	MW-103		1140				X					2
3	MW-106		1240				X					2
4	MW-111		1320				X					2
5	CB-1N		1005				X					2
6	CB-1S		1000				X					2
7	CB-2N		1210				X					2
8	CB-2S		1200				X					2
9	CB-9		1330				X					2

[2] Preservation Code

Courier Use Only
Total Number Of:
VIALS
GLASS
PLASTIC
BACTERIA
ENCORE

Glassware in the fridge? Y / N
Glassware in freezer? Y / N
Prepackaged Cooler? Y / N
*Contest is not responsible for missing samples from prepacked coolers

[1] Matrix Codes:
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil
SL = Sludge
SOL = Solid
O = Other (please define)

[2] Preservation Codes:
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium Bisulfate
X = Sodium Hydroxide
T = Sodium Thiosulfate
O = Other (please define)

Relinquished by: (signature)	Date/Time:
	12/27/19 1353
Received by: (signature) ELS	Date/Time:
4.5 12/27	1353
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Client Comments:

Reporting Limit Requirements:
MA GW-1/2/3
or
Other

Special Requirements:
☐ MA MCP Required
☐ MCP Certification Form Required
☐ CT RCP Required
☐ RCP Certification Form Required
☐ MA State DW Required
PWSID #

Please use the following codes to indicate possible sample concentration within the Conc Code column above:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

NELAC and AIHA-LAP, LLC Accredited

Project Entity
Government ☐ Municipality ☐ MWRA ☐ WRTA ☐
Federal ☐ 21 J ☐ School ☐
City ☐ Brownfield ☐ MBTA ☐

Other
☐ Chromatogram
☐ AIHA-LAP,LLC

PCB ONLY
☐ Soxhlet
☐ Non Soxhlet

Comments:

Disclaimer: Con-Test Labs is not responsible for any omitted information on the Chain of Custody. The Chain of Custody is a legal document that must be complete and accurate and is used to determine wha analyses the laboratory will perform. Any missing information is not the laboratory's responsibility. Cor Test values your partnership on each project and will try to assist with missing information, but will not t held accountable.

Table of Contents

I Have Not Confirmed Sample Container Numbers With Lab Staff Before Relinquishing Over Samples_____

con-test® ANALYTICAL LABORATORY

Doc# 277 Rev 5 2017

Login Sample Receipt Checklist - (Rejection Criteria Listing - Using Acceptance Policy) Any False Statement will be brought to the attention of the Client - State True or False

Client DTO

Received By SA Date 12/27 Time 1353

How were the samples received? In Cooler T No Cooler ____ On Ice T No Ice ____ Direct from Sampling ____ Ambient ____ Melted Ice ____

Were samples within Temperature? 2-6°C T By Gun # 5 Actual Temp - 4.5 By Blank # ____ Actual Temp - ____

Was Custody Seal Intact? NA Were Samples Tampered with? NA

Was COC Relinquished ? T Does Chain Agree With Samples? T

Are there broken/leaking/loose caps on any samples? F

Is COC in ink/ Legible? T Were samples received within holding time? T

Did COC include all pertinent Information? Client T Project T Analysis ID's T T Sampler Name T Collection Dates/Times T

Are Sample labels filled out and legible? T

Are there Lab to Filters? F Who was notified? ____

Are there Rushes? F Who was notified? ____

Are there Short Holds? F Who was notified? ____

Is there enough Volume? T

Is there Headspace where applicable? F MS/MSD? F

Proper Media/Containers Used? T Is splitting samples required? F

Were trip blanks received? F On COC? F

Do all samples have the proper pH? Acid NA Base NA

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.	
HCL-	27	500 mL Amb.		500 mL Plastic		8oz Amb/Clear	
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear	
Bisulfate-		Flashpoint		Col./Bacteria		2oz Amb/Clear	
DI-		Other Glass		Other Plastic		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Unused Media

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.	
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear	
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear	
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear	
DI-		Other Plastic		Other Glass		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Comments:

MADEP MCP Analytical Method Report Certification Form

Laboratory Name: Con-Test Analytical Laboratory	Project #: 19L1106
Project Location: GREENFIELD MA	RTN:

This Form provides certifications for the following data set: [list Laboratory Sample ID Number(s)]

19L1106-01 thru 19L1106-09

Matrices: Water

CAM Protocol (check all that below)

8260 VOC CAM II A (X)	7470/7471 Hg CAM IIIB ( )	MassDEP VPH CAM IV A ( )	8082 PCB CAM V A ( )	9014 Total Cyanide/PAC CAM VI A ( )	6860 Perchlorate CAM VIII B ( )
8270 SVOC CAM II B ( )	7010 Metals CAM III C ( )	MassDEP VPH CAM IV C ( )	8081 Pesticides CAM V B ( )	7196 Hex Cr CAM VI B ( )	MassDEP APH CAM IX A ( )
6010 Metals CAM III A ( )	6020 Metals CAM III D ( )	MassDEP EPH CAM IV B ( )	8151 Herbicides CAM V C ( )	8330 Explosives CAM VIII A ( )	TO-15 VOC CAM IX B ( )

Affirmative response to Questions A throughF is required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	☑ Yes	☐ No[1]
B	Were the analytical method(s) and all associated QC requirements specificed in the selected CAM protocol(s) followed?	☑ Yes	☐ No[1]
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	☑ Yes	☐ No[1]
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, Quality Assurance and Quality Control Guidlines for the Acquisition and Reporting of Analytical Data?	☑ Yes	☐ No[1]
E a	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	☐ Yes	☐ No[1]
E b	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	☐ Yes	☐ No[1]
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all No responses to Qestions A through E)?	☑ Yes	☐ No[1]

A response to questions G, H and I below is required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	☐ Yes	☑ No[1]

<u>Data User Note:</u> Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.

H	Were all QC perfomance standards specified in the CAM protocol(s) achieved?	☐ Yes	☑ No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	☐ Yes	☑ No[1]

[1] *All Negative responses must be addressed in an attached Environmental Laboratory case narrative.*

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: Lisa Worthington Position: Technical Representative

Printed Name: Lisa A. Worthington Date: 01/02/20

APPENDIX F

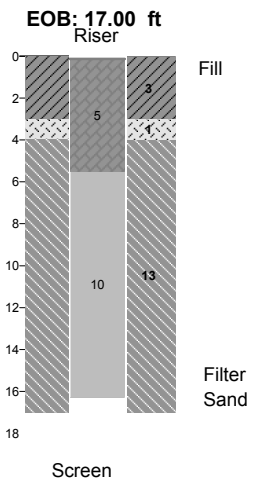
588 Silver Street
Agawam, MA 01001

SOIL BORING & MONITORING WELL INSTALLATION LOG

Boring Name: MW-6		Job Number: 14685.00	
Boring Company:	Environmental Compliance Services , Inc	**Site Name:**	Golys Garage
Address:	588 Silver Street	**Address:**	286 Federal Street
Town:	Agawam	**Town:**	Greenfield
State/Zip:	MA 01001	**State/Zip:**	MA 01301
Foreman:	Stanley Werbicki	**Client:**	Goly's Garage Inc.

Installed/Finished: 09/08/2006 - 09/08/2006

Location of Boring:



Depth (feet)	Penetration/ Recovery (inches)	Blow Count (per 6 in.)	Strata	Soil Descriptions	Field Testing
0 - 1	12/0				
1 - 2	12/0				
2 - 3	12/0				
3 - 4	12/0				
4 - 5	12/0				
5 - 6	12/9	3-4	Clay	damp gray CLAY, silt, fine sand	356
6 - 7	12/12	3-4	Clay	damp gray CLAY, silt, fine sand	356
7 - 8	12/0				
8 - 9	12/0				
9 - 10	12/0				
10 - 11	12/12	3-2	Clay	wet gray CLAY, trace of silt, fine sand	2187

Depth(s), Analyte(s), Time(s) Sampled: Sampled

11 - 12	12/12	3-5	Clay	wet gray CLAY, trace of silt, fine sand	2187
12 - 13	12/0				
13 - 14	12/0				
14 - 15	12/0				
15 - 16	12/12	2-1	Clay	wet gray CLAY, trace of silt, fine sand	1112
16 - 17	12/12	2-2	Clay	wet gray CLAY, trace of silt, fine sand	1112

Boring Type: Hollow Stem Auger 1
Auger Inside Diameter (in): 4.25
Hammer Weight (lbs): 140
Hammer Fall (in): 30
Sampler Inside Diameter (in): 1.375
Sampler Type: S.S. Split Spoon 1
Sampler Length (in.): 24
ECS Inspector: Anita Hansen

Well Construction Data:

A 2.00 inch monitoring well was installed at 15.00 ft below grade using 10.00 ft of 0.01 slotted screen and 5.00 ft of solid riser, sand packed to 4.00 ft below grade, bentonite sealed to 3.00 ft below grade; native fill.

Notes: Field Testing values represent total volatile organic vapors (referenced to a benzene standard) measured in the headspace of sealed soil sample jars with an OVM 580B photoionization meter with a Detection Limit of 0.1 ppm. Results reported in Parts Per Million (ppm), BDL=Below Detection Limit

Notes:

Depth(s), Analyte(s), Time(s) Sampled: Sampled

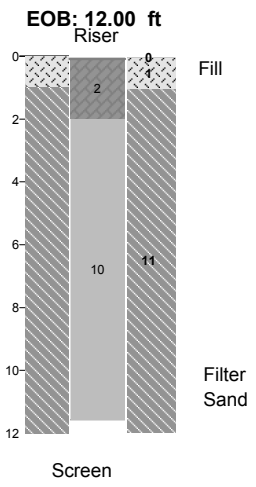
588 Silver Street
Agawam, MA 01001

SOIL BORING & MONITORING WELL INSTALLATION LOG

Boring Name: MW-7		Job Number: 14685.00	
Boring Company:	Environmental Compliance Services , Inc	**Site Name:**	Golys Garage
Address:	588 Silver Street	**Address:**	286 Federal Street
Town:	Agawam	**Town:**	Greenfield
State/Zip:	MA 01001	**State/Zip:**	MA 01301
Foreman:	Stanley Werbicki	**Client:**	Goly's Garage Inc.

Installed/Finished: 09/08/2006 - 09/08/2006

Location of Boring:



Depth (feet)	Penetration/ Recovery (inches)	Blow Count (per 6 in.)	Strata	Soil Descriptions	Field Testing
0 - 1	12/0				
1 - 2	12/0				
2 - 3	12/0				
3 - 4	12/0				
4 - 5	12/0				
5 - 6	12/10	1-2	Clay	damp light brown CLAY, trace of fine sand, silt	0
6 - 7	12/12	3-5	Clay	damp light brown CLAY, trace of fine sand, silt	0
7 - 8	12/0				
8 - 9	12/0				
9 - 10	12/0				
10 - 11	12/12	2-1	Clay	moist 22" gray CLAY, over 2" red med sand, clay	0

Depth(s), Analyte(s), Time(s) Sampled: Sampled

11 - 12	12/12	2-refusal	Clay	moist 22" gray CLAY, over 2" red med sand, clay	0

Boring Type: Hollow Stem Auger 1
Auger Inside Diameter (in): 4.25
Hammer Weight (lbs): 140
Hammer Fall (in): 30
Sampler Inside Diameter (in): 1.375
Sampler Type: S.S. Split Spoon 1
Sampler Length (in.): 24
ECS Inspector: Anita Hansen

Well Construction Data:

A 2.00 inch monitoring well was installed at 12.00 ft below grade using 10.00 ft of 0.01 slotted screen and 2.00 ft of solid riser, sand packed to 1.00 ft below grade, bentonite sealed to 0.00 ft below grade; native fill.

Notes: Field Testing values represent total volatile organic vapors (referenced to a benzene standard) measured in the headspace of sealed soil sample jars with an OVM 580B photoionization meter with a Detection Limit of 0.1 ppm. Results reported in Parts Per Million (ppm), BDL=Below Detection Limit

Notes:

Depth(s), Analyte(s), Time(s) Sampled: Sampled

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING LS-7

PROJECT : Lunt Silversmith			LOCATION:	Greenfield, MA	PROJECT NO. : 1753-03-01
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Mike HELPER Doug		DATE STARTED	01/11/2012	DATE FINISHED 01/11/2012
DRILLING EQUIPMENT Geoprobe			COMPLETION DEPTH	8'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL		No. Samples	2	UNDIST.
CASING	Rod		TIME		FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT	DROP	WATER LEVEL (FT.)		4'
SAMPLER:			BORING	Western end of building, southwest corner	
SAMPLER HAMMER	WEIGHT	DROP	LOCATION	N42° 36.068' W72° 35.767'	
			ENGINEER/GEOLOGIST	Brin Warenda	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	REMARKS
			30/48	S-1	Top 4": Topsoil, brown, fine SAND and SILT, trace medium		TOPSOIL	
				0-4'	sand (frost)	2.4	FILL	
					Middle 12": Brown-black, fine to medium SAND, some ash, trace red rock, dry	(0-2')	2'	
					Bottom 14": Brown(iron stained), fine to medium SAND, trace coarse sand, moist	7.2	SAND AND SILT	
						(2-4')		
	5		40/48	S-2	Top 20": Brown, fine to medium SAND, trace silt, wet			
				4-8'	Bottom 20": Grey, fine SAND and SILT, some clay (iron staining), wet	1.3		
						(4-6')		
						0.8		
						(6-8')	8'	
					End of Exploration at 8'			
	10							
	15							
	20							
	25							

Remarks:

1. Soil screened in field using TEI Model 580B photoionization detector (PID) with 11.7eV lamp eferenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING LS-8

PROJECT : Lunt Silversmith			LOCATION:	Greenfield, MA	PROJECT NO. : 1753-03-01
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Mike HELPER Doug		DATE STARTED	01/11/2012	DATE FINISHED 01/11/2012
DRILLING EQUIPMENT Geoprobe			COMPLETION DEPTH	8'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL		No. Samples	2	UNDIST.
CASING	Rod		TIME		FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT	DROP	WATER LEVEL (FT.)		4'
SAMPLER:			BORING	Western end of building, northwest corner	
SAMPLER HAMMER	WEIGHT	DROP	LOCATION	N42° 36.080' W72° 35.761'	
			ENGINEER/GEOLOGIST	Brin Warenda	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	REMARKS
			36/48	S-1	Top 4": Topsoil, brown, fine SAND and SILT (frost)		TOPSOIL	
				0-4'	Bottom 32": Brown, fine to medium SAND, little silt, trace fine gravel, moist	0.0 (0-2')	FILL	
						0.0 (2-4')		
	5		42/48	S-2	Top 12": Brown, fine to medium SAND, little silt, trace fine gravel, wet at 4'		5'	
				4-8'	Middle 12": Grey-black, SILTY CLAY, trace fine sand, wet (petroleum odor)	0.0 (4-6')	SAND AND SILT	
					Bottom 18": Grey-brown, fine SAND and SILT, little clay, wet	0.0 (6-8')	8'	
					End of Exploration at 8'			
	10							
	15							
	20							
	25							

Remarks:

1. Soil screened in field using TEI Model 580B photoionization detector (PID) with 11.7eV lamp eferenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING LS-9

PROJECT : Lunt Silversmith			LOCATION:	Greenfield, MA	PROJECT NO. : 1753-03-01
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Mike HELPER Doug		DATE STARTED	01/11/2012	DATE FINISHED 01/11/2012
DRILLING EQUIPMENT Geoprobe			COMPLETION DEPTH	8'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL		No. Samples	2	UNDIST.
CASING	Rod		TIME		FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT	DROP	WATER LEVEL (FT.)		4.5'
SAMPLER:			BORING	Northwest portion of building, west corner	
SAMPLER HAMMER	WEIGHT	DROP	LOCATION	N42° 36.082' W72° 35.760'	
			ENGINEER/GEOLOGIST	Brin Warenda	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	REMARKS
			46/48	S-1 0-4'	Top 12": Topsoil, brown, fine SAND and SILT, trace fine gravel, dry Middle 16": Brown, fine to medium SAND, some silt, little medium sand, trace debris (brick), dry Bottom 18": Brown, fine to medium SAND, some silt, moist	0.0 (0-2') 0.0 (2-4')	TOPSOIL 1' FILL 3' SAND AND SILT	
	5		40/48	S-2 4-8'	Top 14": Brown, fine to medium SAND, some silt, wet at 4.5' Bottom 26": Brown-grey, fine SAND and SILT, little clay, wet	4.3 (4-5') 159.0 (5-6') 2.3 (6-8')	8'	
					End of Exploration at 8'			
	10							
	15							
	20							
	25							

Remarks:

1. Soil screened in field using TEI Model 580B photoionization detector (PID) with 11.7eV lamp eferenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING LS-10

PROJECT : Lunt Silversmith		LOCATION: Greenfield, MA	PROJECT NO. : 1753-03-01
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Mike HELPER Doug	DATE STARTED 01/11/2012	DATE FINISHED 01/12/2012
DRILLING EQUIPMENT Geoprobe		COMPLETION DEPTH 8'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL	No. Samples 2	UNDIST.
CASING	Rod	TIME	FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT / DROP	WATER LEVEL (FT.)	4'
SAMPLER:		BORING	Northwest portion of building, adjacent to AST fill line
SAMPLER HAMMER	WEIGHT / DROP	LOCATION	N42° 36.080' W72° 35.755'
		ENGINEER/GEOLOGIST	Brin Warenda

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	REMARKS
			35/48	S-1	Top 5": Topsoil, brown, fine SAND and SILT, dry		TOPSOIL	
				0-4'	Bottom 30": Brown, fine to medium SAND, some silt, little fine gravel, trace coarse sand, trace debris (brick), moist	0.0 (0-2')	FILL	1'
						0.0 (2-4')	4'	2'
	5		34/48	S-2	Top 14": Brown, fine to medium SAND, some silt, wet at 4'		SAND	
				4-8'	Bottom 20": Grey, fine SAND and SILT, trace clay, wet	0.0 (4-6')	5'	
							SAND AND SILT	
						0.0 (6-8')	8'	
	10				End of Exploration at 8'			12'
	15							
	20							
	25							

Remarks:

1. Soil screened in field using TEI Model 580B photoionization detector (PID) with 11.7eV lamp eferenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected
2. Well installed using B-53 Drill Rig with hollow stem augers on 1/12/12, straight drilled to 12'
3. 2" well screen from 12'-2', riser from 2'-grade, sand pack from 12'-1', bentonite from 1'-0.5', sand to grade, curb box cemented in place

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING LS-11

PROJECT : Lunt Silversmith			LOCATION:	Greenfield, MA	PROJECT NO. : 1753-03-01
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Mike HELPER Doug		DATE STARTED	01/11/2012	DATE FINISHED 01/11/2012
DRILLING EQUIPMENT Geoprobe			COMPLETION DEPTH	8'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL		No. Samples	2	UNDIST.
CASING	Rod		TIME		FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT	DROP	WATER LEVEL (FT.)		5'
SAMPLER:			BORING	Northwest portion of building, east corner	
SAMPLER HAMMER	WEIGHT	DROP	LOCATION	N42° 36.079' W72° 35.748'	
			ENGINEER/GEOLOGIST	Brin Warenda	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	REMARKS
			40/48	S-1	Top 5": Topsoil, brown, fine SAND and SILT, frost		TOPSOIL	
				0-4'	Middle 16": Brown-black, medium SAND, little debris(ash), trace fine sand, trace silt, dry	0.0 (0-2')	FILL	
					Bottom 19": Brown, fine to medium SAND, some silt, dry		2'	
						0.0 (2-4')	SAND AND SILT	
	5		45/48	S-2	Top 30": Brown, fine to medium SAND, some silt, wet at 5'			
				4-8'	Bottom 15": Brown-grey, fine SAND and SILT, wet	0.0 (4-6')		
						0.0 (6-8')		
					End of Exploration at 8'			
	10							
	15							
	20							
	25							

Remarks:

1. Soil screened in field using TEI Model 580B photoionization detector (PID) with 11.7eV lamp eferenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING LS-12

PROJECT : Lunt Silversmith			LOCATION:	Greenfield, MA	PROJECT NO. : 1753-03-01
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Mike HELPER Doug		DATE STARTED	01/11/2012	DATE FINISHED 01/11/2012
DRILLING EQUIPMENT Geoprobe			COMPLETION DEPTH	8'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL		No. Samples	2	UNDIST.
CASING	Rod		TIME		FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT	DROP	WATER LEVEL (FT.)		3.5'
SAMPLER:			BORING	Northwest portion of building, northcentral portion of parking area	
SAMPLER HAMMER	WEIGHT	DROP	LOCATION	N42° 36.089' W72° 35.751'	
			ENGINEER/GEOLOGIST	Brin Warenda	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	REMARKS
			33/48	S-1	2" Asphalt		ASPHALT	
				0-4'	Top 23": Brown, fine to medium SAND, some fine gravel, trace silt	0.0	FILL	
					trace coarse sand, dry	(0-2')		
					Bottom 10": Brown, fine to medium sand, little silt, wet at 3.5'			
						0.0		
						(2-4')	4'	
	5		36/48	S-2	Top 18": Brown-grey, fine SAND and SILT, wet		SAND AND SILT	
				4-8'	Bottom 18": Grey, fine SAND and SILT, wet	0.0		
						(4-6')		
						0.0		
						(6-8')		
					End of Exploration at 8'			
	10							
	15							
	20							
	25							

Remarks:

1. Soil screened in field using TEI Model 580B photoionization detector (PID) with 11.7eV lamp eferenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING LS-13

PROJECT : Lunt Silversmith			LOCATION:	Greenfield, MA	PROJECT NO. : 1753-03-01
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Mike HELPER Doug		DATE STARTED	01/11/2012	DATE FINISHED 01/11/2012
DRILLING EQUIPMENT Geoprobe			COMPLETION DEPTH	8'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL		No. Samples	2	UNDIST.
CASING	Rod		TIME		FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT	DROP	WATER LEVEL (FT.)		3'
SAMPLER:			BORING	Southwest corner of parking area	
SAMPLER HAMMER	WEIGHT	DROP	LOCATION	N42° 36.049' W72° 35.801'	
			ENGINEER/GEOLOGIST	Brin Warenda	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	REMARKS
			27/48	S-1	3" Asphalt		ASPHALT	
				0-4'	Top 12": Brown, fine to medium SAND, some fine gravel, trace silt	0.0	FILL	
					dry	(0-2')	1.5'	
					Bottom 12": Brown-grey, fine SAND and SILT, little clay, wet at 3'		SILTY CLAY	
						0.3		
						(2-4')		
	5		48/48	S-2	Grey, SILTY CLAY, wet			
				4-8'		4.1		
						(4-6')		
						0.0		
						(6-8')	8'	
					End of Exploration at 8'			
	10							
	15							
	20							
	25							

Remarks:

1. Soil screened in field using TEI Model 580B photoionization detector (PID) with 11.7eV lamp eferenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING LS-14

PROJECT : Lunt Silversmith			LOCATION:	Greenfield, MA	PROJECT NO. : 1753-03-01
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Mike HELPER Doug		DATE STARTED	01/11/2012	DATE FINISHED 01/11/2012
DRILLING EQUIPMENT Geoprobe			COMPLETION DEPTH	12'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL		No. Samples	3	UNDIST.
CASING	Rod		TIME		FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT	DROP	WATER LEVEL (FT.)		4'
SAMPLER:			BORING	Western portion of building, southwest end	
SAMPLER HAMMER	WEIGHT	DROP	LOCATION	N42° 36.056' W72° 35.751'	
			ENGINEER/GEOLOGIST	Brin Warenda	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	REMARKS
			46/48	S-1 0-4'	Top 6": Topsoil, brown, fine SAND and SILT, dry Bottom 40": Brown, fine to medium SAND, some silt, trace coarse sand, wet at 4'	0.0 (0-2') 0.0 (2-4')	TOPSOIL SAND AND SILT	
	5		46/48	S-2 4-8'	Brown, fine to medium SAND, some silt, trace coarse sand, wet	1.2 (4-6') 53.1 (6-8')		
	10		46/48	S-3 8-12'	Top 14": Brown, fine to medium SAND, some silt, trace coarse sand, wet Bottom 32": Grey, CLAYEY SILT, trace fine sand, wet	50.1 (8-10') 11.2 (10-12')	9' CLAYEY SILT 12'	
					End of Exploration at 12'			
	15							
	20							
	25							

Remarks:

1. Soil screened in field using TEI Model 580B photoionization detector (PID) with 11.7eV lamp eferenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING LS-15

PROJECT : Lunt Silversmith			LOCATION:	Greenfield, MA	PROJECT NO. : 1753-03-01
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Mike HELPER Doug		DATE STARTED	01/11/2012	DATE FINISHED 01/11/2012
DRILLING EQUIPMENT Geoprobe			COMPLETION DEPTH	8'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL		No. Samples	2	UNDIST.
CASING	Rod		TIME		FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT	DROP	WATER LEVEL (FT.)		5'
SAMPLER:			BORING	Western end of building, southwest end near transformer pad	
SAMPLER HAMMER	WEIGHT	DROP	LOCATION	N42° 36.053' W72° 35.744'	
			ENGINEER/GEOLOGIST	Brin Warenda	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	REMARKS
			48/48	S-1 0-4'	Top 6": Topsoil, brown, fine SAND and SILT, trace medium sand	0.0 (0-2')	TOPSOIL FILL	
					Bottom 42": Brown, fine to medium SAND, some silt, trace debris (brick), moist	0.0 (2-4')	4'	
	5		44/48	S-2 4-8'	Top 30": Brown, fine to medium SAND, some silt, wet at 5'		SAND AND SILT	
					Bottom 14": Grey, medium-coarse SAND, trace fine sand, trace silt, wet	0.0 (4-6')		
						0.0 (6-8')		
					End of Exploration at 8'			
	10							
	15							
	20							
	25							

Remarks:

1. Soil screened in field using TEI Model 580B photoionization detector (PID) with 11.7eV lamp eferenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING LS-16

PROJECT : Lunt Silversmith			LOCATION:	Greenfield, MA	PROJECT NO. : 1753-03-01
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Mike HELPER Doug		DATE STARTED	01/11/2012	DATE FINISHED 01/11/2012
DRILLING EQUIPMENT Geoprobe			COMPLETION DEPTH	8'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL		No. Samples	2	UNDIST.
CASING	Rod		TIME		FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT	DROP	WATER LEVEL (FT.)		5'
SAMPLER:			BORING	Western portion of building, southeastern end inside gated area	
SAMPLER HAMMER	WEIGHT	DROP	LOCATION	N42° 36.050' W72° 35.734'	
			ENGINEER/GEOLOGIST	Brin Warenda	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	REMARKS
			36/48	S-1 0-4'	Top 6": Topsoil, brown, fine SAND and SILT, dry Bottom 30": Brown-grey, fine SAND and SILT, some medium sand, trace fine gravel, wet at 4'	0.0 (0-2') 0.0 (2-4')	TOPSOIL SAND AND SILT	
	5		42/48	S-2 4-8'	Top 28": Brown-grey, fine SAND and SILT, some medium sand, trace fine gravel, bottom 30" wet Bottom 14": Grey, fine-medium SAND, some silt, wet	0.0 (4-6') 0.0 (6-8')		
	10				End of Exploration at 8'			
	15							
	20							
	25							

Remarks:

1. Soil screened in field using TEI Model 580B photoionization detector (PID) with 11.7eV lamp eferenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING LS-17

PROJECT : Lunt Silversmith			LOCATION:	Greenfield, MA	PROJECT NO. : 1753-03-01
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Mike HELPER Doug		DATE STARTED	01/11/2012	DATE FINISHED 01/11/2012
DRILLING EQUIPMENT Geoprobe			COMPLETION DEPTH	12'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL		No. Samples	3	UNDIST.
CASING	Rod		TIME		FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT	DROP	WATER LEVEL (FT.)		4'
SAMPLER:			BORING	Southeast corner of parking lot	
SAMPLER HAMMER	WEIGHT	DROP	LOCATION	N42° 36.040' W72° 35.759'	
			ENGINEER/GEOLOGIST	Brin Warenda	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	REMARKS
			34/48	S-1	2" Asphalt		ASPHALT	
				0-4'	Brown, fine to medium SAND, some fine gravel, trace silt, dry	0.8 (0-2')	FILL	
						8.0 (2-4')	4'	
	5		46/48	S-2	Top 6": Grey, fine to medium SAND, little silt, wet at 4'		CLAYEY SILT	
				4-8'	Bottom 40": Grey, CLAYEY SILT, trace fine sand, wet	14.7 (4-6')		
						24.4 (6-8')		
	10		48/48	S-3	Top 24": Grey, fine SAND and SILT, some gravel, wet			
				8-12'	Bottom 24": Grey, CLAYEY SILT, trace fine sand, wet	2.4 (8-10')		
						5.3 (10-12')	12'	
					End of Exploration at 12'			
	15							
	20							
	25							

Remarks:

1. Soil screened in field using TEI Model 580B photoionization detector (PID) with 11.7eV lamp eferenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING LS-18

PROJECT : Lunt Silversmith			LOCATION:	Greenfield, MA	PROJECT NO. : 1753-03-01
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Mike HELPER Doug		DATE STARTED	01/12/2012	DATE FINISHED 01/12/2012
DRILLING EQUIPMENT B-53 Truck Mounted Rig			COMPLETION DEPTH	5'	GROUND SURFACE ELEV. DATUM
TYPE BIT Hollow Stem Auger	SIZE &TYPE OF CORE BARREL		No. Samples	2	UNDIST.
CASING	Rod		TIME		FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT	DROP	WATER LEVEL (FT.)		-
SAMPLER: 2" O.D. Split Spoon			BORING LOCATION	Southeast portion of site, northeast corner of building visitor parking area N42° 36.034' W72° 35.677'	
SAMPLER HAMMER Safety	WEIGHT 140 lbs.	DROP 30" (Wire Line)	ENGINEER/GEOLOGIST	Brin Warenda	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	REMARKS
					1" ASPHALT 8" BRICK		ASPHALT FILL	
X			12/24	S-1 1-3'	Brown-grey, fine SAND and SILT, moist	0.0	SAND AND SILT	
X		17/41/ 50 for 1"	14/24	S-2 3-5'	Top 12": Very dense, brown-grey, fine SAND and SILT, moist Bottom 2": Very dense, brown-red, fine SAND and SILT, some fine gravel, dry	0.0		
	5				Auger refusal at 5'			Off-set two times and could not advance past 3 feet. No well installed at this location due to shallow refusal.
	10							
	15							
	20							
	25							

Remarks:

1. Soil screened in field using TEI Model 580B photoionization detector (PID) with 11.7eV lamp eferenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING LS-19

PROJECT : Lunt Silversmith			LOCATION: Greenfield, MA	PROJECT NO. : 1753-03-01	
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Mike HELPER Doug		DATE STARTED 01/12/2012	DATE FINISHED 01/12/2012	
DRILLING EQUIPMENT B-53 Truck Mounted Rig			COMPLETION DEPTH 12'	GROUND SURFACE ELEV. DATUM	
TYPE BIT Hollow Stem Auger	SIZE &TYPE OF CORE BARREL Rod		No. Samples 5	UNDIST.	
CASING			TIME	FIRST / COMPL. / HR.	
CASING HAMM.	WEIGHT	DROP	WATER LEVEL (FT.)	4'	
SAMPLER: 2" O.D. Split Spoon			BORING Southcentral of parking lot		
SAMPLER HAMMER Safety	WEIGHT 140 lbs.	DROP 30" (Wire Line)	LOCATION N42° 36.043' W72° 35.774'		
			ENGINEER/GEOLOGIST Brin Warenda		

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	WELL CONSTRUCTION
					2" ASPHAL		ASPHALT	
					6" FROST LAYER		FILL	1'
			16/24	S-1	Top 4": Brown, fine SAND and SILT, some medium sand, dry	0.3		
				1-3'	Middle 6": Grey, fine GRAVEL, dry		2'	2'
					Bottom 4": Brown-grey, fine SAND and SILT, moist		SAND AND SILT	
			18/24	S-2	Brown-grey, fine SAND and SILT, wet at 4'	1.0		
				3-5'			5'	
	5		15/24	S-3	Grey, CLAYEY SILT, trace fine sand, wet	0.8	CLAYEY SILT	
				5-7'				
			16/24	S-4	Grey, CLAYEY SILT, trace fine sand, wet	54.8		
				7-9'				
			16/24	S-5	Grey, CLAYEY SILT, trace fine sand, wet	9.7		
	10			9-11'				
					End of Exploration at 12'			
	15							
	20							
	25							

Remarks:

1. Soil screened in field using TEI Model 580B photoionization detector (PID) with 11.7eV lamp eferenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected
2. 2" well screened from 12'-2', riser from 2'-grade, sand pack from 10'-1', bentonite seal from 1'-0.5', sand to grade, curb box cemented in place

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING LS-20

PROJECT : Lunt Silversmith		LOCATION: Greenfield, MA	PROJECT NO. : 1753-03-01
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Mike HELPER Doug	DATE STARTED 01/12/2012	DATE FINISHED 01/12/2012
DRILLING EQUIPMENT B-53 Truck Mounted Rig		COMPLETION DEPTH 10'	GROUND SURFACE ELEV. DATUM
TYPE BIT Hollow Stem Auger	SIZE &TYPE OF CORE BARREL	No. Samples 4	UNDIST.
CASING	Rod	TIME	FIRST / COMPL. / HR.
CASING HAMM. WEIGHT	DROP	WATER LEVEL (FT.)	4.5'
SAMPLER: 2" O.D. Split Spoon		BORING LOCATION	Southcentral portion of building, in parking spaces
SAMPLER HAMMER Safety	WEIGHT 140 lbs. / DROP 30" (Wire Line)	ENGINEER/GEOLOGIST	Brin Warenda

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	WELL CONSTRUCTION
					2" ASPHALT 4" FROST LAYER		ASPHALT	
		15/24/17/15	22/24	S-1 1-3'	Dense brown-black, fine SAND and SILT, some ash, trace debris (brick), dry	1.3	FILL 3'	1'
		20/20/20/10	20/24	S-2 3-5'	Dense brown-grey, fine to medium SAND, some silt, moist- wet at 4.5'	0.0	SAND AND SILT 5'	2'
	5	7/1/1/1	20/24	S-3 5-7'	Very soft, grey, SILTY CLAY, wet	0.0	SILTY CLAY	
		24/50 for 5"	14/24	S-4 7-9'	Top 12": Grey, SILTY CLAY, wet Bottom 2": Brown-red, fine to medium SAND, some gravel, wet	0.0	9'	
	10						BEDROCK	
					Auger refusal at 10'			
	15							
	20							
	25							

Remarks:

1. Soil screened in field using TEI Model 580B photoionization detector (PID) with 11.7eV lamp eferenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected
2. 2" well screened from 10'-2', riser from 2'-grade, sand pack from 10'-1', bentonite seal from 1'-0.5', sand to grade, curb box cemented in place

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING LS-21

PROJECT: Lunt Silversmith			LOCATION Greenfield, MA	PROJECT NO. 1753-03-01	
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN David HELPER Jeff		DATE STARTED 2/21/2012	DATE FINISHED 2/21/2012	
DRILLING EQUIPMENT Geoprobe 5340DT			COMPLETION DEPTH 12'	GROUND SURFACE ELEV. DATUM	
TYPE BIT	SIZE &TYPE OF CORE BARREL		No. of samples collected 3	UNDIST.	
CASING			TIME	FIRST	COMPL. HR.
CASING HAMM.	WEIGHT	DROP	WATER LEVEL (FT.)	5.5'	
SAMPLER:			BORING LOCATION Southeastern corner of fields		
SAMPLER HAMMER Split Spoon	WEIGHT	DROP	ENGINEER/GEOL Brin Thompson		

SAMPLES	DEPTH FT.	SAMPLES PENETR. RESIST. BL/6 IN.	SAMPLES REC. IN.	SAMPLES TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	WELL CONSTRUCTION
			46/48	S-1 0'-4'	Top 12": Brown, fine to medium SAND and SILT, trace fine gravel, dry (TOPSOIL)	0.0 (0'-2')	TOPSOIL 1'	1'
					Bottom 34": Brown to gray, fine SAND and SILT, dry	0.0 (2'-4')	SAND AND SILT	2'
	5		40/48	S-2 4'-8'	Top 36": Gray, fine SAND and SILT, wet at 5.5'	0.0		
					Bottom 4": Gray, CLAYEY SILT, trace fine sand, wet	(4'-6') 0.0 (6'-8')	7.5' CLAYEY SILT	
	10		42/48	S-3 8'-12'	Gray, CLAYEY SILT, trace fine sand, wet	0.0 (8'-10') 0.0 (10'-12')		
					End of exploration at 12'			
	15							
	20							
	25							

Remarks:

1. Soil headspace screened in field using TEI model 580B photoionization detector (PID) referenced to benzene in air. Readings shown in parts per million (ppm)
2. 1" PVC well at 12' below ground surface, screen 12'-2', riser from 2' to ground surface. Sand pack 12'-1', bentonite clay seal 1'-0.5', sand to grade, curb box cemented in place

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING LS-22

PROJECT: Lunt Silversmith		LOCATION Greenfield, MA	PROJECT NO. 1753-03-01
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN David HELPER Jeff	DATE STARTED 2/21/2012	DATE FINISHED 2/21/2012
DRILLING EQUIPMENT Geoprobe 5340DT		COMPLETION DEPTH 12'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL	No. of samples collected 3	UNDIST.
CASING		TIME	FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT / DROP	WATER LEVEL (FT.)	4'
SAMPLER:		BORING LOCATION South side of street, between 22 and 28 Kendall St.	
SAMPLER HAMMER Split Spoon	WEIGHT / DROP	ENGINEER/GEOL Brin Thompson	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	WELL CONSTRUCTION
			22/48	S-1 0'-4'	Top 4": Brown, fine SAND and SILT, dry (TOPSOIL) Bottom 18": Brown to gray, fine to medium SAND, some silt, moist	0.0 (0'-2') 0.0 (2'-4')	TOPSOIL FILL	1' 2'
	5		48/48	S-2 4'-8'	Top 12": Brown to gray, fine to medium SAND, some silt, wet at 4' Bottom 36": Gray, CLAYEY SILT, trace fine sand, wet	0.0 (4'-6') 0.0 (6'-8')	5' CLAYEY SILT	
	10		44/48	S-3 8'-12'	Gray, CLAYEY SILT, trace fine sand, wet	0.0 (8'-10') 0.0 (10'-12')		
	15				End of exploration at 12'			
	20							
	25							

Remarks:

1. Soil headspace screened in field using TEI model 580B photoionization detector (PID) referenced to benzene in air. Readings shown in parts per million (ppm)
2. 1" PVC well at 12' below ground surface, screen 12'-2', riser from 2' to ground surface. Sand pack 12'-1', bentonite clay seal 1'-0.5', sand to grade, curb box cemented in place

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING LS-23

PROJECT: Lunt Silversmith			LOCATION Greenfield, MA	PROJECT NO. 1753-03-01	
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN David HELPER Jeff		DATE STARTED 2/21/2012	DATE FINISHED 2/21/2012	
DRILLING EQUIPMENT Geoprobe 5340DT			COMPLETION DEPTH 12'	GROUND SURFACE ELEV. DATUM	
TYPE BIT	SIZE &TYPE OF CORE BARREL		No. of samples collected 3	UNDIST.	
CASING			TIME	FIRST	COMPL. HR.
CASING HAMM. WEIGHT	DROP		WATER LEVEL (FT.)	4.5'	
SAMPLER:			BORING LOCATION South side of Kenwood St between #14 and Plumbing Supply		
SAMPLER HAMMER Split Spoon WEIGHT	DROP		ENGINEER/GEOL Brin Thompson		

SAMPLES	DEPTH FT.	SAMPLES PENETR. RESIST. BL/6 IN.	SAMPLES REC. IN.	SAMPLES TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	WELL CONSTRUCTION
			40/48	S-1 0'-4'	Top 4": Brown, fine to medium SAND and SILT, dry (TOPSOIL) Next 6": CONCRETE Bottom 30": Brown, fine to medium SAND, little silt, moist	0.0 (0'-2') 0.0 (2'-4')	TOPSOIL FILL	1' 2'
	5		38/48	S-2 4'-8'	Top 6": Brown, fine to medium SAND, little silt, moist Bottom 32": Brown to gray, CLAYEY SILT, little fine sand, wet at 4.5'	0.0 (4'-6') 0.0 (6'-8')	4.5' CLAYEY SILT	
	10		30/48	S-3 8'-12'	Gray, CLAYEY SILT, little fine sand, wet	0.0 (8'-10') 0.0 (10'-12')		
	15				End of exploration at 12'			
	20							
	25							

Remarks:

1. Soil headspace screened in field using TEI model 580B photoionization detector (PID) referenced to benzene in air. Readings shown in parts per million (ppm)
2. 1" PVC well at 12' below ground surface, screen 12'-2', riser from 2' to ground surface. Sand pack 12'-1', bentonite clay seal 1'-0.5', sand to grade, curb box cemented in place

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING LS-24

PROJECT: Lunt Silversmith		LOCATION Greenfield, MA	PROJECT NO. 1753-03-01
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN David HELPER Jeff	DATE STARTED 2/21/2012	DATE FINISHED 2/21/2012
DRILLING EQUIPMENT Geoprobe 5340DT		COMPLETION DEPTH 12'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL	No. of samples collected 3	UNDIST.
CASING		TIME	FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT / DROP	WATER LEVEL (FT.)	6'
SAMPLER:		BORING LOCATION Gated area, under former dumpster area, west of building	
SAMPLER HAMMER Split Spoon	WEIGHT / DROP	ENGINEER/GEOL Brin Thompson	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	WELL CONSTRUCTION
			24/48	S-1 0'-4'	Brown, fine to medium SAND and SILT, trace fine gravel, moist	24.1 (0'-4')	FILL	1'
	5		36/48	S-2 4'-8'	Top 18": Brown, fine to medium SAND and SILT, trace fine gravel, moist Bottom 18": Brown, fine to medium SAND, some silt, wet at 6'	31.9 (4'-6') 54.6 (6'-8')	4.5' SAND AND SILT	2'
	10			S-3 8'-12'	Top 24": Brown, fine to medium SAND, some silt, wet Bottom 24": Gray, CLAYEY SILT, trace fine sand, wet	17.9 (8'-10') 1.2 (10'-12')	10' CLAYEY SILT	
					End of exploration at 12'			
	15							
	20							
	25							

Remarks:

1. Soil headspace screened in field using TEI model 580B photoionization detector (PID) referenced to benzene in air. Readings shown in parts per million (ppm)
2. 1" PVC well at 12' below ground surface, screen 12'-2', riser from 2' to ground surface. Sand pack 12'-1', bentonite clay seal 1'-0.5', sand to grade, curb box cemented in place

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING LS-27

PROJECT: Lunt Silversmith		LOCATION Greenfield, MA	PROJECT NO. 1753-03-01
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN David HELPER Jeff	DATE STARTED 2/21/2012	DATE FINISHED 2/21/2012
DRILLING EQUIPMENT Geoprobe 5340DT		COMPLETION DEPTH 12'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL	No. of samples collected 3	UNDIST.
CASING		TIME	FIRST / COMPL. / HR.
CASING HAMM. WEIGHT DROP		WATER LEVEL (FT.)	6.5'
SAMPLER:		BORING LOCATION Northwest side of building, south side of AST location	
SAMPLER HAMMER WEIGHT DROP		ENGINEER/GEOL Brin Thompson	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	REMARKS
			30/48	S-1 0'-4'	Brown, fine to medium SAND and SILT, trace(-) fine gravel, moist	10.7 (0'-2') 0.4 (2'-4')	FILL	
	5		30/48	S-2 4'-8'	Top 18": Brown, fine to medium SAND and SILT, trace (fine gravel, moist to wet at 6.5' Bottom 12": Gray, CLAYEY SILT, trace fine sand, wet	0.3 (4'-6') 0.4 (6'-8')	7' CLAYEY SILT	
	10		18/48	S-3 8'-12'	Gray, CLAYEY SILT, trace fine sand, wet	0.0 (8'-10') 0.0 (10'-12')		
	15				End of exploration at 12'			
	20							
	25							

Remarks:

1. Soil headspace screened in field using TEI model 580B photoionization detector (PID) referenced to benzene in air. Readings shown in parts per million (ppm)

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING LS-29

PROJECT: Lunt Silversmith		LOCATION Greenfield, MA	PROJECT NO. 1753-03-01
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN David HELPER Jeff	DATE STARTED 2/21/2012	DATE FINISHED 2/21/2012
DRILLING EQUIPMENT Shovel		COMPLETION DEPTH 2'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL	No. of samples collected 2	UNDIST.
CASING		TIME	FIRST / COMPL. / HR.
CASING HAMM. WEIGHT DROP		WATER LEVEL (FT.)	NE
SAMPLER:		BORING LOCATION Directly beneath two cyclones, south side of building	
SAMPLER HAMMER WEIGHT DROP		ENGINEER/GEOL Brin Thompson	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	REMARKS
				S-1 0'-1'	Dark brown, fine to medium sand, some silt, little coarse sand, dry	0.0	FILL	
				S-2 1'-2'	Brown, fine to medium sand, little silt, dry	0.0	2'	
	5				End exploration at 2'			
	10							
	15							
	20							
	25							

Remarks:

1. Soil headspace screened in field using TEI model 580B photoionization detector (PID) referenced to benzene in air. Readings shown in parts per million (ppm)

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING LS-30

PROJECT: Lunt Silversmith			LOCATION Greenfield, MA	PROJECT NO. 1753-03-01	
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN David HELPER Jeff		DATE STARTED 2/21/2012	DATE FINISHED 2/21/2012	
DRILLING EQUIPMENT Geoprobe 5340DT			COMPLETION DEPTH 12'	GROUND SURFACE ELEV. DATUM	
TYPE BIT	SIZE &TYPE OF CORE BARREL		No. of samples collected 3	UNDIST.	
CASING			TIME	FIRST	COMPL. HR.
CASING HAMM.	WEIGHT	DROP	WATER LEVEL (FT.)	6'	
SAMPLER:			BORING LOCATION Northeast side of property, near loading dock		
SAMPLER HAMMER Split Spoon	WEIGHT	DROP	ENGINEER/GEOL Brin Thompson		

SAMPLES	DEPTH FT.	SAMPLES PENETR. RESIST. BL/6 IN.	SAMPLES REC. IN.	SAMPLES TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	REMARKS
			28/48	S-1 0'-4'	Brown, fine to medium SAND, some silt, little fine gravel, trace debris (brick), dry	0.0 (0'-2') 0.0 (2'-4')	FILL	
							4'	
							SAND AND SILT	
	5		14/48	S-2 4'-8'	Brown to gray, fine to medium SAND, some silt, wet at 6' (petroleum odor)	4.6 (4'-8')		
							8'	
							CLAYEY SILT	
	10		36/48	S-3 8'-12'	Gray, CLAYEY SILT, trace fine sand, wet	0.0 (8'-10') 0.0 (10'-12')		
					End of exploration at 12'			
	15							
	20							
	25							

Remarks:

1. Soil headspace screened in field using TEI model 580B photoionization detector (PID) referenced to benzene in air. Readings shown in parts per million (ppm)

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING MW-100

PROJECT : Lunt Silversmiths, 298 Federal Street		LOCATION: Greenfield, MA	PROJECT NO. : 1753-03-02
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Frank HELPER Dave	DATE STARTED 03/01/2013	DATE FINISHED 03/01/2013
DRILLING EQUIPMENT Geoprobe		COMPLETION DEPTH 12.5	GROUND SURFACE ELEV. DATUM
TYPE BIT Hollow Stem Auger	SIZE &TYPE OF CORE BARREL	No. Samples 5	UNDIST.
CASING	Rod	TIME	FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT / DROP	WATER LEVEL (FT.)	1'
SAMPLER: 5' Plastic sleeve	Rod A 1 5/8" O.D.	BORING 42 36' 1.34"N 72 35' 43.72"W	
SAMPLER HAMMER Safety	WEIGHT 140 lbs. / DROP 30" (Wire Line)	LOCATION on lunt property	
		ENGINEER/GEOLOGIST Sabrina Moreau	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS (PID)	SOIL DESCRIPTION	WELL CONSTRUCTION
			32/60	S-1 (0-2.5')	Black, ASPHALT Brown, fine SAND, trace(-) medium sand, wet at 1'	4.8	ASPHALT FINE SAND	1' 1.5'
				S-2 (2.5'-5')	Top 14": Brown, fine SAND, trace(-) medium sand Bottom 2": Gray, CLAYEY SILT, wet	0.7	3' CLAYEY SILT	2.5'
	5		54/60	S-3 (5'-7.5')	Gray, CLAYEY SILT, wet	5.0		
				S-4 (7.5'-10')	Gray, CLAYEY SILT, wet	8.4		
	10		8/30	S-5 (10'-12.5')	Reddish-brown, fine SAND, little medium SAND and SILT, trace(-) fine gravel, wet (GLACIAL TILL) Refusal at 12.5'	4.6	10' GLACIAL TILL	
					End of exploration at 12.5'			
	15							
	20							
	25							

Remarks:

1. Soil screened in field using MiniRae 3000 photoionization detector (PID) referenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected
2. 1.5" PVC well installed to 12.5' below grade. Screen from 12.5'-2' prepacked with sand, annulus between prepacked well and boring sidewall backfilled with soil cuttings from 12.5' to 1.5', bentonite from 1.5'-1', sand 1' to 0.5', set in concrete curb box

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING MW-101

PROJECT : Lunt Silversmiths, 298 Federal Street		LOCATION: Greenfield, MA	PROJECT NO. : 1753-03-02
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Frank HELPER Dave	DATE STARTED 03/01/2013	DATE FINISHED 03/01/2013
DRILLING EQUIPMENT Geoprobe		COMPLETION DEPTH 15'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL	No. Samples 6	UNDIST.
CASING	Rod	TIME	FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT / DROP	WATER LEVEL (FT.)	4'
SAMPLER: 5' Plastic sleeve	Rod A 1 5/8" O.D.	BORING 42 36' 1.39"N 72 35' 43.37"W	
SAMPLER HAMMER Safety	WEIGHT 140 lbs. DROP 30" (Wire Line)	LOCATION east of 12 Kenwood	
		ENGINEER/GEOLOGIST Steve McLaughlin	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS (PID)	SOIL DESCRIPTION	WELL CONSTRUCTION
			30/60	S-1 (0-2.5')	3": Black, ASPHALT 14": Brown, fine to medium SAND, little fine gravel, trace(+) silt, trace debris (asphalt), dry	0.0	ASPHALT FINE SAND	1' 2'
				S-2 (2.5'-5')	Top 10": Brown, fine to medium SAND, little fine gravel, trace(+) silt, trace debris(asphalt), dry Bottom 6": Gray, fine SAND, some silt, wet	0.0	3' FINE SAND AND SILT	3'
	5		48/60	S-3 (5'-7.5')	Gray, CLAYEY SILT, wet	0.0	5' CLAYEY SILT	
				S-4 (7.5'-10')	Gray, CLAYEY SILT, wet	0.0		
	10		36/60	S-5 (10'-12.5')	18": Gray, CLAYEY SILT, wet	0.3	13'	
				S-6 (12.5'-15')	14": Reddish-brown, fine to medium SAND, trace silt, wet (GLACIAL TILL)	0.0	GLACIAL TILL	
	15				Refusal at 15'			
					End of exploration at 15'			
	20							
	25							

Remarks:

1. Soil screened in field using MiniRae 3000 photoionization detector (PID) referenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected
2. 1.5" PVC well installed to 13' below grade. Screen from 13'-3' prepacked with sand, annulus between prepacked well and boring sidewall backfilled with soil cuttings from 13' to 2', bentonite from 2'-1', sand 1' to 0.5', set in concrete curb box

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING MW-102

PROJECT : Lunt Silversmiths, 298 Federal Street		LOCATION: Greenfield, MA	PROJECT NO. : 1753-03-02
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Frank HELPER Dave	DATE STARTED 03/03/2013	DATE FINISHED 03/03/2013
DRILLING EQUIPMENT Geoprobe		COMPLETION DEPTH 30'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL	No. Samples 12	UNDIST.
CASING	Rod	TIME	FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT / DROP	WATER LEVEL (FT.)	4'
SAMPLER: 5' Plastic sleeve	Rod A 1 5/8" O.D.	BORING 42 36' 1.9"N 72 35' 44.83"W	
SAMPLER HAMMER Safety	WEIGHT 140 lbs. / DROP 30" (Wire Line)	LOCATION lunt driveway opposite of 14 Kenwood	
		ENGINEER/GEOLOGIST Sabrina Moreau	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS (PID)	SOIL DESCRIPTION	WELL CONSTRUCTION
			30/60	S-1	Black, ASPHALT		ASPHALT	
				(0-2.5')	10": Brown, fine to medium SAND, trace(-) silt and fine to medium gravel, dry	0.1	TO MEDIUM SAND	1'
							FINE SAND 2'	2'
				S-2 (2.5'-5')	10": Brown, fine SAND, wet 10": Gray, fine SAND and SILT, wet	0.1	CLAYEY SILT	3'
	5		40/60	S-3 (5'-7.5')	Gray, CLAYEY SILT, wet	0.3		
				S-4 (7.5'-10')	Gray, CLAYEY SILT, wet	1.1		
	10		40/60	S-5 (10'-12.5')	Gray, CLAYEY SILT, wet	1.3		
				S-6 (12.5'-15')	Gray, CLAYEY SILT, wet	0.0		13'
	15		60/60	S-7 (15'-17.5')	Gray, CLAYEY SILT, wet	0.0		
				S-8 (17.5'-20')	Gray, CLAYEY SILT, wet	0.0		
	20		48/60	S-9 (20'-22.5')	Gray, CLAYEY SILT, wet	0.0		
				S-10 (22.5'-25')	Gray, CLAYEY SILT, wet	0.0		
	25		60/60	S-11 (25'-27.5')	Gray, CLAYEY SILT, wet	0.0		

Remarks:

1. Soil screened in field using MiniRae 3000 photoionization detector (PID) referenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected
2. 1.5" PVC well installed to 13' below grade. Screen from 13'-3' prepacked with sand, annulus between prepacked well and boring sidewall backfilled with soil cuttings from 13' to 2', bentonite from 2'-1', sand 1' to 0.5', set in concrete curb box

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING **MW-102**

Project No. 1753-03-01
1753-03-02

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	WELL CONSTRUCTION
SAMF	30			S-12 (27.5'-30)	Gray, CLAYEY SILT, wet	0.0	CLAYEY SILT	
					End of exploration at 30'			
	35							
	40							
	45							
	50							
	55							
	60							

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING MW-103

PROJECT : Lunt Silversmiths, 298 Federal Street		LOCATION: Greenfield, MA	PROJECT NO. : 1753-03-02
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Frank HELPER Dave	DATE STARTED 03/03/2013	DATE FINISHED 03/03/2013
DRILLING EQUIPMENT Geoprobe		COMPLETION DEPTH 30'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL	No. Samples 12	UNDIST.
CASING	Rod	TIME	FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT / DROP	WATER LEVEL (FT.)	4'
SAMPLER: 5' Plastic sleeve	Rod A 1 5/8" O.D.	BORING 42 36' 1.91"N 72 35' 45.84"W	
SAMPLER	WEIGHT / DROP	LOCATION east of 20 Kenwood	
HAMMER Safety	140 lbs. / 30" (Wire Line)	ENGINEER/GEOLOGIST Sabrina Moreau	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS (PID)	SOIL DESCRIPTION	WELL CONSTRUCTION
			30/60	S-1 (0-2.5')	3": ASPHALT Top 20": Brown to gray, fine SAND, little fine gravel, trace silt, trace coarse sand, trace medium sand, dry Bottom 10": Gray, fine SAND and SILT, wet	0.0	ASPHALT FINE SAND AND SILT	1' 2'
				S-2 (2.5'-5)	10": Gray, CLAYEY SILT, wet	0.0	4' CLAYEY SILT	3'
	5		36/60	S-3 (5'-7.5')	Gray, CLAYEY SILT, wet	0.0		
				S-4 (7.5'-10')	Gray, CLAYEY SILT, wet	0.3		
	10		42/60	S-5 (10'-12.5')	Gray, CLAYEY SILT, wet	0.4		
				S-6 (12.5'-15')	Gray, CLAYEY SILT, wet	0.0		13'
	15		40/60	S-7 (15'-17.5')	Gray, CLAYEY SILT, wet	0.0		
				S-8 (17.5'-20')	Gray, CLAYEY SILT, wet	0.0		
	20		60/60	S-9 (20'-22.5')	Gray, CLAYEY SILT, wet	0.0		
				S-10 (22.5'-25')	Gray, CLAYEY SILT, wet	0.0		
	25		60/60	S-11 (25'-27.5')	Gray, CLAYEY SILT, wet	0.0		

Remarks:

1. Soil screened in field using MiniRae 3000 photoionization detector (PID) referenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected
2. 1.5" PVC well installed to 13' below grade. Screen from 13'-3' prepacked with sand, annulus between prepacked well and boring sidewall backfilled with soil cuttings from 13' to 2', bentonite from 2'-1', sand 1' to 0.5', set in concrete curb box

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING **MW-103**

Project No. 1753-03-01
1753-03-02

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	REMARKS
SAMP	30			S-12 (27.5'-30')	Gray, CLAYEY SILT, wet		CLAYEY SILT	
					End of exploration at 30'			
	35							
	40							
	45							
	50							
	55							
	60							

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING MW-104

PROJECT : Lunt Silversmiths, 298 Federal Street		LOCATION: Greenfield, MA	PROJECT NO. : 1753-03-02
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Frank HELPER Dave	DATE STARTED 03/01/2013	DATE FINISHED 03/01/2013
DRILLING EQUIPMENT Geoprobe		COMPLETION DEPTH 30'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL	No. Samples 12	UNDIST.
CASING	Rod	TIME	FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT / DROP	WATER LEVEL (FT.)	5'
SAMPLER: 5' Plastic sleeve	Rod A 1 5/8" O.D.	BORING 42 36' 2.17"N 72 35' 46.01"W	
SAMPLER HAMMER Safety	WEIGHT 140 lbs. / DROP 30" (Wire Line)	LOCATION on Lunt east of 20 Kenwood	
		ENGINEER/GEOLOGIST Sabrina Moreau	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS (PID)	SOIL DESCRIPTION	WELL CONSTRUCTION
			30/60	S-1 (0-2.5')	3": Black, ASPHALT Brown, fine to medium SAND, dry 4": Brown, fine to medium SAND, moist	0.1	ASPHALT FINE TO MEDIUM SAND	2'
				S-2 (2.5'-5')	18": Gray, fine SAND and SILT, wet	1.3	4'	3'
	5		42/60	S-3 (5'-7.5')	Gray, fine SAND and SILT, wet	204	FINE SAND AND SILT	5'
				S-4 (7.5'-10')	Gray, CLAYEY SILT, wet	328	7' CLAYEY SILT	
	10		48/60	S-5 (10'-12.5')	Gray, CLAYEY SILT, wet	417		
				S-6 (12.5'-15')	Gray, CLAYEY SILT, wet	66.7		
	15		52/60	S-7 (15'-17.5')	Gray, CLAYEY SILT, wet	11.9		15'
				S-8 (17.5'-20')	Gray, CLAYEY SILT, wet	8.4		
	20		60/60	S-9 (20'-22.5')	Gray, CLAYEY SILT, wet	3.9		
				S-10 (22.5'-25')	Gray, CLAYEY SILT, wet	1.3		
	25		60/60	S-11 (25'-27.5')	Gray, CLAYEY SILT, wet	1.1		

Remarks:

1. Soil screened in field using MiniRae 3000 photoionization detector (PID) referenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected
2. 1.5" PVC well installed to 15' below grade. Screen from 15'-5' prepacked with sand, annulus between prepacked well and boring sidewall backfilled with soil cuttings from 15' to 3', bentonite from 2'-1', sand 1' to 0.5', set in concrete curb box

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING **MW-104**

Project No. 1753-03-01
1753-03-02

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	REMARKS
SAMP	30			S-12 (27.5'-30')	Gray, CLAYEY SILT, wet	1.1	CLAYEY SILT	
					End of exploration at 30'			
	35							
	40							
	45							
	50							
	55							
	60							

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING MW-105

PROJECT : Lunt Silversmiths, 298 Federal Street		LOCATION: Greenfield, MA	PROJECT NO. : 1753-03-02
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Frank HELPER Dave	DATE STARTED 03/01/2013	DATE FINISHED 03/01/2013
DRILLING EQUIPMENT Geoprobe		COMPLETION DEPTH 30'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL	No. Samples 12	UNDIST.
CASING	Rod	TIME	FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT / DROP	WATER LEVEL (FT.)	2'
SAMPLER: 5' Plastic sleeve	Rod A 1 5/8" O.D.	BORING 42 36' 2.72"N 72 35' 48.1"W	
SAMPLER HAMMER Safety	WEIGHT 140 lbs. / DROP 30" (Wire Line)	LOCATION on Lunt opposite center of driveway of 28 Kenwood	
		ENGINEER/GEOLOGIST Sabrina Moreau	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS (PID)	SOIL DESCRIPTION	WELL CONSTRUCTION
			40/60	S-1 (0-2.5')	Brown, fine to medium SAND, trace fine to medium gravel, wet	0.5	GRASS	1'
							FINE TO MEDIUM SAND	2'
				S-2 (2.5'-5')	Brown, fine SAND and SILT, wet	0.6	FINE SAND AND SILT	3'
	5					17.9	5'	
			54/60	S-3 (5'-7.5')	Top 4": Brown, fine SAND and SILT, wet Bottom 23": Gray, CLAYEY SILT, wet		CLAYEY SILT	
				S-4 (7.5'-10')	Gray, CLAYEY SILT, wet	5.2		
	10		60/60	S-5 (10'-12.5')	Gray, CLAYEY SILT, wet	6.9		
				S-6 (12.5'-15')	Gray, CLAYEY SILT, wet	0.7		13'
	15		60/60	S-7 (15'-17.5')	Gray, CLAYEY SILT, wet	0.7		
				S-8 (17.5'-20')	Gray, CLAYEY SILT, wet	0.0		
	20		58/60	S-9 (20'-22.5')	Gray, CLAYEY SILT, wet	0.0		
				S-10 (22.5'-25')	Gray, CLAYEY SILT, wet	0.0		
	25		60/60	S-11 (25'-27.5')	Gray, CLAYEY SILT, wet	0.0		

Remarks:

1. Soil screened in field using MiniRae 3000 photoionization detector (PID) referenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected
2. 1.5" PVC well installed to 13' below grade. Screen from 13'-3' prepacked with sand, annulus between prepacked well and boring sidewall backfilled with soil cuttings from 13' to 2', bentonite from 2'-1', sand 1' to 0.5', set in concrete curb box

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING **MW-105**

Project No. 1753-03-01
1753-03-02

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	REMARKS
SAMP	30			S-12 (27.5'-30')	Gray, CLAYEY SILT, wet	0.0	CLAYEY SILT	
					End of exploration at 30'			
	35							
	40							
	45							
	50							
	55							
	60							

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING MW-106

PROJECT : Lunt Silversmiths, 298 Federal Street		LOCATION: Greenfield, MA	PROJECT NO. : 1753-03-02
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Frank HELPER Dave	DATE STARTED 03/01/2013	DATE FINISHED 03/01/2013
DRILLING EQUIPMENT Geoprobe		COMPLETION DEPTH 30'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL	No. Samples 12	UNDIST.
CASING	Rod	TIME	FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT / DROP	WATER LEVEL (FT.)	
SAMPLER: 5' Plastic sleeve	Rod A 1 5/8" O.D.	BORING 42 36' 2.58"N 72 35' 48.54"W	
SAMPLER HAMMER Safety	WEIGHT 140 lbs. / DROP 30" (Wire Line)	LOCATION 28 Kenwood	
		ENGINEER/GEOLOGIST Sabrina Moreau	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS (PID)	SOIL DESCRIPTION	WELL CONSTRUCTION
			40/60	S-1 (0-2.5')	Black, ASPHALT 10": Brown, fine to medium SAND, trace(-) silt, dry	0.2	ASPHALT FINE TO MEDIUM SAND	1'
				S-2 (2.5'-5')	30": Grey, fine SAND, some silt, moist (odor), wet at 4"	0.3	3'	2' / 3'
	5		56/60	S-3 (5'-7.5')	Gray, fine SAND and SILT, wet	0.1	FINE SAND 5' FINE SAND AND SILT	
				S-4 (7.5'-10')	28": Brown, fine SAND and SILT, wet	0.1		
	10		58/60	S-5 (10'-12.5')	Gray, CLAYEY SILT, wet	0.0	10' CLAYEY SILT	
				S-6 (12.5'-15')	Gray, CLAYEY SILT, wet	0.0		13'
	15		42/60	S-7 (15'-17.5')	Gray, CLAYEY SILT, wet	0.0		
				S-8 (17.5'-20')	Gray, CLAYEY SILT, wet	0.0		
	20		60/60	S-9 (20'-22.5')	Gray, CLAYEY SILT, wet	0.0		
				S-10 (22.5'-25')	Gray, CLAYEY SILT, wet	0.0		
	25		56/60	S-11 (25'-27.5')	Gray, CLAYEY SILT, wet	0.0		

Remarks:

1. Soil screened in field using MiniRae 3000 photoionization detector (PID) referenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected
2. 1.5" PVC well installed to 13' below grade. Screen from 13'-3' prepacked with sand, annulus between prepacked well and boring sidewall backfilled with soil cuttings from 13' to 2', bentonite from 2'-1', sand 1' to 0.5', set in concrete curb box

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING **MW-106**

Project No. 1753-03-01
1753-03-02

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	REMARKS
SAMP	30			S-12 (27.5'-30')	Gray, CLAYEY SILT, wet	0.0	CLAYEY SILT	
					End of exploration at 30'			
	35							
	40							
	45							
	50							
	55							
	60							

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING MW-107

PROJECT : Lunt Silversmiths, 298 Federal Street		LOCATION: Greenfield, MA	PROJECT NO. : 1753-03-02
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Frank HELPER Dave	DATE STARTED 03/01/2013	DATE FINISHED 03/01/2013
DRILLING EQUIPMENT Geoprobe		COMPLETION DEPTH 25'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL	No. Samples 10	UNDIST.
CASING	Rod	TIME	FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT / DROP	WATER LEVEL (FT.)	7.5'
SAMPLER: 5' Plastic sleeve	Rod A 1 5/8" O.D.	BORING 42 36' 2.98"N 72 35' 50.11"W	
SAMPLER	WEIGHT / DROP	LOCATION 30 Kenwood	
HAMMER Safety	140 lbs. / 30" (Wire Line)	ENGINEER/GEOLOGIST Sabrina Moreau	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS (PID)	SOIL DESCRIPTION	WELL CONSTRUCTION
			44/60	S-1 (0-2.5')	Black, ASPHALT		ASPHALT	
					Top 18": Brown, fine SAND, some fine to medium gravel, trace(-) silt, dry	0.0	1' FINE SAND	1'
					Bottom 4": Brown, fine SAND and SILT, dry		FINE SAND AND SILT	2'
				S-2 (2.5'-5')	22": Brown, fine SAND and SILT, dry	0.0		3'
	5		60/60	S-3 (5'-7.5')	Gray, CLAYEY SILT, wet	0.0	5' CLAYEY SILT	
				S-4 (7.5'-10')	Gray, CLAYEY SILT, wet	0.0		
	10		60/60	S-5 (10'-12.5')	Gray, CLAYEY SILT, wet	0.0		
				S-6 (12.5'-15')	Gray, CLAYEY SILT, wet	0.0		13'
	15		60/60	S-7 (15'-17.5')	Gray, CLAYEY SILT, wet	0.0		
				S-8 (17.5'-20')	Gray, CLAYEY SILT, wet	0.0		
	20		60/60	S-9 (20'-22.5')	Gray, CLAYEY SILT, wet	0.1		
				S-10 (22.5'-25')	Top 20": Gray, CLAYEY SILT, wet	0.1		
					Bottom 10": Red, fine SAND and SILT, trace medium sand, wet, (GLACIAL TILL)		23' GLACIAL TILL	
	25				Refusal at 25'			
					End of exploration at 25'			

Remarks:

1. Soil screened in field using MiniRae 3000 photoionization detector (PID) referenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected
2. 1.5" PVC well installed to 13' below grade. Screen from 13'-3' prepacked with sand, annulus between prepacked well and boring sidewall backfilled with soil cuttings from 13' to 2', bentonite from 2'-1', sand 1' to 0.5', set in concrete curb box

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING MW-108

PROJECT : Lunt Silversmiths, 298 Federal Street		LOCATION: Greenfield, MA	PROJECT NO. : 1753-03-02
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Frank HELPER Dave	DATE STARTED 03/01/2013	DATE FINISHED 03/01/2013
DRILLING EQUIPMENT Geoprobe		COMPLETION DEPTH 25	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL	No. Samples 10	UNDIST.
CASING	Rod	TIME	FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT / DROP	WATER LEVEL (FT.)	3'
SAMPLER: 5' Plastic sleeve	Rod A 1 5/8" O.D.	BORING 42 36' 3.5"N 72 35' 51.99"W	
SAMPLER HAMMER Safety	WEIGHT 140 lbs. / DROP 30" (Wire Line)	LOCATION east of 44 Kenwood	
		ENGINEER/GEOLOGIST Sabrina Moreau	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS (PID)	SOIL DESCRIPTION	WELL CONSTRUCTION
			30/60	S-1 (0-2.5')	Black, ASPHALT 10": Brown, fine to medium SAND, some fine to medium gravel, dry	0.4	ASPHALT FINE TO MEDIUM SAND	1'
				S-2 (2.5'-5')	10": Brown, fine SAND, moist, 4": Reddish-brown, fine SAND, wet 6": Brown, fine SAND, wet	0.1	2.5' FINE SAND	2' 3'
	5		50/60	S-3 (5'-7.5')	Gray, CLAYEY SILT, wet	0.1	5' CLAYEY SILT	
				S-4 (7.5'-10')	Gray, CLAYEY SILT, wet	0.1		
	10		60/60	S-5 (10'-12.5')	Gray, CLAYEY SILT, wet	0.1		
				S-6 (12.5'-15')	Gray, CLAYEY SILT, wet	0.1		13'
	15			S-7 (15'-17.5')	Gray, CLAYEY SILT, wet	0.1		
				S-8 (17.5'-20')	Gray, CLAYEY SILT, wet	0.1		
	20		60/60	S-9 (20'-22.5')	Gray, CLAYEY SILT, wet	0.1		
				S-10 (22.5'-25')	Gray, CLAYEY SILT, wet	0.1		
	25				Refusal at 25			
					End of exploration at 25'			

Remarks:

1. Soil screened in field using MiniRae 3000 photoionization detector (PID) referenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected
2. 1.5" PVC well installed to 13' below grade. Screen from 13'-3' prepacked with sand, annulus between prepacked well and boring sidewall backfilled with soil cuttings from 13' to 2', bentonite from 2'-1', sand 1' to 0.5', set in concrete curb box

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING MW-109

PROJECT : Lunt Silversmiths, 298 Federal Street		LOCATION: Greenfield, MA	PROJECT NO. : 1753-03-02
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Frank HELPER Dave	DATE STARTED 03/01/2013	DATE FINISHED 03/01/2013
DRILLING EQUIPMENT Geoprobe		COMPLETION DEPTH 30'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL	No. Samples 12	UNDIST.
CASING	Rod	TIME	FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT / DROP	WATER LEVEL (FT.)	4'
SAMPLER: 5' Plastic sleeve	Rod A 1 5/8" O.D.	BORING 42 36' 4.05"N 72 35' 55.33"W	
SAMPLER	WEIGHT / DROP	LOCATION easy of 60 Kenwood Driveway	
HAMMER Safety	140 lbs. / 30" (Wire Line)	ENGINEER/GEOLOGIST Sabrina Moreau	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS (PID)	SOIL DESCRIPTION	WELL CONSTRUCTION
			32/60	S-1 (0-2.5')	Black, ASPHALT Brown, fine SAND and fine to medium GRAVEL, dry	0.8	ASPHALT FINE SAND	1'
				S-2 (2.5'-5')	Top 6": Brown, fine SAND, moist Bottom 10": Brown, fine SAND, wet	0.0		2' 3'
	5		42/60	S-3 (5'-7.5')	Gray, fine SAND, some silt, wet	0.1		
				S-4 (7.5'-10')	Gray, fine SAND, some silt, wet	0.1		
	10		48/60	S-5 (10'-12.5')	Gray, fine SAND, some silt, wet	0.0		
				S-6 (12.5'-15')	Gray, CLAYEY SILT, wet	0.0	12' CLAYEY SILT	13'
	15		40/60	S-7 (15'-17.5')	Gray, CLAYEY SILT, wet	0.0		
				S-8 (17.5'-20')	Gray, CLAYEY SILT, wet	0.0		
	20		32/60	S-9 (20'-22.5')	Gray, CLAYEY SILT, wet	0.0		
				S-10 (22.5'-25')	Gray, CLAYEY SILT, wet	0.0		
	25		58/60	S-11 (25'-27.5')	Gray, CLAYEY SILT, wet	0.0		

Remarks:

1. Soil screened in field using MiniRae 3000 photoionization detector (PID) referenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected
2. 1.5" PVC well installed to 13' below grade. Screen from 13'-3' prepacked with sand, annulus between prepacked well and boring sidewall backfilled with soil cuttings from 13' to 2', bentonite from 2'-1', sand 1' to 0.5', set in concrete curb box

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING **MW-109**

Project No. 1753-03-01
1753-03-02

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	REMARKS
SAMP	30			S-12 (27.5'-30')	Gray, CLAYEY SILT, wet	0.0	CLAYEY SILT	
					End of exploration at 30'			
	35							
	40							
	45							
	50							
	55							
	60							

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING MW-110

PROJECT : Lunt Silversmiths, 298 Federal Street		LOCATION: Greenfield, MA	PROJECT NO. : 1753-03-02
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Frank HELPER Dave	DATE STARTED 03/01/2013	DATE FINISHED 03/01/2013
DRILLING EQUIPMENT Geoprobe		COMPLETION DEPTH 30'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL	No. Samples 12	UNDIST.
CASING	Rod	TIME	FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT / DROP	WATER LEVEL (FT.)	5'
SAMPLER: 5' Plastic sleeve	Rod A 1 5/8" O.D.	BORING 42 36' 4.82"N 72 35' 58.0"W	
SAMPLER	WEIGHT / DROP	LOCATION 66 Kenwood Street	
HAMMER Safety	140 lbs. / 30" (Wire Line)	ENGINEER/GEOLOGIST Sabrina Moreau	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS (PID)	SOIL DESCRIPTION	WELL CONSTRUCTION
			20/60	S-1 (0-2.5')	Black, ASPHALT Top 2": FRAGMENTED ASPHALT, dry Bottom 8": Brown, fine to medium SAND, little fine to medium gravel, dry	0.1	ASPHALT FINE TO MEDIUM SAND	1' 2'
				S-2 (2.5'-5')	Brown, fine to medium SAND, little fine to medium gravel, dry	0.0		3'
	5		38/60	S-3 (5'-7.5')	Gray, fine SAND, some silt, trace(-) clay, wet	0.0	5' FINE SAND	
				S-4 (7.5'-10')	Gray, fine SAND, some silt, trace(-) clay, wet	0.0		
	10		50/60	S-5 (10'-12.5')	Gray, fine SAND, some silt, trace(-) clay, wet	0.0		
				S-6 (12.5'-15')	Gray, CLAYEY SILT, wet	0.0	12' CLAYEY SILT	13'
	15		60/60	S-7 (15'-17.5')	Gray, CLAYEY SILT, wet	0.0		
				S-8 (17.5'-20')	Gray, CLAYEY SILT, wet	0.0		
	20		60/60	S-9 (20'-22.5')	Gray, CLAYEY SILT, wet	0.0		
				S-10 (22.5'-25')	Gray, CLAYEY SILT, wet	0.0		
	25		60/60	S-11 (25'-27.5')	Gray, CLAYEY SILT, wet	0.0		

Remarks:

1. Soil screened in field using MiniRae 3000 photoionization detector (PID) referenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected
2. 1.5" PVC well installed to 13' below grade. Screen from 13'-3' prepacked with sand, annulus between prepacked well and boring sidewall backfilled with soil cuttings from 13' to 2', bentonite from 2'-1', sand 1' to 0.5', set in concrete curb box

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING **MW-110**

Project No. 1753-03-01
1753-03-02

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	REMARKS
SAMP	30			S-12 (27.5'-30')	Gray, CLAYEY SILT, wet	0.0	CLAYEY SILT	
					End of exploration at 30'			
	35							
	40							
	45							
	50							
	55							
	60							

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING MW-111

PROJECT : Lunt Silversmiths, 298 Federal Street		LOCATION: Greenfield, MA	PROJECT NO. : 1753-03-02
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Frank HELPER Dave	DATE STARTED 03/01/2013	DATE FINISHED 03/01/2013
DRILLING EQUIPMENT Geoprobe		COMPLETION DEPTH 30'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL	No. Samples 12	UNDIST.
CASING	Rod	TIME	FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT / DROP	WATER LEVEL (FT.)	3'
SAMPLER: 5' Plastic sleeve	Rod A 1 5/8" O.D.	BORING 42 36' 4.39"N 72 35' 59.59"W	
SAMPLER HAMMER Safety	WEIGHT 140 lbs. / DROP 30" (Wire Line)	LOCATION North edge of 317 Davis ENGINEER/GEOLOGIST Sabrina Moreau	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS (PID)	SOIL DESCRIPTION	WELL CONSTRUCTION
			30/60	S-1 (0-2.5')	Black, ASPHALT		ASPHALT	
					4": Dark brown, fine to medium SAND, little fine to medium gravel, dry	0.2	FINE TO MEDIUM SAND	1'
					12":Brown, fine to medium SAND, little fine to medium gravel, moist			2'
				S-2 (2.5'-5')	14": Gray, fine SAND and SILT, wet	0.0	3'	3'
	5						FINE SAND AND SILT 5'	
			30/60	S-3 (5'-7.5')	20": Gray, fine SAND, little silt, wet	0.0	FINE SAND 7'	
				S-4 (7.5'-10')	10": Gray, fine SAND and SILT, wet	0.0	FINE SAND AND SILT 10'	
	10		42/60	S-5 (10'-12.5')	Gray, CLAYEY SILT, wet	0.0	CLAYEY SILT	
				S-6 (12.5'-15')	Gray, CLAYEY SILT, wet	0.0		13'
	15		60/60	S-7 (15'-17.5')	Gray, CLAYEY SILT, wet	0.0		
				S-8 (17.5'-20')	Gray, CLAYEY SILT, wet	0.0		
	20		60/60	S-9 (20'-22.5')	Gray, CLAYEY SILT, wet	0.0		
				S-10 (22.5'-25')	Gray, CLAYEY SILT, wet	0.0		
	25		60/60	S-11 (25'-27.5')	Gray, CLAYEY SILT, wet	0.0		

Remarks:

1. Soil screened in field using MiniRae 3000 photoionization detector (PID) referenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected
2. 1.5" PVC well installed to 13' below grade. Screen from 13'-3' prepacked with sand, annulus between prepacked well and boring sidewall backfilled with soil cuttings from 13' to 2', bentonite from 2'-1', sand 1' to 0.5', set in concrete curb box

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING **MW-111**

Project No. 1753-03-01
1753-03-02

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	REMARKS
SAMP	30			S-12 (27.5'-30')	Gray, CLAYEY SILT, wet	0.0	CLAYEY SILT	
					End of exploration at 30'			
	35							
	40							
	45							
	50							
	55							
	60							

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING MW-112

PROJECT : Lunt Silversmiths, 298 Federal Street		LOCATION: Greenfield, MA	PROJECT NO. : 1753-03-02
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Frank HELPER Dave	DATE STARTED 03/01/2013	DATE FINISHED 03/01/2013
DRILLING EQUIPMENT Geoprobe		COMPLETION DEPTH 30'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL	No. Samples 12	UNDIST.
CASING	Rod	TIME	FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT / DROP	WATER LEVEL (FT.)	3'
SAMPLER: 5' Plastic sleeve	Rod A 1 5/8" O.D.	BORING 42 36' 2.56"N 72 35' 59.77"W	
SAMPLER HAMMER Safety	WEIGHT 140 lbs. / DROP 30" (Wire Line)	LOCATION North edge of 308 Davis driveway	
		ENGINEER/GEOLOGIST Sabrina Moreau	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS (PID)	SOIL DESCRIPTION	WELL CONSTRUCTION
			34/60	S-1 (0-2.5')	Black, ASPHALT 10": Dark brown, fine to medium SAND, little fine to medium gravel, dry	0.2	ASPHALT FINE TO MEDIUM SAND 2'	1' 2'
				S-2 (2.5'-5')	24": Brown, fine SAND, little silt, wet	0.0	FINE SAND 5'	3'
	5		42/60	S-3 (5'-7.5')	Gray, fine SAND and SILT, wet	0.0	FINE SAND AND SILT	
				S-4 (7.5'-10')	Gray, CLAYEY SILT, wet	0.0	8' CLAYEY SILT	
	10		48/60	S-5 (10'-12.5')	Gray, CLAYEY SILT, wet	0.0		
				S-6 (12.5'-15')	Gray, CLAYEY SILT, wet	0.0		13'
	15		60/60	S-7 (15'-17.5')	Gray, CLAYEY SILT, wet	0.0		
				S-8 (17.5'-20')	Gray, CLAYEY SILT, wet	0.0		
	20		60/60	S-9 (20'-22.5')	Gray, CLAYEY SILT, wet	0.0		
				S-10 (22.5'-25')	Gray, CLAYEY SILT, wet	0.0		
	25		60/60	S-11 (25'-27.5')	Gray, CLAYEY SILT, wet	0.0		

Remarks:

1. Soil screened in field using MiniRae 3000 photoionization detector (PID) referenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected
2. 1.5" PVC well installed to 13' below grade. Screen from 13'-3' prepacked with sand, annulus between prepacked well and boring sidewall backfilled with soil cuttings from 13' to 2', bentonite from 2'-1', sand 1' to 0.5', set in concrete curb box

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING **MW-112**

Project No. 1753-03-01
1753-03-02

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	REMARKS
SAMP	30			S-12 (27.5'-30')	Gray, CLAYEY SILT, wet	0.0	CLAYEY SILT	
					End of exploration at 30'			
	35							
	40							
	45							
	50							
	55							
	60							

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING MW-113

PROJECT : Lunt Silversmiths, 298 Federal Street		LOCATION: Greenfield, MA	PROJECT NO. : 1753-03-02
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Frank HELPER Dave	DATE STARTED 03/01/2013	DATE FINISHED 03/01/2013
DRILLING EQUIPMENT Geoprobe		COMPLETION DEPTH 30'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL	No. Samples 12	UNDIST.
CASING	Rod	TIME	FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT / DROP	WATER LEVEL (FT.)	3'
SAMPLER: 5' Plastic sleeve	Rod A 1 5/8" O.D.	BORING 42 36' 1.65"N 72 35' 57.5"W	
SAMPLER HAMMER Safety	WEIGHT 140 lbs. / DROP 30" (Wire Line)	LOCATION west corner of 53 forest	
		ENGINEER/GEOLOGIST Sabrina Moreau	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS (PID)	SOIL DESCRIPTION	WELL CONSTRUCTION
			32/60	S-1 (0-2.5')	Black, ASPHALT Top 18": Brown, fine to medium SAND, some fine to medium gravel, dry Next 4": FRAGMENTED BRICK, dry	0.5	ASPHALT FINE TO MEDIUM SAND 2'	1' 2'
				S-2 (2.5'-5')	10": Gray, fine SAND, some silt, moist 8": Brown, fine SAND, trace(-) silt, wet	0.1	FINE SAND 5'	3'
	5		42/60	S-3 (5'-7.5')	20": Brown, fine SAND and SILT, dry	0.1	FINE SAND AND SILT	
				S-4 (7.5'-10')	22": Gray, CLAYEY SILT, wet	0.1	8' CLAYEY SILT	
	10		40/60	S-5 (10'-12.5')	Gray, CLAYEY SILT, wet	0.1		
				S-6 (12.5'-15')	Gray, CLAYEY SILT, wet	0.1		13'
	15		50/60	S-7 (15'-17.5')	Gray, CLAYEY SILT, wet	0.1		
				S-8 (17.5'-20')	Gray, CLAYEY SILT, wet	0.1		
	20		60/60	S-9 (20'-22.5')	Gray, CLAYEY SILT, wet	0.1		
				S-10 (22.5'-25')	Gray, CLAYEY SILT, wet	0.1		
	25		60/60	S-11 (25'-27.5')	Gray, CLAYEY SILT, wet	0.1		

Remarks:

1. Soil screened in field using MiniRae 3000 photoionization detector (PID) referenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected
2. 1.5" PVC well installed to 13' below grade. Screen from 13'-3' prepacked with sand, annulus between prepacked well and boring sidewall backfilled with soil cuttings from 13' to 2', bentonite from 2'-1', sand 1' to 0.5', set in concrete curb box

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING **MW-113**

Project No. 1753-03-01
1753-03-02

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	REMARKS
SAMP	30			S-12 (27.5'-30')	Gray, CLAYEY SILT, wet	0.0	CLAYEY SILT	
					End of exploration at 30'			
	35							
	40							
	45							
	50							
	55							
	60							

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING MW-114

PROJECT : Lunt Silversmiths, 298 Federal Street		LOCATION: Greenfield, MA	PROJECT NO. : 1753-03-02
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Frank HELPER Dave	DATE STARTED 03/01/2013	DATE FINISHED 03/01/2013
DRILLING EQUIPMENT Geoprobe		COMPLETION DEPTH 30'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL	No. Samples 12	UNDIST.
CASING	Rod	TIME	FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT / DROP	WATER LEVEL (FT.)	3'
SAMPLER: 5' Plastic sleeve	Rod A 1 5/8" O.D.	BORING 42 36' 0.99"N 72 35' 54.94"W	
SAMPLER HAMMER Safety	WEIGHT 140 lbs. / DROP 30" (Wire Line)	LOCATION east corner of 45 Forest	
		ENGINEER/GEOLOGIST Sabrina Moreau	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS (PID)	SOIL DESCRIPTION	WELL CONSTRUCTION
			24/60	S-1 (0-2.5')	Black, ASPHALT 10": Brown, fine to medium SAND, some silt, trace fine to medium gravel, dry	0.4	ASPHALT FINE TO MEDIUM SAND	1' 2'
				S-2 (2.5'-5')	14": Brown, fine SAND and SILT, moist	0.0	2.5' FINE SAND AND SILT	3'
	5		36/60	S-3 (5'-7.5')	Brown, fine SAND and SILT, wet	0.0		
				S-4 (7.5'-10')	Brown, fine SAND and SILT, wet	0.0		
	10		60/60	S-5 (10'-12.5')	Gray, CLAYEY SILT, wet	0.0	10' CLAYEY SILT	
				S-6 (12.5'-15')	Gray, CLAYEY SILT, wet	0.0		13'
	15		60/60	S-7 (15'-17.5')	Gray, CLAYEY SILT, wet	0.0		
				S-8 (17.5'-20')	Gray, CLAYEY SILT, wet	0.0		
	20		60/60	S-9 (20'-22.5')	Gray, CLAYEY SILT, wet	0.0		
				S-10 (22.5'-25')	Gray, CLAYEY SILT, wet	0.0		
	25		60/60	S-11 (25'-27.5')	Gray, CLAYEY SILT, wet	0.0		

Remarks:

1. Soil screened in field using MiniRae 3000 photoionization detector (PID) referenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected
2. 1.5" PVC well installed to 13' below grade. Screen from 13'-3' prepacked with sand, annulus between prepacked well and boring sidewall backfilled with soil cuttings from 13' to 2', bentonite from 2'-1', sand 1' to 0.5', set in concrete curb box

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING **MW-114**

Project No. 1753-03-01
1753-03-02

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	REMARKS
SAMP	30			S-12 (27.5'-30')	Gray, CLAYEY SILT, wet	0.0	CLAYEY SILT	
					End of exploration at 30'			
	35							
	40							
	45							
	50							
	55							
	60							

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING MW-115

PROJECT : Lunt Silversmiths, 298 Federal Street		LOCATION: Greenfield, MA	PROJECT NO. : 1753-03-02
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Frank HELPER Dave	DATE STARTED 03/01/2013	DATE FINISHED 03/01/2013
DRILLING EQUIPMENT Geoprobe		COMPLETION DEPTH 30'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL	No. Samples 12	UNDIST.
CASING	Rod	TIME	FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT / DROP	WATER LEVEL (FT.)	5'
SAMPLER: 5' Plastic sleeve	Rod A 1 5/8" O.D.	BORING 42 36' 0.56"N 72 35' 52.45"W	
SAMPLER	WEIGHT / DROP	LOCATION 33 Forest Driveway 35 Forest House	
HAMMER Safety	140 lbs. / 30" (Wire Line)	ENGINEER/GEOLOGIST Sabrina Moreau	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS (PID)	SOIL DESCRIPTION	WELL CONSTRUCTION
			24/60	S-1 (0-2.5')	Black, ASPHALT		ASPHALT	1'
					Dark brown to brown, fine SAND, some fine gravel, trace(+) coarse sand, trace(+) silt, trace debris (ASPHALT)	0.0	FINE SAND	2'
				S-2 (2.5'-5')	Brown, fine SAND, trace(+) silt, bottom 2" wet	0.0		3'
	5						5'	
			36/60	S-3 (5'-7.5')	Brown to gray, fine SAND and SILT, trace(+) clay, wet	0.0	FINE SAND AND SILT	
				S-4 (7.5'-10')	Brown to gray, fine SAND and SILT, trace(+) clay, wet	0.0		
	10		60/60	S-5 (10'-12.5')	Gray, CLAYEY SILT, wet	0.0	10' CLAYEY SILT	
				S-6 (12.5'-15')	Gray, CLAYEY SILT, wet	0.0		13'
	15		60/60	S-7 (15'-17.5')	Gray, CLAYEY SILT, wet	0.0		
				S-8 (17.5'-20')	Gray, CLAYEY SILT, wet	0.0		
	20		60/60	S-9 (20'-22.5')	Gray, CLAYEY SILT, wet	0.0		
				S-10 (22.5'-25')	Top 24": Gray, CLAYEY SILT, wet Bottom 6": Reddish-brown, fine SAND, some silt, trace(-) fine gravel, wet (GLACIAL TILL)	0.0	24' GLACIAL TILL	
	25		60/60	S-11 (25'-27.5')	Reddish-brown, fine SAND, some silt, trace(-) fine gravel, wet (GLACIAL TILL)	0.0		

Remarks:

1. Soil screened in field using MiniRae 3000 photoionization detector (PID) referenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected
2. 1.5" PVC well installed to 13' below grade. Screen from 13'-3' prepacked with sand, annulus between prepacked well and boring sidewall backfilled with soil cuttings from 13' to 2', bentonite from 2'-1', sand 1' to 0.5', set in concrete curb box

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING **MW-115**

Project No. 1753-03-01
1753-03-02

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS	SOIL DESCRIPTION	REMARKS
SAMP	30			S-12 (27.5'-30')	Reddish-brown, fine SAND, some silt, trace(-) fine gravel, wet (GLACIAL TILL)	0.0	GLACIAL TILL	
					End of exploration at 30'			
	35							
	40							
	45							
	50							
	55							
	60							

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING MW-116

PROJECT : Lunt Silversmiths, 298 Federal Street		LOCATION: Greenfield, MA	PROJECT NO. : 1753-03-02
DRILLING CONTRACTOR Seaboard Environmental Drilling	FOREMAN Frank HELPER Dave	DATE STARTED 03/01/2013	DATE FINISHED 03/01/2013
DRILLING EQUIPMENT Geoprobe		COMPLETION DEPTH 25'	GROUND SURFACE ELEV. DATUM
TYPE BIT	SIZE &TYPE OF CORE BARREL	No. Samples 10	UNDIST.
CASING	Rod	TIME	FIRST / COMPL. / HR.
CASING HAMM.	WEIGHT / DROP	WATER LEVEL (FT.)	5'
SAMPLER: 5' Plastic sleeve	Rod A 1 5/8" O.D.	BORING 42 36' 0.08"N 72 35' 49.98"W	
SAMPLER HAMMER Safety	WEIGHT 140 lbs. / DROP 30" (Wire Line)	LOCATION 25 Forest	
		ENGINEER/GEOLOGIST Sabrina Moreau	

SAMPLES	DEPTH FT.	SAMPLES: PENETR. RESIST. BL/6 IN.	SAMPLES: REC. IN.	SAMPLES: TYPE/ NO.	DESCRIPTION	FIELD MEASUREMENTS (PID)	SOIL DESCRIPTION	WELL CONSTRUCTION
			34/60	S-1 (0-2.5')	Black, ASPHALT		ASPHALT	1'
					10": Brown, fine to medium SAND, some fine to medium gravel, dry	0.0	FINE TO MEDIUM SAND	2'
					10": Brown, fine SAND, dry			
				S-2 (2.5'-5')	14": Brown, fine SAND and SILT, moist to wet	0.0	3'	3'
	5		60/60	S-3 (5'-7.5')	Brown, fine SAND and SILT	0.0	FINE SAND AND SILT	
				S-4 (7.5'-10')	Brown, fine SAND and SILT	0.0		
	10		60/60	S-5 (10'-12.5')	Brown, fine SAND and SILT	0.0		
				S-6 (12.5'-15')	Brown, fine SAND and SILT	0.0		13'
	15		56/60	S-7 (15'-17.5')	Gray, CLAYEY SILT, wet	0.0	15' CLAYEY SILT	
				S-8 (17.5'-20')	Top 24": Gray, CLAYEY SILT, wet Bottom 4": Red, fine SAND, some silt, some fine to medium gravel, wet (GLACIAL TILL)	0.0	19'	
	20		50/60	S-9 (20'-22.5')	Red, fine SAND, some silt, some fine to medium gravel, wet (GLACIAL TILL)	0.0	GLATIAL TILL	
				S-10 (22.5'-25')	Red, fine SAND, some silt, some fine to medium gravel, wet (GLACIAL TILL)	0.0		
	25					0.0		
					Refusal at 25' End of exploration at 25'			

Remarks:

1. Soil screened in field using MiniRae 3000 photoionization detector (PID) referenced to benzene in air. Readings in parts per million by volume. "ND" indicates none detected
2. 1.5" PVC well installed to 13' below grade. Screen from 13'-3' prepacked with sand, annulus between prepacked well and boring sidewall backfilled with soil cuttings from 13' to 2', bentonite from 2'-1', sand 1' to 0.5', set in concrete curb box

APPENDIX G

REMOVAL PROGRAM
AFTER ACTION REPORT
FOR THE
LUNT SILVERSMITHS SITE
GREENFIELD, FRANKLIN COUNTY, MASSACHUSETTS
26 MAY THROUGH 8 SEPTEMBER 2015

Prepared For:

U.S. Environmental Protection Agency
Region I
Emergency Planning and Response Branch
5 Post Office Square, Suite 100
Boston, Massachusetts 02109-3912

CONTRACT NO. EP-S3-15-01

TDD NO. TO1-01-15-07-0015

SITE ID. 01LF

TASK NO. 0017

DC NO. R-00081

Submitted By:

Weston Solutions, Inc.
Superfund Technical Assessment and Response Team IV (START)
3 Riverside Drive
Andover, Massachusetts 01810

October 2015

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1.0 INTRODUCTION

The following report, entitled *Removal Program After Action Report for the Lunt Silversmiths Site, Greenfield, Franklin County, Massachusetts, 26 May 2015 through 8 September 2015,* is a chronological summary of the response actions taken by the U.S. Environmental Protection Agency (EPA), Region I, Emergency Planning and Response Branch (EPRB). The report details the situation as it developed, actions taken, and resources committed.

Site activities included: mobilizing personnel and equipment to site; conducting inventory of various chemical containers, drums, and settling vats throughout the building; documenting site conditions and activities; performing perimeter and personal air monitoring and sampling; collecting surface and subsurface soil samples; conducting hazard categorization (hazcatting) of chemicals found inside the building; consolidating and disposing of hazardous materials found inside the building; excavating and removing of contaminated soils; backfilling and compacting within excavated areas; performing final restoration; and demobilizing from the site.

2.0 SITE CONDITIONS AND BACKGROUND

2.1 Site Location and Description

The Lunt Silversmiths Site is located at 298 Federal Street in Greenfield, Franklin County, Massachusetts (see Appendix A, Figure 1). The approximate geographic coordinates for the Site are 72° 35′ 48.7″ West (Longitude) and 42° 36′ 4.5″ North (Latitude), and it is referenced on the Greenfield Assessor's Office as Map 95, Lot 1. The property is bounded by Norwood Street on the north, Federal Street on the east, Kenwood Street on the south, and grass ball fields on the west.

The Lunt Silversmiths Site is an industrially zoned property consisting of 4.72 acres. The Site property includes the facility buildings, open courtyards, and paved parking areas. The original site building was constructed in 1850, with multiple additions made to the building over time. The most recent addition was constructed in the 1990s. The local topography is generally flat and slopes gently downward to the west, toward the Green River, which is located approximately 5,500 feet to the west. The nearest surface water body is the Connecticut River, which is located approximately 4,000 feet to the east of the Site. There are several residential properties located directly across the street from the Site on Kenwood Street and Norwood Street. Development to the east, along the east side of Federal Street, is primarily commercial. Three ball fields used by the Greenfield Minor Baseball League abut the western portion of the property. James H. Lunt, Trustee of 298 Federal Street Commercial Condominium Trust, sold the 6.62-acre ball fields, formerly a portion of the Site property, to the City of Greenfield for a sum of $660,000 (Book 6551, Page 30; recorded 11 July 2014).

The site buildings are serviced by municipal water and sewer systems, and are heated by fuel oil. Heating oil is stored in a 30,000-gallon aboveground storage tank (AST) constructed on the northwest corner of the site building. The tank is enclosed in a concrete and cinder block building. Exterior portions of the site include paved parking areas on the east and west sides of the building. A landscaped garden is located on the east side of the building, near the main entrance. A grass courtyard is present in the center of the Site building, and is accessible only by passing through the building. [2].

2.2 Site History/Previous Actions

The former Lunt Silversmiths factory operated from 1902 until approximately 2010. Lunt Silversmiths manufactured pewter utensils, silver plating and sterling silverware, silver plating tableware and hollowware. The (former) western portion of the site was historically developed for housing for World War II veterans and (until 2014) consisted of three athletic fields. In February 2010, a release of an unknown amount of trichloroethylene (TCE) occurred at the site [3, 4].

In October 2011, Weston & Sampson Engineers, Inc. (W&S) prepared a Phase I Environmental Site Assessment (ESA) for the Franklin Regional Council of Governments (FRCOG). The ESA indicated that the site had been used for industrial purposes for over 100 years, but is currently vacant. Past use of the facility was identified primarily as silverware manufacturing, but over the years included the storage of other products such as bicycle, car and airplane parts, surgical equipment, and military supplies. The Phase I ESA identified areas of Recognized Environmental Concern (RECs) which included the following:

(1) REC-1: The site was historically used to manufacture silverware, hollowware, and tableware using high-powered machinery. Processes included cutting, stamping, degreasing, smelting, annealing, electroplating, buffing, and polishing. These processes utilized raw hazardous chemicals, including TCE and petroleum products, and generated hazardous wastes, including waste silver cyanide, dry cyanide mixture, waste nitrating acid mixture, and nitric acid.

(2) REC-2: There were abandoned chemical containers present throughout the building, the majority of which were unlabeled, improperly stored, and in poor condition.

(3) REC-3: The site has been identified as a Resource Conservation and Recovery Act (RCRA) generator, and as potentially having a release of TCE. In addition, chlorinated solvents have been detected in groundwater at the site exceeding Reportable Concentrations (RCS-1) per the Massachusetts Contingency Plan (MCP).

(4) REC-4: A 30,000-gallon heating oil AST, age and condition unknown, was present on site.

(5) REC-5: There were four exterior cyclone dust collectors, which had been used to remove silver and other particles, present on site.

(6) REC-6: The western portion of the site was identified as a REC due to the industrial nature of the site and the unknown quality of fill below the ball fields.

(7) REC-7: Asbestos-containing material (ACM), lead-based paint, and polychlorinated biphenyls (PCBs) were suspected to be present inside the buildings [4].

In May 2012, O'Reilly, Talbot & Okun Associates, Inc. (OTO) prepared a Phase II ESA, on behalf of the Town of Greenfield. As part of the Phase II ESA, OTO advanced soil borings and installed monitoring wells; and collected soil, groundwater, water (from catch basins and storm drains), soil gas, and indoor air samples. Soil sample analytical results indicated elevated levels of volatile organic compounds (VOCs) [cis-1,2-dichloroethylene (DCE), TCE, and tetrachloroethylene (PCE)] and metals (arsenic, cadmium, chromium, copper, lead, nickel, and

silver) above MCP RCS-1. Groundwater sample analytical results indicated elevated levels of four VOCs (DCE, TCE, PCE, and vinyl chloride) above MCP Reportable Concentrations in Groundwater (RCGW-2). Analytical results of the catch basin water samples indicated elevated levels of DCE, TCE, and PCE, with concentrations of TCE exceeding the MCP surface water benchmarks. Soil gas sample analytical results indicated elevated levels of TCE above the Massachusetts Department of Environmental Protection (MassDEP) Commercial/Industrial Sub-Slab Screening Values. Indoor air samples indicated elevated levels of TCE and PCE above the MassDEP Commercial/Industrial Indoor Air Threshold Values [5].

In March 2013, OTO conducted additional sampling activities as part of the Phase II ESA. These included advancing soil borings and installing 17 additional monitoring wells; collecting 10 additional soil samples; conducting an elevation survey of new wells and existing catch basins; collecting groundwater samples from the 17 newly installed wells and eight existing wells; collecting water samples from six storm water catch basins along Kenwood Street; and collecting sediment samples from the Kenwood Street catch basins. Analytical results were consistent with the known VOC contamination at the site [5].

In December 2013, EPA and Weston Solutions, Inc. Superfund Technical Assessment and Response Team (START) personnel mobilized to the site to collect indoor air and sub-slab soil gas samples at select residential and commercial properties along Kenwood Street and Forest Avenue. No significantly elevated levels were detected in any of the indoor air or soil gas samples collected from the properties [6].

In May 2014, EPA and START personnel mobilized to the site to advance soil borings and collect groundwater, subsurface soil, and drum and container samples at the site. No elevated levels of VOCs were detected during ambient air monitoring. Analytical results for groundwater samples indicated that TCE [18,000 micrograms per liter (µg/L)], PCE (1,900 µg/L), DCE (350 µg/L), trans-1,2-dichloroethene (450 µg/L) and vinyl chloride (3.3 µg/L) exceeded the MCP GW-2 or MCP GW-3 standards [7].

Analytical results for the field screening or laboratory analyses of subsurface soil samples indicated elevated levels of TCE [356,000 micrograms per kilogram (µg/Kg)], PCE (27,400 µg/Kg), lead (32,000 mg/Kg), silver (530 mg/Kg), arsenic (260 mg/Kg), antimony (500 mg/Kg) and vanadium (1,600 mg/Kg) that exceeded MCP Method 1 S-2/GW-3 levels in site soils.

Drum sample analytical results indicated that there were drums containing solvent mixtures for cleaning; sulfuric, hydrochloric and nitric acids (pH <1); caustic chemicals (pH >14); and flammable liquids (flashpoint).

In May 2015, Weston Solutions, Inc. START personnel mobilized to the site to collect additional subsurface soil and vat samples. Subsurface soil sampling focused on the southern side of the Lunt building in the parking area between the building and Kenwood Street. Samples were delivered to the EPA fixed laboratory, the Office of Environmental Measurement and Evaluation (OEME) located in North Chelmsford, Massachusetts, for VOC, semivolatile organic compound (SVOC), pesticide and PCBs, metals, and direct mercury analyses [8 - 22]. TCE was detected at a maximum concentration of 770,000 µg/Kg in soil sample SB-112E at subsurface soil sample location SB-112E.

3.0 SUMMARY OF FEDERAL RESPONSE ACTIONS

3.1 Organization of the Response

ORGANIZATION OF THE RESPONSE		
Organization	Representatives	Responsibilities
U.S. Environmental Protection Agency (EPA) Emergency Planning and Response Branch (EPRB) 5 Post Office Square, Suite 100 Boston, Massachusetts 02109-3912 Wing Chau Marcus Holmes	Wing Chau Marcus Holmes	EPA On-Scene Coordinators (OSC) responsible for the initiation, oversight, and completion of all removal activities. The OSCs coordinated with State and local officials.
Weston Solutions, Inc. (Weston) Superfund Technical Assessment and Response Team (START) 3 Riverside Drive Andover, MA 01810 (978) 552-2100	Kenneth Robinson Mark Hall John Burton William Mahany	START Site Personnel that provided the OSC with technical assistance, site documentation, site health and safety monitoring, air monitoring, and draft and final report preparation.
Environmental Restoration, LLC (ER) Emergency and Rapid Response Services (ERRS) 22 Weymouth Street Rockland, MA 02370 (781) 878-2100	Joe Overend	Response Manager (RM) for the ERRS contractor that performed removal activities. The RM was responsible for oversight and organization of mobilization, demobilization, and waste removal activities.
Town of Greenfield Department of Planning and Development 114 Main Street Greenfield, MA 01301 (413) 772-1549	Eric Twarog	Director of Town of Greenfield Department of Planning and Development that provided contact information during removal activities
Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup Western Regional Office 436 Dwight Street, Suite 500 Springfield, MA 01103 (413) 755-2285	Bernard Fish Caprice Shaw	State representatives that provided input for removal activities.

3.2 Mobilization and Site Preparation

The site-specific removal health and safety plan (HASP) was reviewed and signed by all personnel before any work commenced. In addition, emergency telephone numbers and directions to the hospital were posted and work zones were delineated. All activities were performed in appropriate personal protective equipment (PPE) in accordance with the HASP. The HASP was prepared by START personnel as a separate document, entitled *Health and Safety Plan for the Lunt Silversmiths Site, Greenfield, Franklin County, Massachusetts* [23]. On 26 May 2015, the mobilization and staging of Emergency Rapid Response Services (ERRS) equipment was initiated.

Site preparation activities conducted by ERRS personnel consisted of a site walk through the interior of the building and through the western portion of the property.

3.3 Chronology of Removal Activities

Week of 20 April 2015

EPA Office of Site Remediation and Restoration (OSRR) Acting Division Director Nancy Barmakian signed the Action Memorandum approving the proposed removal action.

Week of 25 May 2015

Personnel on site:

OSC – EPA	Wing Chau
START – Weston	Kenneth Robinson
Response Manager – ER	Joseph Overend
Crew – ER	2 laborers
MassDEP	Bernard Fish
Town of Greenfield	Eric Twarog

Activities for the week included:

- Conducting daily safety and operations meetings.
- Mobilizing crew and equipment.
- Conducting a site walk with various state and local officials.
- Conducting site preparation activities.
- Commencing the search and collection of hazardous waste containers throughout the interior of the building.
- Reviewing and signing the site HASP.
- Conducting photodocumentation of site conditions and activities.

Key dates:

On 26 May 2015, a site walk was conducted with the following personnel:

- U.S. EPA OSC, Wing Chau
- ERRS RM, Joseph Overend
- START Site Lead (SL), Kenneth Robinson
- MassDEP, Bernard Fish
- Town of Greenfield Director of Planning and Development, Eric Twarog

On 27 May 2015, ERRS began collecting marked containers from various locations inside the facility building that were suspected to contain hazardous materials and consolidated the containers in a staging area in preparation for hazcatting. For the duration of the removal action, START photodocumented site activities (see Appendix B, Photodocumentation Log). RM Overend and SL Robinson conducted an inventory of remaining unknown products located inside the building after ERRS initial collection activities.

On 29 May 2015, START collected surface soil samples SS-01 through SS-09 from areas of potential contamination around the entire building. All sampling activities were conducted in accordance with the *Sampling and Analysis Plan for the Lunt Silversmiths Site, Greenfield, Franklin County, Massachusetts, June 2015* [24]. Soil samples were delivered to EPA fixed laboratory, OEME, in North Chelmsford, Massachusetts. All personnel demobilized from the site for the weekend.

Week of 1 June 2015

Personnel on site:

OSC – EPA	Wing Chau
START – Weston	Kenneth Robinson John Burton William Mahany
Response Manager – ER	Joseph Overend
Chemist – ER	Kenneth Braig
Transportation and Disposal (T&D) Coordinator – ER	Amy Riggot
Crew – ER	2 laborers
York Laboratory	1 courier

Equipment on site:

Type	Quantity
Geoprobe	1

Activities for the week included:

- Conducting daily safety and operations meetings.
- Mobilizing ERRS chemist and T&D coordinator.
- Conducting site preparation.
- Continuing the search and collection of hazardous waste containers throughout the interior of the building.
- Hazcatting of unknown materials from various containers collected from the interior of the building.
- Advancing soil borings and collecting subsurface soils for disposal analysis.
- Reviewing and signing the HASP, as necessary.
- Conducting photodocumentation of site conditions and activities.

Key dates:

On 2 June 2015, ERRS chemist, Kenneth Braig, and ERRS Transportation and Disposal (T&D) Coordinator, Amy Riggot, mobilized to the site to commence hazcatting activities. The ERRS crew continued collecting hazardous waste containers throughout the building.

On 3 June 2015, START personnel John Burton and William Mahany mobilized to site to conduct subsurface soil sampling activities with a truck-mounted Geoprobe® (Model 540) for disposal analysis. A total of four borings were advanced 4 feet below ground surface (bgs) at two

discrete sample locations in the rear courtyard. Two four-point composite samples were collected from 0-to-4 feet bgs for disposal analysis [25].

On 4 June 2015, START personnel advanced a total of four borings to a depth of 4 feet bgs at two discrete sample locations in the southern asphalt parking area. Two four-point composite samples were collected from 0-to-8 feet bgs for disposal analysis.

On 5 June 2015, ERRS transferred four composite soil samples, collected by START personnel for disposal analysis, to a courier for delivery to York Analytical Laboratory located in Stratford, Connecticut.

Week of 8 June 2015

Personnel on site:

OSC – EPA	Wing Chau
Chemist - OEME	Scott Clifford
Community Involvement Coordinator - EPA	Kelsey O'Neil
START – Weston	Kenneth Robinson
Response Manager – ER	Joseph Overend
Chemist – ER	Kenneth Braig
Transportation and Disposal (T&D) Coordinator – ER	Amy Riggot
Crew – ER	2 laborers

Equipment on site:

Type	Quantity
Office Trailer	1
Conex Box	1
Generator	1
Portable Toilet	2
Hand Wash Station	1
Water Buffalo	1
2 cubic yard Dumpster	1

Activities for the week included:

- Conducting daily safety and operations meetings.
- Delivering site equipment.
- Conducting identification and collection of suspected hazardous chemicals from throughout the building.
- Bulking of suspected hazardous chemicals collected from various containers throughout the building.
- Collecting unknown solid materials from the 1900 Building (See Appendix A, Figure 2) for metals and VOC field screening by the EPA OEME Mobile Laboratory.
- Distributing site information pamphlets to nearby residents and businesses.

- Collecting surface soil samples around the building perimeter.
- Photodocumentation of site conditions and activities.

Key dates:

On 8 June 2015, a Conex box, office trailer, generator, two portable bathrooms, and a hand wash station were delivered to the site and set up along the western edge of the property.

On 9 June 2015, START collected samples from cooling trays and tanks in the first floor of the 1900 Building for metals and VOC field screening by the EPA OEME Mobile Laboratory. Kelsey O'Neil of EPA mobilized to site to distribute pamphlets with site information to residents and businesses located on Kenwood Street and Norwood Street.

On 10 and 11 June 2015, START collected surface soil samples SS-301 through SS-309 from areas along the exterior of the building for metals and VOC analytes (see Appendix A, Figure 3) [26 - 29]. Analytical results are summarized in Appendix C, Table 1 and Table 2. See Appendix E, Analytical Results and Chain-of-Custody Records for the complete analytical reports. ERRS completed identification and collection of containers from within the building. A total of 19 waste streams were identified by ERRS personnel.

Week of 15 June 2015

Personnel on site:

OSC – EPA	Wing Chau
Chemist - OEME	Scott Clifford
START – Weston	Mark Hall
Response Manager – ER	Joseph Overend
Chemist – ER	Kenneth Braig
Crew – ER	2 laborers
York Laboratory	1 courier

Equipment on site:

Type	Quantity
Office Trailer	1
Conex Box	1
Generator	1
Portable Toilet	2
Hand Wash Station	1
Water Buffalo	1
2-yard Dumpster	1

Activities for the week included:

- Conducting daily safety and operations meetings.
- Submitting samples for waste stream profile analysis.
- Continuing bulking of waste.
- Confirming drums classified as RCRA empty for disposal.

- Conducting an inspection of the central courtyard to determine volume of material for excavation.
- Removing compressed gas cylinders from the facility.
- Conducting brush clearing of the central courtyard.
- Conducting photodocumentation of site conditions and activities.

Key dates:

On 16 June 2015, Airgas personnel collected an empty oxygen cylinder and removed it from site. A waste stream profile sample, collected by ERRS for disposal analysis, was provided to a York Laboratory courier for delivery.

On 17 June 2015, brush clearing began in the central courtyard in preparation for manual excavation of contaminated soils below and around the cyclone dust collector and an adjacent outfall pipe in the area north of the 1900 Building.

Week of 22 June 2015

Personnel on site:

OSC – EPA	Wing Chau
Chemist - OEME	Scott Clifford
START – Weston	Kenneth Robinson John Burton
Response Manager – ER	Joseph Overend
Chemist – ER	Kenneth Braig
Crew – ER	2 laborers

Equipment on site:

Type	Quantity
Office Trailer	1
Conex Box	1
Generator	1
Portable Toilet	2
Hand Wash Station	1
Water Buffalo	1
2 cubic yard Dumpster	1
30 cubic yard Roll-off Container	1

Activities for the week included:

- Conducting daily safety and operations meetings.
- Continuing bulking of waste.
- Disposing of RCRA empty containers.
- Conducting an inspection of the central courtyard to determine volume of material for excavation.
- Conducting air monitoring during manual excavation activities.
- Conducting brush clearing of the central courtyard.

- Removing the 30-cubic-yard roll-off container filled with RCRA empty containers.
- Collecting surface soil samples from locations targeted for removal and other potentially contaminated areas to define the extent of surficial contamination.
- Conducting manual removal of contaminated soils from the central courtyard.
- Recording measurements for asphalt patching along Kenwood Street.
- Conducting photodocumentation of site conditions and activities.
- Demobilizing for the holiday week.

Key dates:

On 22 June 2015, ERRS personnel began manual excavation of contaminated soils located in the central courtyard. START personnel deployed particulate air monitoring instrumentation in the area of manual excavation and collected surface soil samples (SS-311 through SS-321) to better characterize the extent of contamination in the central courtyard. Surface soil samples were submitted to the EPA OEME Mobile Laboratory for metals and VOC field screening [30, 31].

On 23 June 2015, START personnel collected surface soil samples (SS-322 through SS-325) in the rear courtyard and near the 1900 Building to better characterize the extent of contamination. START personnel also collected a floor sample from the 1-foot excavation in the central courtyard. Surface soil samples were submitted to the OEME Mobile Laboratory for field screening and to EPA OEME fixed laboratory in North Chelmsford, MA for metals and VOC confirmatory analyses [32, 33].

On 24 June 2015, a meeting was conducted at the Town of Greenfield Office of Planning and Development, located at 114 Main Street in Greenfield, Massachusetts, to review the present site conditions and the scope of field activities to be completed. The following personnel were in attendance: OSC Chau; RM Overend; SL Robinson; Town of Greenfield Department of Public Works Manager Don Willette; Department of Planning and Development Director Eric Twarog; and several Town of Greenfield representatives. START member John Burton mobilized to site to deliver an X-Ray fluorescence (XRF) unit to site, as OEME Mobile Laboratory Chemist Scott Clifford would be demobilizing from site [34].

On 25 June 2015, START personnel constructed a 3-foot by 3-foot grid system around the cyclone dust collector and outfall pipe in the central courtyard; a total of 35 grids were constructed. START proceeded to collect soil samples from each grid and screen them with an Innov-X XRF unit for lead and arsenic in soils to determine if excavation and removal was warranted. The 30-cubic-yard roll-off container of RCRA empty containers was transported off site for disposal.

On 26 June 2015, the site was secured and all personnel demobilized with site work scheduled to resume on 7 July 2015.

Week of 7 July 2015

Personnel on site:

OSC – EPA	Wing Chau
Chemist - OEME	Scott Clifford
START – Weston	Kenneth Robinson
Response Manager – ER	Joseph Overend

Chemist – ER	Kenneth Braig
Crew – ER	2 equipment operators 2 laborers
MassDEP	Caprice Shaw
Town of Greenfield	Paul Raskevitz
Barlow Paving Co.	Scott Barlow

Equipment on site:

Type	Quantity
Office Trailer	1
Conex Box	1
Generator	1
Portable Toilet	2
Hand Wash Station	1
Water Buffalo	1
2 cubic yard Dumpster	1
Excavator	1
Loader	1
Skid Steer	1

Activities for the week included:

- Remobilizing to the site.
- Conducting daily safety and operations meetings.
- Delivering clean fill from Ray Haluch, Inc.
- Conducting perimeter and personal air monitoring.
- Conducting excavation of contaminated soils.
- Collecting five-point composite floor samples from excavated grids to determine if additional removal was warranted.
- Backfilling and compacting grids upon completion of excavation and sampling activities.
- Conducting photodocumentation of site conditions and activities.

Key dates:

On 7 July 2015, EPA, START, and ERRS personnel remobilized to the site. Hillview Equipment delivered a CAT 322C excavator, a CAT 4-yard loader, and a T320 Bobcat to the site. Caprice Shaw of MassDEP conducted a site visit and spoke with OSC Chau regarding site activities.

On 8 July 2015, START conducted perimeter air monitoring and perimeter air sampling [35 - 37]. ERRS personnel began personal air sampling. ERRS conducted excavation of Grid 1 and Grid 2 in the rear courtyard (see Appendix A, Figure 4).

On 9 July 2015, START collected five-point composite floor samples from Grid 1 and Grid 2 at 2-feet bgs (Grid-01-B and Grid-02-B) and submitted the soil samples to the EPA OEME Mobile Laboratory for field screening [38, 39]. Paul Raskevitz from the Town of Greenfield Department of Public Works arrived on site to provide technical assistance to ERRS by providing access to

dust control and decontamination water. Scott Barlow of Barlow Paving Company conducted a site walk with ERRS RM Overend.

Week of 13 July 2015

Personnel on site:

OSC – EPA	Wing Chau
Chemist - OEME	Scott Clifford
START – Weston	Kenneth Robinson
Response Manager – ER	Joseph Overend
Crew – ER	2 equipment operators 2 laborers
Contest Laboratory	1 courier

Equipment on site:

Type	Quantity
Office Trailer	1
Conex Box	1
Generator	1
Portable Toilet	2
Hand Wash Station	1
Water Buffalo	1
2 cubic yard Dumpster	1
Excavator	1
Loader	1
Skid Steer	1

Activities for the week included:

- Conducting daily safety and operations meetings.
- Transferring perimeter air samples to the Contest Laboratory courier.
- Delivering clean fill from Ray Haluch, Inc.
- Conducting perimeter air monitoring.
- Excavating contaminated soils.
- Collecting five-point composite floor samples from excavated grids to determine if additional removal was warranted.
- Backfilling and compacting grids upon completion of excavation and sampling activities.
- Loading out contaminated soils.
- Conducting photodocumentation of site conditions and activities.

Key dates:

On 13 July 2015, START transferred air samples to Contest Laboratory courier for metals analysis at the Contest Laboratory in East Longmeadow, Massachusetts. ERRS continued excavation and stockpiling of contaminated soils from Grid 1, Grid 2, and Grid 3. START collected five-point composite floor samples from Grid 1, Grid 2, and Grid 3 (Grid-01-C, Grid-02-C, and Grid-03-B) for metals and VOC field screening [40, 41].

On 14 July 2015, ERRS excavated Grid 1 and Grid 2 until groundwater was encountered, approximately 5-feet bgs. START collected five-point composite floor samples from Grid 1 and Grid 2 (Grid-01-E and Grid-02-E).

On 15 July 2015, ERRS excavated Grid 3 to a depth of 2-feet bgs; analytical results of a five-point composite floor sample for Grid 3 were not in exceedance of EPA action levels. ERRS applied geotextile fabric and backfilled Grid 1, Grid 2, and Grid 3 with clean fill. ERRS began load out activities (contaminated soil loads with manifest numbers LS-0001 and LS-0002 were transported off site by Goulet Trucking). See Appendix D, Waste Disposal Summary Table for details.

On 16 July 2015, ERRS continued load out activities (LS-0003, LS-0004, LS-0005, and LS-0006 were transported off site by Goulet Trucking). ERRS began excavation of Grid 4 to a depth of 2-feet bgs. START collected a five-point composite floor sample from Grid 4 (Grid-04-B) for metals and VOC field screening. Based upon field screening data, ERRS applied geotextile fabric and backfilled Grid 4 with clean fill.

On 17 July 2015, ERRS continued load out activities (LS-0007 was transported off site by Goulet Trucking) and began excavation of Grid 5. START transferred air samples to the Contest Laboratory courier for metals analysis at the Contest Laboratory in East Longmeadow, Massachusetts. START collected two five-point composite floor samples from Grid 5 (Grid-05-B and Grid-05-C) for metals and VOC screening. ERRS excavated Grid 5 to a maximum depth of 3-feet bgs. Based upon field screening data, ERRS applied geotextile fabric and backfilled Grid 5. START and ERRS reviewed field screening data from the central courtyard. OSC Chau directed that all grids exceeding 400 parts per million (ppm) lead be excavated to a depth of 1-foot bgs.

Week of 20 July 2015

Personnel on site:

Chemist - OEME	Scott Clifford
START – Weston	John Burton
Response Manager – ER	Joseph Overend
Crew – ER	2 equipment operators 2 laborers
Capital Environmental	Bruce Hillman
MassDEP	Caprice Shaw

Equipment on site:

Type	Quantity
Office Trailer	1
Conex Box	1
Generator	1
Portable Toilet	2
Hand Wash Station	1
Water Buffalo	1
2 cubic yard Dumpster	1
Excavator	1

Type	Quantity
Loader	1
Skid Steer	1

Activities for the week included:

- Conducting daily safety and operations meetings.
- Delivering clean fill from Ray Haluch, Inc.
- Conducting perimeter air monitoring.
- Excavating contaminated soils.
- Collecting five-point composite floor samples from excavated grids to determine if additional removal was warranted.
- Loading out contaminated soils.
- Backfilling and compacting grids upon completion of excavation and sampling activities.
- Conducting photodocumentation of site conditions and activities.

Key dates:

On 20 July 2015, ERRS continued load out activities (LS-0008, LS-0009, and LS-0010 were transported off site by Goulet Trucking). ERRS manually excavated several grids in the central courtyard. Bruce Hillman of Capital Environmental, responsible for coordinating truck scheduling for T&D, mobilized to site to review scope of work with RM Overend.

On 21 July 2015, START collected five-point composite floor samples from Grid A1, Grid B2, Grid B4, and Grid C5 in the central courtyard and from Grid 6 (Grid-06-B) in the rear courtyard for metals and VOC field screening [42, 43]. ERRS continued load out activities (LS-0011, LS-0012, and LS-0013 were transported off site by Goulet Trucking).

On 22 July 2015, ERRS continued load out activities (LS-0014, LS-0015, and LS-0016 were transported off site by Goulet Trucking). START collected five-point composite soil samples from Grid C1-Grid C2, Grid D1-Grid D2, Grid E1-Grid E2, and Grid G1-Grid G5 in the central courtyard and from Grid 6 (Grid-06-C) from the rear courtyard for metals and VOC field screening. ERRS excavated Grid 6 to a depth of 3-feet bgs. The samples were submitted to the EPA OEME fixed laboratory in North Chelmsford, MA for confirmatory analysis [44, 45].

On 23 July 2015, based upon OEME field screening data, ERRS lined Grid 6 with geotextile fabric and backfilled the excavation with clean fill. ERRS also continued load out activities (LS-0017, LS-0018, and LS-0019 were transported off site by Goulet Trucking). MassDEP Representative Caprice Shaw mobilized to site to review and document site activities.

On 24 July 2015, START collected a five-point composite floor sample from Grid F1, located in the central courtyard. ERRS continued load out activities (LS-0020, LS-0021, LS-22, and LS-0023 were transported off site by Goulet Trucking).

Week of 27 July 2015

Personnel on site:

OSC – EPA	Wing Chau
START – Weston	Kenneth Robinson
Response Manager – ER	Joseph Overend

Crew – ER	2 equipment operators 2 laborers

Equipment on site:

Type	Quantity
Office Trailer	1
Conex Box	1
Generator	1
Portable Toilet	2
Hand Wash Station	1
Water Buffalo	1
2 cubic yard Dumpster	1
Excavator	1
Loader	1
Skid Steer	1

Activities for the week included:

- Conducting daily safety and operations meetings.
- Delivering clean fill from Ray Haluch, Inc.
- Conducting perimeter air monitoring.
- Excavating contaminated soils.
- Collecting five-point composite floor samples from excavated grids to determine if additional removal was warranted.
- Loading out contaminated soils.
- Backfilling and compacting grids upon completion of excavation and sampling activities.
- Conducting photodocumentation of site conditions and activities.

Key dates:

On 27 July 2015, START collected samples Grid F1 and Grid F2 for XRF field screening. ERRS began excavation of Grid 7 and Grid 8. ERRS excavated Grid 8 to a depth of 2-feet bgs. ERRS continued load out activities (LS-0024, LS-0025, and LS-0026 were transported off site by Goulet Trucking; LS-0027 was transported off site by Murdock Trucking).

On 28 July 2015, START collected five-point composite floor samples from Grid 7 and Grid 8 (Grid-07-B and Grid-08-B) for XRF field screening. ERRS continued load out activities (LS-0028 and LS-0029 were transported off site by Goulet Trucking).

On 29 July 2015, OSC Chau requested that a load of crushed stone be delivered to the site for compaction and erosion control purposes. ERRS began pumping the liquid from vats in the basement into 250-gallon carboys and staged the material for disposal. ERRS excavated Grid 7 to a depth of 3-feet bgs. START collected a five-point composite floor sample from Grid 7 (Grid-07-C) [46-49]. ERRS installed geotextile fabric and completed backfilling Grid 7 and Grid 8. ERRS continued load out activities (LS-0030 and LS-0031 were transported off site by Goulet Trucking).

On 30 July 2015, RM Overend and START constructed a grid system consisting of approximately 15-foot by 10-foot grids in the asphalt parking area north of Kenwood Street. A

total of 18 individual grids were established (see Appendix A, Figure 4). ERRS conducted grading and compaction activities in the rear courtyard.

On 31 July 2015, ERRS completed manual excavation of contaminated soils in the central courtyard and continued backfilling activities. Field screening results indicated lead concentrations up to 1,700 mg/Kg remaining at a depth of 1-foot bgs in the central courtyard around the cyclone dust collector after excavation and backfilling activities had been completed [46].

Week of 3 August 2015

Personnel on site:

OSC – EPA	Marcus Holmes
Chemist - OEME	Scott Clifford
Health & Safety Coordinator – EPA	Anthony Honnellio
START – Weston	Kenneth Robinson
Response Manager – ER	Joseph Overend
Crew – ER	2 equipment operators 2 laborers
Transportation and Disposal (T&D) Coordinator – ER	Amy Riggot

Equipment on site:

Type	Quantity
Office Trailer	1
Conex Box	1
Generator	1
Portable Toilet	2
Hand Wash Station	1
Water Buffalo	1
2 cubic yard Dumpster	1
Excavator	1
Loader	1
Skid Steer	1

Activities for the week included:

- Conducting daily safety and operations meetings.
- Delivering clean fill from Ray Haluch, Inc.
- Conducting perimeter air monitoring.
- Conducting excavation of contaminated soils.
- Conducting saw cutting of asphalt prior to excavation activities.
- Collecting five-point composite floor samples from excavated grids to determine if additional removal was warranted.
- Loading out contaminated soils.
- Loading out 24 waste streams composed of various bulked materials collected from within the facility.
- Backfilling and compacting grids upon completion of excavation and sampling activities.
- Conducting a site health and safety audit.

- Conducting photodocumentation of site conditions and activities.

Key dates:

On 3 August 2015, ERRS completed backfilling and compaction activities for the interior courtyard excavation area. ERRS began excavation activities in the grids along Kenwood Street. ERRS excavated Grid 9 to a depth of 2-feet bgs, where an underground natural gas line was encountered. START collected a five-point composite floor sample from Grid 9 (Grid-09-B) for metals and VOC field screening by the EPA OEME Mobile Laboratory [30 – 33]. Grid 9 was then backfilled with clean fill, compacted in 1-foot lifts.

On 4 August 2015, ERRS excavated Grid 10 and Grid 11 to a depth of 2-feet bgs. An underground natural gas line was encountered in Grid 11, and excavation was stopped. START collected a five-point composite floor sample from Grid 10 and Grid 11 (Grid-10-B and Grid-11-B, respectively) for metals and VOC field screening. Grid 11 was then backfilled with clean fill, compacted in 1-foot lifts.

On 5 August 2015, based upon analytical data, ERRS excavated Grid 10 to a depth of 4-feet bgs. START collected a five-point composite floor sample from Grid 10 (Grid-10-D) for metals and VOC field screening. EPA Health and Safety Coordinator Tony Honnellio mobilized to site to conduct a site health and safety audit. ERRS continued load out activities (LS-0032 was transported off site by Goulet Trucking). Based upon field screening results, ERRS backfilled Grid 10 with clean fill, compacting in 1-foot lifts.

On 6 August 2015, ERRS conducted lab-pack load out activities, led by T&D Coordinator Amy Riggot. A total of 24 waste streams, excluding a cyanide waste stream, were loaded and transported off site by Enpro personnel for disposal. ERRS excavated Grid 12 to a depth of 2-feet bgs, where an underground natural gas line was encountered. START collected a five-point composite floor sample from Grid 12 (Grid-12-B) for metals and VOC field screening. ERRS backfilled Grid 12 with clean fill, compacting in 1-foot lifts.

On 7 August 2015, ERRS excavated Grid 14 to a depth of 2-feet bgs. START collected a five-point composite floor sample from Grid 14 (Grid-14-B) for metals and VOC field screening. START and OEME personnel selected samples for confirmatory VOC and metals analyses at EPA OEME fixed laboratory located in North Chelmsford, MA.

Week of 10 August 2015

Personnel on site:

OSC – EPA	Marcus Holmes
Chemist - OEME	Scott Clifford
START – Weston	Kenneth Robinson
Response Manager – ER	Joseph Overend
Crew – ER	2 equipment operators 2 laborers

Equipment on site:

Type	Quantity
Office Trailer	1

Type	Quantity
Conex Box	1
Generator	1
Portable Toilet	2
Hand Wash Station	1
Water Buffalo	1
2 cubic yard Dumpster	1
Excavator	1
Loader	1
Skid Steer	1

Activities for the week included:

- Conducting daily safety and operations meetings.
- Delivering clean fill from Ray Haluch, Inc.
- Conducting perimeter air monitoring.
- Excavating contaminated soils.
- Conducting saw cutting of asphalt prior to excavation activities.
- Collecting five-point composite floor samples from excavated grids to determine if additional removal was warranted.
- Loading out contaminated soils.
- Abandoning a monitoring well that was encountered in an excavation grid.
- Backfilling and compacting grids upon completion of excavation and sampling activities.
- Conducting photodocumentation of site conditions and activities.

Key dates:

On 10 August 2015, ERRS excavated Grid 14 to a depth of 4-feet bgs, where groundwater was encountered. START collected a five-point composite floor sample from Grid 14 (Grid-14-D) for metals and VOC screening [50, 51]. ERRS encountered monitoring well LS-20, which was abandoned prior to backfilling Grid 14. During backfilling activities, ERRS compacted soil in 1-foot lifts.

On 11 August 2015, ERRS excavated Grid 13 to a depth of 2-feet bgs. START collected a five-point composite floor sample from Grid 13 (Grid-13-B) for metals and VOC field screening. ERRS lined Grid 13 with poly and then backfilled with the excavated soils due to inclement weather and erosional concerns. Enpro mobilized to site and conducted load out of the remaining cyanide waste stream.

On 12 August 2015, ERRS excavated Grid 13 to a depth of 4-feet bgs based upon elevated TCE concentrations detected during a previous Preliminary Assessment/Site Investigation (PA/SI) sampling event conducted in May 2015. START collected a five-point composite floor sample from Grid 13 (Grid-13-D) for VOC and metals field screening. ERRS excavated Grid 15 to a depth of 2-feet bgs. START collected a five-point composite floor sample from Grid 15 (Grid-15-B). ERRS excavated Grid 16 to a depth of 2-feet and then 4-feet bgs, where groundwater was encountered. START collected two five-point composite floor samples from Grid 16 (Grid-16-B and Grid-16-D, respectively). ERRS backfilled Grid 13, Grid 15, and Grid 16 with clean fill, compacting in 1-foot lifts.

On 13 August 2015, ERRS continued load out activities (LS-0034 and LS-0035 were transported off site by Goulet Trucking). ERRS excavated Grid 17, Grid 18, Grid 19, and Grid 20 to a depth of 2-feet bgs. START collected four five-point composite floor samples from each of the grids (Grid-17-B, Grid-18-B, Grid-19-B, and Grid-20-B). Based upon field screening results, Grid 20 was excavated to a depth of 4-feet bgs. START collected a five-point composite floor sample from Grid 20 (Grid-20-D). Field screening results for sample Grid-20-D were below removal action levels considered for this time-critical removal action. ERRS backfilled Grid 17, Grid 18, Grid 19, and Grid 20, compacting in 1-foot lifts.

On 14 August 2015, ERRS transferred crushed stone to backfilled areas north of Kenwood Street and compacted the material for erosion control. START and OEME selected samples for confirmatory metals and VOC analysis at OEME.

Week of 17 August 2015

Personnel on site:

OSC – EPA	Wing Chau
Chemist – OEME	Scott Clifford
START – Weston	Kenneth Robinson
Response Manager – ER	Joseph Overend
Crew – ER	2 equipment operators 2 laborers
Barlow Paving Co.	Scott Barlow
Town of Greenfield	Eric Twarog

Equipment on site:

Type	Quantity
Office Trailer	1
Conex Box	1
Generator	1
Portable Toilet	2
Hand Wash Station	1
Water Buffalo	1
2 cubic yard Dumpster	1
Excavator	1
Loader	1
Skid Steer	1

Activities for the week included:

- Conducting daily safety and operations meetings.
- Conducting perimeter air monitoring.
- Excavating contaminated soils.
- Collecting five-point composite floor samples from excavated grids to determine if additional removal was warranted.
- Collecting sidewall samples to determine if additional excavation was warranted.
- Loading out contaminated soils.
- Backfilling and compacting grids upon completion of excavation and sampling activities.

- Conducting a site walk with Barlow Paving Company.
- Conducting a site walk with Town of Greenfield Director of Planning and Development.
- Conducting photodocumentation of site conditions and activities.

Key dates:

On 17 August 2015, RM Overend and START reviewed the grid system and re-marked the remaining grids with spray paint. During excavation activities, the original spray paint markings of the grids were destroyed. As a result, there was 13 linear feet of non-excavated material between the western edge of Grid 19/Grid 20 and where the eastern edge of Grid 21 and Grid 22 was initially marked. Grid 19.5 and Grid 20.5 were established to account for the lateral discrepancies in the final grid locations. ERRS continued load out activities (LS-0036 and LS-0037 were transported off site by Goulet Trucking). ERRS excavated Grid 19.5 and Grid 20.5 to a depth of 2-feet bgs. START collected five-point composite floor samples from Grid 19.5 and Grid 20.5 (Grid-19.5-B and Grid-20.5-B, respectively) and submitted the samples for VOC and metals field screening [52 – 55]. ERRS backfilled Grid 19.5, compacting in 1-foot lifts.

On 18 August 2015, based upon field screening results, Grid 20.5 was excavated to a depth of 4-feet bgs by ERRS. Grid 21 was excavated to a depth of 2-feet bgs. START collected a five-point composite floor sample from Grid 20.5 and Grid 21 (Grid-20.5-D and Grid-21-B, respectively) for VOC and metals field screening. START also collected samples from the southern and western sidewalls of Grid 21 (Grid-21-S and Grid-21-W, respectively) to determine if additional soil removal was warranted. Field screening indicated that Grid-20.5-D was below EPA action levels; and ERRS backfilled Grid 20.5, compacting in 1-foot lifts. Scott Barlow, of Barlow Paving Company, conducted a site walk with RM Overend. OSC Chau, RM Overend, and START conducted a site walk to review site conditions and evaluate remaining scope of work.

On 19 August 2015, after reviewing field screening data from sidewall samples collected on 18 August 2015 and previous PA/SI data, OSC Chau determined excavation activities would cease. ERRS backfilled Grid 21, compacting in 1-foot lifts. ERRS continued load out activities (LS-0039 and LS-0040 were transported off site by Goulet Trucking). START and OEME selected samples to be submitted for confirmatory metals and VOC analyses at OEME fixed laboratory.

On 20 August 2015, ERRS continued load out activities (LS-0041, LS-0042, and LS-0043 were transported off site by Goulet Trucking). Town of Greenfield Director of Planning and Development, Eric Twarog, conducted a site walk with OSC Chau.

On 21 August 2015, ERRS completed load out activities (LS-0044 was transported off site by Goulet Trucking). ERRS began preparing for demobilization activities.

Week of 24 August 2015

Personnel on site:

START – Weston	Kenneth Robinson
Response Manager – ER	Joseph Overend
Crew – ER	2 laborers

Equipment on site:

Type	Quantity
Office Trailer	1
Conex Box	1
Generator	1
Portable Toilet	2
Hand Wash Station	1
Water Buffalo	1
2 cubic yard Dumpster	1
Excavator	1
Loader	1
Skid Steer	1

Activities for the week included:

- Conducting daily safety and operations meetings.
- Cleaning and preparation for pickup of equipment.
- Demobilizing of on-site equipment and fencing.

Key dates:

On 24 August 2015, Hillview Rental mobilized to site to pick up the CAT excavator.

On 25 August 2015, Hillview Rental mobilized to site to pick up the CAT loader. RM Overend disconnected the generator from the office trailer in support of demobilization efforts.

On 26 August 2015, Eagle Rental mobilized to site to pick up the Conex box. Premier Fencing mobilized to site to breakdown and remove the perimeter fencing. RM Overend spoke with nearby business owners to request that vehicles not be parked in the excavated area north of Kenwood Street until after paving activities had been completed.

Week of 31 August 2015

Personnel on site:

Response Manager	Joseph Overend
Barlow Paving, Inc.	Scott Barlow and crew

Activities for the week included:

- Paving of excavated area north of Kenwood Street.

Week of 7 September 2015

Personnel on site:

OSC – EPA	Wing Chau
START – Weston	Kenneth Robinson
Response Manager – ER	Joseph Overend
Town of Greenfield	Eric Twarog

Activities for the week included:

- Conducting a final walkthrough of the site.
- Conducting photodocumentation of site conditions.

Key dates:

On 8 September 2015, OSC Chau, RM Overend, START, and Town of Greenfield Director of Planning and Development, Eric Twarog, conducted a site walk to review the final site condition and the scope of work completed. START photodocumented site conditions, including the asphalt patching.

3.4 Summary of Removal Activities

Under this EPA Time-Critical Removal Action, hazardous materials stored in various-sized containers within the facility were removed and disposed of appropriately. In addition, contaminated surficial soils posing a contact threat and contaminated subsurface soils acting as a continuing source of release of hazardous substances to the environment were addressed to the extent practicable under the scope of this removal action. A total of 1,358.01 tons of soil were removed from site for disposal (See Appendix D, Waste Disposal Summary Table for details).

4.0 ESTIMATED EPA CONTRACTOR COSTS FOR THE REMOVAL ACTION

EPA contracted cost resources committed under this Removal Action are summarized below:

Cost Category	Ceiling	Costs Incurred	Remainder
Regional Removal EPA Contract Allowance Costs			
ERRS	**$500,000.00**	**$417,087.00**	**$82,913.00**
Other Extramural Costs Not Funded from the Regional Allowance			
START Contractor	**$200,000.00**	**$89,929.00**	**$ 110,071.00**
Extramural Contingency	**$140,000.000**	**$0.00**	**$140,000.00**
Total Removal Project Costs	**$840,000.00**	**$507,016.00**	**$332,984.00**

This accounting of expenditures is an estimate based on figures known to the OSC at the time this report was written. The cost accounting provided in this report does not necessarily represent an exact monetary figure which the government may include in any claim for cost recovery.

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[15] U.S. Environmental Protection Agency, New England Regional Laboratory, Office of Environmental Measurement and Evaluation. 8 June 2015. Laboratory Report. Project Number 15050011, Metals in Soil Medium Level by ICP. Lunt Silversmiths - Greenfield, Massachusetts.

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Appendices

Appendix A

Figures

Figure 1 – Site Location Map
Figure 2 – Site Diagram
Figure 3 – Soil Sample Location Map
Figure 4 –Excavation Grid Diagram



Figure 1

Site Location Map

Lunt Silversmiths
298 Federal Street
Greenfield, Massachusetts

EPA Region I
Superfund Technical Assessment and Response Team (START) IV
Contract No. EP-S3-15-01

TDD Number:	TO1-01-15-07-0015
Created by:	B. Mace
Created on:	30 September 2013
Modified by:	K. Robinson
Modified on:	10 September 2015

Data Sources:
Topos: MicroPath/USGS
Quadrangle Name: Greenfield, MA
All other data: START

E:\MA_gis\Lunt Silversmiths Removal\MXDs\0017_Figure 1.mxd

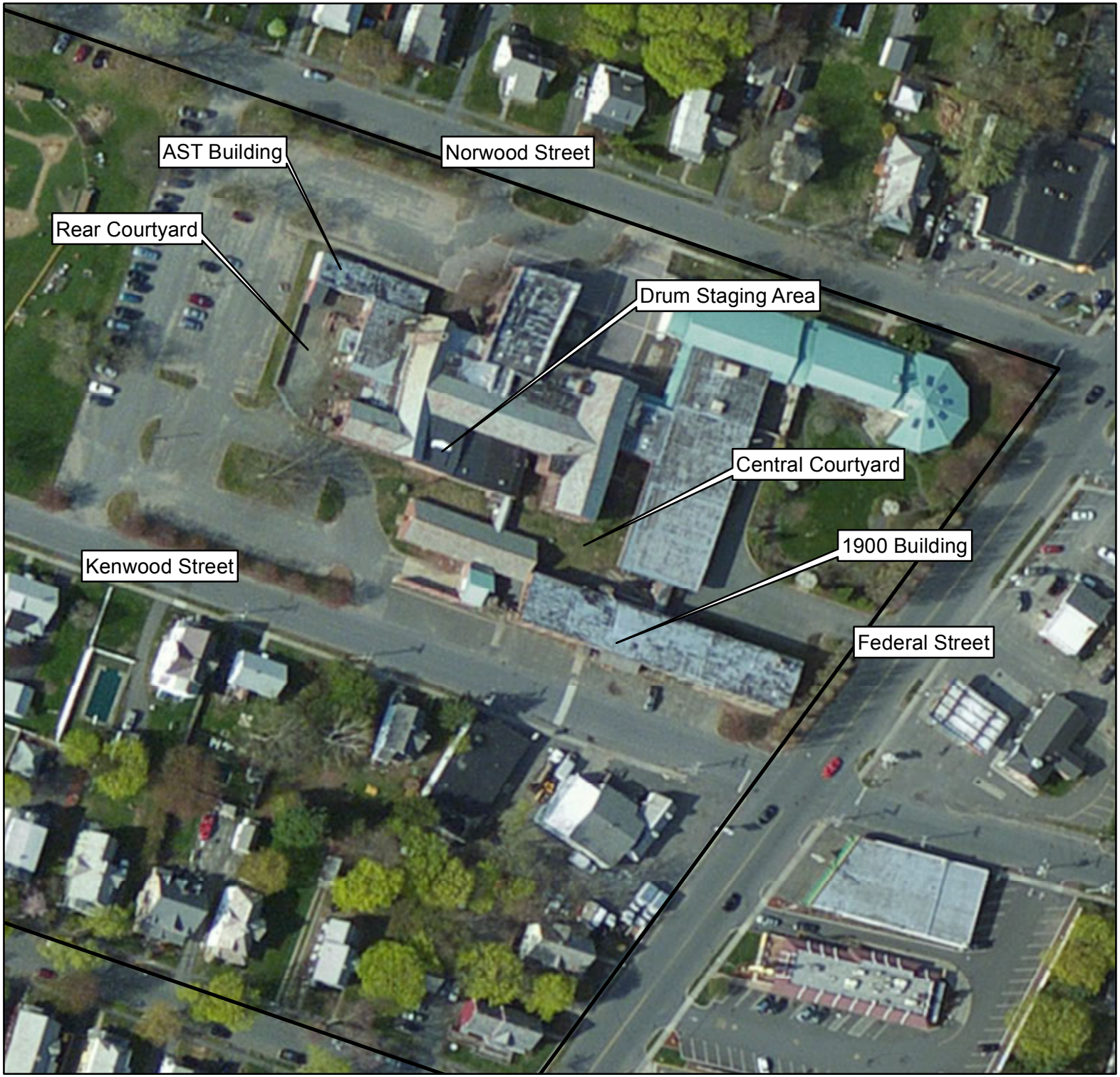


Figure 2

Site Diagram

Lunt Silversmiths
298 Federal Street
Greenfield, Massachusetts

EPA Region I
Superfund Technical Assessment and Response Team (START) IV
Contract No. EP-S3-15-01

TDD Number:	TO1-01-15-07-0015
Created by:	B. Mahany
Created on:	2 June 2015
Modified by:	K. Robinson
Modified on:	29 June 2015

Legend

Site Boundary

N

0 25 50 100 150
Feet

Data Sources:

Imagery: ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGP
All other data: START

WESTON SOLUTIONS

E:\MA_gis\Lunt Silversmiths Removal\MXDs\AAR\Figure 2 - Site Diagram.mxd

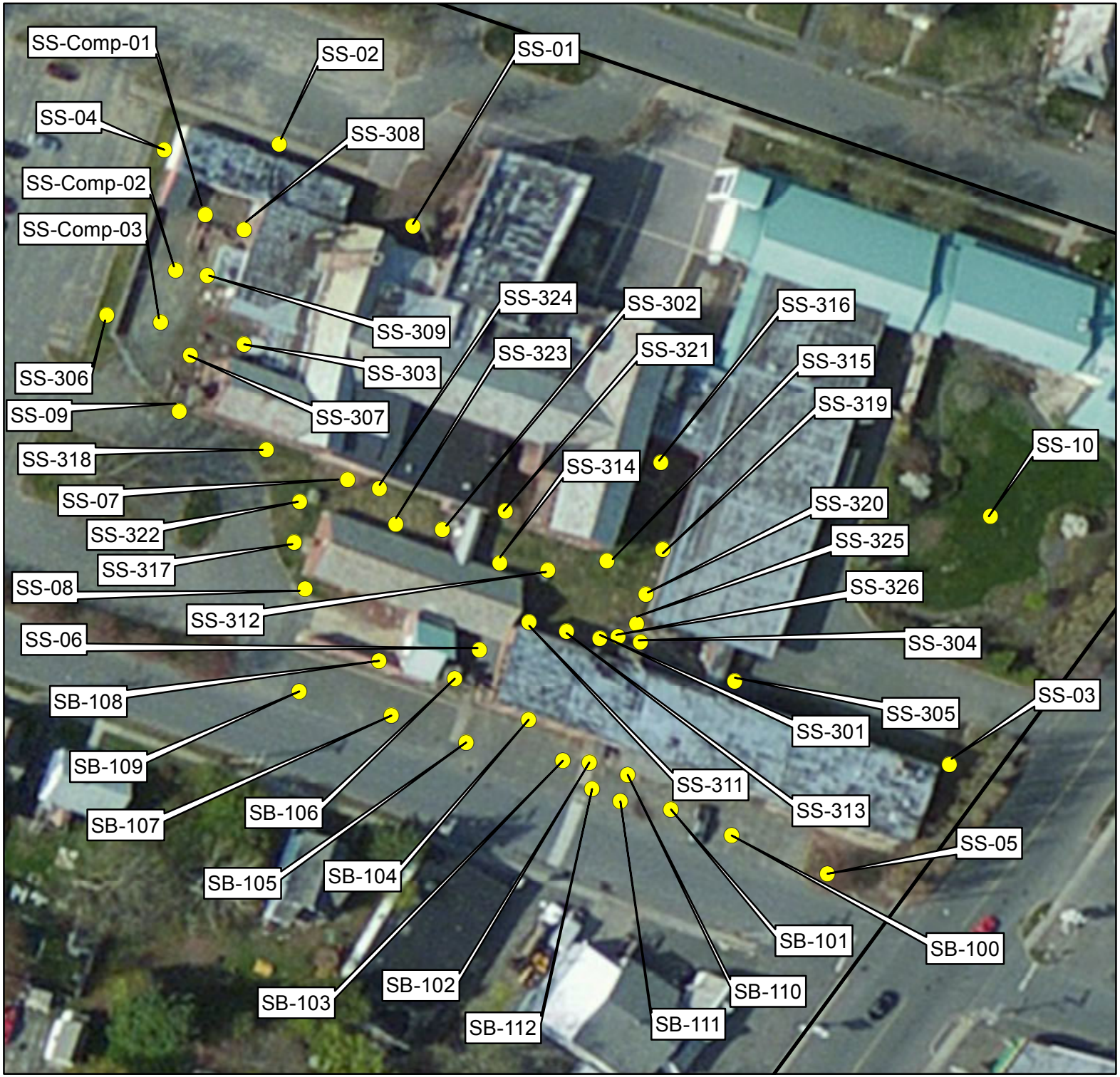


Figure 3

Surface Soil Sample Location Map

Lunt Silversmith
298 Federal Street
Greenfield, Massachusetts

EPA Region I
Superfund Technical Assessment and Response Team (START) IV
Contract No. EP-S3-15-01

TDD Number:	TO1-01-15-07-0015
Created by:	B. Mahany
Created on:	2 June 2015
Modified by:	K. Robinson
Modified on:	10 September 2015

Legend

- Soil Sample Location
- Site Boundary

N

0 25 50 100 Feet

Data Sources:

Imagery: ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGP
All other data: START

WESTON SOLUTIONS

E:\MA_gis\Lunt Silversmiths Removal\MXDs\Figure 3 - Surface Soil Sample Location.mxd

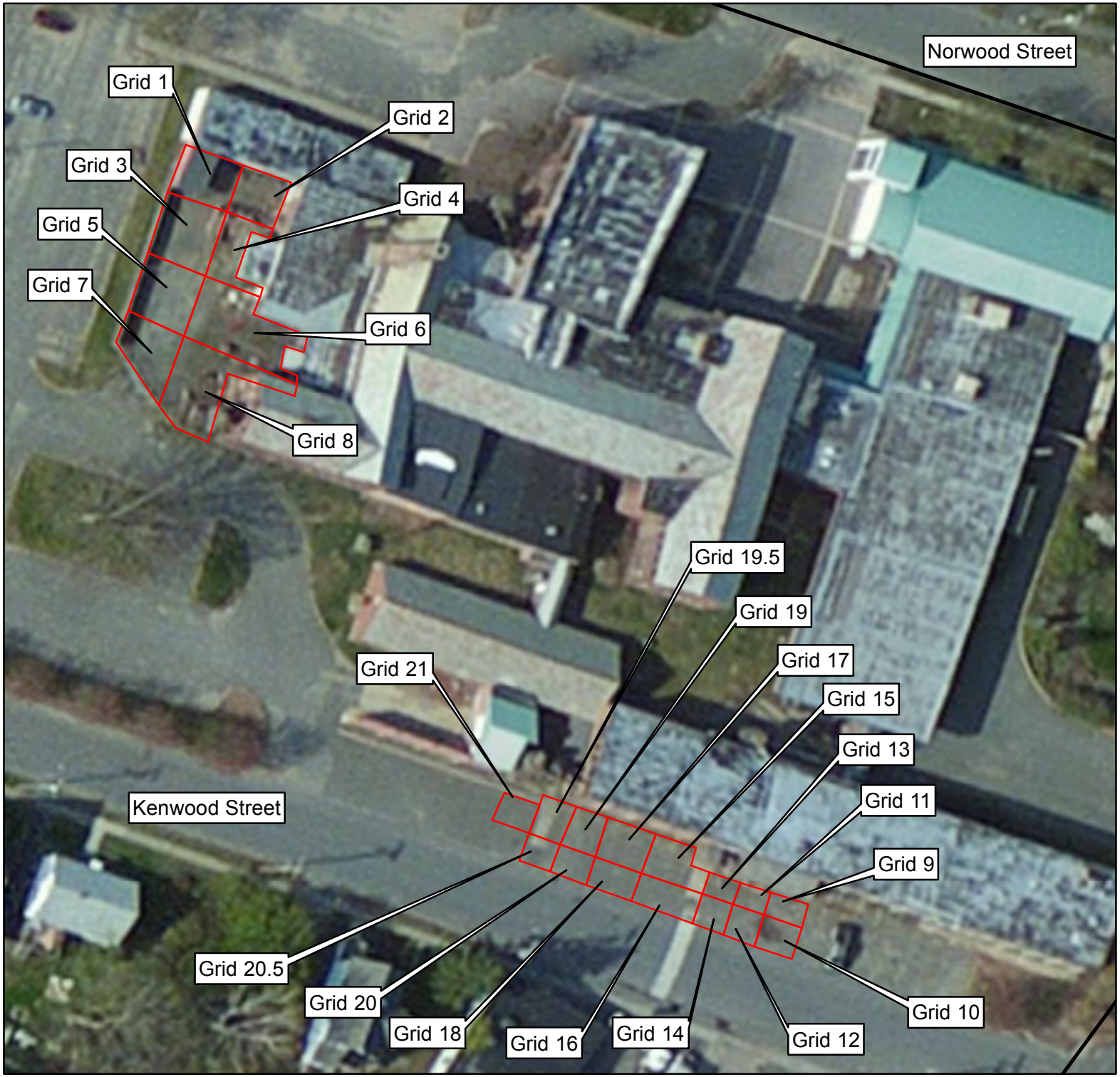


Figure 4

Excavation Grid Diagram

Lunt Silversmiths
298 Federal Street
Greenfield, Massachusetts

EPA Region I
Superfund Technical Assessment and Response Team (START) IV
Contract No. EP-S3-15-01

TDD Number:	TO1-01-15-07-0015
Created by:	B. Mahany
Created on:	2 June 2015
Modified by:	K. Robinson
Modified on:	15 September 2015

Legend

- Site Boundary
- Excavation Grids

N

0 25 50

Feet

Data Sources:

Imagery: ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGP
All other data: START

WESTON SOLUTIONS

E:\MA_gis\Lunt Silversmiths Removal\MXDs\AAR\Figure 4 - Excavation Grid Diagram.mxd

Appendix B

Photodocumentation Log

PHOTODOCUMENTATION LOG
Lunt Silversmiths ● Greenfield, Massachusetts



SCENE: View of the Lunt Silversmiths building and the rear parking lot. Photograph taken facing northeast.

DATE: 8 May 2014 **TIME:** 1042 hours
PHOTOGRAPHER: George Mavris **CAMERA:** Apple/iPhone 4S



SCENE: View of drums and small containers staged in the Drum Storage Area.

DATE: 8 May 2014 **TIME:** 1221 hours
PHOTOGRAPHER: Ken Robinson **CAMERA:** Apple/iPhone 4S



SCENE: View of 1-gallon and smaller containers which include potassium cyanide, and toluene containers.

DATE: 8 May 2014 **TIME:** 1252 hours
PHOTOGRAPHER: Ken Robinson **CAMERA:** Apple/iPhone 4S



SCENE: View of 1-gallon and smaller containers which include potassium cyanide, and toluene containers.

DATE: 8 May 2014 **TIME:** 1252 hours
PHOTOGRAPHER: Ken Robinson **CAMERA:** Apple/iPhone 4S



SCENE: View of the rear courtyard area. Photograph taken facing north.

DATE: 8 May 2014 **TIME:** 1045 hours
PHOTOGRAPHER: George Mavris **CAMERA:** Apple/iPhone 4S



SCENE: View of Lunt Silversmiths site from Federal Street. Photograph taken facing southwest.

DATE: 24 June 2015 **TIME:** 1024 hours
PHOTOGRAPHER: K. Robinson **CAMERA:** iPhone 4S



SCENE: View of various containers collected from the Lunt facility staged prior to hazardous categorization (hazcat) activities. Only identifiable products were collected and staged prior to conducting hazcat activities. Photograph taken facing south.

DATE: 27 May 2015 **TIME:** 1056 hours
PHOTOGRAPHER: K. Robinson **CAMERA:** iPhone 4S



SCENE: View of collected and staged drums of material prepared for hazcat activities. Photograph taken facing east.

DATE: 01 June 2015 **TIME:** 1450 hours
PHOTOGRAPHER: K. Robinson **CAMERA:** iPhone 4S



SCENE: View of START Truck-mounted Geoprobe 540 unit in the rear courtyard during waste stream profile subsurface soil sample collection activities. Photograph taken facing south.
DATE: 03 June 2015 **TIME:** 1320 hours
PHOTOGRAPHER: K. Robinson **CAMERA:** iPhone 4S



SCENE: View of staged materials during bulking activities prior to transportation and disposal. Photograph taken facing southwest.
DATE: 24 June 2015 **TIME:** 1024 hours
PHOTOGRAPHER: K. Robinson **CAMERA:** iPhone 4S



SCENE: View of Resource Conservation and Recovery Act (RCRA)-empty containers loaded for transportation and disposal. Photograph taken facing south.
DATE: 24 June 2015 **TIME:** 1604 hours
PHOTOGRAPHER: K. Robinson **CAMERA:** iPhone 4S



SCENE: View of cyclone dust collector and the area of manual excavation located in the central courtyard. Excavation was conducted to a maximum of 1 foot below ground surface based on field screening data. Photograph taken facing east.
DATE: 24 June 2015 **TIME:** 1604 hours
PHOTOGRAPHER: K. Robinson **CAMERA:** iPhone 4S



SCENE: View of 55-gallon drums containing waste oil stored on site that will be disposed of by the Town of Greenfield. Photograph taken facing northeast.
DATE: 7 July 2015 **TIME:** 1334 hours
PHOTOGRAPHER: K. Robinson **CAMERA:** iPhone 4S



SCENE: View of soil excavation activities in Grid 1, located in the rear courtyard. Photograph taken facing northwest.

DATE: 8 July 2015 **TIME:** 1527 hours
PHOTOGRAPHER: K. Robinson **CAMERA:** iPhone 4S



SCENE: View of geotextile fabric placed at the bottom of the Grid 1 and Grid 2 excavations in the rear courtyard prior to backfill activities. Photograph taken facing northeast.
DATE: 8 July 2015 **TIME:** 1527 hours
PHOTOGRAPHER: K. Robinson **CAMERA:** iPhone 4S



SCENE: View of contaminated soil load out activities conducted in the rear courtyard. Photograph taken facing southwest.
.
DATE: 8 July 2015 **TIME:** 1527 hours
PHOTOGRAPHER: K. Robinson **CAMERA:** iPhone 4S



SCENE: View of compaction and grading operations in the rear courtyard after completion of excavation and backfilling activities. Photograph taken facing north.
DATE: 30 July 2015 **TIME:** 0827 hours
PHOTOGRAPHER: K. Robinson **CAMERA:** iPhone 6



SCENE: View of Grid 1 after excavation, backfilling, compaction, and grading activities were completed. Photograph taken facing northwest.
DATE: 30 July 2015 **TIME:** 0828 hours
PHOTOGRAPHER: K. Robinson **CAMERA:** iPhone 6



SCENE: View of the rear courtyard after excavation, backfilling, compaction, and grading activities were completed. The rear courtyard fence was secured with a chain and padlock upon completion of activities. Photograph taken facing northeast.
DATE: 03 August 2015 **TIME:** 1249 hours
PHOTOGRAPHER: K. Robinson **CAMERA:** iPhone 6



SCENE: View of excavation activities conducted in Grid 9, located north of Kenwood Street. Excavation ceased when an underground natural gas line was encountered. Photograph taken facing east.
DATE: 03 August 2015 **TIME:** 1249 hours
PHOTOGRAPHER: K. Robinson **CAMERA:** iPhone 6



SCENE: View of excavation activities conducted in Grid 14, located north of Kenwood Street. Excavation ceased when groundwater was encountered. Photograph taken facing east.
DATE: 10 August 2015 **TIME:** 1044 hours
PHOTOGRAPHER: K. Robinson **CAMERA:** iPhone 6



SCENE: View of excavation activities conducted in Grid 19 and Grid 20, located north of Kenwood Street. Excavation ceased at 2 feet below ground surface based upon field screening data. Photograph taken facing west.
DATE: 13 August 2015 **TIME:** 1249 hours
PHOTOGRAPHER: K. Robinson **CAMERA:** iPhone 6



SCENE: View of gravel spread and graded at the entrance of the rear courtyard to provide erosion control. Photograph taken facing northeast.
DATE: 26 August 2015 **TIME:** 0745 hours
PHOTOGRAPHER: K. Robinson **CAMERA:** iPhone 6



SCENE: View of the area excavated and backfilled north of Kenwood Street. Photograph taken facing east.

DATE: 26 August 2015 **TIME:** 0745 hours
PHOTOGRAPHER: K. Robinson **CAMERA:** iPhone 6

PHOTODOCUMENTATION LOG
Lunt Silversmiths ● Greenfield, Massachusetts



SCENE: View of the area excavated and backfilled north of Kenwood Street, after completion of asphalt paving. Photograph taken facing northeast.
DATE: 8 September 2015 **TIME:** 1059 hours
PHOTOGRAPHER: K. Robinson **CAMERA:** iPhone 6

Appendix C

Table 1 – Field Screening Summary Results

Table 2 – Confirmatory Analytical Summary Results

Table 3 – Extent of Excavation and Floor Sample Analytical Results

Table 1
Field Screening Summary Results
Lunt Silversmiths Site
Greenfield, Massachusetts

COMPOUND	SAMPLE LOCATION:		Table Mat.	Tank 1	SS-301	SS-302	SS-303
	SAMPLE DEPTH:		NA	NA	0-6 inches	0-6 inches	0-6 inches
	MCP S-1/ GW-2	MCP S-2/ GW-2					
VOLATILE ORGANIC COMPOUNDS (VOCs)			µg/Kg				
Trichloroethylene (TCE)	300	300	ND (20)	ND (20)	ND (20)	ND (20)	6
Tetrachloroethylene (PCE)	10,000	10,000	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
METALS			mg/Kg				
Lead	200	600	ND (5.0)	4	**700**	**320**	69
Arsenic	20	20	ND (5.0)	ND (5.0)	ND (23)	19	**36**

Analytical Procedure:

VOCs prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDVOA2.
Metals prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDXRFNITON4.

Notes:

1) Samples analyzed by US EPA Office of Environmental Measurement and Evaluation (OEME).
2) Bold and yellow highlighted values exceed MA MCP S-1/GW-2.
3) Bold and red highlighted values exceed MA MCP S-2/GW-2.
4) ND = Not detected above reporting limit. Reporting limit in parentheses.
5) µg/Kg = micrograms per Kilogram.
6) mg/Kg = milligrams per Kilogram.
7) MCP = Massachusetts Contingency Plan.

COMPOUND	SAMPLE LOCATION:		SS-304	SS-305	SS-306	SS-307	SS-308
	SAMPLE DEPTH:		0-6 inches	0-6 inches	0-6 inches	0-6 inches	0-6 inches
	MCP S-1/ GW-2	MCP S-2/ GW-2					
VOLATILE ORGANIC COMPOUNDS (VOCs)			µg/Kg				
Trichloroethylene (TCE)	300	300	ND (20)	ND (20)	**630**	ND (20)	**59,000**
Tetrachloroethylene (PCE)	10,000	10,000	ND (10)	ND (10)	ND (10)	ND (10)	6,800
METALS			mg/Kg				
Lead	200	600	**1,000**	97	66	**1,200**	**1,100**
Arsenic	20	20	ND (23)	ND (18)	ND (8.0)	**53**	**43**

Analytical Procedure:

VOCs prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDVOA2.
Metals prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDXRFNITON4.

Notes:

1) Samples analyzed by US EPA Office of Environmental Measurement and Evaluation (OEME).
2) Bold and yellow highlighted values exceed MA MCP S-1/GW-2.
3) Bold and red highlighted values exceed MA MCP S-2/GW-2.
4) ND = Not detected above reporting limit. Reporting limit in parentheses.
5) µg/Kg = micrograms per Kilogram.
6) mg/Kg = milligrams per Kilogram.
7) MCP = Massachusetts Contingency Plan.

Table 1
Field Screening Summary Results
Lunt Silversmiths Site
Greenfield, Massachusetts

COMPOUND	SAMPLE LOCATION: / SAMPLE DEPTH:	MCP S-1/ GW-2	MCP S-2/ GW-2	SS-309 0-6 inches	SS-311 0-6 inches	SS-312 0-6 inches	SS-313 0-6 inches	SS-314 0-6 inches
VOLATILE ORGANIC COMPOUNDS (VOCs)				µg/Kg				
Trichloroethylene (TCE)		300	300	**4,500**	230	ND (20)	27	ND (20)
Tetrachloroethylene (PCE)		10,000	10,000	450	16	ND (10)	ND (10)	ND (10)
METALS				mg/Kg				
Lead		200	600	150	**230**	100	180	87
Arsenic		20	20	13	ND (13)	ND (8)	ND (12)	ND (9)

Analytical Procedure:

VOCs prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDVOA2.
Metals prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDXRFNITON4.

Notes:

1) Samples analyzed by US EPA Office of Environmental Measurement and Evaluation (OEME).
2) Bold and yellow highlighted values exceed MA MCP S-1/GW-2.
3) Bold and red highlighted values exceed MA MCP S-2/GW-2.
4) ND = Not detected above reporting limit. Reporting limit in parentheses.
5) µg/Kg = micrograms per Kilogram.
6) mg/Kg = milligrams per Kilogram.
7) MCP = Massachusetts Contingency Plan.

COMPOUND	SAMPLE LOCATION: / SAMPLE DEPTH:	MCP S-1/ GW-2	MCP S-2/ GW-2	SS-315 0-6 inches	SS-316 0-6 inches	SS-317 0-6 inches	SS-318 0-6 inches	SS-319 0-6 inches
VOLATILE ORGANIC COMPOUNDS (VOCs)				µg/Kg				
Trichloroethylene (TCE)		300	300	ND (20)	ND (20)	140	6	ND (20)
Tetrachloroethylene (PCE)		10,000	10,000	ND (10)	ND (10)	59	ND (10)	ND (10)
METALS				mg/Kg				
Lead		200	600	**200**	50	100	150	65
Arsenic		20	20	ND (12)	ND (7)	ND (8)	12	8

Analytical Procedure:

VOCs prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDVOA2.
Metals prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDXRFNITON4.

Notes:

1) Samples analyzed by US EPA Office of Environmental Measurement and Evaluation (OEME).
2) Bold and yellow highlighted values exceed MA MCP S-1/GW-2.
3) Bold and red highlighted values exceed MA MCP S-2/GW-2.
4) ND = Not detected above reporting limit. Reporting limit in parentheses.
5) µg/Kg = micrograms per Kilogram.
6) mg/Kg = milligrams per Kilogram.
7) MCP = Massachusetts Contingency Plan.

Table 1
Field Screening Summary Results
Lunt Silversmiths Site
Greenfield, Massachusetts

COMPOUND	SAMPLE LOCATION: / SAMPLE DEPTH:	MCP S-1/ GW-2	MCP S-2/ GW-2	SS-320 0-6 inches	SS-321 0-6 inches	SS-322 0-6 inches	SS-323 0-6 inches	SS-324 0-6 inches
VOLATILE ORGANIC COMPOUNDS (VOCs)				µg/Kg				
Trichloroethylene (TCE)		300	300	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)
Tetrachloroethylene (PCE)		10,000	10,000	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
METALS				mg/Kg				
Lead		200	600	**490**	140	44	150	60
Arsenic		20	20	ND (17)	11	ND (7)	ND (10)	ND (7)

Analytical Procedure:

VOCs prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDVOA2.
Metals prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDXRFNITON4.

Notes:

1) Samples analyzed by US EPA Office of Environmental Measurement and Evaluation (OEME).
2) Bold and yellow highlighted values exceed MA MCP S-1/GW-2.
3) Bold and red highlighted values exceed MA MCP S-2/GW-2.
4) ND = Not detected above reporting limit. Reporting limit in parentheses.
5) µg/Kg = micrograms per Kilogram.
6) mg/Kg = milligrams per Kilogram.
7) MCP = Massachusetts Contingency Plan.

COMPOUND	SAMPLE LOCATION: / SAMPLE DEPTH:	MCP S-1/ GW-2	MCP S-2/ GW-2	SS-325 0-6 inches	SS-326 0-6 inches	Grid-01-B 2-feet	Grid-01-C 3-feet	Grid-01-E 5-feet
VOLATILE ORGANIC COMPOUNDS (VOCs)				µg/Kg				
Trichloroethylene (TCE)		300	300	ND (20)	ND (20)	**4,100**	**45,000**	120
Tetrachloroethylene (PCE)		10,000	10,000	ND (10)	ND (10)	490	**10,000**	50
METALS				mg/Kg				
Lead		200	600	**280**	**2,600**	**400**	**260**	21
Arsenic		20	20	ND (14)	**55**	ND (17)	14	ND (5)

Analytical Procedure:

VOCs prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDVOA2.
Metals prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDXRFNITON4.

Notes:

1) Samples analyzed by US EPA Office of Environmental Measurement and Evaluation (OEME).
2) Bold and yellow highlighted values exceed MA MCP S-1/GW-2.
3) Bold and red highlighted values exceed MA MCP S-2/GW-2.
4) ND = Not detected above reporting limit. Reporting limit in parentheses.
5) µg/Kg = micrograms per Kilogram.
6) mg/Kg = milligrams per Kilogram.
7) MCP = Massachusetts Contingency Plan.

Table 1
Field Screening Summary Results
Lunt Silversmiths Site
Greenfield, Massachusetts

COMPOUND	SAMPLE LOCATION: / SAMPLE DEPTH:	MCP S-1/ GW-2	MCP S-2/ GW-2	Grid-02-B 2-feet	Grid-02-C 4-feet	Grid-02-E 5-feet	Grid-03-B 2-feet	Grid-04-B 2-feet
VOLATILE ORGANIC COMPOUNDS (VOCs)				µg/Kg				
Trichloroethylene (TCE)		300	300	**6,100**	**22,000**	**6,300**	**4,600**	**860**
Tetrachloroethylene (PCE)		10,000	10,000	3,300	6,200	2,200	1,300	380
METALS				mg/Kg				
Lead		200	600	**1,900**	**370**	15	73	110
Arsenic		20	20	ND (37)	**23**	ND (5)	17	ND (9)

Analytical Procedure:

VOCs prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDVOA2.
Metals prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDXRFNITON4.

Notes:

1) Samples analyzed by US EPA Office of Environmental Measurement and Evaluation (OEME).
2) Bold and yellow highlighted values exceed MA MCP S-1/GW-2.
3) Bold and red highlighted values exceed MA MCP S-2/GW-2.
4) ND = Not detected above reporting limit. Reporting limit in parentheses.
5) µg/Kg = micrograms per Kilogram.
6) mg/Kg = milligrams per Kilogram.
7) MCP = Massachusetts Contingency Plan.

COMPOUND	SAMPLE LOCATION: / SAMPLE DEPTH:	MCP S-1/ GW-2	MCP S-2/ GW-2	Grid-05-B 2-feet	Grid-05-C 3-feet	Grid-06-B 2-feet	Grid-06-C 3-feet	Grid-07-B 2-feet
VOLATILE ORGANIC COMPOUNDS (VOCs)				µg/Kg				
Trichloroethylene (TCE)		300	300	23	**870**	**31,000**	**7,400**	**32,000**
Tetrachloroethylene (PCE)		10,000	10,000	ND (10)	240	**19,000**	1,900	1,100
METALS				mg/Kg				
Lead		200	600	33	21	45	26	140
Arsenic		20	20	**63**	**34**	ND (7)	ND (14)	**46**

Analytical Procedure:

VOCs prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDVOA2.
Metals prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDXRFNITON4.

Notes:

1) Samples analyzed by US EPA Office of Environmental Measurement and Evaluation (OEME).
2) Bold and yellow highlighted values exceed MA MCP S-1/GW-2.
3) Bold and red highlighted values exceed MA MCP S-2/GW-2.
4) ND = Not detected above reporting limit. Reporting limit in parentheses.
5) µg/Kg = micrograms per Kilogram.
6) mg/Kg = milligrams per Kilogram.
7) MCP = Massachusetts Contingency Plan.

Table 1
Field Screening Summary Results
Lunt Silversmiths Site
Greenfield, Massachusetts

COMPOUND	SAMPLE LOCATION: / SAMPLE DEPTH:	MCP S-1/ GW-2	MCP S-2/ GW-2	Grid-07-C 3-feet	Grid-08-B 2-feet	Grid-09-B 2-feet	Grid-10-B 2-feet	Grid-10-D 4-feet
VOLATILE ORGANIC COMPOUNDS (VOCs)				µg/Kg				
Trichloroethylene (TCE)		300	300	**6,300**	ND (20)	**14,000**	**240,000**	**620**
Tetrachloroethylene (PCE)		10,000	10,000	520	ND (10)	170	1,400	ND (35)
METALS				mg/Kg				
Lead		200	600	66	62	**330**	**260**	20
Arsenic		20	20	18	12	21	15	6

Analytical Procedure:

VOCs prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDVOA2.
Metals prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDXRFNITON4.

Notes:

1) Samples analyzed by US EPA Office of Environmental Measurement and Evaluation (OEME).
2) Bold and yellow highlighted values exceed MA MCP S-1/GW-2.
3) Bold and red highlighted values exceed MA MCP S-2/GW-2.
4) ND = Not detected above reporting limit. Reporting limit in parentheses.
5) µg/Kg = micrograms per Kilogram.
6) mg/Kg = milligrams per Kilogram.
7) MCP = Massachusetts Contingency Plan.

COMPOUND	SAMPLE LOCATION: / SAMPLE DEPTH:	MCP S-1/ GW-2	MCP S-2/ GW-2	Grid-11-B 2-feet	Grid-12-B 2-feet	Grid-13-B 2-feet	Grid-13-D 4-feet	Grid-14-B 2-feet
VOLATILE ORGANIC COMPOUNDS (VOCs)				µg/Kg				
Trichloroethylene (TCE)		300	300	**26,000**	**57,000**	**4,100**	**3,600**	**84,000**
Tetrachloroethylene (PCE)		10,000	10,000	350	350	10	65	510
METALS				mg/Kg				
Lead		200	600	**2,600**	**2,000**	**1717**	**3070**	**400**
Arsenic		20	20	**100**	**100**	**90**	**110**	**220**

Analytical Procedure:

VOCs prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDVOA2.
Metals prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDXRFNITON4.

Notes:

1) Samples analyzed by US EPA Office of Environmental Measurement and Evaluation (OEME).
2) Bold and yellow highlighted values exceed MA MCP S-1/GW-2.
3) Bold and red highlighted values exceed MA MCP S-2/GW-2.
4) ND = Not detected above reporting limit. Reporting limit in parentheses.
5) µg/Kg = micrograms per Kilogram.
6) mg/Kg = milligrams per Kilogram.
7) MCP = Massachusetts Contingency Plan.

Table 1
Field Screening Summary Results
Lunt Silversmiths Site
Greenfield, Massachusetts

COMPOUND	SAMPLE LOCATION: / SAMPLE DEPTH:	MCP S-1/ GW-2	MCP S-2/ GW-2	Grid-14-D 4-feet	Grid-15-B 2-feet	Grid-16-B 2-feet	Grid-16-D 4-feet	Grid-17-B 2-feet
VOLATILE ORGANIC COMPOUNDS (VOCs)				µg/Kg				
Trichloroethylene (TCE)		300	300	**5,800**	**7,300**	**19,000**	130	**310**
Tetrachloroethylene (PCE)		10,000	10,000	93	8	63	ND (35)	ND (35)
METALS				mg/Kg				
Lead		200	600	**766**	**1,160**	**963**	50	135
Arsenic		20	20	**49**	**65**	ND (24)	**29**	**35**

Analytical Procedure:

VOCs prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDVOA2.
Metals prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDXRFNITON4.

Notes:

1) Samples analyzed by US EPA Office of Environmental Measurement and Evaluation (OEME).
2) Bold and yellow highlighted values exceed MA MCP S-1/GW-2.
3) Bold and red highlighted values exceed MA MCP S-2/GW-2.
4) ND = Not detected above reporting limit. Reporting limit in parentheses.
5) µg/Kg = micrograms per Kilogram.
6) mg/Kg = milligrams per Kilogram.
7) MCP = Massachusetts Contingency Plan.

COMPOUND	SAMPLE LOCATION: / SAMPLE DEPTH:	MCP S-1/ GW-2	MCP S-2/ GW-2	Grid-18-B 2-feet	Grid-19-B 2-feet	Grid-20-B 2-feet	Sidewall-19W 2-feet	Sidewall-20W 2-feet
VOLATILE ORGANIC COMPOUNDS (VOCs)				µg/Kg				
Trichloroethylene (TCE)		300	300	19	270	120	84	**2,700**
Tetrachloroethylene (PCE)		10,000	10,000	ND (35)	ND (35)	ND (35)	ND (35)	ND (35)
METALS				mg/Kg				
Lead		200	600	**1,360**	**924**	**815**	**930**	**3,700**
Arsenic		20	20	**63**	**54**	ND (23)	**42**	**127**

Analytical Procedure:

VOCs prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDVOA2.
Metals prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDXRFNITON4.

Notes:

1) Samples analyzed by US EPA Office of Environmental Measurement and Evaluation (OEME).
2) Bold and yellow highlighted values exceed MA MCP S-1/GW-2.
3) Bold and red highlighted values exceed MA MCP S-2/GW-2.
4) ND = Not detected above reporting limit. Reporting limit in parentheses.
5) µg/Kg = micrograms per Kilogram.
6) mg/Kg = milligrams per Kilogram.
7) MCP = Massachusetts Contingency Plan.

Table 1
Field Screening Summary Results
Lunt Silversmiths Site
Greenfield, Massachusetts

COMPOUND	SAMPLE LOCATION: / SAMPLE DEPTH:	MCP S-1/ GW-2	MCP S-2/ GW-2	Grid-19.5-B 2-feet	Grid-20.5 2-feet	Grid-21-B 2-feet	Sidewall-21-S 2-feet	Sidewall-21-W 2-feet
VOLATILE ORGANIC COMPOUNDS (VOCs)				µg/Kg				
Trichloroethylene (TCE)		300	300	**8,400**	150	100	ND (25)	ND (25)
Tetrachloroethylene (PCE)		10,000	10,000	ND (35)	ND (35)	ND (35)	ND (35)	ND (35)
METALS				mg/Kg				
Lead		200	600	**710**	**5,800**	182	29	38
Arsenic		20	20	ND (22)	**330**	ND (11)	ND (6)	ND (6)

Analytical Procedure:

VOCs prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDVOA2.
Metals prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDXRFNITON4.

Notes:

1) Samples analyzed by US EPA Office of Environmental Measurement and Evaluation (OEME).
2) Bold and yellow highlighted values exceed MA MCP S-1/GW-2.
3) Bold and red highlighted values exceed MA MCP S-2/GW-2.
4) ND = Not detected above reporting limit. Reporting limit in parentheses.
5) µg/Kg = micrograms per Kilogram.
6) mg/Kg = milligrams per Kilogram.
7) MCP = Massachusetts Contingency Plan.

COMPOUND	SAMPLE LOCATION: / SAMPLE DEPTH:	MCP S-1/ GW-2	MCP S-2/ GW-2					
VOLATILE ORGANIC COMPOUNDS (VOCs)								
Trichloroethylene (TCE)		300	300					
Tetrachloroethylene (PCE)		10,000	10,000					
METALS								
Lead		200	600					
Arsenic		20	20					

Analytical Procedure:

VOCs prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDVOA2.
Metals prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDXRFNITON4.

Notes:

1) Samples analyzed by US EPA Office of Environmental Measurement and Evaluation (OEME).
2) Bold and yellow highlighted values exceed MA MCP S-1/GW-2.
3) Bold and red highlighted values exceed MA MCP S-2/GW-2.
4) ND = Not detected above reporting limit. Reporting limit in parentheses.
5) µg/Kg = micrograms per Kilogram.
6) mg/Kg = milligrams per Kilogram.
7) MCP = Massachusetts Contingency Plan.

Table 2
Confirmatory Analytical Summary Results
Lunt Silversmiths Site
Greenfield, Massachusetts

COMPOUND	SAMPLE LOCATION:		SS-01	SS-02	SS-03	SS-04	SS-05
	SAMPLE DEPTH:		0-6 inches	0-6 inches	0-6 inches	0-6 inches	0-6 inches
	MCP S-1 / GW-2	MCP S-2 / GW-2					
Volatile Organic Compounds (VOCs)			micrograms per Kilogram (µg/Kg)				
2-Propanone (acetone)	50,000	50,000	ND (100)	ND (70)	ND (84)	84	ND (83)
Trans-1,2-Dichloroethylene	NL	NL	ND (100)	ND (70)	ND (84)	ND (75)	ND (83)
cis-1,2-Dichloroethylene	NL	NL	ND (100)	ND (70)	ND (84)	ND (75)	ND (83)
Trichloroethylene (TCE)	300	300	ND (100)	ND (70)	ND (84)	ND (75)	ND (83)
Tetrachloroethylene (PCE)	10,000	10,000	ND (100)	ND (70)	ND (84)	ND (75)	ND (83)
Naphthalene	20,000	20,000	ND (100)	ND (70)	ND (84)	ND (75)	ND (83)
Metals			milligrams per Kilogram (mg/Kg)				
Silver	100	200	**860**	26	18	**130**	22
Aluminum	NL	NL	16,000	13,000	15,000	8,600	13,000
Arsenic	20	20	ND (5.3)	ND (5.3)	ND (5.0)	9.3	ND (5.0)
Barium	1,000	3,000	58	47	61	67	55
Calcium	NL	NL	1,700	1,100	1,700	1,700	2,500
Cadmium	70	100	ND (2.6)	ND (2.6)	ND (2.5)	ND (2.6)	ND (2.5)
Cobalt	NL	NL	12	9.2	11	7	9.6
Chromium*	100	200	27	20	24	19	25
Copper	NL	NL	130	42	32	69	50
Iron	NL	NL	27,000	26,000	23,000	188,000	24,000
Magnesium	NL	NL	6,100	4,800	5,900	3,700	5,600
Manganese	NL	NL	480 J1	370	460	310	400
Nickel	600	1,000	32	24	24	27	22
Lead	200	600	32	25	36	130	48
Antimony	20	30	ND (5.3) J1	ND (5.3)	ND (5.0)	ND (5.3)	ND (5.0)
Selenium	400	700	ND (11)	ND (11)	ND (10)	ND (11)	ND (10)
Thallium	8	60	ND (5.3)	ND (5.3)	ND (5.0)	ND (5.3)	ND (5.0)
Vanadium	400	700	68	29	33	25	35
Zinc	1,000	3,000	86	75	74	130	110

Analytical Procedure:

VOCs prepared and analyzed according to:

EPA Region I SOP EIASOP-VOAGCMS9

Metals prepared and analyzed according to:

EPA Region I SOP, EIASOP-INGMETALSPREP8

EPA Region I SOP, EIASOP-OPTIMASO1

Notes:

1) Samples analyzed by U.S. EPA Office of Environmental Measurement and Evaluation (OEME).
2) Bold and yellow highlighted values exceed MA MCP S-1/GW-2. Bold and red highlighted values exceed MA MCP S-2/GW-2.
3) NL = not listed. ND = not detected above reporting limit. Reporting limit shown in parentheses.
4) * = Chromium IV values used as regulatory standard due to non-speciation of chromium analysis.
5) Samples with all non-detected results are not included in this table. In addition, only compounds with results above the reporting limit are presented. Refer to Appendix E.
6) J1 = Estimated value due to matrix spike recovery outside acceptance criteria.
7) J3 = Estimated value due to relative percent difference result outside acceptance criteria.

Table 2
Confirmatory Analytical Summary Results
Lunt Silversmiths Site
Greenfield, Massachusetts

COMPOUND	SAMPLE LOCATION:	SS-06	SS-07	SS-08	SS-09	SS-10
	SAMPLE DEPTH:	0-6 inches	0-6 inches	0-6 inches	0-6 inches	0-6 inches
	MCP S-1 / GW-2	MCP S-2 / GW-2					
Volatile Organic Compounds (VOCs)			µg/Kg				
2-Propanone (acetone)	50,000	50,000	ND (57)	ND (65)	ND (75)	ND (82)	ND (120)
Trans-1,2-Dichloroethylene	NL	NL	ND (57)	ND (65)	ND (75)	ND (82)	ND (120)
cis-1,2-Dichloroethylene	NL	NL	ND (57)	ND (65)	ND (75)	ND (82)	ND (120)
Trichloroethylene (TCE)	300	300	ND (57)	ND (65)	ND (75)	110	ND (120)
Tetrachloroethylene (PCE)	10,000	10,000	ND (57)	ND (65)	ND (75)	ND (82)	ND (120)
Naphthalene	20,000	20,000	ND (57)	ND (65)	ND (75)	ND (82)	ND (120)
Metals			mg/Kg				
Silver	100	200	**1,400**	60	68	**270**	50
Aluminum	NL	NL	9,900	8,500	13,000	13,000	15,000
Arsenic	20	20	ND (10)	5.9	5.9	8.2	6.2
Barium	1,000	3,000	77	31	65	370	74
Calcium	NL	NL	1,800	990	1,500	1,700	1,700
Cadmium	70	100	ND (5.0)	ND (2.5)	ND (2.4)	ND (2.6)	ND (2.5)
Cobalt	NL	NL	ND (10)	ND (5.0)	7.3	8.2	9
Chromium*	100	200	22	16	22	37	23
Copper	NL	NL	1,000	25	120	230	69
Iron	NL	NL	19,000	11,000	19,000	23,000	21,000
Magnesium	NL	NL	4,100	1,900	4,100	3,900	4,900
Manganese	NL	NL	370	220	280	300	380
Nickel	600	1,000	35	9.6	31	51	27
Lead	200	600	**730**	24	130	**310**	140
Antimony	20	30	**20**	ND (5.0)	ND (4.8)	ND (5.3)	ND (5.0)
Selenium	400	700	ND (20)	ND (10)	ND (9.5)	ND (11)	ND (10)
Thallium	8	60	ND (10)	ND (5.0)	ND (4.8)	ND (5.3)	ND (5.0)
Vanadium	400	700	37	19	35	38	35
Zinc	1,000	3,000	440	160	100	**1,100**	85

Analytical Procedure:

VOCs prepared and analyzed according to:
EPA Region I SOP EIASOP-VOAGCMS9

Metals prepared and analyzed according to:
EPA Region I SOP, EIASOP-INGMETALSPREP8
EPA Region I SOP, EIASOP-OPTIMASO1

Notes:

1) Samples analyzed by U.S. EPA Office of Environmental Measurement and Evaluation (OEME).
2) Bold and yellow highlighted values exceed MA MCP S-1/GW-2. Bold and red highlighted values exceed MA MCP S-2/GW-2.
3) NL = not listed. ND = not detected above reporting limit. Reporting limit shown in parentheses.
4) * = Chromium IV values used as regulatory standard due to non-speciation of chromium analysis.
5) Samples with all non-detected results are not included in this table. In addition, only compounds with results above the reporting limit are presented. Refer to Appendix E.
6) J1 = Estimated value due to matrix spike recovery outside acceptance criteria.
7) J3 = Estimated value due to relative percent difference result outside acceptance criteria.

Table 2
Confirmatory Analytical Summary Results
Lunt Silversmiths Site
Greenfield, Massachusetts

COMPOUND	SAMPLE LOCATION: / SAMPLE DEPTH:	MCP S-1 / GW-2	MCP S-2 / GW-2	SS-311 0-6 inches	SS-317 0-6 inches	Grid-06-B 2-feet	Grid-06-C 3-feet	Grid-09-B 2-feet
Volatile Organic Compounds (VOCs)				µg/Kg				
2-Propanone (acetone)		50,000	50,000	ND (60)	ND (61)	ND (2,400)	ND (270)	ND (560)
Trans-1,2-Dichloroethylene		NL	NL	ND (60)	ND (61)	ND (2,400)	ND (270)	ND (560)
cis-1,2-Dichloroethylene		NL	NL	ND (60)	ND (61)	37,000	320	7,700
Trichloroethylene (TCE)		300	300	**330**	240	**25,000**	**15,000**	**30,000**
Tetrachloroethylene (PCE)		10,000	10,000	ND (60)	99	**13,000**	3,700	ND (560)
Naphthalene		20,000	20,000	ND (60)	ND (61)	ND (2,400)	ND (270)	ND (560)
Metals				mg/Kg				
Silver		100	200	**760**	**180**	41	21	44
Aluminum		NL	NL	9,600	12,000	10,000	12,000	16,000
Arsenic		20	20	ND (10)	ND (10)	7.5	4.2	11
Barium		1,000	3,000	30	50	25	32	180
Calcium		NL	NL	800	1,400	720	680	1,900
Cadmium		70	100	ND (5.0)	ND (5.1)	ND (1.0)	ND (1.0)	ND (1.0)
Cobalt		NL	NL	ND (10)	ND (10)	4.7	3.9	11
Chromium*		100	200	15	26	16	18	37
Copper		NL	NL	160	84	82	51	190
Iron		NL	NL	17,000	17,000	18,000	16,000	24,000
Magnesium		NL	NL	2,600	3,300	2,300	2,100	5,700
Manganese		NL	NL	170	250	190	150	380
Nickel		600	1,000	17	23	23	16	40
Lead		200	600	**300**	110	37	27	**540**
Antimony		20	30	ND (10)	ND (10) J1	ND (2.0)	ND (2.0)	11
Selenium		400	700	ND (20)	ND (20)	ND (4.1)	ND (4.1)	ND (4.0)
Thallium		8	60	ND (10)	ND (10)	ND (2.0)	ND (2.0)	ND (4.0)
Vanadium		400	700	32	30	24	24	38
Zinc		1,000	3,000	150	130	54	50	200

Analytical Procedure:

VOCs prepared and analyzed according to:
EPA Region I SOP EIASOP-VOAGCMS9

Metals prepared and analyzed according to:
EPA Region I SOP, EIASOP-INGMETALSPREP8
EPA Region I SOP, EIASOP-OPTIMASO1

Notes:

1) Samples analyzed by U.S. EPA Office of Environmental Measurement and Evaluation (OEME).
2) Bold and yellow highlighted values exceed MA MCP S-1/GW-2. Bold and red highlighted values exceed MA MCP S-2/GW-2.
3) NL = not listed. ND = not detected above reporting limit. Reporting limit shown in parentheses.
4) * = Chromium IV values used as regulatory standard due to non-speciation of chromium analysis.
5) Samples with all non-detected results are not included in this table. In addition, only compounds with results above the reporting limit are presented. Refer to Appendix E.
6) J1 = Estimated value due to matrix spike recovery outside acceptance criteria.
7) J3 = Estimated value due to relative percent difference result outside acceptance criteria.

Table 2
Confirmatory Analytical Summary Results
Lunt Silversmiths Site
Greenfield, Massachusetts

COMPOUND	SAMPLE LOCATION: / SAMPLE DEPTH: MCP S-1 / GW-2	MCP S-2 / GW-2	Grid-10-B 2-feet	Grid-10-D 4-feet	Grid-11-B 2-feet	Grid-12-B 2-feet	Grid-13-B 2-feet
Volatile Organic Compounds (VOCs)			µg/Kg				
2-Propanone (acetone)	50,000	50,000	25,000	ND (100)	ND (1,200)	ND (3,400)	ND (230)
Trans-1,2-Dichloroethylene	NL	NL	ND (21,000)	170	ND (1,200)	ND (3,400)	440
cis-1,2-Dichloroethylene	NL	NL	ND (21,000)	460	7,200	12,000	ND (230)
Trichloroethylene (TCE)	300	300	**560,000**	**1,500**	**110,000**	**240,000**	**16,000**
Tetrachloroethylene (PCE)	10,000	10,000	ND (21,000)	ND (100)	1,400	ND (3,400)	ND (230)
Naphthalene	20,000	20,000	ND (21,000)	ND (100)	ND (1,200)	ND (3,400)	290 B
Metals			mg/Kg				
Silver	100	200	36	ND (2.0)	35	14	2.4
Aluminum	NL	NL	6,800	33,000	5,900	9,400	8,900
Arsenic	20	20	**42**	8.3	**39**	**28**	**29**
Barium	1,000	3,000	120	180	110	110	41
Calcium	NL	NL	2,600	3,600	2,400	2,400	1,400
Cadmium	70	100	ND (2.0)	ND (2.0)	ND (1.9)	ND (3.1)	ND (1.0)
Cobalt	NL	NL	7.5	23	7	9.1	4.5
Chromium*	100	200	15	55	13	17	16
Copper	NL	NL	540	49	490	770	570
Iron	NL	NL	25,000	44,000	23,000	21,000	21,000
Magnesium	NL	NL	2,000	13,000	1,900	2,000	2,200
Manganese	NL	NL	200	800	170	130	98 J1
Nickel	600	1,000	24	50	29	31	15
Lead	200	600	**3,400**	13	**3,100**	**4,200**	**2,500**
Antimony	20	30	**110**	ND (4.0)	**110**	**66**	**86 J1**
Selenium	400	700	ND (8.0)	ND (8.0)	ND (7.7)	ND (12)	ND (4.0)
Thallium	8	60	ND (8.0)	ND (8.0)	ND (7.7)	ND (12)	ND (4.0)
Vanadium	400	700	29	74	29	28	24
Zinc	1,000	3,000	140	110	120	150	45

Analytical Procedure:

VOCs prepared and analyzed according to:
EPA Region I SOP EIASOP-VOAGCMS9

Metals prepared and analyzed according to:
EPA Region I SOP, EIASOP-INGMETALSPREP8
EPA Region I SOP, EIASOP-OPTIMASO1

Notes:

1) Samples analyzed by U.S. EPA Office of Environmental Measurement and Evaluation (OEME).
2) Bold and yellow highlighted values exceed MA MCP S-1/GW-2. Bold and red highlighted values exceed MA MCP S-2/GW-2.
3) NL = not listed. ND = not detected above reporting limit. Reporting limit shown in parentheses.
4) * = Chromium IV values used as regulatory standard due to non-speciation of chromium analysis.
5) Samples with all non-detected results are not included in this table. In addition, only compounds with results above the reporting limit are presented. Refer to Appendix E.
6) J1 = Estimated value due to matrix spike recovery outside acceptance criteria.
7) J3 = Estimated value due to relative percent difference result outside acceptance criteria.

Table 2
Confirmatory Analytical Summary Results
Lunt Silversmiths Site
Greenfield, Massachusetts

COMPOUND	SAMPLE LOCATION: / SAMPLE DEPTH: MCP S-1 / GW-2	MCP S-2 / GW-2	Grid-13-D 4-feet	Grid-14-B 2-feet	Grid-14-D 4-feet	Grid-15-B 2-feet	Grid-16-D 4-feet
Volatile Organic Compounds (VOCs)			µg/Kg				
2-Propanone (acetone)	50,000	50,000	ND (300)	ND (5,900)	ND (540)	ND (490)	ND (52)
Trans-1,2-Dichloroethylene	NL	NL	ND (300)	ND (5,900)	ND (540)	ND (490)	ND (52)
cis-1,2-Dichloroethylene	NL	NL	580	22,000	640	ND (490)	ND (52)
Trichloroethylene (TCE)	300	300	**24,000**	**300,000**	**25,000**	**34,000**	150
Tetrachloroethylene (PCE)	10,000	10,000	340	ND (5,900)	ND (540)	ND (490)	ND (52)
Naphthalene	20,000	20,000	ND (300)	ND (5,900)	ND (540)	ND (490)	ND (52)
Metals			mg/Kg				
Silver	100	200	ND (16)	9.1	3.2	43	ND (5.4)
Aluminum	NL	NL	10,000	8,700	7,400	6,500	23,000
Arsenic	20	20	**32**	**86**	16	**77**	**39**
Barium	1,000	3,000	59	110	46	58	130
Calcium	NL	NL	2,200	2,200	1,200	1,100	1,700
Cadmium	70	100	ND (16)	ND (3.0)	ND (1.1)	1.1	ND (5.4)
Cobalt	NL	NL	ND (32)	6.1	3.9	4.4	ND (11)
Chromium*	100	200	ND (32)	24	14	15	33
Copper	NL	NL	1,700	1,000	350	290	50
Iron	NL	NL	15,000	32,000	15,000	24,000	41,000
Magnesium	NL	NL	2,500	1,900	2,600	2,300	7,700
Manganese	NL	NL	91	100	95	130	230
Nickel	600	1,000	ND (32)	22	33	18	42
Lead	200	600	**28,000**	**5,700**	**1,100**	**1,500**	39
Antimony	20	30	**670 J3**	**140**	**26**	**52**	ND (11)
Selenium	400	700	ND (64)	ND (12)	ND (4.2)	ND (4.1)	ND (22)
Thallium	8	60	ND (64)	ND (12)	ND (4.2)	ND (4.1)	ND (22)
Vanadium	400	700	23	32	17	68	47
Zinc	1,000	3,000	170 J3	160	56	110	110

Analytical Procedure:

VOCs prepared and analyzed according to:
EPA Region I SOP EIASOP-VOAGCMS9

Metals prepared and analyzed according to:
EPA Region I SOP, EIASOP-INGMETALSPREP8
EPA Region I SOP, EIASOP-OPTIMASO1

Notes:

1) Samples analyzed by U.S. EPA Office of Environmental Measurement and Evaluation (OEME).
2) Bold and yellow highlighted values exceed MA MCP S-1/GW-2. Bold and red highlighted values exceed MA MCP S-2/GW-2.
3) NL = not listed. ND = not detected above reporting limit. Reporting limit shown in parentheses.
4) * = Chromium IV values used as regulatory standard due to non-speciation of chromium analysis.
5) Samples with all non-detected results are not included in this table. In addition, only compounds with results above the reporting limit are presented. Refer to Appendix E.
6) J1 = Estimated value due to matrix spike recovery outside acceptance criteria.
7) J3 = Estimated value due to relative percent difference result outside acceptance criteria.

Table 2
Confirmatory Analytical Summary Results
Lunt Silversmiths Site
Greenfield, Massachusetts

COMPOUND	SAMPLE LOCATION: / SAMPLE DEPTH:	MCP S-1 / GW-2	MCP S-2 / GW-2	Grid-17-B 2-feet	Grid-18-B 2-feet	Grid-20.5 2-feet	Grid-21-B 2-feet	Sidewall-21-S 2-feet
Volatile Organic Compounds (VOCs)				µg/Kg				
2-Propanone (acetone)		50,000	50,000	ND (61)	ND (41)	ND (55)	ND (41)	ND (45)
Trans-1,2-Dichloroethylene		NL	NL	ND (61)	ND (41)	ND (55)	ND (41)	ND (45)
cis-1,2-Dichloroethylene		NL	NL	ND (61)	ND (41)	ND (55)	ND (41)	ND (45)
Trichloroethylene (TCE)		300	300	**950**	ND (41)	130	**400**	ND (45)
Tetrachloroethylene (PCE)		10,000	10,000	ND (61)	ND (41)	ND (55)	ND (41)	ND (45)
Naphthalene		20,000	20,000	ND (61)	ND (41)	ND (55)	ND (41)	ND (45)
Metals				mg/Kg				
Silver		100	200	9	6.7	7.4	35	ND (2.0)
Aluminum		NL	NL	5,800	9,800	17,000	7,700	8,700
Arsenic		20	20	**49**	**44**	15	4.4	2.8
Barium		1,000	3,000	28	63	110	24	19
Calcium		NL	NL	900	1300	1,800	640	840
Cadmium		70	100	37	ND (2.0)	ND (2.0)	ND (0.98)	ND (1.0)
Cobalt		NL	NL	3.1	6	15	4.7	4.3
Chromium*		100	200	12	18	30	15	13
Copper		NL	NL	37	880	210	100	64
Iron		NL	NL	17,000	31,000	34,000	15,000	14,000
Magnesium		NL	NL	2,300	2,600	7,100	2,900	3,200
Manganese		NL	NL	100	160	340	130	130
Nickel		600	1,000	13	24	31	17	16
Lead		200	600	130	**2,600**	**630**	150	17
Antimony		20	30	7.7	**44**	15 J1	3.3	ND (2.0)
Selenium		400	700	ND (3.9)	ND (8.0)	ND (7.8)	ND (3.9)	ND (4.0)
Thallium		8	60	ND (3.9)	ND (8.0)	ND (7.8)	ND (3.9)	ND (4.0)
Vanadium		400	700	17	32	41	15	15
Zinc		1,000	3,000	69	66	120	140	85

Analytical Procedure:

VOCs prepared and analyzed according to:
EPA Region I SOP EIASOP-VOAGCMS9

Metals prepared and analyzed according to:
EPA Region I SOP, EIASOP-INGMETALSPREP8
EPA Region I SOP, EIASOP-OPTIMASO1

Notes:

1) Samples analyzed by U.S. EPA Office of Environmental Measurement and Evaluation (OEME).
2) Bold and yellow highlighted values exceed MA MCP S-1/GW-2. Bold and red highlighted values exceed MA MCP S-2/GW-2.
3) NL = not listed. ND = not detected above reporting limit. Reporting limit shown in parentheses.
4) * = Chromium IV values used as regulatory standard due to non-speciation of chromium analysis.
5) Samples with all non-detected results are not included in this table. In addition, only compounds with results above the reporting limit are presented. Refer to Appendix E.
6) J1 = Estimated value due to matrix spike recovery outside acceptance criteria.
7) J3 = Estimated value due to relative percent difference result outside acceptance criteria.

Table 2
Confirmatory Analytical Summary Results
Lunt Silversmiths Site
Greenfield, Massachusetts

COMPOUND	SAMPLE LOCATION:		Sidewall-21-W				
	SAMPLE DEPTH:		2-feet				
	MCP S-1 / GW-2	MCP S-2 / GW-2					
Volatile Organic Compounds (VOCs)			µg/Kg				
2-Propanone (acetone)	50,000	50,000	ND (47)				
Trans-1,2-Dichloroethylene	NL	NL	ND (47)				
cis-1,2-Dichloroethylene	NL	NL	ND (47)				
Trichloroethylene (TCE)	300	300	ND (47)				
Tetrachloroethylene (PCE)	10,000	10,000	ND (47)				
Naphthalene	20,000	20,000	ND (47)				
Metals			mg/Kg				
Silver	100	200	20				
Aluminum	NL	NL	8,800				
Arsenic	20	20	4.7				
Barium	1,000	3,000	27				
Calcium	NL	NL	670				
Cadmium	70	100	ND (0.98)				
Cobalt	NL	NL	4.6				
Chromium*	100	200	13				
Copper	NL	NL	110				
Iron	NL	NL	14,000				
Magnesium	NL	NL	2,900				
Manganese	NL	NL	130				
Nickel	600	1,000	29				
Lead	200	600	**200**				
Antimony	20	30	3.1				
Selenium	400	700	ND (3.9)				
Thallium	8	60	ND (3.9)				
Vanadium	400	700	16				
Zinc	1,000	3,000	130				

Analytical Procedure:

VOCs prepared and analyzed according to:
EPA Region I SOP EIASOP-VOAGCMS9

Metals prepared and analyzed according to:
EPA Region I SOP, EIASOP-INGMETALSPREP8
EPA Region I SOP, EIASOP-OPTIMASO1

Notes:

1) Samples analyzed by U.S. EPA Office of Environmental Measurement and Evaluation (OEME).
2) Bold and yellow highlighted values exceed MA MCP S-1/GW-2. Bold and red highlighted values exceed MA MCP S-2/GW-2.
3) NL = not listed. ND = not detected above reporting limit. Reporting limit shown in parentheses.
4) * = Chromium IV values used as regulatory standard due to non-speciation of chromium analysis.
5) Samples with all non-detected results are not included in this table. In addition, only compounds with results above the reporting limit are presented. Refer to Appendix E.
6) J1 = Estimated value due to matrix spike recovery outside acceptance criteria.
7) J3 = Estimated value due to relative percent difference result outside acceptance criteria.

Table 3
Extent of Excavation and Floor Sample Analytical Results
Lunt Silversmiths Site
Greenfield, Massachusetts

COMPOUND	EPA RML HQ1	MCP S-1/ GW-2	MCP S-2/ GW-2	EXCAVATION GRID:	Grid-01	Grid-02	Grid-03	Grid-04	Grid-05
				MAXIMUM EXCAVATION DEPTH:	5-feet	5-feet	2-feet	2-feet	3-feet
VOLATILE ORGANIC COMPOUNDS (VOCs)					µg/Kg				
Trichloroethylene (TCE)	19,000	300	300		120	**6,300**	**4,600**	**860**	**870**
Tetrachloroethylene (PCE)	390,000	10,000	10,000		50	2,200	1,300	380	240
METALS					mg/Kg				
Lead	800	200	600		21	15	73	110	21
Arsenic	300	20	20		ND (5)	ND (5)	17	ND (9)	**34**

Analytical Procedure:

VOCs prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDVOA2.
Metals prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDXRFNITON4.

Excavation Protocols:

* - An asphalt cap was applied to the backfilled grid, therefore, subsurface material does not pose a contact threat.

** - Excavation was terminated due to groundwater or subsurface utilities encountered.

Notes:

1) Samples analyzed by US EPA Office of Environmental Measure and Evaluation (OEME).
2) Bold and yellow highlighted values exceed MCP S-1/GW-2.
3) Bold and red highlighted values exceed MCP S-2/GW-2.
4) ND = Not detected above reporting limit. Reporting limit in parentheses.
5) µg/Kg = micrograms per Kilogram; mg/Kg = milligrams per Kilogram.
6) RML HQ1 = Removal Management Level, Hazard Quotient equals 1.
7) MCP = Massachusetts Contingency Plan.

COMPOUND	EPA RML HQ1	MCP S-1/ GW-2	MCP S-2/ GW-2	EXCAVATION GRID:	Grid-06	Grid-07	Grid-08	Grid-09**	Grid-10
				MAXIMUM EXCAVATION DEPTH:	3-feet	3-feet	2-feet	2-feet	4-feet
VOLATILE ORGANIC COMPOUNDS (VOCs)					µg/Kg				
Trichloroethylene (TCE)	19,000	300	300		**7,400**	**6,300**	ND (20)	**14,000**	**620**
Tetrachloroethylene (PCE)	390,000	10,000	10,000		1,900	520	ND (10)	170	ND (35)
METALS					mg/Kg				
Lead	800	200	600		26	66	62	**330**	20
Arsenic	300	20	20		ND (14)	18	12	**21**	6

Analytical Procedure:

VOCs prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDVOA2.
Metals prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDXRFNITON4.

Excavation Protocols:

* - An asphalt cap was applied to the backfilled grid, therefore, subsurface material does not pose a contact threat.

** - Excavation was terminated due to groundwater or subsurface utilities encountered.

Notes:

1) Samples analyzed by US EPA Office of Environmental Measure and Evaluation (OEME).
2) Bold and yellow highlighted values exceed MCP S-1/GW-2.
3) Bold and red highlighted values exceed MCP S-2/GW-2.
4) ND = Not detected above reporting limit. Reporting limit in parentheses.
5) µg/Kg = micrograms per Kilogram; mg/Kg = milligrams per Kilogram.
6) RML HQ1 = Removal Management Level, Hazard Quotient equals 1.
7) MCP = Massachusetts Contingency Plan.

Table 3
Extent of Excavation and Floor Sample Analytical Results
Lunt Silversmiths Site
Greenfield, Massachusetts

COMPOUND	EPA RML HQ1	MCP S-1/ GW-2	MCP S-2/ GW-2	EXCAVATION GRID:	Grid-11**	Grid-12**	Grid-13	Grid-14**	Grid-15
				MAXIMUM EXCAVATION DEPTH:	2-feet	2-feet	4-feet	4-feet	2-feet
VOLATILE ORGANIC COMPOUNDS (VOCs)					µg/Kg				
Trichloroethylene (TCE)	19,000	300	300		**26,000**	**57,000**	**3,600**	**5,800**	**7,300**
Tetrachloroethylene (PCE)	390,000	10,000	10,000		350	350	65	93	8
METALS					mg/Kg				
Lead	800	200	600		**2,600**	**2,000**	**3,070**	**766**	**1,160**
Arsenic	300	20	20		**100**	**100**	**110**	**49**	**65**

Analytical Procedure:

VOCs prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDVOA2.
Metals prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDXRFNITON4.

Excavation Protocols:

* - An asphalt cap was applied to the backfilled grid, therefore, subsurface material does not pose a contact threat.

** - Excavation was terminated due to groundwater or subsurface utilities encountered.

Notes:

1) Samples analyzed by US EPA Office of Environmental Measure and Evaluation (OEME).
2) Bold and yellow highlighted values exceed MCP S-1/GW-2.
3) Bold and red highlighted values exceed MCP S-2/GW-2.
4) ND = Not detected above reporting limit. Reporting limit in parentheses.
5) µg/Kg = micrograms per Kilogram; mg/Kg = milligrams per Kilogram.
6) RML HQ1 = Removal Management Level, Hazard Quotient equals 1.
7) MCP = Massachusetts Contingency Plan.

COMPOUND	EPA RML HQ1	MCP S-1/ GW-2	MCP S-2/ GW-2	EXCAVATION GRID:	Grid-16	Grid-17	Grid-18*	Grid-19*	Grid-19.5
				MAXIMUM EXCAVATION DEPTH:	4-feet	2-feet	2-feet	2-feet	2-feet
VOLATILE ORGANIC COMPOUNDS (VOCs)					µg/Kg				
Trichloroethylene (TCE)	19,000	300	300		130	**310**	19	270	**8,400**
Tetrachloroethylene (PCE)	390,000	10,000	10,000		ND (35)	ND (35)	ND (35)	ND (35)	ND (35)
METALS					mg/Kg				
Lead	800	200	600		50	135	**1,360**	**924**	**710**
Arsenic	300	20	20		**29**	**35**	**63**	**54**	ND (22)

Analytical Procedure:

VOCs prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDVOA2.
Metals prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDXRFNITON4.

Excavation Protocols:

* - An asphalt cap was applied to the backfilled grid, therefore, subsurface material does not pose a contact threat.

** - Excavation was terminated due to groundwater or subsurface utilities encountered.

Notes:

1) Samples analyzed by US EPA Office of Environmental Measure and Evaluation (OEME).
2) Bold and yellow highlighted values exceed MCP S-1/GW-2.
3) Bold and red highlighted values exceed MCP S-2/GW-2.
4) ND = Not detected above reporting limit. Reporting limit in parentheses.
5) µg/Kg = micrograms per Kilogram; mg/Kg = milligrams per Kilogram.
6) RML HQ1 = Removal Management Level, Hazard Quotient equals 1.
7) MCP = Massachusetts Contingency Plan.

Table 3
Extent of Excavation and Floor Sample Analytical Results
Lunt Silversmiths Site
Greenfield, Massachusetts

COMPOUND	EPA RML HQ1	MCP S-1/ GW-2	MCP S-2/ GW-2	EXCAVATION GRID:	Grid-20-B*	Grid-20.5*	Grid-21		
				MAXIMUM EXCAVATION DEPTH:	2-feet	2-feet	2-feet		
VOLATILE ORGANIC COMPOUNDS (VOCs)					µg/Kg				
Trichloroethylene (TCE)	19,000	300	300		120	150	100		
Tetrachloroethylene (PCE)	390,000	10,000	10,000		ND (35)	ND (35)	ND (35)		
METALS					mg/Kg				
Lead	800	200	600		**815**	**5,800**	182		
Arsenic	300	20	20		ND (23)	**330**	ND (11)		

Analytical Procedure:

VOCs prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDVOA2.
Metals prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDXRFNITON4.

Excavation Protocols:

* - An asphalt cap was applied to the backfilled grid, therefore, subsurface material does not pose a contact threat.

** - Excavation was terminated due to groundwater or subsurface utilities encountered.

Notes:

1) Samples analyzed by US EPA Office of Environmental Measure and Evaluation (OEME).
2) Bold and yellow highlighted values exceed MCP S-1/GW-2.
3) Bold and red highlighted values exceed MCP S-2/GW-2.
4) ND = Not detected above reporting limit. Reporting limit in parentheses.
5) µg/Kg = micrograms per Kilogram; mg/Kg = milligrams per Kilogram.
6) RML HQ1 = Removal Management Level, Hazard Quotient equals 1.
7) MCP = Massachusetts Contingency Plan.

COMPOUND	EPA RML HQ1	MCP S-1/ GW-2	MCP S-2/ GW-2	EXCAVATION GRID:					
				MAXIMUM EXCAVATION DEPTH:					
VOLATILE ORGANIC COMPOUNDS (VOCs)									
Trichloroethylene (TCE)	19,000	300	300						
Tetrachloroethylene (PCE)	390,000	10,000	10,000						
METALS									
Lead	800	200	600						
Arsenic	300	20	20						

Analytical Procedure:

VOCs prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDVOA2.
Metals prepared and analyzed according to:
EPA Region I SOP, EIASOP-FLDXRFNITON4.

Excavation Protocols:

* - An asphalt cap was applied to the backfilled grid, therefore, subsurface material does not pose a contact threat.

** - Excavation was terminated due to groundwater or subsurface utilities encountered.

Notes:

1) Samples analyzed by US EPA Office of Environmental Measure and Evaluation (OEME).
2) Bold and yellow highlighted values exceed MCP S-1/GW-2.
3) Bold and red highlighted values exceed MCP S-2/GW-2.
4) ND = Not detected above reporting limit. Reporting limit in parentheses.
5) µg/Kg = micrograms per Kilogram; mg/Kg = milligrams per Kilogram.
6) RML HQ1 = Removal Management Level, Hazard Quotient equals 1.
7) MCP = Massachusetts Contingency Plan.

Appendix D

Waste Disposal Summary Table

WASTE DISPOSAL SUMMARY TABLE

LUNT SILVERSMITHS SITE
GREENFIELD, MASSACHUSETTS

Manifest No.	Date of Shipment	Description	Containers		Total Quantity (Tons*)	Waste Codes	Transporter	Destination
			No.	Type				
LS-0001	7/15/2015	Non-regulated Waste, Solid n.o.s.	1	DT	31.93	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0002	7/15/2015	Non-regulated Waste, Solid n.o.s.	1	DT	31.17	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0003	7/16/2015	Non-regulated Waste, Solid n.o.s.	1	DT	27.61	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0004	7/16/2015	Non-regulated Waste, Solid n.o.s.	1	DT	28.65	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0005	7/16/2015	Non-regulated Waste, Solid n.o.s.	1	DT	26.78	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0006	7/16/2015	Non-regulated Waste, Solid n.o.s.	1	DT	25.82	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0007	7/17/2015	Non-regulated Waste, Solid n.o.s.	1	DT	28.98	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0008	7/20/2015	Non-regulated Waste, Solid n.o.s.	1	DT	30.36	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0009	7/20/2015	Non-regulated Waste, Solid n.o.s.	1	DT	26.34	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0010	7/20/2015	Non-regulated Waste, Solid n.o.s.	1	DT	32.20	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0011	7/21/2015	Non-regulated Waste, Solid n.o.s.	1	DT	34.10	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0012	7/21/2015	Non-regulated Waste, Solid n.o.s.	1	DT	30.34	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0013	7/21/2015	Non-regulated Waste, Solid n.o.s.	1	DT	22.48	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0014	7/22/2015	Non-regulated Waste, Solid n.o.s.	1	DT	33.89	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0015	7/22/2015	Non-regulated Waste, Solid n.o.s.	1	DT	32.43	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0016	7/22/2015	Non-regulated Waste, Solid n.o.s.	1	DT	29.95	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0017	7/23/2015	Non-regulated Waste, Solid n.o.s.	1	DT	34.54	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0018	7/23/2015	Non-regulated Waste, Solid n.o.s.	1	DT	35.25	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0019	7/23/2015	Non-regulated Waste, Solid n.o.s.	1	DT	28.49	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0020	7/24/2015	Non-regulated Waste, Solid n.o.s.	1	DT	29.66	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0021	7/24/2015	Non-regulated Waste, Solid n.o.s.	1	DT	30.61	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0022	7/24/2015	Non-regulated Waste, Solid n.o.s.	1	DT	26.91	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0023	7/24/2015	Non-regulated Waste, Solid n.o.s.	1	DT	28.91	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0024	7/27/2015	Non-regulated Waste, Solid n.o.s.	1	DT	31.88	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0025	7/27/2015	Non-regulated Waste, Solid n.o.s.	1	DT	35.02	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205

NOTES:
* Unless otherwise specified
No. = Number.
n.o.s. = Not otherwise specified.
NY = New York
VT = Vermont
G = Gallons
P = Pounds
CF = Fiber or plastic boxes, cartons, cases.
TP = Portable tanks
DM = Metal drums, barrels, kegs.
DF = Fiberboard or plastic drums, barrels, kegs.
DT = Dump Truck.

WASTE DISPOSAL SUMMARY TABLE

LUNT SILVERSMITHS SITE
GREENFIELD, MASSACHUSETTS

Manifest No.	Date of Shipment	Description	Containers		Total Quantity (Tons*)	Waste Codes	Transporter	Destination
			No.	Type				
LS-0026	7/27/2015	Non-regulated Waste, Solid n.o.s.	1	DT	31.18	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0027	7/27/2015	Non-regulated Waste, Solid n.o.s.	1	DT	31.58	D008 D004 F002	Murdock, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0028	7/28/2015	Non-regulated Waste, Solid n.o.s.	1	DT	22.59	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0029	7/28/2015	Non-regulated Waste, Solid n.o.s.	1	DT	30.46	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0030	7/29/2015	Non-regulated Waste, Solid n.o.s.	1	DT	36.12	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0031	7/29/2015	Non-regulated Waste, Solid n.o.s.	1	DT	34.10	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0032	8/5/2015	Non-regulated Waste, Solid n.o.s.	1	DT	37.86	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0033	8/12/2015	Non-regulated Waste, Solid n.o.s.	1	DT	35.95	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0034	8/13/2015	Non-regulated Waste, Solid n.o.s.	1	DT	36.77	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0035	8/13/2015	Non-regulated Waste, Solid n.o.s.	1	DT	31.83	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0036	8/17/2015	Non-regulated Waste, Solid n.o.s.	1	DT	30.58	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0037	8/17/2015	Non-regulated Waste, Solid n.o.s.	1	DT	37.80	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0038	8/18/2015	Non-regulated Waste, Solid n.o.s.	1	DT	34.37	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0039	8/19/2015	Non-regulated Waste, Solid n.o.s.	1	DT	31.73	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0040	8/19/2015	Non-regulated Waste, Solid n.o.s.	1	DT	28.23	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0041	8/20/2015	Non-regulated Waste, Solid n.o.s.	1	DT	28.48	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0042	8/20/2015	Non-regulated Waste, Solid n.o.s.	1	DT	29.91	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0043	8/20/2015	Non-regulated Waste, Solid n.o.s.	1	DT	30.13	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
LS-0044	8/21/2015	Non-regulated Waste, Solid n.o.s.	1	DT	24.04	D008 D004 F002	Goulet Trucking, Inc.	City of Albany Solid Waste Management Facility 525 Rapp Road, Albany, NY 12205
002932076GBF	8/11/2015	RQ UN1935, Waste Cyanide Solutions, n.o.s. 6.1 PGII (Silver Cyanide, Potassium Cyanide)	1	DF	2.50 P	D003 D011	Enpro Services, Inc.	Enpro Services of Vermont 54 Avenue D Williston, VT 05495
002486799GBF	8/6/2015	NA 3082, Hazardous waste, liquid, n.o.s. 9, PH III (LCAD, 1.4 Dichlorobenzo)	1	DM	250 P	D008 D027	Enpro Services, Inc.	Enpro Services of Vermont 54 Avenue D Williston, VT 05495
002932048GBF	8/6/2015	UN 1263, WASTE Paint related material 3. PGII (Petroleum Distallates, Mineral Spirits)	1	CF	1000 P	D001	Enpro Services, Inc.	Enpro Services of Vermont 54 Avenue D Williston, VT 05495
		UN 1479 Waste Oxidizing Solid, n.o.s. 5.1 PGIII (Chlorine Granules)	1	DM	150 P	D001		
		UN 2920 Pesticides, liquid, toxic, n.o.s. 6.1, PHII (Permethrin, carberyl)	1	DF	50 P	VT06		
		NON DOT, NON RCRA REGULATED MATERIAL (GREASE)	1	DF	50 P	MA99 VT06		

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TP = Portable tanks
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DT = Dump Truck.

WASTE DISPOSAL SUMMARY TABLE

LUNT SILVERSMITHS SITE
GREENFIELD, MASSACHUSETTS

Manifest No.	Date of Shipment	Description	Containers		Total Quantity (Tons*)	Waste Codes	Transporter	Destination
			No.	Type				
002932048GBF	8/6/2015	UN 1950, WASTE Aerosols 2.1 (Petroleum Distallates, Mineral Spirits)	1	DF	200 P	D001	Enpro Services, Inc.	Enpro Services of Vermont 54 Avenue D Williston, VT 05495
		NON DOT, NON RCRA REGULATED MATERIAL (Latex Paint)	1	CF	1500 P	MA99 VT99		
		NA3082, Hazardous Waste, liquid, n.o.s. 9, PGIII (Lead, Benzene) NSL-1	1	DM	50 G	D005 D008 D018		
		NA3082, Hazardous Waste, liquid, n.o.s. 9, PGIII (Lead, Benzene) NSL-1	1	DM	450 P	D001 D008 D018		
		NA3082, Hazardous Waste, liquid, n.o.s. 9, PGIII (Lead, 1,4 Dichlorobenzene) FL-1	4	DM	1350 P	D008 D027		
		NA3082, Hazardous waste, liquid, n.o.s. 9, PGIII (Lead, Silver) VW-1	3	TP	6000 P	D008 D011		
		NA3082, Hazardous waste, liquid, n.o.s. 9, PGIII (Selenium, Silver) NL-1	2	DM	1600 P	D008 D010 D011		
		UN3264. WASTE Corrosive liquid, acidic, inorganic, n.o.s. 8, PGII (Sulfuric acid, Lead) Sulfuric-1	1	DF	150 P	D002 D004 D007 D008 D010		
		UN3264, WASTE Corrosive liquid, acidic, inorganic, n.o.s. 8, PGII (Nitric acid, Lead) Nitric-1	2	DF	350 P	D002 D006 D008 D010 D011		
		RQ UN3264, WASTE corrosive liquid, acidic, inorganic, n.o.s. 8, PGII (Hydrochloric acid, Lead) HCL-1	1	DF	350 P	D002 D007 D008 D011		
		RQ UN3264, WASTE corrosive liquid, acidic, inorganic, n.o.s. 8, PGII (Hydrochloric acid, Lead) HCL-2	1	DF	500 P	D002 D007 D008 D011		
		RQ UN3264, WASTE Corrosive liquid, basic, inorganic, n.o.s. 8, PGII (Sodium Hydroxide, Silver) BL-1	1	DF	500 P	D002 D007 D008 D011		
		RQ UN3266, WASTE Corrosive liquid, basic, inorganic, n.o.s. 8, PGII (Sodium hydroxide, Silver) BL-1	1	DF	500 P	D002 D007 D008 D011		
		UN3262, Corrosive solid, basic, inorganic, n.o.s. 8, PGII (hydroxide solids) BS-1	1	DF	500 P	VT 020		
		NA3077, Hazardous waste, solid, n.o.s. 9, PGIII (lead) NS-4	1	DM	400 P	D008		
		NON DOT, NON RCRA REGULATED MATERIAL (Non Haz Lunt 22.0) NS-2	2	DM	1000 P	MA99 VT99		
		NON DOT, NON RCRA REGULATED MATERIAL (Non Haz 23) NS-2, FS-1	2	DF	1050 P	MA99 VT99		
		NON DOT, NON RCRA REGULATED MATERIAL (line 24.0 Drum) NS-3	1	DM	500 P	MA99 VT99		
		NONDOT, NON RCRA REGULATED MATERIAL (Non Haz 25) NS-1	2	CF	3000 P	MA99 VT99		

NOTES:

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DF = Fiberboard or plastic drums, barrels, kegs.
DT = Dump Truck.

Appendix E

Analytical Results and Chain-of-Custody Records

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

June 15, 2015

Wing Chau - Mail Code OSRR02-2
US EPA New England R1

Project Number: 15050048
Project: Lunt Silversmiths - Greenfield, MA
Analysis: VOAs in Soil High Level Method
EPA Chemist: Joseph Montanaro

Date Samples Received by the Laboratory: 05/29/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-VOAGCMS9.

Samples were analyzed by GC/MS. Samples were introduced to the GC via a Tekmar preconcentrator and an Archon auto-sampler. The analysis SOP is based on US EPA Method 8260B, revision 2.0, 1996 and Method 5035A, draft revision 1, 2002, from SW-846.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA,
email=boudreau.dan@epa.gov, c=US
Date: 2015.06.15 10:37:19 -04'00'

15050048$VOAHS

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0001	Lab Sample ID:	AB56533
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/01/2015	Amount Prepared:	5 mL
Date of Analysis:	6/01/2015	Percent Solids:	78%
Dry Weight Prepared:	5.715 grams	Extract Dilution:	50
Wet Weight Prepared:	7.339 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	100	
75-01-4	Vinyl Chloride	ND	100	
74-83-9	Bromomethane	ND	100	
75-00-3	Chloroethane	ND	100	
75-69-4	Trichlorofluoromethane	ND	100	
60-29-7	Ethyl Ether	ND	100	
67-64-1	2-Propanone (acetone)	ND	100	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	100	
75-35-4	1,1-Dichloroethylene	ND	100	
75-15-0	Carbon Disulfide	ND	100	
75-71-8	Dichlorodifluoromethane	ND	100	
75-09-2	Methylene Chloride	ND	100	
107-13-1	Acrylonitrile	ND	100	
1634-04-4	Methyl-t-Butyl Ether	ND	100	
156-60-5	Trans-1,2-Dichloroethylene	ND	100	
75-34-3	1,1-dichloroethane	ND	100	
108-05-4	Vinyl Acetate	ND	100	
78-93-3	2-Butanone (MEK)	ND	100	
594-20-7	2,2-Dichloropropane	ND	100	
156-59-2	cis-1,2-Dichloroethylene	ND	100	
67-66-3	Chloroform	ND	100	
74-97-5	Bromochloromethane	ND	100	
109-99-9	Tetrahydrofuran	ND	100	
71-55-6	1,1,1-Trichloroethane	ND	100	
107-06-2	1,2-Dichloroethane	ND	100	
56-23-5	Carbon tetrachloride	ND	100	
71-43-2	Benzene	ND	100	
10061-01-5	c-1,3-dichloropropene	ND	100	
108-88-3	Toluene	ND	100	
10061-02-6	t-1,3-Dichloropropene	ND	100	
79-00-5	1,1,2-Trichloroethane	ND	100	
124-48-1	Dibromochloromethane	ND	100	
108-90-7	Chlorobenzene	ND	100	
563-58-6	1,1-Dichloropropene	ND	100	
79-01-6	Trichloroethylene	ND	100	
78-87-5	1,2-Dichloropropane	ND	100	
75-27-4	Bromodichloromethane	ND	100	
74-95-3	Dibromomethane	ND	100	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	100	
142-28-9	1,3-Dichloropropane	ND	100	
127-18-4	Tetrachloroethylene	ND	100	
106-93-4	1,2-Dibromoethane	ND	100	
591-78-6	2-Hexanone	ND	100	
630-20-6	1,1,1,2-Tetrachloroethane	ND	100	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0001	Lab Sample ID:	AB56533
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/01/2015	Amount Prepared:	5 mL
Date of Analysis:	6/01/2015	Percent Solids:	78%
Dry Weight Prepared:	5.715 grams	Extract Dilution:	50
Wet Weight Prepared:	7.339 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	100	
108-38-3/106-42-3	M/P Xylene	ND	200	
95-47-6	Ortho Xylene	ND	100	
100-42-5	Styrene	ND	100	
75-25-2	Bromoform	ND	100	
79-34-5	1,1,2,2-Tetrachloroethane	ND	100	
98-82-8	Isopropylbenzene	ND	100	
108-86-1	Bromobenzene	ND	100	
96-18-4	1,2,3-Trichloropropane	ND	100	
103-65-1	N-Propylbenzene	ND	100	
95-49-8	2-Chlorotoluene	ND	100	
106-43-4	4-Chlorotoluene	ND	100	
98-06-6	Tert-Butylbenzene	ND	100	
108-67-8	1,3,5-Trimethylbenzene	ND	100	
95-63-6	1,2,4-Trimethylbenzene	ND	100	
135-98-8	Sec-Butylbenzene	ND	100	
541-73-1	1,3-Dichlorobenzene	ND	100	
99-87-6	Para-Isopropyltoluene	ND	100	
106-46-7	1,4-Dichlorobenzene	ND	100	
95-50-1	1,2-Dichlorobenzene	ND	100	
104-51-8	N-Butylbenzene	ND	100	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	100	
120-82-1	1,2,4-Trichlorobenzene	ND	100	
87-68-3	Hexachlorobutadiene	ND	100	
91-20-3	Naphthalene	ND	100	
87-61-6	1,2,3-Trichlorobenzene	ND	100	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	96	74 - 136
Toluene-D8	97	85 - 118
1,4-Bromofluorobenzene	96	78 - 111

Comments:

Lunt Silversmiths - Greenfield, MA

Laboratory Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	6/01/2015	Amount Prepared:	5 mL
Date of Analysis:	6/01/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	~6

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
74-87-3	Chloromethane	ND	1.0	
75-01-4	Vinyl Chloride	ND	1.0	
74-83-9	Bromomethane	ND	1.0	
75-00-3	Chloroethane	ND	1.0	
75-69-4	Trichlorofluoromethane	ND	1.0	
60-29-7	Ethyl Ether	ND	1.0	
67-64-1	2-Propanone (acetone)	ND	1.0	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	1.0	
75-35-4	1,1-Dichloroethylene	ND	1.0	
75-15-0	Carbon Disulfide	ND	1.0	
75-71-8	Dichlorodifluoromethane	ND	1.0	
75-09-2	Methylene Chloride	ND	1.0	
107-13-1	Acrylonitrile	ND	1.0	
1634-04-4	Methyl-t-Butyl Ether	ND	1.0	
156-60-5	Trans-1,2-Dichloroethylene	ND	1.0	
75-34-3	1,1-dichloroethane	ND	1.0	
108-05-4	Vinyl Acetate	ND	1.0	
78-93-3	2-Butanone (MEK)	ND	1.0	
594-20-7	2,2-Dichloropropane	ND	1.0	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	
67-66-3	Chloroform	ND	1.0	
74-97-5	Bromochloromethane	ND	1.0	
109-99-9	Tetrahydrofuran	ND	1.0	
71-55-6	1,1,1-Trichloroethane	ND	1.0	
107-06-2	1,2-Dichloroethane	ND	1.0	
56-23-5	Carbon tetrachloride	ND	1.0	
71-43-2	Benzene	ND	1.0	
10061-01-5	c-1,3-dichloropropene	ND	1.0	
108-88-3	Toluene	ND	1.0	
10061-02-6	t-1,3-Dichloropropene	ND	1.0	
79-00-5	1,1,2-Trichloroethane	ND	1.0	
124-48-1	Dibromochloromethane	ND	1.0	
108-90-7	Chlorobenzene	ND	1.0	
563-58-6	1,1-Dichloropropene	ND	1.0	
79-01-6	Trichloroethylene	ND	1.0	
78-87-5	1,2-Dichloropropane	ND	1.0	
75-27-4	Bromodichloromethane	ND	1.0	
74-95-3	Dibromomethane	ND	1.0	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	1.0	
142-28-9	1,3-Dichloropropane	ND	1.0	
127-18-4	Tetrachloroethylene	ND	1.0	
106-93-4	1,2-Dibromoethane	ND	1.0	
591-78-6	2-Hexanone	ND	1.0	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	

Lunt Silversmiths - Greenfield, MA

Laboratory Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	6/01/2015	Amount Prepared:	5 mL
Date of Analysis:	6/01/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	~6

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
100-41-4	Ethylbenzene	ND	1.0	
108-38-3/106-42-3	M/P Xylene	ND	2.0	
95-47-6	Ortho Xylene	ND	1.0	
100-42-5	Styrene	ND	1.0	
75-25-2	Bromoform	ND	1.0	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	
98-82-8	Isopropylbenzene	ND	1.0	
108-86-1	Bromobenzene	ND	1.0	
96-18-4	1,2,3-Trichloropropane	ND	1.0	
103-65-1	N-Propylbenzene	ND	1.0	
95-49-8	2-Chlorotoluene	ND	1.0	
106-43-4	4-Chlorotoluene	ND	1.0	
98-06-6	Tert-Butylbenzene	ND	1.0	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	
135-98-8	Sec-Butylbenzene	ND	1.0	
541-73-1	1,3-Dichlorobenzene	ND	1.0	
99-87-6	Para-Isopropyltoluene	ND	1.0	
106-46-7	1,4-Dichlorobenzene	ND	1.0	
95-50-1	1,2-Dichlorobenzene	ND	1.0	
104-51-8	N-Butylbenzene	ND	1.0	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	1.0	
120-82-1	1,2,4-Trichlorobenzene	ND	1.0	
87-68-3	Hexachlorobutadiene	ND	1.0	
91-20-3	Naphthalene	ND	1.0	
87-61-6	1,2,3-Trichlorobenzene	ND	1.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	92	74 - 136
Toluene-D8	96	85 - 118
1,4-Bromofluorobenzene	94	78 - 111

Comments: Method blank; results are in ug/L.

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0002	Lab Sample ID:	AB56534
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/01/2015	Amount Prepared:	5 mL
Date of Analysis:	6/01/2015	Percent Solids:	78%
Dry Weight Prepared:	8.923 grams	Extract Dilution:	50
Wet Weight Prepared:	11.410 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	70	
75-01-4	Vinyl Chloride	ND	70	
74-83-9	Bromomethane	ND	70	
75-00-3	Chloroethane	ND	70	
75-69-4	Trichlorofluoromethane	ND	70	
60-29-7	Ethyl Ether	ND	70	
67-64-1	2-Propanone (acetone)	ND	70	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	70	
75-35-4	1,1-Dichloroethylene	ND	70	
75-15-0	Carbon Disulfide	ND	70	
75-71-8	Dichlorodifluoromethane	ND	70	
75-09-2	Methylene Chloride	ND	70	
107-13-1	Acrylonitrile	ND	70	
1634-04-4	Methyl-t-Butyl Ether	ND	70	
156-60-5	Trans-1,2-Dichloroethylene	ND	70	
75-34-3	1,1-dichloroethane	ND	70	
108-05-4	Vinyl Acetate	ND	70	
78-93-3	2-Butanone (MEK)	ND	70	
594-20-7	2,2-Dichloropropane	ND	70	
156-59-2	cis-1,2-Dichloroethylene	ND	70	
67-66-3	Chloroform	ND	70	
74-97-5	Bromochloromethane	ND	70	
109-99-9	Tetrahydrofuran	ND	70	
71-55-6	1,1,1-Trichloroethane	ND	70	
107-06-2	1,2-Dichloroethane	ND	70	
56-23-5	Carbon tetrachloride	ND	70	
71-43-2	Benzene	ND	70	
10061-01-5	c-1,3-dichloropropene	ND	70	
108-88-3	Toluene	ND	70	
10061-02-6	t-1,3-Dichloropropene	ND	70	
79-00-5	1,1,2-Trichloroethane	ND	70	
124-48-1	Dibromochloromethane	ND	70	
108-90-7	Chlorobenzene	ND	70	
563-58-6	1,1-Dichloropropene	ND	70	
79-01-6	Trichloroethylene	ND	70	
78-87-5	1,2-Dichloropropane	ND	70	
75-27-4	Bromodichloromethane	ND	70	
74-95-3	Dibromomethane	ND	70	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	70	
142-28-9	1,3-Dichloropropane	ND	70	
127-18-4	Tetrachloroethylene	ND	70	
106-93-4	1,2-Dibromoethane	ND	70	
591-78-6	2-Hexanone	ND	70	
630-20-6	1,1,1,2-Tetrachloroethane	ND	70	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0002	Lab Sample ID:	AB56534
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/01/2015	Amount Prepared:	5 mL
Date of Analysis:	6/01/2015	Percent Solids:	78%
Dry Weight Prepared:	8.923 grams	Extract Dilution:	50
Wet Weight Prepared:	11.410 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	70	
108-38-3/106-42-3	M/P Xylene	ND	140	
95-47-6	Ortho Xylene	ND	70	
100-42-5	Styrene	ND	70	
75-25-2	Bromoform	ND	70	
79-34-5	1,1,2,2-Tetrachloroethane	ND	70	
98-82-8	Isopropylbenzene	ND	70	
108-86-1	Bromobenzene	ND	70	
96-18-4	1,2,3-Trichloropropane	ND	70	
103-65-1	N-Propylbenzene	ND	70	
95-49-8	2-Chlorotoluene	ND	70	
106-43-4	4-Chlorotoluene	ND	70	
98-06-6	Tert-Butylbenzene	ND	70	
108-67-8	1,3,5-Trimethylbenzene	ND	70	
95-63-6	1,2,4-Trimethylbenzene	ND	70	
135-98-8	Sec-Butylbenzene	ND	70	
541-73-1	1,3-Dichlorobenzene	ND	70	
99-87-6	Para-Isopropyltoluene	ND	70	
106-46-7	1,4-Dichlorobenzene	ND	70	
95-50-1	1,2-Dichlorobenzene	ND	70	
104-51-8	N-Butylbenzene	ND	70	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	70	
120-82-1	1,2,4-Trichlorobenzene	ND	70	
87-68-3	Hexachlorobutadiene	ND	70	
91-20-3	Naphthalene	ND	70	
87-61-6	1,2,3-Trichlorobenzene	ND	70	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	94	74 - 136
Toluene-D8	95	85 - 118
1,4-Bromofluorobenzene	97	78 - 111

Comments:

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0003	Lab Sample ID:	AB56535
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/01/2015	Amount Prepared:	5 mL
Date of Analysis:	6/01/2015	Percent Solids:	90%
Dry Weight Prepared:	7.233 grams	Extract Dilution:	50
Wet Weight Prepared:	8.059 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	75	
75-01-4	Vinyl Chloride	ND	75	
74-83-9	Bromomethane	ND	75	
75-00-3	Chloroethane	ND	75	
75-69-4	Trichlorofluoromethane	ND	75	
60-29-7	Ethyl Ether	ND	75	
67-64-1	2-Propanone (acetone)	**84**	75	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	75	
75-35-4	1,1-Dichloroethylene	ND	75	
75-15-0	Carbon Disulfide	ND	75	
75-71-8	Dichlorodifluoromethane	ND	75	
75-09-2	Methylene Chloride	ND	75	
107-13-1	Acrylonitrile	ND	75	
1634-04-4	Methyl-t-Butyl Ether	ND	75	
156-60-5	Trans-1,2-Dichloroethylene	ND	75	
75-34-3	1,1-dichloroethane	ND	75	
108-05-4	Vinyl Acetate	ND	75	
78-93-3	2-Butanone (MEK)	ND	75	
594-20-7	2,2-Dichloropropane	ND	75	
156-59-2	cis-1,2-Dichloroethylene	ND	75	
67-66-3	Chloroform	ND	75	
74-97-5	Bromochloromethane	ND	75	
109-99-9	Tetrahydrofuran	ND	75	
71-55-6	1,1,1-Trichloroethane	ND	75	
107-06-2	1,2-Dichloroethane	ND	75	
56-23-5	Carbon tetrachloride	ND	75	
71-43-2	Benzene	ND	75	
10061-01-5	c-1,3-dichloropropene	ND	75	
108-88-3	Toluene	ND	75	
10061-02-6	t-1,3-Dichloropropene	ND	75	
79-00-5	1,1,2-Trichloroethane	ND	75	
124-48-1	Dibromochloromethane	ND	75	
108-90-7	Chlorobenzene	ND	75	
563-58-6	1,1-Dichloropropene	ND	75	
79-01-6	Trichloroethylene	ND	75	
78-87-5	1,2-Dichloropropane	ND	75	
75-27-4	Bromodichloromethane	ND	75	
74-95-3	Dibromomethane	ND	75	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	75	
142-28-9	1,3-Dichloropropane	ND	75	
127-18-4	Tetrachloroethylene	ND	75	
106-93-4	1,2-Dibromoethane	ND	75	
591-78-6	2-Hexanone	ND	75	
630-20-6	1,1,1,2-Tetrachloroethane	ND	75	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0003	Lab Sample ID:	AB56535
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/01/2015	Amount Prepared:	5 mL
Date of Analysis:	6/01/2015	Percent Solids:	90%
Dry Weight Prepared:	7.233 grams	Extract Dilution:	50
Wet Weight Prepared:	8.059 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	75	
108-38-3/106-42-3	M/P Xylene	ND	150	
95-47-6	Ortho Xylene	ND	75	
100-42-5	Styrene	ND	75	
75-25-2	Bromoform	ND	75	
79-34-5	1,1,2,2-Tetrachloroethane	ND	75	
98-82-8	Isopropylbenzene	ND	75	
108-86-1	Bromobenzene	ND	75	
96-18-4	1,2,3-Trichloropropane	ND	75	
103-65-1	N-Propylbenzene	ND	75	
95-49-8	2-Chlorotoluene	ND	75	
106-43-4	4-Chlorotoluene	ND	75	
98-06-6	Tert-Butylbenzene	ND	75	
108-67-8	1,3,5-Trimethylbenzene	ND	75	
95-63-6	1,2,4-Trimethylbenzene	ND	75	
135-98-8	Sec-Butylbenzene	ND	75	
541-73-1	1,3-Dichlorobenzene	ND	75	
99-87-6	Para-Isopropyltoluene	ND	75	
106-46-7	1,4-Dichlorobenzene	ND	75	
95-50-1	1,2-Dichlorobenzene	ND	75	
104-51-8	N-Butylbenzene	ND	75	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	75	
120-82-1	1,2,4-Trichlorobenzene	ND	75	
87-68-3	Hexachlorobutadiene	ND	75	
91-20-3	Naphthalene	ND	75	
87-61-6	1,2,3-Trichlorobenzene	ND	75	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	97	74 - 136
Toluene-D8	99	85 - 118
1,4-Bromofluorobenzene	96	78 - 111

Comments:

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0004	Lab Sample ID:	AB56536
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/01/2015	Amount Prepared:	5 mL
Date of Analysis:	6/01/2015	Percent Solids:	89%
Dry Weight Prepared:	6.467 grams	Extract Dilution:	50
Wet Weight Prepared:	7.253 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	84	
75-01-4	Vinyl Chloride	ND	84	
74-83-9	Bromomethane	ND	84	
75-00-3	Chloroethane	ND	84	
75-69-4	Trichlorofluoromethane	ND	84	
60-29-7	Ethyl Ether	ND	84	
67-64-1	2-Propanone (acetone)	ND	84	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	84	
75-35-4	1,1-Dichloroethylene	ND	84	
75-15-0	Carbon Disulfide	ND	84	
75-71-8	Dichlorodifluoromethane	ND	84	
75-09-2	Methylene Chloride	ND	84	
107-13-1	Acrylonitrile	ND	84	
1634-04-4	Methyl-t-Butyl Ether	ND	84	
156-60-5	Trans-1,2-Dichloroethylene	ND	84	
75-34-3	1,1-dichloroethane	ND	84	
108-05-4	Vinyl Acetate	ND	84	
78-93-3	2-Butanone (MEK)	ND	84	
594-20-7	2,2-Dichloropropane	ND	84	
156-59-2	cis-1,2-Dichloroethylene	ND	84	
67-66-3	Chloroform	ND	84	
74-97-5	Bromochloromethane	ND	84	
109-99-9	Tetrahydrofuran	ND	84	
71-55-6	1,1,1-Trichloroethane	ND	84	
107-06-2	1,2-Dichloroethane	ND	84	
56-23-5	Carbon tetrachloride	ND	84	
71-43-2	Benzene	ND	84	
10061-01-5	c-1,3-dichloropropene	ND	84	
108-88-3	Toluene	ND	84	
10061-02-6	t-1,3-Dichloropropene	ND	84	
79-00-5	1,1,2-Trichloroethane	ND	84	
124-48-1	Dibromochloromethane	ND	84	
108-90-7	Chlorobenzene	ND	84	
563-58-6	1,1-Dichloropropene	ND	84	
79-01-6	Trichloroethylene	ND	84	
78-87-5	1,2-Dichloropropane	ND	84	
75-27-4	Bromodichloromethane	ND	84	
74-95-3	Dibromomethane	ND	84	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	84	
142-28-9	1,3-Dichloropropane	ND	84	
127-18-4	Tetrachloroethylene	ND	84	
106-93-4	1,2-Dibromoethane	ND	84	
591-78-6	2-Hexanone	ND	84	
630-20-6	1,1,1,2-Tetrachloroethane	ND	84	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0004	Lab Sample ID:	AB56536
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/01/2015	Amount Prepared:	5 mL
Date of Analysis:	6/01/2015	Percent Solids:	89%
Dry Weight Prepared:	6.467 grams	Extract Dilution:	50
Wet Weight Prepared:	7.253 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	84	
108-38-3/106-42-3	M/P Xylene	ND	170	
95-47-6	Ortho Xylene	ND	84	
100-42-5	Styrene	ND	84	
75-25-2	Bromoform	ND	84	
79-34-5	1,1,2,2-Tetrachloroethane	ND	84	
98-82-8	Isopropylbenzene	ND	84	
108-86-1	Bromobenzene	ND	84	
96-18-4	1,2,3-Trichloropropane	ND	84	
103-65-1	N-Propylbenzene	ND	84	
95-49-8	2-Chlorotoluene	ND	84	
106-43-4	4-Chlorotoluene	ND	84	
98-06-6	Tert-Butylbenzene	ND	84	
108-67-8	1,3,5-Trimethylbenzene	ND	84	
95-63-6	1,2,4-Trimethylbenzene	ND	84	
135-98-8	Sec-Butylbenzene	ND	84	
541-73-1	1,3-Dichlorobenzene	ND	84	
99-87-6	Para-Isopropyltoluene	ND	84	
106-46-7	1,4-Dichlorobenzene	ND	84	
95-50-1	1,2-Dichlorobenzene	ND	84	
104-51-8	N-Butylbenzene	ND	84	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	84	
120-82-1	1,2,4-Trichlorobenzene	ND	84	
87-68-3	Hexachlorobutadiene	ND	84	
91-20-3	Naphthalene	ND	84	
87-61-6	1,2,3-Trichlorobenzene	ND	84	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	94	74 - 136
Toluene-D8	99	85 - 118
1,4-Bromofluorobenzene	94	78 - 111

Comments:

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0005	Lab Sample ID:	AB56537
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/01/2015	Amount Prepared:	5 mL
Date of Analysis:	6/01/2015	Percent Solids:	90%
Dry Weight Prepared:	6.430 grams	Extract Dilution:	50
Wet Weight Prepared:	7.127 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	83	
75-01-4	Vinyl Chloride	ND	83	
74-83-9	Bromomethane	ND	83	
75-00-3	Chloroethane	ND	83	
75-69-4	Trichlorofluoromethane	ND	83	
60-29-7	Ethyl Ether	ND	83	
67-64-1	2-Propanone (acetone)	ND	83	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	83	
75-35-4	1,1-Dichloroethylene	ND	83	
75-15-0	Carbon Disulfide	ND	83	
75-71-8	Dichlorodifluoromethane	ND	83	
75-09-2	Methylene Chloride	ND	83	
107-13-1	Acrylonitrile	ND	83	
1634-04-4	Methyl-t-Butyl Ether	ND	83	
156-60-5	Trans-1,2-Dichloroethylene	ND	83	
75-34-3	1,1-dichloroethane	ND	83	
108-05-4	Vinyl Acetate	ND	83	
78-93-3	2-Butanone (MEK)	ND	83	
594-20-7	2,2-Dichloropropane	ND	83	
156-59-2	cis-1,2-Dichloroethylene	ND	83	
67-66-3	Chloroform	ND	83	
74-97-5	Bromochloromethane	ND	83	
109-99-9	Tetrahydrofuran	ND	83	
71-55-6	1,1,1-Trichloroethane	ND	83	
107-06-2	1,2-Dichloroethane	ND	83	
56-23-5	Carbon tetrachloride	ND	83	
71-43-2	Benzene	ND	83	
10061-01-5	c-1,3-dichloropropene	ND	83	
108-88-3	Toluene	ND	83	
10061-02-6	t-1,3-Dichloropropene	ND	83	
79-00-5	1,1,2-Trichloroethane	ND	83	
124-48-1	Dibromochloromethane	ND	83	
108-90-7	Chlorobenzene	ND	83	
563-58-6	1,1-Dichloropropene	ND	83	
79-01-6	Trichloroethylene	ND	83	
78-87-5	1,2-Dichloropropane	ND	83	
75-27-4	Bromodichloromethane	ND	83	
74-95-3	Dibromomethane	ND	83	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	83	
142-28-9	1,3-Dichloropropane	ND	83	
127-18-4	Tetrachloroethylene	ND	83	
106-93-4	1,2-Dibromoethane	ND	83	
591-78-6	2-Hexanone	ND	83	
630-20-6	1,1,1,2-Tetrachloroethane	ND	83	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0005	Lab Sample ID:	AB56537
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/01/2015	Amount Prepared:	5 mL
Date of Analysis:	6/01/2015	Percent Solids:	90%
Dry Weight Prepared:	6.430 grams	Extract Dilution:	50
Wet Weight Prepared:	7.127 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	83	
108-38-3/106-42-3	M/P Xylene	ND	170	
95-47-6	Ortho Xylene	ND	83	
100-42-5	Styrene	ND	83	
75-25-2	Bromoform	ND	83	
79-34-5	1,1,2,2-Tetrachloroethane	ND	83	
98-82-8	Isopropylbenzene	ND	83	
108-86-1	Bromobenzene	ND	83	
96-18-4	1,2,3-Trichloropropane	ND	83	
103-65-1	N-Propylbenzene	ND	83	
95-49-8	2-Chlorotoluene	ND	83	
106-43-4	4-Chlorotoluene	ND	83	
98-06-6	Tert-Butylbenzene	ND	83	
108-67-8	1,3,5-Trimethylbenzene	ND	83	
95-63-6	1,2,4-Trimethylbenzene	ND	83	
135-98-8	Sec-Butylbenzene	ND	83	
541-73-1	1,3-Dichlorobenzene	ND	83	
99-87-6	Para-Isopropyltoluene	ND	83	
106-46-7	1,4-Dichlorobenzene	ND	83	
95-50-1	1,2-Dichlorobenzene	ND	83	
104-51-8	N-Butylbenzene	ND	83	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	83	
120-82-1	1,2,4-Trichlorobenzene	ND	83	
87-68-3	Hexachlorobutadiene	ND	83	
91-20-3	Naphthalene	ND	83	
87-61-6	1,2,3-Trichlorobenzene	ND	83	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	97	74 - 136
Toluene-D8	101	85 - 118
1,4-Bromofluorobenzene	95	78 - 111

Comments:

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0006	Lab Sample ID:	AB56538
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/01/2015	Amount Prepared:	5 mL
Date of Analysis:	6/01/2015	Percent Solids:	89%
Dry Weight Prepared:	9.823 grams	Extract Dilution:	50
Wet Weight Prepared:	10.990 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	57	
75-01-4	Vinyl Chloride	ND	57	
74-83-9	Bromomethane	ND	57	
75-00-3	Chloroethane	ND	57	
75-69-4	Trichlorofluoromethane	ND	57	
60-29-7	Ethyl Ether	ND	57	
67-64-1	2-Propanone (acetone)	ND	57	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	57	
75-35-4	1,1-Dichloroethylene	ND	57	
75-15-0	Carbon Disulfide	ND	57	
75-71-8	Dichlorodifluoromethane	ND	57	
75-09-2	Methylene Chloride	ND	57	
107-13-1	Acrylonitrile	ND	57	
1634-04-4	Methyl-t-Butyl Ether	ND	57	
156-60-5	Trans-1,2-Dichloroethylene	ND	57	
75-34-3	1,1-dichloroethane	ND	57	
108-05-4	Vinyl Acetate	ND	57	
78-93-3	2-Butanone (MEK)	ND	57	
594-20-7	2,2-Dichloropropane	ND	57	
156-59-2	cis-1,2-Dichloroethylene	ND	57	
67-66-3	Chloroform	ND	57	
74-97-5	Bromochloromethane	ND	57	
109-99-9	Tetrahydrofuran	ND	57	
71-55-6	1,1,1-Trichloroethane	ND	57	
107-06-2	1,2-Dichloroethane	ND	57	
56-23-5	Carbon tetrachloride	ND	57	
71-43-2	Benzene	ND	57	
10061-01-5	c-1,3-dichloropropene	ND	57	
108-88-3	Toluene	ND	57	
10061-02-6	t-1,3-Dichloropropene	ND	57	
79-00-5	1,1,2-Trichloroethane	ND	57	
124-48-1	Dibromochloromethane	ND	57	
108-90-7	Chlorobenzene	ND	57	
563-58-6	1,1-Dichloropropene	ND	57	
79-01-6	Trichloroethylene	ND	57	
78-87-5	1,2-Dichloropropane	ND	57	
75-27-4	Bromodichloromethane	ND	57	
74-95-3	Dibromomethane	ND	57	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	57	
142-28-9	1,3-Dichloropropane	ND	57	
127-18-4	Tetrachloroethylene	ND	57	
106-93-4	1,2-Dibromoethane	ND	57	
591-78-6	2-Hexanone	ND	57	
630-20-6	1,1,1,2-Tetrachloroethane	ND	57	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0006	Lab Sample ID:	AB56538
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/01/2015	Amount Prepared:	5 mL
Date of Analysis:	6/01/2015	Percent Solids:	89%
Dry Weight Prepared:	9.823 grams	Extract Dilution:	50
Wet Weight Prepared:	10.990 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	57	
108-38-3/106-42-3	M/P Xylene	ND	110	
95-47-6	Ortho Xylene	ND	57	
100-42-5	Styrene	ND	57	
75-25-2	Bromoform	ND	57	
79-34-5	1,1,2,2-Tetrachloroethane	ND	57	
98-82-8	Isopropylbenzene	ND	57	
108-86-1	Bromobenzene	ND	57	
96-18-4	1,2,3-Trichloropropane	ND	57	
103-65-1	N-Propylbenzene	ND	57	
95-49-8	2-Chlorotoluene	ND	57	
106-43-4	4-Chlorotoluene	ND	57	
98-06-6	Tert-Butylbenzene	ND	57	
108-67-8	1,3,5-Trimethylbenzene	ND	57	
95-63-6	1,2,4-Trimethylbenzene	ND	57	
135-98-8	Sec-Butylbenzene	ND	57	
541-73-1	1,3-Dichlorobenzene	ND	57	
99-87-6	Para-Isopropyltoluene	ND	57	
106-46-7	1,4-Dichlorobenzene	ND	57	
95-50-1	1,2-Dichlorobenzene	ND	57	
104-51-8	N-Butylbenzene	ND	57	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	57	
120-82-1	1,2,4-Trichlorobenzene	ND	57	
87-68-3	Hexachlorobutadiene	ND	57	
91-20-3	Naphthalene	ND	57	
87-61-6	1,2,3-Trichlorobenzene	ND	57	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	97	74 - 136
Toluene-D8	98	85 - 118
1,4-Bromofluorobenzene	96	78 - 111

Comments:

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0007	Lab Sample ID:	AB56539
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/01/2015	Amount Prepared:	5 mL
Date of Analysis:	6/01/2015	Percent Solids:	86%
Dry Weight Prepared:	8.865 grams	Extract Dilution:	50
Wet Weight Prepared:	10.333 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	65	
75-01-4	Vinyl Chloride	ND	65	
74-83-9	Bromomethane	ND	65	
75-00-3	Chloroethane	ND	65	
75-69-4	Trichlorofluoromethane	ND	65	
60-29-7	Ethyl Ether	ND	65	
67-64-1	2-Propanone (acetone)	ND	65	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	65	
75-35-4	1,1-Dichloroethylene	ND	65	
75-15-0	Carbon Disulfide	ND	65	
75-71-8	Dichlorodifluoromethane	ND	65	
75-09-2	Methylene Chloride	ND	65	
107-13-1	Acrylonitrile	ND	65	
1634-04-4	Methyl-t-Butyl Ether	ND	65	
156-60-5	Trans-1,2-Dichloroethylene	ND	65	
75-34-3	1,1-dichloroethane	ND	65	
108-05-4	Vinyl Acetate	ND	65	
78-93-3	2-Butanone (MEK)	ND	65	
594-20-7	2,2-Dichloropropane	ND	65	
156-59-2	cis-1,2-Dichloroethylene	ND	65	
67-66-3	Chloroform	ND	65	
74-97-5	Bromochloromethane	ND	65	
109-99-9	Tetrahydrofuran	ND	65	
71-55-6	1,1,1-Trichloroethane	ND	65	
107-06-2	1,2-Dichloroethane	ND	65	
56-23-5	Carbon tetrachloride	ND	65	
71-43-2	Benzene	ND	65	
10061-01-5	c-1,3-dichloropropene	ND	65	
108-88-3	Toluene	ND	65	
10061-02-6	t-1,3-Dichloropropene	ND	65	
79-00-5	1,1,2-Trichloroethane	ND	65	
124-48-1	Dibromochloromethane	ND	65	
108-90-7	Chlorobenzene	ND	65	
563-58-6	1,1-Dichloropropene	ND	65	
79-01-6	Trichloroethylene	ND	65	
78-87-5	1,2-Dichloropropane	ND	65	
75-27-4	Bromodichloromethane	ND	65	
74-95-3	Dibromomethane	ND	65	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	65	
142-28-9	1,3-Dichloropropane	ND	65	
127-18-4	Tetrachloroethylene	ND	65	
106-93-4	1,2-Dibromoethane	ND	65	
591-78-6	2-Hexanone	ND	65	
630-20-6	1,1,1,2-Tetrachloroethane	ND	65	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0007	Lab Sample ID:	AB56539
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/01/2015	Amount Prepared:	5 mL
Date of Analysis:	6/01/2015	Percent Solids:	86%
Dry Weight Prepared:	8.865 grams	Extract Dilution:	50
Wet Weight Prepared:	10.333 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	65	
108-38-3/106-42-3	M/P Xylene	ND	130	
95-47-6	Ortho Xylene	ND	65	
100-42-5	Styrene	ND	65	
75-25-2	Bromoform	ND	65	
79-34-5	1,1,2,2-Tetrachloroethane	ND	65	
98-82-8	Isopropylbenzene	ND	65	
108-86-1	Bromobenzene	ND	65	
96-18-4	1,2,3-Trichloropropane	ND	65	
103-65-1	N-Propylbenzene	ND	65	
95-49-8	2-Chlorotoluene	ND	65	
106-43-4	4-Chlorotoluene	ND	65	
98-06-6	Tert-Butylbenzene	ND	65	
108-67-8	1,3,5-Trimethylbenzene	ND	65	
95-63-6	1,2,4-Trimethylbenzene	ND	65	
135-98-8	Sec-Butylbenzene	ND	65	
541-73-1	1,3-Dichlorobenzene	ND	65	
99-87-6	Para-Isopropyltoluene	ND	65	
106-46-7	1,4-Dichlorobenzene	ND	65	
95-50-1	1,2-Dichlorobenzene	ND	65	
104-51-8	N-Butylbenzene	ND	65	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	65	
120-82-1	1,2,4-Trichlorobenzene	ND	65	
87-68-3	Hexachlorobutadiene	ND	65	
91-20-3	Naphthalene	ND	65	
87-61-6	1,2,3-Trichlorobenzene	ND	65	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	96	74 - 136
Toluene-D8	100	85 - 118
1,4-Bromofluorobenzene	98	78 - 111

Comments:

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0008	Lab Sample ID:	AB56540
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/01/2015	Amount Prepared:	5 mL
Date of Analysis:	6/01/2015	Percent Solids:	89%
Dry Weight Prepared:	7.292 grams	Extract Dilution:	50
Wet Weight Prepared:	8.195 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	75	
75-01-4	Vinyl Chloride	ND	75	
74-83-9	Bromomethane	ND	75	
75-00-3	Chloroethane	ND	75	
75-69-4	Trichlorofluoromethane	ND	75	
60-29-7	Ethyl Ether	ND	75	
67-64-1	2-Propanone (acetone)	ND	75	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	75	
75-35-4	1,1-Dichloroethylene	ND	75	
75-15-0	Carbon Disulfide	ND	75	
75-71-8	Dichlorodifluoromethane	ND	75	
75-09-2	Methylene Chloride	ND	75	
107-13-1	Acrylonitrile	ND	75	
1634-04-4	Methyl-t-Butyl Ether	ND	75	
156-60-5	Trans-1,2-Dichloroethylene	ND	75	
75-34-3	1,1-dichloroethane	ND	75	
108-05-4	Vinyl Acetate	ND	75	
78-93-3	2-Butanone (MEK)	ND	75	
594-20-7	2,2-Dichloropropane	ND	75	
156-59-2	cis-1,2-Dichloroethylene	ND	75	
67-66-3	Chloroform	ND	75	
74-97-5	Bromochloromethane	ND	75	
109-99-9	Tetrahydrofuran	ND	75	
71-55-6	1,1,1-Trichloroethane	ND	75	
107-06-2	1,2-Dichloroethane	ND	75	
56-23-5	Carbon tetrachloride	ND	75	
71-43-2	Benzene	ND	75	
10061-01-5	c-1,3-dichloropropene	ND	75	
108-88-3	Toluene	ND	75	
10061-02-6	t-1,3-Dichloropropene	ND	75	
79-00-5	1,1,2-Trichloroethane	ND	75	
124-48-1	Dibromochloromethane	ND	75	
108-90-7	Chlorobenzene	ND	75	
563-58-6	1,1-Dichloropropene	ND	75	
79-01-6	Trichloroethylene	ND	75	
78-87-5	1,2-Dichloropropane	ND	75	
75-27-4	Bromodichloromethane	ND	75	
74-95-3	Dibromomethane	ND	75	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	75	
142-28-9	1,3-Dichloropropane	ND	75	
127-18-4	Tetrachloroethylene	ND	75	
106-93-4	1,2-Dibromoethane	ND	75	
591-78-6	2-Hexanone	ND	75	
630-20-6	1,1,1,2-Tetrachloroethane	ND	75	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0008	Lab Sample ID:	AB56540
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/01/2015	Amount Prepared:	5 mL
Date of Analysis:	6/01/2015	Percent Solids:	89%
Dry Weight Prepared:	7.292 grams	Extract Dilution:	50
Wet Weight Prepared:	8.195 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	75	
108-38-3/106-42-3	M/P Xylene	ND	150	
95-47-6	Ortho Xylene	ND	75	
100-42-5	Styrene	ND	75	
75-25-2	Bromoform	ND	75	
79-34-5	1,1,2,2-Tetrachloroethane	ND	75	
98-82-8	Isopropylbenzene	ND	75	
108-86-1	Bromobenzene	ND	75	
96-18-4	1,2,3-Trichloropropane	ND	75	
103-65-1	N-Propylbenzene	ND	75	
95-49-8	2-Chlorotoluene	ND	75	
106-43-4	4-Chlorotoluene	ND	75	
98-06-6	Tert-Butylbenzene	ND	75	
108-67-8	1,3,5-Trimethylbenzene	ND	75	
95-63-6	1,2,4-Trimethylbenzene	ND	75	
135-98-8	Sec-Butylbenzene	ND	75	
541-73-1	1,3-Dichlorobenzene	ND	75	
99-87-6	Para-Isopropyltoluene	ND	75	
106-46-7	1,4-Dichlorobenzene	ND	75	
95-50-1	1,2-Dichlorobenzene	ND	75	
104-51-8	N-Butylbenzene	ND	75	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	75	
120-82-1	1,2,4-Trichlorobenzene	ND	75	
87-68-3	Hexachlorobutadiene	ND	75	
91-20-3	Naphthalene	ND	75	
87-61-6	1,2,3-Trichlorobenzene	ND	75	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	99	74 - 136
Toluene-D8	103	85 - 118
1,4-Bromofluorobenzene	96	78 - 111

Comments:

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0009	Lab Sample ID:	AB56541
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/01/2015	Amount Prepared:	5 mL
Date of Analysis:	6/01/2015	Percent Solids:	86%
Dry Weight Prepared:	6.772 grams	Extract Dilution:	50
Wet Weight Prepared:	7.841 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	82	
75-01-4	Vinyl Chloride	ND	82	
74-83-9	Bromomethane	ND	82	
75-00-3	Chloroethane	ND	82	
75-69-4	Trichlorofluoromethane	ND	82	
60-29-7	Ethyl Ether	ND	82	
67-64-1	2-Propanone (acetone)	ND	82	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	82	
75-35-4	1,1-Dichloroethylene	ND	82	
75-15-0	Carbon Disulfide	ND	82	
75-71-8	Dichlorodifluoromethane	ND	82	
75-09-2	Methylene Chloride	ND	82	
107-13-1	Acrylonitrile	ND	82	
1634-04-4	Methyl-t-Butyl Ether	ND	82	
156-60-5	Trans-1,2-Dichloroethylene	ND	82	
75-34-3	1,1-dichloroethane	ND	82	
108-05-4	Vinyl Acetate	ND	82	
78-93-3	2-Butanone (MEK)	ND	82	
594-20-7	2,2-Dichloropropane	ND	82	
156-59-2	cis-1,2-Dichloroethylene	ND	82	
67-66-3	Chloroform	ND	82	
74-97-5	Bromochloromethane	ND	82	
109-99-9	Tetrahydrofuran	ND	82	
71-55-6	1,1,1-Trichloroethane	ND	82	
107-06-2	1,2-Dichloroethane	ND	82	
56-23-5	Carbon tetrachloride	ND	82	
71-43-2	Benzene	ND	82	
10061-01-5	c-1,3-dichloropropene	ND	82	
108-88-3	Toluene	ND	82	
10061-02-6	t-1,3-Dichloropropene	ND	82	
79-00-5	1,1,2-Trichloroethane	ND	82	
124-48-1	Dibromochloromethane	ND	82	
108-90-7	Chlorobenzene	ND	82	
563-58-6	1,1-Dichloropropene	ND	82	
79-01-6	Trichloroethylene	**110**	82	
78-87-5	1,2-Dichloropropane	ND	82	
75-27-4	Bromodichloromethane	ND	82	
74-95-3	Dibromomethane	ND	82	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	82	
142-28-9	1,3-Dichloropropane	ND	82	
127-18-4	Tetrachloroethylene	ND	82	
106-93-4	1,2-Dibromoethane	ND	82	
591-78-6	2-Hexanone	ND	82	
630-20-6	1,1,1,2-Tetrachloroethane	ND	82	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0009	Lab Sample ID:	AB56541
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/01/2015	Amount Prepared:	5 mL
Date of Analysis:	6/01/2015	Percent Solids:	86%
Dry Weight Prepared:	6.772 grams	Extract Dilution:	50
Wet Weight Prepared:	7.841 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	82	
108-38-3/106-42-3	M/P Xylene	ND	160	
95-47-6	Ortho Xylene	ND	82	
100-42-5	Styrene	ND	82	
75-25-2	Bromoform	ND	82	
79-34-5	1,1,2,2-Tetrachloroethane	ND	82	
98-82-8	Isopropylbenzene	ND	82	
108-86-1	Bromobenzene	ND	82	
96-18-4	1,2,3-Trichloropropane	ND	82	
103-65-1	N-Propylbenzene	ND	82	
95-49-8	2-Chlorotoluene	ND	82	
106-43-4	4-Chlorotoluene	ND	82	
98-06-6	Tert-Butylbenzene	ND	82	
108-67-8	1,3,5-Trimethylbenzene	ND	82	
95-63-6	1,2,4-Trimethylbenzene	ND	82	
135-98-8	Sec-Butylbenzene	ND	82	
541-73-1	1,3-Dichlorobenzene	ND	82	
99-87-6	Para-Isopropyltoluene	ND	82	
106-46-7	1,4-Dichlorobenzene	ND	82	
95-50-1	1,2-Dichlorobenzene	ND	82	
104-51-8	N-Butylbenzene	ND	82	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	82	
120-82-1	1,2,4-Trichlorobenzene	ND	82	
87-68-3	Hexachlorobutadiene	ND	82	
91-20-3	Naphthalene	ND	82	
87-61-6	1,2,3-Trichlorobenzene	ND	82	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	100	74 - 136
1,4-Bromofluorobenzene	96	78 - 111
Toluene-D8	100	85 - 118

Comments:

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0010	Lab Sample ID:	AB56542
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/01/2015	Amount Prepared:	5 mL
Date of Analysis:	6/01/2015	Percent Solids:	90%
Dry Weight Prepared:	4.474 grams	Extract Dilution:	50
Wet Weight Prepared:	4.960 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	120	
75-01-4	Vinyl Chloride	ND	120	
74-83-9	Bromomethane	ND	120	
75-00-3	Chloroethane	ND	120	
75-69-4	Trichlorofluoromethane	ND	120	
60-29-7	Ethyl Ether	ND	120	
67-64-1	2-Propanone (acetone)	ND	120	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	120	
75-35-4	1,1-Dichloroethylene	ND	120	
75-15-0	Carbon Disulfide	ND	120	
75-71-8	Dichlorodifluoromethane	ND	120	
75-09-2	Methylene Chloride	ND	120	
107-13-1	Acrylonitrile	ND	120	
1634-04-4	Methyl-t-Butyl Ether	ND	120	
156-60-5	Trans-1,2-Dichloroethylene	ND	120	
75-34-3	1,1-dichloroethane	ND	120	
108-05-4	Vinyl Acetate	ND	120	
78-93-3	2-Butanone (MEK)	ND	120	
594-20-7	2,2-Dichloropropane	ND	120	
156-59-2	cis-1,2-Dichloroethylene	ND	120	
67-66-3	Chloroform	ND	120	
74-97-5	Bromochloromethane	ND	120	
109-99-9	Tetrahydrofuran	ND	120	
71-55-6	1,1,1-Trichloroethane	ND	120	
107-06-2	1,2-Dichloroethane	ND	120	
56-23-5	Carbon tetrachloride	ND	120	
71-43-2	Benzene	ND	120	
10061-01-5	c-1,3-dichloropropene	ND	120	
108-88-3	Toluene	ND	120	
10061-02-6	t-1,3-Dichloropropene	ND	120	
79-00-5	1,1,2-Trichloroethane	ND	120	
124-48-1	Dibromochloromethane	ND	120	
108-90-7	Chlorobenzene	ND	120	
563-58-6	1,1-Dichloropropene	ND	120	
79-01-6	Trichloroethylene	ND	120	
78-87-5	1,2-Dichloropropane	ND	120	
75-27-4	Bromodichloromethane	ND	120	
74-95-3	Dibromomethane	ND	120	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	120	
142-28-9	1,3-Dichloropropane	ND	120	
127-18-4	Tetrachloroethylene	ND	120	
106-93-4	1,2-Dibromoethane	ND	120	
591-78-6	2-Hexanone	ND	120	
630-20-6	1,1,1,2-Tetrachloroethane	ND	120	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0010	Lab Sample ID:	AB56542
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/01/2015	Amount Prepared:	5 mL
Date of Analysis:	6/01/2015	Percent Solids:	90%
Dry Weight Prepared:	4.474 grams	Extract Dilution:	50
Wet Weight Prepared:	4.960 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	120	
108-38-3/106-42-3	M/P Xylene	ND	230	
95-47-6	Ortho Xylene	ND	120	
100-42-5	Styrene	ND	120	
75-25-2	Bromoform	ND	120	
79-34-5	1,1,2,2-Tetrachloroethane	ND	120	
98-82-8	Isopropylbenzene	ND	120	
108-86-1	Bromobenzene	ND	120	
96-18-4	1,2,3-Trichloropropane	ND	120	
103-65-1	N-Propylbenzene	ND	120	
95-49-8	2-Chlorotoluene	ND	120	
106-43-4	4-Chlorotoluene	ND	120	
98-06-6	Tert-Butylbenzene	ND	120	
108-67-8	1,3,5-Trimethylbenzene	ND	120	
95-63-6	1,2,4-Trimethylbenzene	ND	120	
135-98-8	Sec-Butylbenzene	ND	120	
541-73-1	1,3-Dichlorobenzene	ND	120	
99-87-6	Para-Isopropyltoluene	ND	120	
106-46-7	1,4-Dichlorobenzene	ND	120	
95-50-1	1,2-Dichlorobenzene	ND	120	
104-51-8	N-Butylbenzene	ND	120	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	120	
120-82-1	1,2,4-Trichlorobenzene	ND	120	
87-68-3	Hexachlorobutadiene	ND	120	
91-20-3	Naphthalene	ND	120	
87-61-6	1,2,3-Trichlorobenzene	ND	120	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	98	74 - 136
Toluene-D8	101	85 - 118
1,4-Bromofluorobenzene	96	78 - 111

Comments:

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB56533

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
1,1,1,2-Tetrachloroethane	2032	ND	1900	94	74 - 124
1,1,1-Trichloroethane	2032	ND	2200	110	76 - 132
1,1,2,2-Tetrachloroethane	2032	ND	1900	94	69 - 125
1,1,2-Trichloro-1,2,2-Trifluoroetha	2032	ND	2400	120	68 - 144
1,1,2-Trichloroethane	2032	ND	2000	98	75 - 126
1,1-Dichloroethylene	2032	ND	2500	120	65 - 140
1,1-Dichloropropene	2032	ND	2000	98	81 - 125
1,1-dichloroethane	2032	ND	2200	110	77 - 130
1,2,3-Trichlorobenzene	2032	ND	1700	84	64 - 125
1,2,3-Trichloropropane	2032	ND	1900	94	68 - 122
1,2,4-Trichlorobenzene	2032	ND	1900	94	72 - 120
1,2,4-Trimethylbenzene	2032	ND	2000	98	81 - 125
1,2-Dibromo-3-Chloropropane	2032	ND	1700	84	54 - 125
1,2-Dibromoethane	2032	ND	1900	94	73 - 124
1,2-Dichlorobenzene	2032	ND	1900	94	81 - 116
1,2-Dichloroethane	2032	ND	2000	98	74 - 130
1,2-Dichloropropane	2032	ND	2000	98	78 - 120
1,3,5-Trimethylbenzene	2032	ND	2000	98	81 - 125
1,3-Dichlorobenzene	2032	ND	2000	98	82 - 117
1,3-Dichloropropane	2032	ND	1900	94	76 - 123
1,4-Dichlorobenzene	2032	ND	1900	94	80 - 116
2,2-Dichloropropane	2032	ND	2300	110	57 - 147
2-Butanone (MEK)	2032	ND	1800	89	41 - 151
2-Chlorotoluene	2032	ND	2000	98	82 - 119
2-Hexanone	2032	ND	1700	84	51 - 148
2-Propanone (acetone)	2032	ND	1800	89	25 - 161
4-Chlorotoluene	2032	ND	2000	98	82 - 119
4-Methyl-2-Pentanone(MIBK)	2032	ND	1700	84	62 - 130
Acrylonitrile	2032	ND	2100	100	67 - 130
Benzene	2032	ND	2300	110	82 - 124
Bromobenzene	2032	ND	2000	98	79 - 119
Bromochloromethane	2032	ND	2200	110	79 - 125
Bromodichloromethane	2032	ND	1800	89	71 - 126
Bromoform	2032	ND	1700	84	56 - 119
Bromomethane	2032	ND	2200	110	37 - 161
Carbon Disulfide	2032	ND	2300	110	63 - 134
Carbon tetrachloride	2032	ND	1900	94	68 - 136
Chlorobenzene	2032	ND	2000	98	82 - 126
Chloroethane	2032	ND	2300	110	57 - 148
Chloroform	2032	ND	2100	100	78 - 130
Chloromethane	2032	ND	2300	110	56 - 147
Dibromochloromethane	2032	ND	1900	94	62 - 131
Dibromomethane	2032	ND	1900	94	75 - 122
Dichlorodifluoromethane	2032	ND	2100	100	59 - 131
Ethyl Ether	2032	ND	2300	110	65 - 138
Ethylbenzene	2032	ND	2000	98	82 - 122
Hexachlorobutadiene	2032	ND	1800	89	70 - 130

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB56533

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
Isopropylbenzene	2032	ND	2100	100	82 - 125
M/P Xylene	4064	ND	4000	98	85 - 120
Methyl-t-Butyl Ether	2032	ND	2100	100	74 - 125
Methylene Chloride	2032	ND	2300	110	67 - 139
N-Butylbenzene	2032	ND	2100	100	80 - 129
N-Propylbenzene	2032	ND	2100	100	81 - 122
Naphthalene	2032	ND	1800	89	59 - 129
Ortho Xylene	2032	ND	1900	94	84 - 122
Para-Isopropyltoluene	2032	ND	2100	100	79 - 129
Sec-Butylbenzene	2032	ND	2000	98	81 - 126
Styrene	2032	ND	2100	100	82 - 125
Tert-Butylbenzene	2032	ND	2000	98	81 - 126
Tetrachloroethylene	2032	ND	1800	89	74 - 133
Tetrahydrofuran	2032	ND	1800	89	60 - 132
Toluene	2032	ND	2100	100	82 - 124
Trans-1,2-Dichloroethylene	2032	ND	2300	110	79 - 127
Trichloroethylene	2032	ND	1900	94	76 - 124
Trichlorofluoromethane	2032	ND	2300	110	65 - 144
Vinyl Acetate	2032	ND	2000	98	14 - 152
Vinyl Chloride	2032	ND	1800	89	34 - 142
c-1,3-dichloropropene	2032	ND	2000	98	68 - 133
cis-1,2-Dichloroethylene	2032	ND	2300	110	79 - 131
t-1,3-Dichloropropene	2032	ND	2000	98	65 - 126

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE DUPLICATE (MSD) RECOVERY

Sample ID:AB56533

PARAMETER	MSD SPIKE ADDED	MSD CONCENTRATION ug/Kg	MSD % REC	RPD %	QC LIMITS RPD
1,1,1,2-Tetrachloroethane	2032	1800	89	6	40
1,1,1-Trichloroethane	2032	2100	100	10	40
1,1,2,2-Tetrachloroethane	2032	1900	94	0	40
1,1,2-Trichloro-1,2,2-Trifluoroetha	2032	2100	100	18	40
1,1,2-Trichloroethane	2032	1900	94	4	40
1,1-Dichloroethylene	2032	2300	110	9	52
1,1-Dichloropropene	2032	1900	94	4	40
1,1-dichloroethane	2032	2100	100	10	40
1,2,3-Trichlorobenzene	2032	1800	89	6	40
1,2,3-Trichloropropane	2032	1800	89	6	40
1,2,4-Trichlorobenzene	2032	1800	89	6	40
1,2,4-Trimethylbenzene	2032	2000	98	0	40
1,2-Dibromo-3-Chloropropane	2032	1600	79	6	40
1,2-Dibromoethane	2032	1900	94	0	40
1,2-Dichlorobenzene	2032	1900	94	0	40
1,2-Dichloroethane	2032	1800	89	10	40
1,2-Dichloropropane	2032	2000	98	0	40
1,3,5-Trimethylbenzene	2032	2000	98	0	40
1,3-Dichlorobenzene	2032	1900	94	4	40
1,3-Dichloropropane	2032	1800	89	6	40
1,4-Dichlorobenzene	2032	1900	94	0	40
2,2-Dichloropropane	2032	2100	100	10	40
2-Butanone (MEK)	2032	1800	89	0	40
2-Chlorotoluene	2032	2000	98	0	40
2-Hexanone	2032	1700	84	0	40
2-Propanone (acetone)	2032	1600	79	12	40
4-Chlorotoluene	2032	1900	94	4	40
4-Methyl-2-Pentanone(MIBK)	2032	1700	84	0	40
Acrylonitrile	2032	2000	98	2	40
Benzene	2032	2000	98	12	24
Bromobenzene	2032	1900	94	4	40
Bromochloromethane	2032	2100	100	10	40
Bromodichloromethane	2032	1900	94	6	40
Bromoform	2032	1700	84	0	40
Bromomethane	2032	2100	100	10	40
Carbon Disulfide	2032	2200	110	0	40
Carbon tetrachloride	2032	1900	94	0	40
Chlorobenzene	2032	1900	94	4	34
Chloroethane	2032	2100	100	10	40
Chloroform	2032	2100	100	0	40
Chloromethane	2032	2500	120	9	40
Dibromochloromethane	2032	1800	89	6	40
Dibromomethane	2032	1900	94	0	40
Dichlorodifluoromethane	2032	2000	98	2	40
Ethyl Ether	2032	2000	98	12	40
Ethylbenzene	2032	1900	94	4	40
Hexachlorobutadiene	2032	1800	89	0	40
Isopropylbenzene	2032	2000	98	2	40

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE DUPLICATE (MSD) RECOVERY

Sample ID:AB56533

PARAMETER	MSD SPIKE ADDED	MSD CONCENTRATION ug/Kg	MSD % REC	RPD %	QC LIMITS RPD
M/P Xylene	4064	4000	98	0	40
Methyl-t-Butyl Ether	2032	2000	98	2	40
Methylene Chloride	2032	2100	100	10	40
N-Butylbenzene	2032	2000	98	2	40
N-Propylbenzene	2032	2000	98	2	40
Naphthalene	2032	1800	89	0	40
Ortho Xylene	2032	1900	94	0	40
Para-Isopropyltoluene	2032	2000	98	2	40
Sec-Butylbenzene	2032	2000	98	0	40
Styrene	2032	2000	98	2	40
Tert-Butylbenzene	2032	1900	94	4	40
Tetrachloroethylene	2032	1800	89	0	40
Tetrahydrofuran	2032	1700	84	6	40
Toluene	2032	2000	98	2	33
Trans-1,2-Dichloroethylene	2032	2200	110	0	40
Trichloroethylene	2032	2000	98	4	27
Trichlorofluoromethane	2032	2100	100	10	40
Vinyl Acetate	2032	2000	98	0	40
Vinyl Chloride	2032	1800	89	0	40
c-1,3-dichloropropene	2032	2000	98	0	40
cis-1,2-Dichloroethylene	2032	2200	110	0	40
t-1,3-Dichloropropene	2032	1900	94	4	40

Lunt Silversmiths - Greenfield, MA

Laboratory Duplicate Results

Sample ID: AB56533

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
1,1,1,2-Tetrachloroethane	ND	ND	NC	40
1,1,1-Trichloroethane	ND	ND	NC	40
1,1,2,2-Tetrachloroethane	ND	ND	NC	40
1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	ND	NC	40
1,1,2-Trichloroethane	ND	ND	NC	40
1,1-Dichloroethylene	ND	ND	NC	40
1,1-Dichloropropene	ND	ND	NC	40
1,1-dichloroethane	ND	ND	NC	40
1,2,3-Trichlorobenzene	ND	ND	NC	40
1,2,3-Trichloropropane	ND	ND	NC	40
1,2,4-Trichlorobenzene	ND	ND	NC	40
1,2,4-Trimethylbenzene	ND	ND	NC	40
1,2-Dibromo-3-Chloropropane	ND	ND	NC	40
1,2-Dibromoethane	ND	ND	NC	40
1,2-Dichlorobenzene	ND	ND	NC	40
1,2-Dichloroethane	ND	ND	NC	40
1,2-Dichloropropane	ND	ND	NC	40
1,3,5-Trimethylbenzene	ND	ND	NC	40
1,3-Dichlorobenzene	ND	ND	NC	40
1,3-Dichloropropane	ND	ND	NC	40
1,4-Dichlorobenzene	ND	ND	NC	40
2,2-Dichloropropane	ND	ND	NC	40
2-Butanone (MEK)	ND	ND	NC	40
2-Chlorotoluene	ND	ND	NC	40
2-Hexanone	ND	ND	NC	40
2-Propanone (acetone)	ND	ND	NC	40
4-Chlorotoluene	ND	ND	NC	40
4-Methyl-2-Pentanone(MIBK)	ND	ND	NC	40
Acrylonitrile	ND	ND	NC	40
Benzene	ND	ND	NC	40
Bromobenzene	ND	ND	NC	40
Bromochloromethane	ND	ND	NC	40
Bromodichloromethane	ND	ND	NC	40
Bromoform	ND	ND	NC	40
Bromomethane	ND	ND	NC	40
Carbon Disulfide	ND	ND	NC	40
Carbon tetrachloride	ND	ND	NC	40
Chlorobenzene	ND	ND	NC	40
Chloroethane	ND	ND	NC	40
Chloroform	ND	ND	NC	40
Chloromethane	ND	ND	NC	40
Dibromochloromethane	ND	ND	NC	40
Dibromomethane	ND	ND	NC	40
Dichlorodifluoromethane	ND	ND	NC	40
Ethyl Ether	ND	ND	NC	40
Ethylbenzene	ND	ND	NC	40
Hexachlorobutadiene	ND	ND	NC	40
Isopropylbenzene	ND	ND	NC	40
M/P Xylene	ND	ND	NC	40
Methyl-t-Butyl Ether	ND	ND	NC	40

Lunt Silversmiths - Greenfield, MA

Laboratory Duplicate Results

Sample ID: AB56533

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
Methylene Chloride	ND	ND	NC	40
N-Butylbenzene	ND	ND	NC	40
N-Propylbenzene	ND	ND	NC	40
Naphthalene	ND	ND	NC	40
Ortho Xylene	ND	ND	NC	40
Para-Isopropyltoluene	ND	ND	NC	40
Sec-Butylbenzene	ND	ND	NC	40
Styrene	ND	ND	NC	40
Tert-Butylbenzene	ND	ND	NC	40
Tetrachloroethylene	ND	ND	NC	40
Tetrahydrofuran	ND	ND	NC	40
Toluene	ND	ND	NC	40
Trans-1,2-Dichloroethylene	ND	ND	NC	40
Trichloroethylene	ND	ND	NC	40
Trichlorofluoromethane	ND	ND	NC	40
Vinyl Acetate	ND	ND	NC	40
Vinyl Chloride	ND	ND	NC	40
c-1,3-dichloropropene	ND	ND	NC	40
cis-1,2-Dichloroethylene	ND	ND	NC	40
t-1,3-Dichloropropene	ND	ND	NC	40

Lunt Silversmiths - Greenfield, MA

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/Kg	LFB RESULT ug/Kg	LFB RECOVERY %	QC LIMITS %
1,1,1,2-Tetrachloroethane	20	18.9	95	77 - 122
1,1,1-Trichloroethane	20	20.9	105	80 - 128
1,1,2,2-Tetrachloroethane	20	18.7	94	73 - 118
1,1,2-Trichloro-1,2,2-Trifluoroeth	20	24.0	120	59 - 146
1,1,2-Trichloroethane	20	19.1	96	79 - 117
1,1-Dichloroethylene	20	26.2	131	70 - 130
1,1-Dichloropropene	20	18.8	94	79 - 123
1,1-dichloroethane	20	22.2	111	81 - 122
1,2,3-Trichlorobenzene	20	17.3	87	70 - 119
1,2,3-Trichloropropane	20	17.1	86	73 - 114
1,2,4-Trichlorobenzene	20	18.5	93	74 - 120
1,2,4-Trimethylbenzene	20	19.5	98	79 - 123
1,2-Dibromo-3-Chloropropane	20	17.6	88	63 - 124
1,2-Dibromoethane	20	18.3	92	79 - 116
1,2-Dichlorobenzene	20	18.1	91	77 - 117
1,2-Dichloroethane	20	18.7	94	75 - 124
1,2-Dichloropropane	20	19.2	96	80 - 117
1,3,5-Trimethylbenzene	20	19.4	97	80 - 122
1,3-Dichlorobenzene	20	19.1	96	78 - 117
1,3-Dichloropropane	20	18.4	92	79 - 116
1,4-Dichlorobenzene	20	19.0	95	77 - 115
2,2-Dichloropropane	20	23.0	115	64 - 152
2-Butanone (MEK)	20	18.0	90	55 - 144
2-Chlorotoluene	20	20.0	100	79 - 119
2-Hexanone	20	16.9	85	58 - 147
2-Propanone (acetone)	20	21.2	106	37 - 168
4-Chlorotoluene	20	18.8	94	78 - 120
4-Methyl-2-Pentanone(MIBK)	20	16.7	84	68 - 125
Acrylonitrile	20	22.1	111	68 - 124
Benzene	20	20.3	102	80 - 120
Bromobenzene	20	18.8	94	80 - 115
Bromochloromethane	20	21.8	109	81 - 120
Bromodichloromethane	20	19.6	98	77 - 125
Bromoform	20	17.8	89	62 - 127
Bromomethane	20	23.1	116	60 - 139
Carbon Disulfide	20	25.4	127	73 - 129
Carbon tetrachloride	20	19.3	97	73 - 136
Chlorobenzene	20	19.2	96	82 - 119
Chloroethane	20	22.5	113	69 - 130
Chloroform	20	21.4	107	80 - 122
Chloromethane	20	25.2	126	65 - 129
Dibromochloromethane	20	19.1	96	71 - 129
Dibromomethane	20	19.4	97	79 - 115
Dichlorodifluoromethane	20	21.8	109	69 - 126
Ethyl Ether	20	22.5	113	69 - 127
Ethylbenzene	20	19.2	96	80 - 121
Hexachlorobutadiene	20	17.5	88	72 - 124
Isopropylbenzene	20	19.1	96	79 - 124
M/P Xylene	40	39.1	98	81 - 120
Methyl-t-Butyl Ether	20	21.8	109	78 - 120
Methylene Chloride	20	23.1	116	73 - 129
N-Butylbenzene	20	19.4	97	78 - 126
N-Propylbenzene	20	19.4	97	78 - 122

Lunt Silversmiths - Greenfield, MA

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/Kg	LFB RESULT ug/Kg	LFB RECOVERY %	QC LIMITS %
Naphthalene	20	18.2	91	66 - 124
Ortho Xylene	20	19.0	95	81 - 121
Para-Isopropyltoluene	20	19.7	99	77 - 127
Sec-Butylbenzene	20	20.0	100	79 - 124
Styrene	20	20.2	101	82 - 122
Tert-Butylbenzene	20	19.3	97	78 - 124
Tetrachloroethylene	20	17.0	85	77 - 125
Tetrahydrofuran	20	18.7	94	67 - 124
Toluene	20	19.9	100	81 - 120
Trans-1,2-Dichloroethylene	20	23.7	119	80 - 121
Trichloroethylene	20	19.2	96	80 - 117
Trichlorofluoromethane	20	24.0	120	68 - 137
Vinyl Acetate	20	19.9	100	25 - 150
Vinyl Chloride	20	23.1	116	67 - 134
c-1,3-dichloropropene	20	20.3	102	73 - 133
cis-1,2-Dichloroethylene	20	22.4	112	82 - 122
t-1,3-Dichloropropene	20	19.8	99	69 - 127

Comments:

Lunt Silversmiths - Greenfield, MA

LABORATORY FORTIFIED DUPLICATE (LFB Dup) RECOVERY

COMPOUND	LFB Dup CONCENTRATION ug/Kg	LFB Dup RECOVERY %	RPD %	QC LIMITS RPD
1,1,1,2-Tetrachloroethane	17.9	90	5	50
1,1,1-Trichloroethane	20.7	104	1	50
1,1,2,2-Tetrachloroethane	18.8	94	1	50
1,1,2-Trichloro-1,2,2-Trifluoroetha	20.7	104	15	50
1,1,2-Trichloroethane	20.0	100	5	50
1,1-Dichloroethylene	22.6	113	15	52
1,1-Dichloropropene	18.5	93	2	50
1,1-dichloroethane	21.5	108	3	50
1,2,3-Trichlorobenzene	17.5	88	1	50
1,2,3-Trichloropropane	18.2	91	6	50
1,2,4-Trichlorobenzene	18.6	93	1	50
1,2,4-Trimethylbenzene	19.2	96	2	50
1,2-Dibromo-3-Chloropropane	17.9	90	2	50
1,2-Dibromoethane	18.8	94	3	50
1,2-Dichlorobenzene	18.4	92	2	50
1,2-Dichloroethane	19.4	97	4	50
1,2-Dichloropropane	19.3	97	1	50
1,3,5-Trimethylbenzene	18.9	95	3	50
1,3-Dichlorobenzene	18.8	94	2	50
1,3-Dichloropropane	18.7	94	2	50
1,4-Dichlorobenzene	18.7	94	2	50
2,2-Dichloropropane	22.5	113	2	50
2-Butanone (MEK)	18.4	92	2	50
2-Chlorotoluene	18.9	95	6	50
2-Hexanone	17.6	88	4	50
2-Propanone (acetone)	18.9	95	12	50
4-Chlorotoluene	18.7	94	1	50
4-Methyl-2-Pentanone(MIBK)	17.3	87	4	50
Acrylonitrile	20.1	101	10	50
Benzene	20.8	104	2	50
Bromobenzene	18.5	93	2	50
Bromochloromethane	21.4	107	2	50
Bromodichloromethane	18.7	94	5	50
Bromoform	18.4	92	3	50
Bromomethane	20.9	105	10	50
Carbon Disulfide	22.1	111	14	50
Carbon tetrachloride	19.6	98	2	50
Chlorobenzene	20.1	101	5	34
Chloroethane	20.8	104	8	50
Chloroform	20.4	102	5	50
Chloromethane	22.9	115	10	50
Dibromochloromethane	19.7	99	3	50
Dibromomethane	18.0	90	8	50
Dichlorodifluoromethane	21.7	109	1	50
Ethyl Ether	20.2	101	11	50
Ethylbenzene	18.9	95	2	50
Hexachlorobutadiene	17.6	88	1	50
Isopropylbenzene	19.6	98	3	50
M/P Xylene	38.4	96	2	50
Methyl-t-Butyl Ether	20.3	102	7	50
Methylene Chloride	20.7	104	11	50

Lunt Silversmiths - Greenfield, MA

LABORATORY FORTIFIED DUPLICATE (LFB Dup) RECOVERY

COMPOUND	LFB Dup CONCENTRATION ug/Kg	LFB Dup RECOVERY %	RPD %	QC LIMITS RPD
N-Butylbenzene	19.6	98	1	50
N-Propylbenzene	19.8	99	2	50
Naphthalene	18.6	93	2	50
Ortho Xylene	18.8	94	1	50
Para-Isopropyltoluene	19.4	97	2	50
Sec-Butylbenzene	19.5	98	3	50
Styrene	20.2	101	0	50
Tert-Butylbenzene	18.8	94	3	50
Tetrachloroethylene	17.3	87	2	50
Tetrahydrofuran	17.8	89	5	50
Toluene	20.5	103	3	50
Trans-1,2-Dichloroethylene	21.8	109	8	50
Trichloroethylene	18.2	91	5	27
Trichlorofluoromethane	22.4	112	7	50
Vinyl Acetate	20.0	100	1	50
Vinyl Chloride	20.7	104	11	50
c-1,3-dichloropropene	20.5	103	1	50
cis-1,2-Dichloroethylene	22.3	112	0	50
t-1,3-Dichloropropene	20.6	103	4	50

Samples in Batch: AB56533, AB56534, AB56535, AB56536, AB56537, AB56538, AB56539, AB56540, AB56541, AB56542

 PN: 15050048

15050048 $VOAHS
15050048 $METMS_PE

, Andover, MA

CHAIN OF CUSTODY RECORD

Lunt Silversmiths/MA
Contact Name: Ken Robinson
Contact Phone: 978-621-1208

No: 05/29/15-0001

Cooler #:
Lab: NERL
Lab Phone:

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	Lab QC
	R120150528WC-0001	SS-01	VOC	Soil	5/29/2015	1	40 mL	MeOH	
	R120150528WC-0001	SS-01	Metals	Soil	5/29/2015	1	4 oz	4 C	
	R120150528WC-0002	SS-02	VOC	Soil	5/29/2015	1	40 mL	MeOH	
	R120150528WC-0002	SS-02	Metals	Soil	5/29/2015	1	4 oz	4 C	
	R120150528WC-0003	SS-04	VOC	Soil	5/29/2015	1	40 mL	MeOH	
	R120150528WC-0003	SS-04	Metals	Soil	5/29/2015	1	4 oz	4 C	
	R120150528WC-0004	SS-03	VOC	Soil	5/29/2015	1	40 mL	MeOH	
	R120150528WC-0004	SS-03	Metals	Soil	5/29/2015	1	4 oz	4 C	
	R120150528WC-0005	SS-05	VOC	Soil	5/29/2015	1	40 mL	MeOH	
	R120150528WC-0005	SS-05	Metals	Soil	5/29/2015	1	4 oz	4 C	

Special Instructions: Please forward results to OSC Wing Chau. Thank you.

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Weston	5/29/15 1530	ESAT	5/29/15 15:30	4° C

 PN: 15050048

15050048 $VOAHS
15050048 $METMS_PE

, Andover, MA

CHAIN OF CUSTODY RECORD

Lunt Silversmiths/MA
Contact Name: Ken Robinson
Contact Phone: 978-621-1208

No: 05/29/15-0001
Cooler #:
Lab: NERL
Lab Phone:

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	Lab QC
	R120150528WC-0006	SS-06	VOC	Soil	5/29/2015	1	40 mL	MeOH	
	R120150528WC-0006	SS-06	Metals	Soil	5/29/2015	1	4 oz	4 C	
	R120150528WC-0007	SS-07	VOC	Soil	5/29/2015	1	40 mL	MeOH	
	R120150528WC-0007	SS-07	Metals	Soil	5/29/2015	1	4 oz	4 C	
	R120150528WC-0008	SS-08	VOC	Soil	5/29/2015	1	40 mL	MeOH	
	R120150528WC-0008	SS-08	Metals	Soil	5/29/2015	1	4 oz	4 C	
	R120150528WC-0009	SS-09	VOC	Soil	5/29/2015	1	40 mL	MeOH	
	R120150528WC-0009	SS-09	Metals	Soil	5/29/2015	1	4 oz	4 C	
	R120150528WC-0010	SS-10	VOC	Soil	5/29/2015	1	40 mL	MeOH	
	R120150528WC-0010	SS-10	Metals	Soil	5/29/2015	1	4 oz	4 C	

Special Instructions: Please forward results to OSC Wing Chau. Thank you.

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
		5/29/15 1530	ESAT	5/29/15 15:30	4°C.

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

June 24, 2015

Wing Chau - Mail Code OSRR02-2
US EPA New England R1

Project Number: 15050048
Project: Lunt Silversmiths - Greenfield, MA
Analysis: Metals in Soil Medium Level by ICP
EPA Chemist: Michael Dowling

Date Samples Received by the Laboratory: 05/29/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-OPTIMASO1.

Samples were prepared following the EPA Region I SOP, EIASOP-INGMETALSPREP8

Preparation and analysis SOP's are based on "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, Revision 2, Final Update III, Methods 3050B and 6010B," respectively. Samples were analyzed using a Perkin Elmer Dual View Inductively Coupled Plasma - Optical Emission Spectrometer.

Samples were prepared and analyzed by ESAT contractors working at the USEPA New England Laboratory.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA, email=boudreau.dan@epa.gov, c=US
Date: 2015.06.24 14:23:56 -04'00'

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

All sample results reported mg/Kg, dry weight basis.

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0001	Lab Sample ID:	AB56533
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/04/2015	Amount Prepared:	N/A
Date of Analysis:	6/16/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**860**	2.6	
7429-90-5	Aluminum	**16000**	29	
7440-38-2	Arsenic	ND	5.3	
7440-39-3	Barium	**58**	5.3	
7440-41-7	Beryllium	ND	2.1	
7440-70-2	Calcium	**1700**	26	
7440-43-9	Cadmium	ND	2.6	
7440-48-4	Cobalt	**12**	5.3	
7440-47-3	Chromium	**27**	5.3	
7440-50-8	Copper	**130**	5.3	
7439-89-6	Iron	**27000**	11	
7439-95-4	Magnesium	**6100**	26	
7439-96-5	Manganese	**480**	5.3	J1
7440-02-0	Nickel	**32**	5.3	
7439-92-1	Lead	**32**	5.3	
7440-36-0	Antimony	ND	5.3	J1
7782-49-2	Selenium	ND	11	
7440-28-0	Thallium	ND	5.3	
7440-62-2	Vanadium	**68**	5.3	
7440-66-6	Zinc	**86**	11	

Comments:

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0002	Lab Sample ID:	AB56534
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/04/2015	Amount Prepared:	N/A
Date of Analysis:	6/16/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**26**	2.6	
7429-90-5	Aluminum	**13000**	29	
7440-38-2	Arsenic	ND	5.3	
7440-39-3	Barium	**47**	5.3	
7440-41-7	Beryllium	ND	2.1	
7440-70-2	Calcium	**1100**	26	
7440-43-9	Cadmium	ND	2.6	
7440-48-4	Cobalt	**9.2**	5.3	
7440-47-3	Chromium	**20**	5.3	
7440-50-8	Copper	**42**	5.3	
7439-89-6	Iron	**26000**	11	
7439-95-4	Magnesium	**4800**	26	
7439-96-5	Manganese	**370**	5.3	
7440-02-0	Nickel	**24**	5.3	
7439-92-1	Lead	**25**	5.3	
7440-36-0	Antimony	ND	5.3	
7782-49-2	Selenium	ND	11	
7440-28-0	Thallium	ND	5.3	
7440-62-2	Vanadium	**29**	5.3	
7440-66-6	Zinc	**75**	11	

Comments:

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0003	Lab Sample ID:	AB56535
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/04/2015	Amount Prepared:	N/A
Date of Analysis:	6/16/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**130**	2.6	
7429-90-5	Aluminum	**8600**	29	
7440-38-2	Arsenic	**9.3**	5.3	
7440-39-3	Barium	**67**	5.3	
7440-41-7	Beryllium	ND	2.1	
7440-70-2	Calcium	**1700**	26	
7440-43-9	Cadmium	ND	2.6	
7440-48-4	Cobalt	**7.0**	5.3	
7440-47-3	Chromium	**19**	5.3	
7440-50-8	Copper	**69**	5.3	
7439-89-6	Iron	**18000**	11	
7439-95-4	Magnesium	**3700**	26	
7439-96-5	Manganese	**310**	5.3	
7440-02-0	Nickel	**27**	5.3	
7439-92-1	Lead	**130**	5.3	
7440-36-0	Antimony	ND	5.3	
7782-49-2	Selenium	ND	11	
7440-28-0	Thallium	ND	5.3	
7440-62-2	Vanadium	**25**	5.3	
7440-66-6	Zinc	**130**	11	

Comments:

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0004	Lab Sample ID:	AB56536
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/04/2015	Amount Prepared:	N/A
Date of Analysis:	6/16/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**18**	2.5	
7429-90-5	Aluminum	**15000**	28	
7440-38-2	Arsenic	ND	5.0	
7440-39-3	Barium	**61**	5.0	
7440-41-7	Beryllium	ND	2.0	
7440-70-2	Calcium	**1700**	25	
7440-43-9	Cadmium	ND	2.5	
7440-48-4	Cobalt	**11**	5.0	
7440-47-3	Chromium	**24**	5.0	
7440-50-8	Copper	**32**	5.0	
7439-89-6	Iron	**23000**	10	
7439-95-4	Magnesium	**5900**	25	
7439-96-5	Manganese	**460**	5.0	
7440-02-0	Nickel	**24**	5.0	
7439-92-1	Lead	**36**	5.0	
7440-36-0	Antimony	ND	5.0	
7782-49-2	Selenium	ND	10	
7440-28-0	Thallium	ND	5.0	
7440-62-2	Vanadium	**33**	5.0	
7440-66-6	Zinc	**74**	10	

Comments:

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0005	Lab Sample ID:	AB56537
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/04/2015	Amount Prepared:	N/A
Date of Analysis:	6/16/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**22**	2.5	
7429-90-5	Aluminum	**13000**	28	
7440-38-2	Arsenic	ND	5.0	
7440-39-3	Barium	**55**	5.0	
7440-41-7	Beryllium	ND	2.0	
7440-70-2	Calcium	**2500**	25	
7440-43-9	Cadmium	ND	2.5	
7440-48-4	Cobalt	**9.6**	5.0	
7440-47-3	Chromium	**25**	5.0	
7440-50-8	Copper	**50**	5.0	
7439-89-6	Iron	**24000**	10	
7439-95-4	Magnesium	**5600**	25	
7439-96-5	Manganese	**400**	5.0	
7440-02-0	Nickel	**22**	5.0	
7439-92-1	Lead	**48**	5.0	
7440-36-0	Antimony	ND	5.0	
7782-49-2	Selenium	ND	10	
7440-28-0	Thallium	ND	5.0	
7440-62-2	Vanadium	**35**	5.0	
7440-66-6	Zinc	**110**	10	

Comments:

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0006	Lab Sample ID:	AB56538
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/04/2015	Amount Prepared:	N/A
Date of Analysis:	6/16/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	2
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**1400**	5.0	
7429-90-5	Aluminum	**9900**	55	
7440-38-2	Arsenic	ND	10	
7440-39-3	Barium	**77**	10	
7440-41-7	Beryllium	ND	4.0	
7440-70-2	Calcium	**1800**	50	
7440-43-9	Cadmium	ND	5.0	
7440-48-4	Cobalt	ND	10	
7440-47-3	Chromium	**22**	10	
7440-50-8	Copper	**1000**	10	
7439-89-6	Iron	**19000**	20	
7439-95-4	Magnesium	**4100**	50	
7439-96-5	Manganese	**370**	10	
7440-02-0	Nickel	**35**	10	
7439-92-1	Lead	**730**	10	
7440-36-0	Antimony	**20**	10	
7782-49-2	Selenium	ND	20	
7440-28-0	Thallium	ND	10	
7440-62-2	Vanadium	**37**	10	
7440-66-6	Zinc	**440**	20	

Comments:

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0007	Lab Sample ID:	AB56539
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/04/2015	Amount Prepared:	N/A
Date of Analysis:	6/16/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**60**	2.5	
7429-90-5	Aluminum	**8500**	28	
7440-38-2	Arsenic	**5.9**	5.0	
7440-39-3	Barium	**31**	5.0	
7440-41-7	Beryllium	ND	2.0	
7440-70-2	Calcium	**990**	25	
7440-43-9	Cadmium	ND	2.5	
7440-48-4	Cobalt	ND	5.0	
7440-47-3	Chromium	**16**	5.0	
7440-50-8	Copper	**25**	5.0	
7439-89-6	Iron	**11000**	10	
7439-95-4	Magnesium	**1900**	25	
7439-96-5	Manganese	**220**	5.0	
7440-02-0	Nickel	**9.6**	5.0	
7439-92-1	Lead	**24**	5.0	
7440-36-0	Antimony	ND	5.0	
7782-49-2	Selenium	ND	10	
7440-28-0	Thallium	ND	5.0	
7440-62-2	Vanadium	**19**	5.0	
7440-66-6	Zinc	**160**	10	

Comments:

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0008	Lab Sample ID:	AB56540
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/04/2015	Amount Prepared:	N/A
Date of Analysis:	6/16/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**68**	2.4	
7429-90-5	Aluminum	**13000**	26	
7440-38-2	Arsenic	**5.9**	4.8	
7440-39-3	Barium	**65**	4.8	
7440-41-7	Beryllium	ND	1.9	
7440-70-2	Calcium	**1500**	24	
7440-43-9	Cadmium	ND	2.4	
7440-48-4	Cobalt	**7.3**	4.8	
7440-47-3	Chromium	**22**	4.8	
7440-50-8	Copper	**120**	4.8	
7439-89-6	Iron	**19000**	9.5	
7439-95-4	Magnesium	**4100**	24	
7439-96-5	Manganese	**280**	4.8	
7440-02-0	Nickel	**31**	4.8	
7439-92-1	Lead	**130**	4.8	
7440-36-0	Antimony	ND	4.8	
7782-49-2	Selenium	ND	9.5	
7440-28-0	Thallium	ND	4.8	
7440-62-2	Vanadium	**35**	4.8	
7440-66-6	Zinc	**100**	9.5	

Comments:

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0009	Lab Sample ID:	AB56541
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/04/2015	Amount Prepared:	N/A
Date of Analysis:	6/16/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**270**	2.6	
7429-90-5	Aluminum	**13000**	29	
7440-38-2	Arsenic	**8.2**	5.3	
7440-39-3	Barium	**370**	5.3	
7440-41-7	Beryllium	ND	2.1	
7440-70-2	Calcium	**1700**	26	
7440-43-9	Cadmium	ND	2.6	
7440-48-4	Cobalt	**8.2**	5.3	
7440-47-3	Chromium	**37**	5.3	
7440-50-8	Copper	**230**	5.3	
7439-89-6	Iron	**23000**	11	
7439-95-4	Magnesium	**3900**	26	
7439-96-5	Manganese	**300**	5.3	
7440-02-0	Nickel	**51**	5.3	
7439-92-1	Lead	**310**	5.3	
7440-36-0	Antimony	ND	5.3	
7782-49-2	Selenium	ND	11	
7440-28-0	Thallium	ND	5.3	
7440-62-2	Vanadium	**38**	5.3	
7440-66-6	Zinc	**1100**	11	

Comments:

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0010	Lab Sample ID:	AB56542
Date of Collection:	5/29/2015	Matrix:	Soil
Date of Preparation:	6/04/2015	Amount Prepared:	N/A
Date of Analysis:	6/16/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**50**	2.5	
7429-90-5	Aluminum	**15000**	28	
7440-38-2	Arsenic	**6.2**	5.0	
7440-39-3	Barium	**74**	5.0	
7440-41-7	Beryllium	ND	2.0	
7440-70-2	Calcium	**1700**	25	
7440-43-9	Cadmium	ND	2.5	
7440-48-4	Cobalt	**9.0**	5.0	
7440-47-3	Chromium	**23**	5.0	
7440-50-8	Copper	**69**	5.0	
7439-89-6	Iron	**21000**	10	
7439-95-4	Magnesium	**4900**	25	
7439-96-5	Manganese	**380**	5.0	
7440-02-0	Nickel	**27**	5.0	
7439-92-1	Lead	**140**	5.0	
7440-36-0	Antimony	ND	5.0	
7782-49-2	Selenium	ND	10	
7440-28-0	Thallium	ND	5.0	
7440-62-2	Vanadium	**35**	5.0	
7440-66-6	Zinc	**85**	10	

Comments:

Lunt Silversmiths - Greenfield, MA

Laboratory Reagent Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	6/04/2015	Amount Prepared:	N/A
Date of Analysis:	6/16/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
7440-22-4	Silver	ND	10	
7429-90-5	Aluminum	ND	110	
7440-38-2	Arsenic	ND	20	
7440-39-3	Barium	ND	20	
7440-41-7	Beryllium	ND	8.0	
7440-70-2	Calcium	ND	100	
7440-43-9	Cadmium	ND	10	
7440-48-4	Cobalt	ND	20	
7440-47-3	Chromium	ND	20	
7440-50-8	Copper	ND	20	
7439-89-6	Iron	ND	40	
7439-95-4	Magnesium	ND	100	
7439-96-5	Manganese	ND	20	
7440-02-0	Nickel	ND	20	
7439-92-1	Lead	ND	20	
7440-36-0	Antimony	ND	20	
7782-49-2	Selenium	ND	40	
7440-28-0	Thallium	ND	20	
7440-62-2	Vanadium	ND	20	
7440-66-6	Zinc	ND	40	

Comments:

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB56533

PARAMETER	SPIKE ADDED mg/Kg	SAMPLE CONCENTRATION mg/Kg	MS CONCENTRATION mg/Kg	MS % REC	QC LIMITS (% REC)
Antimony	263	ND	135	51	75 - 125
Arsenic	263	ND	257	98	75 - 125
Barium	263	58.0	299	92	75 - 125
Beryllium	105	ND	104	99	75 - 125
Cadmium	131	ND	126	96	75 - 125
Chromium	263	27.0	283	97	75 - 125
Cobalt	263	12.0	267	97	75 - 125
Copper	263	130	364	89	75 - 125
Lead	263	32.0	270	91	75 - 125
Manganese	263	480	623	54	75 - 125
Nickel	263	32.0	280	94	75 - 125
Selenium	263	ND	257	98	75 - 125
Silver	53.0	860	701	R	75 - 125
Thallium	263	ND	259	99	75 - 125
Vanadium	263	68.0	315	94	75 - 125
Zinc	263	86.0	322	90	75 - 125

Lunt Silversmiths - Greenfield, MA

Laboratory Duplicate Results

Sample ID: AB56534

PARAMETER	SAMPLE RESULT mg/Kg	SAMPLE DUPLICATE RESULT mg/Kg	PRECISION RPD %	QC LIMITS
Aluminum	13000	16000	21	30
Antimony	ND	ND	NC	30
Arsenic	ND	ND	NC	30
Barium	47.0	54	14	30
Beryllium	ND	ND	NC	30
Cadmium	ND	ND	NC	30
Calcium	1100	1400	24	30
Chromium	20.0	24	18	30
Cobalt	9.2	10	8.3	30
Copper	42.0	41	2.4	30
Iron	26000	23000	12	30
Lead	25.0	28	11	30
Magnesium	4800	6100	24	30
Manganese	370	460	22	30
Nickel	24.0	26	8.0	30
Selenium	ND	ND	NC	30
Silver	26.0	30	14	30
Thallium	ND	ND	NC	30
Vanadium	29.0	35	19	30
Zinc	75.0	92	20	30

Lunt Silversmiths - Greenfield, MA

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/L	LFB RESULT ug/L	LFB RECOVERY %	QC LIMITS %
Aluminum	1000	979	98	85 - 115
Antimony	1000	946	95	85 - 115
Arsenic	1000	947	95	85 - 115
Barium	1000	974	97	85 - 115
Beryllium	400	392	98	85 - 115
Cadmium	500	485	97	85 - 115
Calcium	10000	9620	96	85 - 115
Chromium	1000	1020	102	85 - 115
Cobalt	1000	986	99	85 - 115
Copper	1000	999	100	85 - 115
Iron	1000	997	100	85 - 115
Lead	1000	965	97	85 - 115
Magnesium	10000	9960	100	85 - 115
Manganese	1000	970	97	85 - 115
Nickel	1000	981	98	85 - 115
Selenium	1000	948	95	85 - 115
Silver	200	194	97	85 - 115
Thallium	1000	988	99	85 - 115
Vanadium	1000	1030	103	85 - 115
Zinc	1000	971	97	85 - 115

Comments:

Lunt Silversmiths - Greenfield, MA

Solid Laboratory Control Sample (LCS) Results

PARAMETER	LCS RESULTS mg/Kg	CONTROL LIMITS mg/Kg
Aluminum	8160	2780 - 12100
Antimony	70.9	19.5 - 230
Arsenic	141	97.8 - 195
Barium	205	149 - 258
Beryllium	95.5	71.6 - 121
Cadmium	93.6	70.3 - 122
Calcium	6030	4460 - 7630
Chromium	143	95.1 - 176
Cobalt	154	110 - 185
Copper	175	127 - 210
Iron	16400	4930 - 23300
Lead	134	97.0 - 170
Magnesium	2920	1820 - 3780
Manganese	302	221 - 373
Nickel	125	89.9 - 158
Selenium	182	120 - 233
Silver	41.6	26.6 - 53.9
Thallium	143	94.0 - 182
Vanadium	119	71.1 - 143
Zinc	193	132 - 247

Comments:

Samples in Batch: AB56533, AB56534, AB56535, AB56536, AB56537, AB56538, AB56539, AB56540, AB56541, AB56542

 PN: 15050048

15050048 $VOAHS
15050048 $METMS_PE

, Andover, MA

CHAIN OF CUSTODY RECORD

Lunt Silversmiths/MA
Contact Name: Ken Robinson
Contact Phone: 978-621-1208

No: 05/29/15-0001

Cooler #:
Lab: NERL
Lab Phone:

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	Lab QC
	R120150528WC-0001	SS-01	VOC	Soil	5/29/2015	1	40 mL	MeOH	
	R120150528WC-0001	SS-01	Metals	Soil	5/29/2015	1	4 oz	4 C	
	R120150528WC-0002	SS-02	VOC	Soil	5/29/2015	1	40 mL	MeOH	
	R120150528WC-0002	SS-02	Metals	Soil	5/29/2015	1	4 oz	4 C	
	R120150528WC-0003	SS-04	VOC	Soil	5/29/2015	1	40 mL	MeOH	
	R120150528WC-0003	SS-04	Metals	Soil	5/29/2015	1	4 oz	4 C	
	R120150528WC-0004	SS-03	VOC	Soil	5/29/2015	1	40 mL	MeOH	
	R120150528WC-0004	SS-03	Metals	Soil	5/29/2015	1	4 oz	4 C	
	R120150528WC-0005	SS-05	VOC	Soil	5/29/2015	1	40 mL	MeOH	
	R120150528WC-0005	SS-05	Metals	Soil	5/29/2015	1	4 oz	4 C	

Special Instructions: Please forward results to OSC Wing Chau. Thank you.

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Weston	5/29/15 1530	ESAT	5/29/15 15:30	4° C

 PN: 15050048

15050048 $VOAHS
15050048 $METMS_PE

, Andover, MA

CHAIN OF CUSTODY RECORD

Lunt Silversmiths/MA
Contact Name: Ken Robinson
Contact Phone: 978-621-1208

No: 05/29/15-0001
Cooler #:
Lab: NERL
Lab Phone:

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	Lab QC
	R120150528WC-0006	SS-06	VOC	Soil	5/29/2015	1	40 mL	MeOH	
	R120150528WC-0006	SS-06	Metals	Soil	5/29/2015	1	4 oz	4 C	
	R120150528WC-0007	SS-07	VOC	Soil	5/29/2015	1	40 mL	MeOH	
	R120150528WC-0007	SS-07	Metals	Soil	5/29/2015	1	4 oz	4 C	
	R120150528WC-0008	SS-08	VOC	Soil	5/29/2015	1	40 mL	MeOH	
	R120150528WC-0008	SS-08	Metals	Soil	5/29/2015	1	4 oz	4 C	
	R120150528WC-0009	SS-09	VOC	Soil	5/29/2015	1	40 mL	MeOH	
	R120150528WC-0009	SS-09	Metals	Soil	5/29/2015	1	4 oz	4 C	
	R120150528WC-0010	SS-10	VOC	Soil	5/29/2015	1	40 mL	MeOH	
	R120150528WC-0010	SS-10	Metals	Soil	5/29/2015	1	4 oz	4 C	

Special Instructions: Please forward results to OSC Wing Chau. Thank you.

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
		5/29/15 1530	ESAT	5/29/15 15:30	4°C.

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

June 29, 2015

Wing Chau - Mail Code OSRR02-2
US EPA New England R1

Project Number: 15060023
Project: Lunt Silversmiths - Greenfield, MA
Analysis: Volatile Organic Analysis of Soil
EPA Chemist: Scott Clifford

Date Samples Received by the Laboratory: 06/15/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-FLDVOA2.

Soil samples were collected in 40 mL vials, and preserved in methanol. The samples were analyzed using a Shimadzu gas chromatograph equipped with a 30 meter, 0.53 mm id. column, with electron capture and photoionization detectors. Concentrations of volatile organics were calculated using the external standard technique. Results are reported on a wet weight basis.

Analytes reported by this field method should be treated as tentatively identified compounds and concentrations are approximate.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA, email=boudreau.dan@epa.gov, c=US
Date: 2015.06.29 14:17:20 -04'00'

15060023$FVOAS

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

Lunt Silversmiths - Greenfield, MA

Volatile Organic Analysis of Soil

Client Sample ID:	MB-01	Lab Sample ID:	AB56781
Date of Collection:	6/09/2015	Matrix:	Soil
Date of Preparation:	6/10/2015	Amount Prepared:	N/A
Date of Analysis:	6/10/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
	Trichloroethylene	ND	20	
	Tetrachloroethylene	ND	10	

Lunt Silversmiths - Greenfield, MA

Volatile Organic Analysis of Soil

Client Sample ID:	Table Mat.	Lab Sample ID:	AB56782
Date of Collection:	6/09/2015	Matrix:	Soil
Date of Preparation:	6/10/2015	Amount Prepared:	N/A
Date of Analysis:	6/10/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
	Trichloroethylene	ND	20	
	Tetrachloroethylene	ND	10	

Lunt Silversmiths - Greenfield, MA

Volatile Organic Analysis of Soil

Client Sample ID:	Tank 1	Lab Sample ID:	AB56783
Date of Collection:	6/09/2015	Matrix:	Soil
Date of Preparation:	6/10/2015	Amount Prepared:	N/A
Date of Analysis:	6/10/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
	Trichloroethylene	ND	20	
	Tetrachloroethylene	ND	10	

Lunt Silversmiths - Greenfield, MA

Volatile Organic Analysis of Soil

Client Sample ID:	SS-301	Lab Sample ID:	AB56784
Date of Collection:	6/10/2015	Matrix:	Soil
Date of Preparation:	6/10/2015	Amount Prepared:	N/A
Date of Analysis:	6/10/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
	Trichloroethylene	ND	20	
	Tetrachloroethylene	ND	10	

Lunt Silversmiths - Greenfield, MA

Volatile Organic Analysis of Soil

Client Sample ID:	SS-302	Lab Sample ID:	AB56785
Date of Collection:	6/10/2015	Matrix:	Soil
Date of Preparation:	6/10/2015	Amount Prepared:	N/A
Date of Analysis:	6/10/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
	Trichloroethylene	ND	20	
	Tetrachloroethylene	ND	10	

Lunt Silversmiths - Greenfield, MA

Volatile Organic Analysis of Soil

Client Sample ID:	SS-303	Lab Sample ID:	AB56786
Date of Collection:	6/10/2015	Matrix:	Soil
Date of Preparation:	6/10/2015	Amount Prepared:	N/A
Date of Analysis:	6/10/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
	Trichloroethylene	**6**	6.0	
	Tetrachloroethylene	ND	10	

Lunt Silversmiths - Greenfield, MA

Volatile Organic Analysis of Soil

Client Sample ID:	SS-304	Lab Sample ID:	AB56787
Date of Collection:	6/10/2015	Matrix:	Soil
Date of Preparation:	6/10/2015	Amount Prepared:	N/A
Date of Analysis:	6/10/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
	Trichloroethylene	ND	20	
	Tetrachloroethylene	ND	10	

Lunt Silversmiths - Greenfield, MA

Volatile Organic Analysis of Soil

Client Sample ID:	SS-305	Lab Sample ID:	AB56788
Date of Collection:	6/11/2015	Matrix:	Soil
Date of Preparation:	6/10/2015	Amount Prepared:	N/A
Date of Analysis:	6/10/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
	Trichloroethylene	ND	20	
	Tetrachloroethylene	ND	10	

Lunt Silversmiths - Greenfield, MA

Volatile Organic Analysis of Soil

Client Sample ID:	SS-306	Lab Sample ID:	AB56789
Date of Collection:	6/11/2015	Matrix:	Soil
Date of Preparation:	6/11/2015	Amount Prepared:	N/A
Date of Analysis:	6/11/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
	Trichloroethylene	**630**	20	
	Tetrachloroethylene	ND	10	

Lunt Silversmiths - Greenfield, MA

Volatile Organic Analysis of Soil

Client Sample ID:	SS-307	Lab Sample ID:	AB56790
Date of Collection:	6/11/2015	Matrix:	Soil
Date of Preparation:	6/11/2015	Amount Prepared:	N/A
Date of Analysis:	6/11/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
	Trichloroethylene	ND	20	
	Tetrachloroethylene	ND	10	

Lunt Silversmiths - Greenfield, MA

Volatile Organic Analysis of Soil

Client Sample ID:	SS-308	Lab Sample ID:	AB56791
Date of Collection:	6/11/2015	Matrix:	Soil
Date of Preparation:	6/11/2015	Amount Prepared:	N/A
Date of Analysis:	6/11/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
	Trichloroethylene	**59000**	20	
	Tetrachloroethylene	**6800**	10	

Lunt Silversmiths - Greenfield, MA

Volatile Organic Analysis of Soil

Client Sample ID:	SS-309	Lab Sample ID:	AB56792
Date of Collection:	6/11/2015	Matrix:	Soil
Date of Preparation:	6/11/2015	Amount Prepared:	N/A
Date of Analysis:	6/11/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
	Trichloroethylene	**4500**	20	
	Tetrachloroethylene	**450**	10	

Samples in Batch:

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

June 29, 2015

Wing Chau - Mail Code OSRR02-2
US EPA New England R1

Project Number: 15060023
Project: Lunt Silversmiths - Greenfield, MA
Analysis: Field Analysis of Metals by XRF
EPA Chemist: Scott Clifford

Date Samples Received by the Laboratory: 06/15/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIA-FLDXRFNITON4.

Samples were analyzed using a Niton XL3t 600 x-ray fluorescence (XRF) instrument equipped with a 50 kV X-ray tube and a high resolution Si pin detector.

Samples were placed into XRF cups for analysis.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA, email=boudreau.dan@epa.gov, c=US
Date: 2015.06.29 14:18:56 -04'00'

15060023$FXRF

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

Lunt Silversmiths - Greenfield, MA

Field Analysis of Metals by XRF

Client Sample ID:	Tank 1	Lab Sample ID:	AB56766
Date of Collection:	6/09/2015	Matrix:	Soil
Date of Preparation:	6/09/2015	Amount Prepared:	N/A
Date of Analysis:	6/09/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-50-8	Copper	**8300**	40	
7439-92-1	Lead	**4**	4.0	
7440-38-2	Arsenic	ND	5.0	

Lunt Silversmiths - Greenfield, MA

Field Analysis of Metals by XRF

Client Sample ID:	Table Mat.	Lab Sample ID:	AB56767
Date of Collection:	6/09/2015	Matrix:	Soil
Date of Preparation:	6/09/2015	Amount Prepared:	N/A
Date of Analysis:	6/09/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-66-6	Zinc	**410**	100	
7439-92-1	Lead	ND	5.0	
7440-38-2	Arsenic	ND	5.0	

Lunt Silversmiths - Greenfield, MA

Field Analysis of Metals by XRF

Client Sample ID:	Cooling Tray	Lab Sample ID:	AB56768
Date of Collection:	6/09/2015	Matrix:	Soil
Date of Preparation:	6/09/2015	Amount Prepared:	N/A
Date of Analysis:	6/09/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-50-8	Copper	**5100**	40	
7440-66-6	Zinc	**1400**	100	
7440-47-3	Chromium	**640**	40	
7439-92-1	Lead	**3800**	10	
7440-02-0	Nickel	**3700**	30	
7440-38-2	Arsenic	**110**	5.0	
7440-22-4	Silver	**2500**	5.0	
7440-43-9	Cadmium	**100**	8.0	

Lunt Silversmiths - Greenfield, MA

Field Analysis of Metals by XRF

Client Sample ID:	SS-301	Lab Sample ID:	AB56769
Date of Collection:	6/10/2015	Matrix:	Soil
Date of Preparation:	6/10/2015	Amount Prepared:	N/A
Date of Analysis:	6/10/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-50-8	Copper	**850**	40	
7440-66-6	Zinc	**740**	100	
7440-47-3	Chromium	**350**	40	
7439-92-1	Lead	**700**	10	
7440-38-2	Arsenic	ND	23	
7440-22-4	Silver	**4200**	5.0	
7440-43-9	Cadmium	**28**	8.0	

Lunt Silversmiths - Greenfield, MA

Field Analysis of Metals by XRF

Client Sample ID:	SS-301 Lab Dup	Lab Sample ID:	AB56770
Date of Collection:	6/10/2015	Matrix:	Soil
Date of Preparation:	6/10/2015	Amount Prepared:	N/A
Date of Analysis:	6/10/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-50-8	Copper	**670**	40	
7440-66-6	Zinc	**480**	100	
7440-47-3	Chromium	**310**	40	
7439-92-1	Lead	**920**	10	
7440-38-2	Arsenic	**32**	5.0	
7440-22-4	Silver	**2700**	5.0	
7440-43-9	Cadmium	**13**	8.0	

Lunt Silversmiths - Greenfield, MA

Field Analysis of Metals by XRF

Client Sample ID:	SS-302	Lab Sample ID:	AB56771
Date of Collection:	6/10/2015	Matrix:	Soil
Date of Preparation:	6/10/2015	Amount Prepared:	N/A
Date of Analysis:	6/10/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-50-8	Copper	**450**	40	
7440-66-6	Zinc	**140**	100	
7439-92-1	Lead	**320**	10	
7440-38-2	Arsenic	**19**	5.0	
7440-22-4	Silver	**190**	5.0	

Lunt Silversmiths - Greenfield, MA

Field Analysis of Metals by XRF

Client Sample ID:	SS-303	Lab Sample ID:	AB56772
Date of Collection:	6/10/2015	Matrix:	Soil
Date of Preparation:	6/10/2015	Amount Prepared:	N/A
Date of Analysis:	6/10/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7439-92-1	Lead	**69**	10	
7440-38-2	Arsenic	**36**	5.0	
7440-22-4	Silver	**45**	5.0	

Lunt Silversmiths - Greenfield, MA

Field Analysis of Metals by XRF

Client Sample ID:	SS-304	Lab Sample ID:	AB56773
Date of Collection:	6/10/2015	Matrix:	Soil
Date of Preparation:	6/10/2015	Amount Prepared:	N/A
Date of Analysis:	6/10/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-50-8	Copper	**830**	40	
7440-66-6	Zinc	**380**	100	
7440-47-3	Chromium	**520**	40	
7439-92-1	Lead	**1000**	10	
7440-38-2	Arsenic	ND	23	
7440-22-4	Silver	**2700**	5.0	

Lunt Silversmiths - Greenfield, MA

Field Analysis of Metals by XRF

Client Sample ID:	SS-304 Lab Dup	Lab Sample ID:	AB56774
Date of Collection:	6/10/2015	Matrix:	Soil
Date of Preparation:	6/10/2015	Amount Prepared:	N/A
Date of Analysis:	6/10/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-50-8	Copper	**740**	40	
7440-66-6	Zinc	**320**	100	
7440-47-3	Chromium	**530**	40	
7439-92-1	Lead	**780**	10	
7440-38-2	Arsenic	**36**	5.0	
7440-22-4	Silver	**2900**	5.0	

Lunt Silversmiths - Greenfield, MA

Field Analysis of Metals by XRF

Client Sample ID:	SS-305	Lab Sample ID:	AB56775
Date of Collection:	6/10/2015	Matrix:	Soil
Date of Preparation:	6/10/2015	Amount Prepared:	N/A
Date of Analysis:	6/10/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7439-92-1	Lead	**97**	10	
7440-38-2	Arsenic	ND	18	
7440-22-4	Silver	**56**	5.0	

Lunt Silversmiths - Greenfield, MA

Field Analysis of Metals by XRF

Client Sample ID:	SS-306	Lab Sample ID:	AB56776
Date of Collection:	6/11/2015	Matrix:	Soil
Date of Preparation:	6/10/2015	Amount Prepared:	N/A
Date of Analysis:	6/10/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7439-92-1	Lead	**66**	10	
7440-38-2	Arsenic	ND	8.0	

Lunt Silversmiths - Greenfield, MA

Field Analysis of Metals by XRF

Client Sample ID:	SS-307	Lab Sample ID:	AB56777
Date of Collection:	6/11/2015	Matrix:	Soil
Date of Preparation:	6/10/2015	Amount Prepared:	N/A
Date of Analysis:	6/10/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-50-8	Copper	**8800**	40	
7440-66-6	Zinc	**2000**	100	
7440-47-3	Chromium	**1200**	40	
7439-92-1	Lead	**1200**	10	
7440-38-2	Arsenic	**53**	5.0	
7440-22-4	Silver	**840**	5.0	

Lunt Silversmiths - Greenfield, MA

Field Analysis of Metals by XRF

Client Sample ID:	SS-307 Lab Dup	Lab Sample ID:	AB56778
Date of Collection:	6/11/2015	Matrix:	Soil
Date of Preparation:	6/10/2015	Amount Prepared:	N/A
Date of Analysis:	6/10/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-50-8	Copper	**8900**	40	
7440-66-6	Zinc	**2000**	100	
7440-47-3	Chromium	**670**	40	
7439-92-1	Lead	**1700**	10	
7440-38-2	Arsenic	ND	47	
7440-22-4	Silver	**670**	5.0	

Lunt Silversmiths - Greenfield, MA

Field Analysis of Metals by XRF

Client Sample ID:	SS-308	Lab Sample ID:	AB56779
Date of Collection:	6/11/2015	Matrix:	Soil
Date of Preparation:	6/10/2015	Amount Prepared:	N/A
Date of Analysis:	6/10/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-50-8	Copper	**1100**	40	
7440-66-6	Zinc	**700**	100	
7440-47-3	Chromium	**350**	40	
7439-92-1	Lead	**1100**	10	
7440-38-2	Arsenic	**43**	5.0	
7440-22-4	Silver	**1400**	5.0	

Lunt Silversmiths - Greenfield, MA

Field Analysis of Metals by XRF

Client Sample ID:	SS-309	Lab Sample ID:	AB56780
Date of Collection:	6/11/2015	Matrix:	Soil
Date of Preparation:	6/10/2015	Amount Prepared:	N/A
Date of Analysis:	6/10/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7439-92-1	Lead	**150**	10	
7440-38-2	Arsenic	**13**	5.0	
7440-22-4	Silver	**210**	5.0	

Samples in Batch:

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

July 30, 2015

Wing Chau - Mail Code OSRR02-2
US EPA New England R1

Project Number: 15060048
Project: Lunt Silversmiths - Greenfield, MA
Analysis: Metals in Soil Medium Level by ICP
EPA Chemist: Janet Paquin

Date Samples Received by the Laboratory: 06/26/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-OPTIMASO1.

Samples were prepared following the EPA Region I SOP, EIASOP-INGMETALSPREP8

Preparation and analysis SOP's are based on "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, Revision 2, Final Update III, Methods 3050B and 6010B," respectively. Samples were analyzed using a Perkin Elmer Dual View Inductively Coupled Plasma - Optical Emission Spectrometer.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA, email=boudreau.dan@epa.gov, c=US
Date: 2015.07.30 16:56:12 -04'00'

15060048$METMS_PE

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

Samples results are in mg/Kg dry weight.

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0020	Lab Sample ID:	AB57093
Date of Collection:	6/22/2015	Matrix:	Soil
Date of Preparation:	7/17/2015	Amount Prepared:	N/A
Date of Analysis:	7/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	5
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**760**	5.0	
7429-90-5	Aluminum	**9600**	55	
7440-38-2	Arsenic	ND	10	
7440-39-3	Barium	**30**	10	
7440-41-7	Beryllium	ND	4.0	
7440-70-2	Calcium	**800**	100	J3
7440-43-9	Cadmium	ND	5.0	
7440-48-4	Cobalt	ND	10	
7440-47-3	Chromium	**15**	10	
7440-50-8	Copper	**160**	10	
7439-89-6	Iron	**17000**	40	
7439-95-4	Magnesium	**2600**	50	
7439-96-5	Manganese	**170**	10	
7440-02-0	Nickel	**17**	10	
7439-92-1	Lead	**300**	10	
7440-36-0	Antimony	ND	10	
7782-49-2	Selenium	ND	20	
7440-28-0	Thallium	ND	10	
7440-62-2	Vanadium	**32**	10	
7440-66-6	Zinc	**150**	20	

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0026	Lab Sample ID:	AB57094
Date of Collection:	6/22/2015	Matrix:	Soil
Date of Preparation:	7/17/2015	Amount Prepared:	N/A
Date of Analysis:	7/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	5
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**180**	5.1	
7429-90-5	Aluminum	**12000**	56	
7440-38-2	Arsenic	ND	10	
7440-39-3	Barium	**50**	10	
7440-41-7	Beryllium	ND	4.1	
7440-70-2	Calcium	**1400**	100	
7440-43-9	Cadmium	ND	5.1	
7440-48-4	Cobalt	ND	10	
7440-47-3	Chromium	**26**	10	
7440-50-8	Copper	**84**	10	
7439-89-6	Iron	**17000**	41	
7439-95-4	Magnesium	**3300**	51	
7439-96-5	Manganese	**250**	10	
7440-02-0	Nickel	**23**	10	
7439-92-1	Lead	**110**	10	
7440-36-0	Antimony	ND	10	J1
7782-49-2	Selenium	ND	20	
7440-28-0	Thallium	ND	10	
7440-62-2	Vanadium	**30**	10	
7440-66-6	Zinc	**130**	20	

Lunt Silversmiths - Greenfield, MA

Laboratory Reagent Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	7/17/2015	Amount Prepared:	N/A
Date of Analysis:	7/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
7440-22-4	Silver	ND	10	
7429-90-5	Aluminum	ND	110	
7440-38-2	Arsenic	ND	20	
7440-39-3	Barium	ND	20	
7440-41-7	Beryllium	ND	8.0	
7440-70-2	Calcium	ND	200	
7440-43-9	Cadmium	ND	10	
7440-48-4	Cobalt	ND	20	
7440-47-3	Chromium	ND	20	
7440-50-8	Copper	ND	20	
7439-89-6	Iron	ND	80	
7439-95-4	Magnesium	ND	100	
7439-96-5	Manganese	ND	20	
7440-02-0	Nickel	ND	20	
7439-92-1	Lead	ND	20	
7440-36-0	Antimony	ND	20	
7782-49-2	Selenium	ND	40	
7440-28-0	Thallium	ND	20	
7440-62-2	Vanadium	ND	20	
7440-66-6	Zinc	ND	40	

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB57094

PARAMETER	SPIKE ADDED mg/Kg	SAMPLE CONCENTRATION mg/Kg	MS CONCENTRATION mg/Kg	MS % REC	QC LIMITS (% REC)
Antimony	102	ND	46.8	46	75 - 125
Arsenic	102	ND	115	113	75 - 125
Barium	102	50.0	161	109	75 - 125
Beryllium	41.0	ND	44.6	109	75 - 125
Cadmium	51.0	ND	53.7	105	75 - 125
Chromium	102	26.0	133	105	75 - 125
Cobalt	102	ND	118	116	75 - 125
Copper	102	84.0	203	117	75 - 125
Lead	102	110	208	96	75 - 125
Manganese	102	250	353	101	75 - 125
Nickel	102	23.0	133	108	75 - 125
Selenium	102	ND	108	106	75 - 125
Silver	20.0	180	341	R	75 - 125
Thallium	102	ND	112	110	75 - 125
Vanadium	102	30.0	141	109	75 - 125
Zinc	102	130	232	100	75 - 125

Lunt Silversmiths - Greenfield, MA

Laboratory Duplicate Results

Sample ID: AB57093

PARAMETER	SAMPLE RESULT mg/Kg	SAMPLE DUPLICATE RESULT mg/Kg	PRECISION RPD %	QC LIMITS
Aluminum	9600	9100	5.3	30
Antimony	ND	ND	NC	30
Arsenic	ND	ND	NC	30
Barium	30.0	28	6.9	30
Beryllium	ND	ND	NC	30
Cadmium	ND	ND	NC	30
Calcium	800	1100	32	30
Chromium	15.0	16	6.5	30
Cobalt	ND	ND	NC	30
Copper	160	170	6.1	30
Iron	17000	15000	12	30
Lead	300	280	6.9	30
Magnesium	2600	2300	12	30
Manganese	170	170	0.0	30
Nickel	17.0	17	0.0	30
Selenium	ND	ND	NC	30
Silver	760	720	5.4	30
Thallium	ND	ND	NC	30
Vanadium	32.0	33	3.1	30
Zinc	150	140	6.9	30

Lunt Silversmiths - Greenfield, MA

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/L	LFB RESULT ug/L	LFB RECOVERY %	QC LIMITS %
Aluminum	1000	1060	106	85 - 115
Antimony	1000	1000	100	85 - 115
Arsenic	1000	1010	101	85 - 115
Barium	1000	1020	102	85 - 115
Beryllium	400	409	102	85 - 115
Cadmium	500	493	99	85 - 115
Calcium	10000	10300	103	85 - 115
Chromium	1000	1030	103	85 - 115
Cobalt	1000	1010	101	85 - 115
Copper	1000	1050	105	85 - 115
Iron	1000	1040	104	85 - 115
Lead	1000	978	98	85 - 115
Magnesium	10000	10100	101	85 - 115
Manganese	1000	1010	101	85 - 115
Nickel	1000	1010	101	85 - 115
Selenium	1000	973	97	85 - 115
Silver	200	203	102	85 - 115
Thallium	1000	1020	102	85 - 115
Vanadium	1000	1050	105	85 - 115
Zinc	1000	991	99	85 - 115

Comments:

Lunt Silversmiths - Greenfield, MA

Solid Laboratory Control Sample (LCS) Results

PARAMETER	LCS RESULTS mg/Kg	CONTROL LIMITS mg/Kg
Aluminum	8150	2780 - 12100
Antimony	51.0	19.5 - 230
Arsenic	142	97.8 - 195
Barium	203	149 - 258
Beryllium	98.8	71.6 - 121
Cadmium	93.4	70.3 - 122
Calcium	6320	4460 - 7630
Chromium	139	95.1 - 176
Cobalt	151	110 - 185
Copper	179	127 - 210
Iron	14200	4930 - 23300
Lead	127	97.0 - 170
Magnesium	2910	1820 - 3780
Manganese	310	221 - 373
Nickel	126	89.9 - 158
Selenium	179	120 - 233
Silver	40.4	26.6 - 53.9
Thallium	138	94.0 - 182
Vanadium	112	71.1 - 143
Zinc	191	132 - 247

Comments:

Samples in Batch: AB57093, AB57094

 PN 15060048

Andover, MA

CHAIN OF CUSTODY RECORD

Lunt Silversmiths/MA
Contact Name: Ken Robinson
Contact Phone: (978) 621-1208

No: 06/25/15-0004
Cooler #:
Lab: NERL
Lab Phone:

15060048 $VOAHS
15060048 $METMS_PE

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	Lab QC
	R120150528WC-0020	SS-311	VOC	Soil	6/22/2015	1	40 mL	MeOH 10 mls 8.38 gm Soil	
	R120150528WC-0020	SS-311	Metals	Soil	6/22/2015	1	poly bag		
	R120150528WC-0026	SS-317	VOC	Soil	6/22/2015	1	40 mL	MeOH 10 mls 8.16 gm Soil	
	R120150528WC-0026	SS-317	Metals	Soil	6/22/2015	1	poly bag		
	R120150528WC-0031	MB-300	VOC		6/22/2015	1	40 mL	MeOH 10 mls (Blank)	

Special Instructions: Please forward results to OSC Wing Chau. Thank you.

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	Kenneth Kaplan Weston/SSMKT	6/25/15 1800 hrs		6/25/15 1800 hrs	
	EPA	6/24/15 1430 hrs	ESAT	6/26/15 14:30	5°C

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

July 14, 2015

Wing Chau - Mail Code OSRR02-2
US EPA New England R1

Project Number: 15060048
Project: Lunt Silversmiths - Greenfield, MA
Analysis: VOAs in Soil High Level Method
EPA Chemist: Joseph Montanaro

Date Samples Received by the Laboratory: 06/26/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-VOAGCMS9.

Samples were analyzed by GC/MS. Samples were introduced to the GC via a Tekmar preconcentrator and an Archon auto-sampler. The analysis SOP is based on US EPA Method 8260B, revision 2.0, 1996 and Method 5035A, draft revision 1, 2002, from SW-846.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA, email=boudreau.dan@epa.gov, c=US
Date: 2015.07.14 10:05:38 -04'00'

15060048$VOAHS

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0020	Lab Sample ID:	AB57093
Date of Collection:	6/22/2015	Matrix:	Soil
Date of Preparation:	6/30/2015	Amount Prepared:	5 mL
Date of Analysis:	6/30/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	50
Wet Weight Prepared:	8.38 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	60	
75-01-4	Vinyl Chloride	ND	60	
74-83-9	Bromomethane	ND	60	
75-00-3	Chloroethane	ND	60	
75-69-4	Trichlorofluoromethane	ND	60	
60-29-7	Ethyl Ether	ND	60	
67-64-1	2-Propanone (acetone)	ND	60	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	60	
75-35-4	1,1-Dichloroethylene	ND	60	
75-15-0	Carbon Disulfide	ND	60	
75-71-8	Dichlorodifluoromethane	ND	60	
75-09-2	Methylene Chloride	ND	60	
107-13-1	Acrylonitrile	ND	60	
1634-04-4	Methyl-t-Butyl Ether	ND	60	
156-60-5	Trans-1,2-Dichloroethylene	ND	60	
75-34-3	1,1-dichloroethane	ND	60	
108-05-4	Vinyl Acetate	ND	60	
78-93-3	2-Butanone (MEK)	ND	60	
594-20-7	2,2-Dichloropropane	ND	60	
156-59-2	cis-1,2-Dichloroethylene	ND	60	
67-66-3	Chloroform	ND	60	
74-97-5	Bromochloromethane	ND	60	
109-99-9	Tetrahydrofuran	ND	60	
71-55-6	1,1,1-Trichloroethane	ND	60	
107-06-2	1,2-Dichloroethane	ND	60	
56-23-5	Carbon tetrachloride	ND	60	
71-43-2	Benzene	ND	60	
10061-01-5	c-1,3-dichloropropene	ND	60	
108-88-3	Toluene	ND	60	
10061-02-6	t-1,3-Dichloropropene	ND	60	
79-00-5	1,1,2-Trichloroethane	ND	60	
124-48-1	Dibromochloromethane	ND	60	
108-90-7	Chlorobenzene	ND	60	
563-58-6	1,1-Dichloropropene	ND	60	
79-01-6	Trichloroethylene	**330**	60	
78-87-5	1,2-Dichloropropane	ND	60	
75-27-4	Bromodichloromethane	ND	60	
74-95-3	Dibromomethane	ND	60	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	60	
142-28-9	1,3-Dichloropropane	ND	60	
127-18-4	Tetrachloroethylene	ND	60	
106-93-4	1,2-Dibromoethane	ND	60	
591-78-6	2-Hexanone	ND	60	
630-20-6	1,1,1,2-Tetrachloroethane	ND	60	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0020	Lab Sample ID:	AB57093
Date of Collection:	6/22/2015	Matrix:	Soil
Date of Preparation:	6/30/2015	Amount Prepared:	5 mL
Date of Analysis:	6/30/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	50
Wet Weight Prepared:	8.38 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	60	
108-38-3/106-42-3	M/P Xylene	ND	120	
95-47-6	Ortho Xylene	ND	60	
100-42-5	Styrene	ND	60	
75-25-2	Bromoform	ND	60	
79-34-5	1,1,2,2-Tetrachloroethane	ND	60	
98-82-8	Isopropylbenzene	ND	60	
108-86-1	Bromobenzene	ND	60	
96-18-4	1,2,3-Trichloropropane	ND	60	
103-65-1	N-Propylbenzene	ND	60	
95-49-8	2-Chlorotoluene	ND	60	
106-43-4	4-Chlorotoluene	ND	60	
98-06-6	Tert-Butylbenzene	ND	60	
108-67-8	1,3,5-Trimethylbenzene	ND	60	
95-63-6	1,2,4-Trimethylbenzene	ND	60	
135-98-8	Sec-Butylbenzene	ND	60	
541-73-1	1,3-Dichlorobenzene	ND	60	
99-87-6	Para-Isopropyltoluene	ND	60	
106-46-7	1,4-Dichlorobenzene	ND	60	
95-50-1	1,2-Dichlorobenzene	ND	60	
104-51-8	N-Butylbenzene	ND	60	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	60	
120-82-1	1,2,4-Trichlorobenzene	ND	60	
87-68-3	Hexachlorobutadiene	ND	60	
91-20-3	Naphthalene	ND	60	
87-61-6	1,2,3-Trichlorobenzene	ND	60	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	96	74 - 136
Toluene-D8	99	85 - 118
1,4-Bromofluorobenzene	94	78 - 111

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0026	Lab Sample ID:	AB57094
Date of Collection:	6/22/2015	Matrix:	Soil
Date of Preparation:	6/30/2015	Amount Prepared:	5 mL
Date of Analysis:	6/30/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	50
Wet Weight Prepared:	8.16 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	61	
75-01-4	Vinyl Chloride	ND	61	
74-83-9	Bromomethane	ND	61	
75-00-3	Chloroethane	ND	61	
75-69-4	Trichlorofluoromethane	ND	61	
60-29-7	Ethyl Ether	ND	61	
67-64-1	2-Propanone (acetone)	ND	61	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	61	
75-35-4	1,1-Dichloroethylene	ND	61	
75-15-0	Carbon Disulfide	ND	61	
75-71-8	Dichlorodifluoromethane	ND	61	
75-09-2	Methylene Chloride	ND	61	
107-13-1	Acrylonitrile	ND	61	
1634-04-4	Methyl-t-Butyl Ether	ND	61	
156-60-5	Trans-1,2-Dichloroethylene	ND	61	
75-34-3	1,1-dichloroethane	ND	61	
108-05-4	Vinyl Acetate	ND	61	
78-93-3	2-Butanone (MEK)	ND	61	
594-20-7	2,2-Dichloropropane	ND	61	
156-59-2	cis-1,2-Dichloroethylene	ND	61	
67-66-3	Chloroform	ND	61	
74-97-5	Bromochloromethane	ND	61	
109-99-9	Tetrahydrofuran	ND	61	
71-55-6	1,1,1-Trichloroethane	ND	61	
107-06-2	1,2-Dichloroethane	ND	61	
56-23-5	Carbon tetrachloride	ND	61	
71-43-2	Benzene	ND	61	
10061-01-5	c-1,3-dichloropropene	ND	61	
108-88-3	Toluene	ND	61	
10061-02-6	t-1,3-Dichloropropene	ND	61	
79-00-5	1,1,2-Trichloroethane	ND	61	
124-48-1	Dibromochloromethane	ND	61	
108-90-7	Chlorobenzene	ND	61	
563-58-6	1,1-Dichloropropene	ND	61	
79-01-6	Trichloroethylene	**240**	61	
78-87-5	1,2-Dichloropropane	ND	61	
75-27-4	Bromodichloromethane	ND	61	
74-95-3	Dibromomethane	ND	61	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	61	
142-28-9	1,3-Dichloropropane	ND	61	
127-18-4	Tetrachloroethylene	**99**	61	
106-93-4	1,2-Dibromoethane	ND	61	
591-78-6	2-Hexanone	ND	61	
630-20-6	1,1,1,2-Tetrachloroethane	ND	61	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0026	Lab Sample ID:	AB57094
Date of Collection:	6/22/2015	Matrix:	Soil
Date of Preparation:	6/30/2015	Amount Prepared:	5 mL
Date of Analysis:	6/30/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	50
Wet Weight Prepared:	8.16 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	61	
108-38-3/106-42-3	M/P Xylene	ND	120	
95-47-6	Ortho Xylene	ND	61	
100-42-5	Styrene	ND	61	
75-25-2	Bromoform	ND	61	
79-34-5	1,1,2,2-Tetrachloroethane	ND	61	
98-82-8	Isopropylbenzene	ND	61	
108-86-1	Bromobenzene	ND	61	
96-18-4	1,2,3-Trichloropropane	ND	61	
103-65-1	N-Propylbenzene	ND	61	
95-49-8	2-Chlorotoluene	ND	61	
106-43-4	4-Chlorotoluene	ND	61	
98-06-6	Tert-Butylbenzene	ND	61	
108-67-8	1,3,5-Trimethylbenzene	ND	61	
95-63-6	1,2,4-Trimethylbenzene	ND	61	
135-98-8	Sec-Butylbenzene	ND	61	
541-73-1	1,3-Dichlorobenzene	ND	61	
99-87-6	Para-Isopropyltoluene	ND	61	
106-46-7	1,4-Dichlorobenzene	ND	61	
95-50-1	1,2-Dichlorobenzene	ND	61	
104-51-8	N-Butylbenzene	ND	61	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	61	
120-82-1	1,2,4-Trichlorobenzene	ND	61	
87-68-3	Hexachlorobutadiene	ND	61	
91-20-3	Naphthalene	ND	61	
87-61-6	1,2,3-Trichlorobenzene	ND	61	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	94	74 - 136
Toluene-D8	97	85 - 118
1,4-Bromofluorobenzene	95	78 - 111

Lunt Silversmiths - Greenfield, MA

Laboratory Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	6/30/2015	Amount Prepared:	5 mL
Date of Analysis:	6/30/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	~6

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
74-87-3	Chloromethane	ND	1.0	
75-01-4	Vinyl Chloride	ND	1.0	
74-83-9	Bromomethane	ND	1.0	
75-00-3	Chloroethane	ND	1.0	
75-69-4	Trichlorofluoromethane	ND	1.0	
60-29-7	Ethyl Ether	ND	1.0	
67-64-1	2-Propanone (acetone)	ND	1.0	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	1.0	
75-35-4	1,1-Dichloroethylene	ND	1.0	
75-15-0	Carbon Disulfide	ND	1.0	
75-71-8	Dichlorodifluoromethane	ND	1.0	
75-09-2	Methylene Chloride	ND	1.0	
107-13-1	Acrylonitrile	ND	1.0	
1634-04-4	Methyl-t-Butyl Ether	ND	1.0	
156-60-5	Trans-1,2-Dichloroethylene	ND	1.0	
75-34-3	1,1-dichloroethane	ND	1.0	
108-05-4	Vinyl Acetate	ND	1.0	
78-93-3	2-Butanone (MEK)	ND	1.0	
594-20-7	2,2-Dichloropropane	ND	1.0	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	
67-66-3	Chloroform	ND	1.0	
74-97-5	Bromochloromethane	ND	1.0	
109-99-9	Tetrahydrofuran	ND	1.0	
71-55-6	1,1,1-Trichloroethane	ND	1.0	
107-06-2	1,2-Dichloroethane	ND	1.0	
56-23-5	Carbon tetrachloride	ND	1.0	
71-43-2	Benzene	ND	1.0	
10061-01-5	c-1,3-dichloropropene	ND	1.0	
108-88-3	Toluene	ND	1.0	
10061-02-6	t-1,3-Dichloropropene	ND	1.0	
79-00-5	1,1,2-Trichloroethane	ND	1.0	
124-48-1	Dibromochloromethane	ND	1.0	
108-90-7	Chlorobenzene	ND	1.0	
563-58-6	1,1-Dichloropropene	ND	1.0	
79-01-6	Trichloroethylene	ND	1.0	
78-87-5	1,2-Dichloropropane	ND	1.0	
75-27-4	Bromodichloromethane	ND	1.0	
74-95-3	Dibromomethane	ND	1.0	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	1.0	
142-28-9	1,3-Dichloropropane	ND	1.0	
127-18-4	Tetrachloroethylene	ND	1.0	
106-93-4	1,2-Dibromoethane	ND	1.0	
591-78-6	2-Hexanone	ND	1.0	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	

Lunt Silversmiths - Greenfield, MA

Laboratory Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	6/30/2015	Amount Prepared:	5 mL
Date of Analysis:	6/30/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	~6

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
100-41-4	Ethylbenzene	ND	1.0	
108-38-3/106-42-3	M/P Xylene	ND	2.0	
95-47-6	Ortho Xylene	ND	1.0	
100-42-5	Styrene	ND	1.0	
75-25-2	Bromoform	ND	1.0	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	
98-82-8	Isopropylbenzene	ND	1.0	
108-86-1	Bromobenzene	ND	1.0	
96-18-4	1,2,3-Trichloropropane	ND	1.0	
103-65-1	N-Propylbenzene	ND	1.0	
95-49-8	2-Chlorotoluene	ND	1.0	
106-43-4	4-Chlorotoluene	ND	1.0	
98-06-6	Tert-Butylbenzene	ND	1.0	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	
135-98-8	Sec-Butylbenzene	ND	1.0	
541-73-1	1,3-Dichlorobenzene	ND	1.0	
99-87-6	Para-Isopropyltoluene	ND	1.0	
106-46-7	1,4-Dichlorobenzene	ND	1.0	
95-50-1	1,2-Dichlorobenzene	ND	1.0	
104-51-8	N-Butylbenzene	ND	1.0	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	1.0	
120-82-1	1,2,4-Trichlorobenzene	ND	1.0	
87-68-3	Hexachlorobutadiene	ND	1.0	
91-20-3	Naphthalene	ND	1.0	
87-61-6	1,2,3-Trichlorobenzene	ND	1.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	102	74 - 136
Toluene-D8	98	85 - 118
1,4-Bromofluorobenzene	96	78 - 111

Comments: Laboratory blank is reported in ug/L.

Laboratory blank is associated with all samples in this project.

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0031	Lab Sample ID:	AB57095
Date of Collection:	6/22/2015	Matrix:	Blank
Date of Preparation:	6/30/2015	Amount Prepared:	5 mL
Date of Analysis:	6/30/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	50
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	50	
75-01-4	Vinyl Chloride	ND	50	
74-83-9	Bromomethane	ND	50	
75-00-3	Chloroethane	ND	50	
75-69-4	Trichlorofluoromethane	ND	50	
60-29-7	Ethyl Ether	ND	50	
67-64-1	2-Propanone (acetone)	ND	50	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	50	
75-35-4	1,1-Dichloroethylene	ND	50	
75-15-0	Carbon Disulfide	ND	50	
75-71-8	Dichlorodifluoromethane	ND	50	
75-09-2	Methylene Chloride	ND	50	
107-13-1	Acrylonitrile	ND	50	
1634-04-4	Methyl-t-Butyl Ether	ND	50	
156-60-5	Trans-1,2-Dichloroethylene	ND	50	
75-34-3	1,1-dichloroethane	ND	50	
108-05-4	Vinyl Acetate	ND	50	
78-93-3	2-Butanone (MEK)	ND	50	
594-20-7	2,2-Dichloropropane	ND	50	
156-59-2	cis-1,2-Dichloroethylene	ND	50	
67-66-3	Chloroform	ND	50	
74-97-5	Bromochloromethane	ND	50	
109-99-9	Tetrahydrofuran	ND	50	
71-55-6	1,1,1-Trichloroethane	ND	50	
107-06-2	1,2-Dichloroethane	ND	50	
56-23-5	Carbon tetrachloride	ND	50	
71-43-2	Benzene	ND	50	
10061-01-5	c-1,3-dichloropropene	ND	50	
108-88-3	Toluene	ND	50	
10061-02-6	t-1,3-Dichloropropene	ND	50	
79-00-5	1,1,2-Trichloroethane	ND	50	
124-48-1	Dibromochloromethane	ND	50	
108-90-7	Chlorobenzene	ND	50	
563-58-6	1,1-Dichloropropene	ND	50	
79-01-6	Trichloroethylene	ND	50	
78-87-5	1,2-Dichloropropane	ND	50	
75-27-4	Bromodichloromethane	ND	50	
74-95-3	Dibromomethane	ND	50	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	50	
142-28-9	1,3-Dichloropropane	ND	50	
127-18-4	Tetrachloroethylene	ND	50	
106-93-4	1,2-Dibromoethane	ND	50	
591-78-6	2-Hexanone	ND	50	
630-20-6	1,1,1,2-Tetrachloroethane	ND	50	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0031	Lab Sample ID:	AB57095
Date of Collection:	6/22/2015	Matrix:	Blank
Date of Preparation:	6/30/2015	Amount Prepared:	5 mL
Date of Analysis:	6/30/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	50
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	50	
108-38-3/106-42-3	M/P Xylene	ND	100	
95-47-6	Ortho Xylene	ND	50	
100-42-5	Styrene	ND	50	
75-25-2	Bromoform	ND	50	
79-34-5	1,1,2,2-Tetrachloroethane	ND	50	
98-82-8	Isopropylbenzene	ND	50	
108-86-1	Bromobenzene	ND	50	
96-18-4	1,2,3-Trichloropropane	ND	50	
103-65-1	N-Propylbenzene	ND	50	
95-49-8	2-Chlorotoluene	ND	50	
106-43-4	4-Chlorotoluene	ND	50	
98-06-6	Tert-Butylbenzene	ND	50	
108-67-8	1,3,5-Trimethylbenzene	ND	50	
95-63-6	1,2,4-Trimethylbenzene	ND	50	
135-98-8	Sec-Butylbenzene	ND	50	
541-73-1	1,3-Dichlorobenzene	ND	50	
99-87-6	Para-Isopropyltoluene	ND	50	
106-46-7	1,4-Dichlorobenzene	ND	50	
95-50-1	1,2-Dichlorobenzene	ND	50	
104-51-8	N-Butylbenzene	ND	50	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	50	
120-82-1	1,2,4-Trichlorobenzene	ND	50	
87-68-3	Hexachlorobutadiene	ND	50	
91-20-3	Naphthalene	ND	50	
87-61-6	1,2,3-Trichlorobenzene	ND	50	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	97	74 - 136
Toluene-D8	97	85 - 118
1,4-Bromofluorobenzene	93	78 - 111

Comments: Methanol blank is reported in ug/L.

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB57094

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
1,1,1,2-Tetrachloroethane	1226	ND	1200	98	74 - 124
1,1,1-Trichloroethane	1226	ND	1200	98	76 - 132
1,1,2,2-Tetrachloroethane	1226	ND	1200	98	69 - 125
1,1,2-Trichloro-1,2,2-Trifluoroetha	1226	ND	1300	110	68 - 144
1,1,2-Trichloroethane	1226	ND	1200	98	75 - 126
1,1-Dichloroethylene	1226	ND	1300	110	65 - 140
1,1-Dichloropropene	1226	ND	1300	110	81 - 125
1,1-dichloroethane	1226	ND	1200	98	77 - 130
1,2,3-Trichlorobenzene	1226	ND	1200	98	64 - 125
1,2,3-Trichloropropane	1226	ND	1200	98	68 - 122
1,2,4-Trichlorobenzene	1226	ND	1300	110	72 - 120
1,2,4-Trimethylbenzene	1226	ND	1300	110	81 - 125
1,2-Dibromo-3-Chloropropane	1226	ND	1100	90	54 - 125
1,2-Dibromoethane	1226	ND	1200	98	73 - 124
1,2-Dichlorobenzene	1226	ND	1300	110	81 - 116
1,2-Dichloroethane	1226	ND	1200	98	74 - 130
1,2-Dichloropropane	1226	ND	1300	110	78 - 120
1,3,5-Trimethylbenzene	1226	ND	1300	110	81 - 125
1,3-Dichlorobenzene	1226	ND	1200	98	82 - 117
1,3-Dichloropropane	1226	ND	1200	98	76 - 123
1,4-Dichlorobenzene	1226	ND	1200	98	80 - 116
2,2-Dichloropropane	1226	ND	1100	90	57 - 147
2-Butanone (MEK)	1226	ND	980	80	41 - 151
2-Chlorotoluene	1226	ND	1300	110	82 - 119
2-Hexanone	1226	ND	1200	98	51 - 148
2-Propanone (acetone)	1226	ND	1000	82	25 - 161
4-Chlorotoluene	1226	ND	1300	110	82 - 119
4-Methyl-2-Pentanone(MIBK)	1226	ND	1300	110	62 - 130
Acrylonitrile	1226	ND	1300	110	67 - 130
Benzene	1226	ND	1300	110	82 - 124
Bromobenzene	1226	ND	1300	110	79 - 119
Bromochloromethane	1226	ND	1200	98	79 - 125
Bromodichloromethane	1226	ND	1200	98	71 - 126
Bromoform	1226	ND	1100	90	56 - 119
Bromomethane	1226	ND	1200	98	37 - 161
Carbon Disulfide	1226	ND	1200	98	63 - 134
Carbon tetrachloride	1226	ND	1200	98	68 - 136
Chlorobenzene	1226	ND	1200	98	82 - 126
Chloroethane	1226	ND	1100	90	57 - 148
Chloroform	1226	ND	1200	98	78 - 130
Chloromethane	1226	ND	1100	90	56 - 147
Dibromochloromethane	1226	ND	1100	90	62 - 131
Dibromomethane	1226	ND	1200	98	75 - 122
Dichlorodifluoromethane	1226	ND	1300	110	59 - 131
Ethyl Ether	1226	ND	1300	110	65 - 138
Ethylbenzene	1226	ND	1300	110	82 - 122
Hexachlorobutadiene	1226	ND	1400	110	70 - 130

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB57094

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
Isopropylbenzene	1226	ND	1400	110	82 - 125
M/P Xylene	2452	ND	2600	110	85 - 120
Methyl-t-Butyl Ether	1226	ND	1300	110	74 - 125
Methylene Chloride	1226	ND	1200	98	67 - 139
N-Butylbenzene	1226	ND	1400	110	80 - 129
N-Propylbenzene	1226	ND	1300	110	81 - 122
Naphthalene	1226	ND	1300	110	59 - 129
Ortho Xylene	1226	ND	1300	110	84 - 122
Para-Isopropyltoluene	1226	ND	1400	110	79 - 129
Sec-Butylbenzene	1226	ND	1400	110	81 - 126
Styrene	1226	ND	1300	110	82 - 125
Tert-Butylbenzene	1226	ND	1400	110	81 - 126
Tetrachloroethylene	1226	99.0	1400	110	74 - 133
Tetrahydrofuran	1226	ND	1200	98	60 - 132
Toluene	1226	ND	1200	98	82 - 124
Trans-1,2-Dichloroethylene	1226	ND	1200	98	79 - 127
Trichloroethylene	1226	240	1500	100	76 - 124
Trichlorofluoromethane	1226	ND	1000	82	65 - 144
Vinyl Acetate	1226	ND	1300	110	14 - 152
Vinyl Chloride	1226	ND	950	77	34 - 142
c-1,3-dichloropropene	1226	ND	1300	110	68 - 133
cis-1,2-Dichloroethylene	1226	ND	1300	110	79 - 131
t-1,3-Dichloropropene	1226	ND	1300	110	65 - 126

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE DUPLICATE (MSD) RECOVERY

Sample ID:AB57094

PARAMETER	MSD SPIKE ADDED	MSD CONCENTRATION ug/Kg	MSD % REC	RPD %	QC LIMITS RPD
1,1,1,2-Tetrachloroethane	1226	1200	98	0	40
1,1,1-Trichloroethane	1226	1200	98	0	40
1,1,2,2-Tetrachloroethane	1226	1200	98	0	40
1,1,2-Trichloro-1,2,2-Trifluoroetha	1226	1300	110	0	40
1,1,2-Trichloroethane	1226	1200	98	0	40
1,1-Dichloroethylene	1226	1300	110	0	52
1,1-Dichloropropene	1226	1300	110	0	40
1,1-dichloroethane	1226	1200	98	0	40
1,2,3-Trichlorobenzene	1226	1300	110	12	40
1,2,3-Trichloropropane	1226	1200	98	0	40
1,2,4-Trichlorobenzene	1226	1300	110	0	40
1,2,4-Trimethylbenzene	1226	1300	110	0	40
1,2-Dibromo-3-Chloropropane	1226	1200	98	9	40
1,2-Dibromoethane	1226	1200	98	0	40
1,2-Dichlorobenzene	1226	1300	110	0	40
1,2-Dichloroethane	1226	1200	98	0	40
1,2-Dichloropropane	1226	1200	98	12	40
1,3,5-Trimethylbenzene	1226	1300	110	0	40
1,3-Dichlorobenzene	1226	1200	98	0	40
1,3-Dichloropropane	1226	1200	98	0	40
1,4-Dichlorobenzene	1226	1200	98	0	40
2,2-Dichloropropane	1226	1200	98	9	40
2-Butanone (MEK)	1226	990	81	1	40
2-Chlorotoluene	1226	1300	110	0	40
2-Hexanone	1226	1200	98	0	40
2-Propanone (acetone)	1226	890	73	12	40
4-Chlorotoluene	1226	1300	110	0	40
4-Methyl-2-Pentanone(MIBK)	1226	1300	110	0	40
Acrylonitrile	1226	1200	98	12	40
Benzene	1226	1200	98	12	24
Bromobenzene	1226	1300	110	0	40
Bromochloromethane	1226	1200	98	0	40
Bromodichloromethane	1226	1100	90	9	40
Bromoform	1226	1100	90	0	40
Bromomethane	1226	1200	98	0	40
Carbon Disulfide	1226	1200	98	0	40
Carbon tetrachloride	1226	1200	98	0	40
Chlorobenzene	1226	1200	98	0	34
Chloroethane	1226	1200	98	9	40
Chloroform	1226	1200	98	0	40
Chloromethane	1226	1100	90	0	40
Dibromochloromethane	1226	1100	90	0	40
Dibromomethane	1226	1200	98	0	40
Dichlorodifluoromethane	1226	1300	110	0	40
Ethyl Ether	1226	1200	98	12	40
Ethylbenzene	1226	1200	98	12	40
Hexachlorobutadiene	1226	1400	110	0	40
Isopropylbenzene	1226	1400	110	0	40

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE DUPLICATE (MSD) RECOVERY

Sample ID:AB57094

PARAMETER	MSD SPIKE ADDED	MSD CONCENTRATION ug/Kg	MSD % REC	RPD %	QC LIMITS RPD
M/P Xylene	2452	2500	100	10	40
Methyl-t-Butyl Ether	1226	1300	110	0	40
Methylene Chloride	1226	1200	98	0	40
N-Butylbenzene	1226	1300	110	0	40
N-Propylbenzene	1226	1300	110	0	40
Naphthalene	1226	1300	110	0	40
Ortho Xylene	1226	1300	110	0	40
Para-Isopropyltoluene	1226	1300	110	0	40
Sec-Butylbenzene	1226	1300	110	0	40
Styrene	1226	1300	110	0	40
Tert-Butylbenzene	1226	1400	110	0	40
Tetrachloroethylene	1226	1400	110	0	40
Tetrahydrofuran	1226	1200	98	0	40
Toluene	1226	1200	98	0	33
Trans-1,2-Dichloroethylene	1226	1200	98	0	40
Trichloroethylene	1226	1500	100	0	27
Trichlorofluoromethane	1226	1000	82	0	40
Vinyl Acetate	1226	1300	110	0	40
Vinyl Chloride	1226	970	79	3	40
c-1,3-dichloropropene	1226	1300	110	0	40
cis-1,2-Dichloroethylene	1226	1300	110	0	40
t-1,3-Dichloropropene	1226	1200	98	12	40

Lunt Silversmiths - Greenfield, MA

Laboratory Duplicate Results

Sample ID: AB57094

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
1,1,1,2-Tetrachloroethane	ND	ND	NC	40
1,1,1-Trichloroethane	ND	ND	NC	40
1,1,2,2-Tetrachloroethane	ND	ND	NC	40
1,1,2-Trichloro-1,2,2-Trifluoroeth	ND	ND	NC	40
1,1,2-Trichloroethane	ND	ND	NC	40
1,1-Dichloroethylene	ND	ND	NC	40
1,1-Dichloropropene	ND	ND	NC	40
1,1-dichloroethane	ND	ND	NC	40
1,2,3-Trichlorobenzene	ND	ND	NC	40
1,2,3-Trichloropropane	ND	ND	NC	40
1,2,4-Trichlorobenzene	ND	ND	NC	40
1,2,4-Trimethylbenzene	ND	ND	NC	40
1,2-Dibromo-3-Chloropropane	ND	ND	NC	40
1,2-Dibromoethane	ND	ND	NC	40
1,2-Dichlorobenzene	ND	ND	NC	40
1,2-Dichloroethane	ND	ND	NC	40
1,2-Dichloropropane	ND	ND	NC	40
1,3,5-Trimethylbenzene	ND	ND	NC	40
1,3-Dichlorobenzene	ND	ND	NC	40
1,3-Dichloropropane	ND	ND	NC	40
1,4-Dichlorobenzene	ND	ND	NC	40
2,2-Dichloropropane	ND	ND	NC	40
2-Butanone (MEK)	ND	ND	NC	40
2-Chlorotoluene	ND	ND	NC	40
2-Hexanone	ND	ND	NC	40
2-Propanone (acetone)	ND	ND	NC	40
4-Chlorotoluene	ND	ND	NC	40
4-Methyl-2-Pentanone(MIBK)	ND	ND	NC	40
Acrylonitrile	ND	ND	NC	40
Benzene	ND	ND	NC	40
Bromobenzene	ND	ND	NC	40
Bromochloromethane	ND	ND	NC	40
Bromodichloromethane	ND	ND	NC	40
Bromoform	ND	ND	NC	40
Bromomethane	ND	ND	NC	40
Carbon Disulfide	ND	ND	NC	40
Carbon tetrachloride	ND	ND	NC	40
Chlorobenzene	ND	ND	NC	40
Chloroethane	ND	ND	NC	40
Chloroform	ND	ND	NC	40
Chloromethane	ND	ND	NC	40
Dibromochloromethane	ND	ND	NC	40
Dibromomethane	ND	ND	NC	40
Dichlorodifluoromethane	ND	ND	NC	40
Ethyl Ether	ND	ND	NC	40
Ethylbenzene	ND	ND	NC	40
Hexachlorobutadiene	ND	ND	NC	40
Isopropylbenzene	ND	ND	NC	40
M/P Xylene	ND	ND	NC	40
Methyl-t-Butyl Ether	ND	ND	NC	40

Lunt Silversmiths - Greenfield, MA

Laboratory Duplicate Results

Sample ID: AB57094

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
Methylene Chloride	ND	ND	NC	40
N-Butylbenzene	ND	ND	NC	40
N-Propylbenzene	ND	ND	NC	40
Naphthalene	ND	ND	NC	40
Ortho Xylene	ND	ND	NC	40
Para-Isopropyltoluene	ND	ND	NC	40
Sec-Butylbenzene	ND	ND	NC	40
Styrene	ND	ND	NC	40
Tert-Butylbenzene	ND	ND	NC	40
Tetrachloroethylene	99.0	98	1.0	40
Tetrahydrofuran	ND	ND	NC	40
Toluene	ND	ND	NC	40
Trans-1,2-Dichloroethylene	ND	ND	NC	40
Trichloroethylene	240	260	8.0	40
Trichlorofluoromethane	ND	ND	NC	40
Vinyl Acetate	ND	ND	NC	40
Vinyl Chloride	ND	ND	NC	40
c-1,3-dichloropropene	ND	ND	NC	40
cis-1,2-Dichloroethylene	ND	ND	NC	40
t-1,3-Dichloropropene	ND	ND	NC	40

Lunt Silversmiths - Greenfield, MA

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/Kg	LFB RESULT ug/Kg	LFB RECOVERY %	QC LIMITS %
1,1,1,2-Tetrachloroethane	20	20.6	103	77 - 122
1,1,1-Trichloroethane	20	20.6	103	80 - 128
1,1,2,2-Tetrachloroethane	20	19.3	97	73 - 118
1,1,2-Trichloro-1,2,2-Trifluoroeth	20	21.1	106	59 - 146
1,1,2-Trichloroethane	20	19.8	99	79 - 117
1,1-Dichloroethylene	20	20.8	104	70 - 130
1,1-Dichloropropene	20	21.6	108	79 - 123
1,1-dichloroethane	20	20.8	104	81 - 122
1,2,3-Trichlorobenzene	20	20.8	104	70 - 119
1,2,3-Trichloropropane	20	19.5	98	73 - 114
1,2,4-Trichlorobenzene	20	21.1	106	74 - 120
1,2,4-Trimethylbenzene	20	21.8	109	79 - 123
1,2-Dibromo-3-Chloropropane	20	19.4	97	63 - 124
1,2-Dibromoethane	20	19.8	99	79 - 116
1,2-Dichlorobenzene	20	20.6	103	77 - 117
1,2-Dichloroethane	20	20.1	101	75 - 124
1,2-Dichloropropane	20	20.9	105	80 - 117
1,3,5-Trimethylbenzene	20	21.9	110	80 - 122
1,3-Dichlorobenzene	20	20.6	103	78 - 117
1,3-Dichloropropane	20	20.1	101	79 - 116
1,4-Dichlorobenzene	20	20.2	101	77 - 115
2,2-Dichloropropane	20	21.6	108	64 - 152
2-Butanone (MEK)	20	19.5	98	55 - 144
2-Chlorotoluene	20	20.7	104	79 - 119
2-Hexanone	20	20.2	101	58 - 147
2-Propanone (acetone)	20	17.8	89	37 - 168
4-Chlorotoluene	20	20.9	105	78 - 120
4-Methyl-2-Pentanone(MIBK)	20	20.4	102	68 - 125
Acrylonitrile	20	19.6	98	68 - 124
Benzene	20	20.7	104	80 - 120
Bromobenzene	20	20.6	103	80 - 115
Bromochloromethane	20	20.2	101	81 - 120
Bromodichloromethane	20	20.4	102	77 - 125
Bromoform	20	19.1	96	62 - 127
Bromomethane	20	20.4	102	60 - 139
Carbon Disulfide	20	21.0	105	73 - 129
Carbon tetrachloride	20	21.3	107	73 - 136
Chlorobenzene	20	20.4	102	82 - 119
Chloroethane	20	20.0	100	69 - 130
Chloroform	20	20.7	104	80 - 122
Chloromethane	20	20.3	102	65 - 129
Dibromochloromethane	20	20.2	101	71 - 129
Dibromomethane	20	20.4	102	79 - 115
Dichlorodifluoromethane	20	23.6	118	69 - 126
Ethyl Ether	20	20.3	102	69 - 127
Ethylbenzene	20	20.8	104	80 - 121
Hexachlorobutadiene	20	21.0	105	72 - 124
Isopropylbenzene	20	22.2	111	79 - 124
M/P Xylene	40	42.2	106	81 - 120
Methyl-t-Butyl Ether	20	20.4	102	78 - 120
Methylene Chloride	20	20.6	103	73 - 129
N-Butylbenzene	20	22.1	111	78 - 126
N-Propylbenzene	20	21.5	108	78 - 122

Lunt Silversmiths - Greenfield, MA

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/Kg	LFB RESULT ug/Kg	LFB RECOVERY %	QC LIMITS %
Naphthalene	20	20.7	104	66 - 124
Ortho Xylene	20	21.6	108	81 - 121
Para-Isopropyltoluene	20	22.5	113	77 - 127
Sec-Butylbenzene	20	22.1	111	79 - 124
Styrene	20	21.8	109	82 - 122
Tert-Butylbenzene	20	22.2	111	78 - 124
Tetrachloroethylene	20	20.5	103	77 - 125
Tetrahydrofuran	20	18.7	94	67 - 124
Toluene	20	20.7	104	81 - 120
Trans-1,2-Dichloroethylene	20	20.9	105	80 - 121
Trichloroethylene	20	20.4	102	80 - 117
Trichlorofluoromethane	20	18.9	95	68 - 137
Vinyl Acetate	20	21.1	106	25 - 150
Vinyl Chloride	20	19.9	100	67 - 134
c-1,3-dichloropropene	20	21.7	109	73 - 133
cis-1,2-Dichloroethylene	20	20.8	104	82 - 122
t-1,3-Dichloropropene	20	21.6	108	69 - 127

Comments:

Lunt Silversmiths - Greenfield, MA

LABORATORY FORTIFIED DUPLICATE (LFB Dup) RECOVERY

COMPOUND	LFB Dup CONCENTRATION ug/Kg	LFB Dup RECOVERY %	RPD %	QC LIMITS RPD
1,1,1,2-Tetrachloroethane	20.4	102	1	50
1,1,1-Trichloroethane	20.2	101	2	50
1,1,2,2-Tetrachloroethane	19.6	98	2	50
1,1,2-Trichloro-1,2,2-Trifluoroetha	20.4	102	3	50
1,1,2-Trichloroethane	19.7	99	1	50
1,1-Dichloroethylene	19.6	98	6	52
1,1-Dichloropropene	20.7	104	4	50
1,1-dichloroethane	19.9	100	4	50
1,2,3-Trichlorobenzene	21.0	105	1	50
1,2,3-Trichloropropane	19.8	99	2	50
1,2,4-Trichlorobenzene	21.1	106	0	50
1,2,4-Trimethylbenzene	21.7	109	1	50
1,2-Dibromo-3-Chloropropane	20.1	101	4	50
1,2-Dibromoethane	20.0	100	1	50
1,2-Dichlorobenzene	20.9	105	1	50
1,2-Dichloroethane	19.6	98	3	50
1,2-Dichloropropane	20.2	101	3	50
1,3,5-Trimethylbenzene	21.8	109	1	50
1,3-Dichlorobenzene	20.1	101	3	50
1,3-Dichloropropane	19.7	99	2	50
1,4-Dichlorobenzene	20.0	100	1	50
2,2-Dichloropropane	20.9	105	3	50
2-Butanone (MEK)	20.6	103	6	50
2-Chlorotoluene	20.4	102	2	50
2-Hexanone	21.9	110	8	50
2-Propanone (acetone)	19.0	95	7	50
4-Chlorotoluene	20.8	104	1	50
4-Methyl-2-Pentanone(MIBK)	21.2	106	4	50
Acrylonitrile	20.1	101	3	50
Benzene	20.1	101	3	50
Bromobenzene	20.8	104	1	50
Bromochloromethane	19.4	97	4	50
Bromodichloromethane	19.8	99	3	50
Bromoform	19.4	97	2	50
Bromomethane	19.5	98	5	50
Carbon Disulfide	19.9	100	5	50
Carbon tetrachloride	21.0	105	1	50
Chlorobenzene	20.3	102	1	34
Chloroethane	18.9	95	6	50
Chloroform	19.7	99	5	50
Chloromethane	19.4	97	5	50
Dibromochloromethane	20.2	101	0	50
Dibromomethane	20.0	100	2	50
Dichlorodifluoromethane	22.1	111	7	50
Ethyl Ether	19.9	100	2	50
Ethylbenzene	20.4	102	2	50
Hexachlorobutadiene	20.7	104	1	50
Isopropylbenzene	21.7	109	2	50
M/P Xylene	41.0	103	3	50
Methyl-t-Butyl Ether	20.5	103	1	50
Methylene Chloride	19.8	99	4	50

Lunt Silversmiths - Greenfield, MA

LABORATORY FORTIFIED DUPLICATE (LFB Dup) RECOVERY

COMPOUND	LFB Dup CONCENTRATION ug/Kg	LFB Dup RECOVERY %	RPD %	QC LIMITS RPD
N-Butylbenzene	21.8	109	1	50
N-Propylbenzene	21.3	107	1	50
Naphthalene	21.9	110	6	50
Ortho Xylene	21.2	106	2	50
Para-Isopropyltoluene	22.1	111	2	50
Sec-Butylbenzene	21.8	109	1	50
Styrene	21.3	107	2	50
Tert-Butylbenzene	22.1	111	1	50
Tetrachloroethylene	19.9	100	3	50
Tetrahydrofuran	18.9	95	1	50
Toluene	20.1	101	3	50
Trans-1,2-Dichloroethylene	19.6	98	6	50
Trichloroethylene	20.4	102	0	27
Trichlorofluoromethane	18.5	93	2	50
Vinyl Acetate	21.4	107	1	50
Vinyl Chloride	19.4	97	3	50
c-1,3-dichloropropene	21.8	109	1	50
cis-1,2-Dichloroethylene	19.8	99	5	50
t-1,3-Dichloropropene	21.2	106	2	50

Samples in Batch: AB57093, AB57094, AB57095

 PN 15060048

Andover, MA

CHAIN OF CUSTODY RECORD

Lunt Silversmiths/MA
Contact Name: Ken Robinson
Contact Phone: (978) 621-1208

No: 06/25/15-0004
Cooler #:
Lab: NERL
Lab Phone:

15060048 $VOAHS
15060048 $METMS_PE

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	Lab QC
	R120150528WC-0020	SS-311	VOC	Soil	6/22/2015	1	40 mL	MeOH 10 mls 8.38 gm Soil	
	R120150528WC-0020	SS-311	Metals	Soil	6/22/2015	1	poly bag		
	R120150528WC-0026	SS-317	VOC	Soil	6/22/2015	1	40 mL	MeOH 10 mls 8.16 gm Soil	
	R120150528WC-0026	SS-317	Metals	Soil	6/22/2015	1	poly bag		
	R120150528WC-0031	MB-300	VOC		6/22/2015	1	40 mL	MeOH 10 mls (Blank)	

Special Instructions: Please forward results to OSC Wing Chau. Thank you.

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	Kenneth Kaplan Weston/SSMKT	6/25/15 1800 hrs	Matt	6/25/15 1800 hrs	
	Matt EPA	6/24/15 1430 hrs	ESAT	6/26/15 14:30	5°C

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

July 06, 2015

Wing Chau - Mail Code OSRR02-2
US EPA New England R1

Project Number: 15060050
Project: Lunt Silversmiths - Greenfield, MA
Analysis: Volatile Organic Analysis of Soil
Analyst: Scott Clifford

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-FLDVOA2.

Soil samples were collected in 40 mL vials, and preserved in methanol. The samples were analyzed using a Shimadzu gas chromatograph equipped with a 30 meter, 0.53 mm id. column, with electron capture and photoionization detectors. Concentrations of volatile organics were calculated using the external standard technique. Results are reported on a wet weight basis.

Analytes reported by this field method should be treated as tentatively identified compounds and concentrations are approximate.

Date Samples Received by the Laboratory: 6/29/15

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

Results for soil samples are reported on a wet weight basis.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA, email=boudreau.dan@epa.gov, c=US
Date: 2015.07.06 09:42:06 -04'00'

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Lunt Silversmiths - Greenfield, MA

Volatile Organic Analysis of Soil

Lab Sample ID	Client Sample ID	1,1,1-Trichloroethane ug/Kg	Tetrachloroethylene ug/Kg	Trichloroethylene ug/Kg
AB57125	MB-300		ND (10)	ND (20)
AB57126	SS-311		16	230
AB57127	SS-312		ND (10)	ND (20)
AB57128	SS-313		ND (10)	27
AB57129	SS-314		ND (10)	ND (20)
AB57130	SS-315		ND (10)	ND (20)
AB57131	SS-316		ND (10)	ND (20)
AB57132	SS-317	20	59	140
AB57133	SS-318		ND (10)	6
AB57134	SS-319		ND (10)	ND (20)
AB57135	SS-320		ND (10)	ND (20)
AB57136	SS-321		ND (10)	ND (20)
AB57137	SS-322		ND (10)	ND (20)
AB57138	SS-323		ND (10)	ND (20)
AB57139	SS-324		ND (10)	ND (20)
AB57140	SS-325		ND (10)	ND (20)
AB57141	SS-326		ND (10)	ND (20)

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Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

July 06, 2015

Wing Chau - Mail Code OSRR02-2
US EPA New England R1

Project Number: 15060050
Project: Lunt Silversmiths - Greenfield, MA
Analysis: Field Analysis of Metals by XRF
Analyst: Scott Clifford

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIA-FLDXRFNITON4.

Samples were analyzed using a Niton XL3t 600 x-ray fluorescence (XRF) instrument equipped with a 50 kV X-ray tube and a high resolution Si pin detector.

Samples were placed into XRF cups for analysis.

Date Samples Received by the Laboratory: 6/29/15

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

Results for soil samples are reported on a dry weight basis.

If you have any questions please call me at .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA, email=boudreau.dan@epa.gov, c=US
Date: 2015.07.06 09:44:05 -04'00'

15060050$FXRF

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Lunt Silversmiths - Greenfield, MA

Field Analysis of Metals by XRF

Lab Sample ID	Client Sample ID	Arsenic mg/Kg	Lead mg/Kg	Silver mg/Kg
AB57107	SS-311	ND (13)	230	490
AB57108	SS-312	ND (8)	100	100
AB57109	SS-313	ND (12)	180	230
AB57110	SS-314	ND (9)	87	660
AB57111	SS-315	ND (12)	200	100
AB57112	SS-316	ND (7)	50	180
AB57113	SS-317	ND (8)	100	91
AB57114	SS-318	12	150	83
AB57115	SS-318 Lab Dup	10	92	49
AB57116	SS-319	8	65	58
AB57117	SS-319 Lab Dup	ND (8)	66	33
AB57118	SS-320	ND (17)	490	1200
AB57119	SS-321	11	140	750
AB57120	SS-322	ND (7)	44	36
AB57121	SS-323	ND (10)	150	320
AB57122	SS-324	ND (7)	60	60
AB57123	SS-325	ND (14)	280	1100
AB57124	SS-326	55	2600	71

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
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Laboratory Report

August 10, 2015

Wing Chau - Mail Code OSRR02-2
US EPA New England R1

Project Number: 15070015
Project: Lunt Silversmiths - Greenfield, MA
Analysis: Volatile Organic Analysis of Soil
Analyst: Scott Clifford

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-FLDVOA2.

Soil samples were collected in 40 mL vials, and preserved in methanol. The samples were analyzed using a Shimadzu gas chromatograph equipped with a 30 meter, 0.53 mm id. column, with electron capture and photoionization detectors. Concentrations of volatile organics were calculated using the external standard technique. Results are reported on a wet weight basis.

Analytes reported by this field method should be treated as tentatively identified compounds and concentrations are approximate.

Date Samples Received by the Laboratory: 7/10/15

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

Results for soil samples are reported on a dry weight basis.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA, email=boudreau.dan@epa.gov, c=US
Date: 2015.08.10 10:05:41 -04'00'

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Lunt Silversmiths - Greenfield, MA

Volatile Organic Analysis of Soil

Lab Sample ID	Client Sample ID	Tetrachloroethylene ug/Kg	Trichloroethylene ug/Kg
AB57331	MB-01-B	ND (10)	ND (20)
AB57332	Grid-01-B	490	4100
AB57333	Grid-02-B	3300	6100

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
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Laboratory Report

August 10, 2015

Wing Chau - Mail Code OSRR02-2
US EPA New England R1

Project Number: 15070015
Project: Lunt Silversmiths - Greenfield, MA
Analysis: Field Analysis of Metals by XRF
Analyst: Scott Clifford

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIA-FLDXRFNITON4.

Samples were analyzed using a Niton XL3t 600 x-ray fluorescence (XRF) instrument equipped with a 50 kV X-ray tube and a high resolution Si pin detector.

Samples were placed into XRF cups for analysis.

Date Samples Received by the Laboratory: 7/10/15

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

Results for soil samples are reported on a dry weight basis.

If you have any questions please call me at .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA, email=boudreau.dan@epa.gov, c=US
Date: 2015.08.10 10:07:27 -04'00'

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
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J1 = Estimated value due to MS recovery outside accceptance criteria
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R = No recovery was calculated since the analyte concentration is greater than four times the spike level.

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Lunt Silversmiths - Greenfield, MA

Field Analysis of Metals by XRF

Lab Sample ID	Client Sample ID	Arsenic mg/Kg	Lead mg/Kg
AB57328	Grid 01-B	ND (17)	400
AB57329	Grid 01-B Lab Dup	ND (16)	330
AB57330	Grid 02-B	ND (37)	1900

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Laboratory Report

August 10, 2015

Wing Chau - Mail Code OSRR02-2
US EPA New England R1

Project Number: 15070024
Project: Lunt Silversmiths - Greenfield, MA
Analysis: Field Analysis of Metals by XRF
Analyst: Scott Clifford

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIA-FLDXRFNITON4.

Samples were analyzed using a Niton XL3t 600 x-ray fluorescence (XRF) instrument equipped with a 50 kV X-ray tube and a high resolution Si pin detector.

Samples were placed into XRF cups for analysis.

Date Samples Received by the Laboratory: 7/17/15

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

Results for soil samples are reported on a dry weight basis.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA, email=boudreau.dan@epa.gov, c=US
Date: 2015.08.10 11:21:38 -04'00'

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
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R = No recovery was calculated since the analyte concentration is greater than four times the spike level.

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Lunt Silversmiths - Greenfield, MA

Field Analysis of Metals by XRF

Lab Sample ID	Client Sample ID	Arsenic mg/Kg	Lead mg/Kg
AB57421	Grid -01C	14	260
AB57422	Grid-02C	23	370
AB57423	Grid-03B	17	73
AB57424	Grid-03B Lab Dup	12	89
AB57425	Grid-01E	ND (5)	21
AB57426	Grid-02E	ND (5)	15
AB57427	Grid-04B	ND (9)	110
AB57428	Grid-04B Lab Dup	ND (13)	220
AB57429	Grid-05B	63	33
AB57430	Grid-05B Lab Dup	60	37
AB57431	Grid-05C	34	21

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Laboratory Report

August 10, 2015

Wing Chau - Mail Code OSRR02-2
US EPA New England R1

Project Number: 15070024
Project: Lunt Silversmiths - Greenfield, MA
Analysis: Volatile Organic Analysis of Soil
Analyst: Scott Clifford

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-FLDVOA2.

Soil samples were collected in 40 mL vials, and preserved in methanol. The samples were analyzed using a Shimadzu gas chromatograph equipped with a 30 meter, 0.53 mm id. column, with electron capture and photoionization detectors. Concentrations of volatile organics were calculated using the external standard technique. Results are reported on a wet weight basis.

Analytes reported by this field method should be treated as tentatively identified compounds and concentrations are approximate.

Date Samples Received by the Laboratory: 7/17/15

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

Results for soil samples are reported on a dry weight basis.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA, email=boudreau.dan@epa.gov, c=US
Date: 2015.08.10 11:19:55 -04'00'

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
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R = No recovery was calculated since the analyte concentration is greater than four times the spike level.

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Lunt Silversmiths - Greenfield, MA

Volatile Organic Analysis of Soil

Lab Sample ID	Client Sample ID	Tetrachloroethylene ug/Kg	Trichloroethylene ug/Kg
AB57432	Grid-01C	10000	45000
AB57433	Grid-02C	6200	22000
AB57434	Grid-03B	1300	4600
AB57435	Grid-01E	50	120
AB57436	Grid-02E	2200	6300
AB57437	Grid-04B	380	860
AB57438	Grid-05B	ND (10)	23
AB57439	Grid-05C	240	870

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Laboratory Report

August 24, 2015

Wing Chau - Mail Code OSRR02-2
US EPA New England R1

Project Number: 15070040
Project: Lunt Silversmiths - Greenfield, MA
Analysis: Metals in Soil Medium Level by ICP
EPA Chemist: Janet Paquin

Date Samples Received by the Laboratory: 07/24/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-OPTIMASO1.

Samples were prepared following the EPA Region I SOP, EIASOP-INGMETALSPREP8

Preparation and analysis SOP's are based on "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, Revision 2, Final Update III, Methods 3050B and 6010B," respectively. Samples were analyzed using a Perkin Elmer Dual View Inductively Coupled Plasma - Optical Emission Spectrometer.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA, email=boudreau.dan@epa.gov, c=US
Date: 2015.08.24 13:59:06 -04'00'

15070040$METMS_PE

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

Soil sample results are in mg/Kg dry weight.

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0048	Lab Sample ID:	AB57532
Date of Collection:	7/21/2015	Matrix:	Soil
Date of Preparation:	8/10/2015	Amount Prepared:	N/A
Date of Analysis:	8/12/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**42**	0.98	
7429-90-5	Aluminum	**9400**	11	
7440-38-2	Arsenic	**6.1**	2.0	J3
7440-39-3	Barium	**24**	2.0	
7440-41-7	Beryllium	ND	0.78	
7440-70-2	Calcium	**500**	20	
7440-43-9	Cadmium	ND	0.98	
7440-48-4	Cobalt	**5.2**	2.0	
7440-47-3	Chromium	**13**	2.0	
7440-50-8	Copper	**49**	2.0	
7439-89-6	Iron	**17000**	3.9	
7439-95-4	Magnesium	**2700**	9.8	
7439-96-5	Manganese	**260**	2.0	
7440-02-0	Nickel	**15**	2.0	
7439-92-1	Lead	**58**	2.0	J3
7440-36-0	Antimony	ND	2.0	
7782-49-2	Selenium	ND	3.9	
7440-28-0	Thallium	ND	2.0	
7440-62-2	Vanadium	**21**	2.0	
7440-66-6	Zinc	**51**	3.9	

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0049	Lab Sample ID:	AB57533
Date of Collection:	7/21/2015	Matrix:	Soil
Date of Preparation:	8/10/2015	Amount Prepared:	N/A
Date of Analysis:	8/12/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**8.1**	0.98	
7429-90-5	Aluminum	**11000**	11	
7440-38-2	Arsenic	**5.1**	2.0	
7440-39-3	Barium	**25**	2.0	
7440-41-7	Beryllium	ND	0.78	
7440-70-2	Calcium	**500**	20	
7440-43-9	Cadmium	ND	0.98	
7440-48-4	Cobalt	**5.2**	2.0	
7440-47-3	Chromium	**14**	2.0	
7440-50-8	Copper	**120**	2.0	
7439-89-6	Iron	**18000**	3.9	
7439-95-4	Magnesium	**2500**	9.8	
7439-96-5	Manganese	**310**	2.0	J1
7440-02-0	Nickel	**15**	2.0	
7439-92-1	Lead	**460**	2.0	
7440-36-0	Antimony	**15**	2.0	J1
7782-49-2	Selenium	ND	3.9	
7440-28-0	Thallium	ND	2.0	
7440-62-2	Vanadium	**19**	2.0	
7440-66-6	Zinc	**90**	3.9	

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0051	Lab Sample ID:	AB57535
Date of Collection:	7/21/2015	Matrix:	Soil
Date of Preparation:	8/10/2015	Amount Prepared:	N/A
Date of Analysis:	8/12/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**41**	1.0	
7429-90-5	Aluminum	**10000**	11	
7440-38-2	Arsenic	**7.5**	2.0	
7440-39-3	Barium	**25**	2.0	
7440-41-7	Beryllium	ND	0.82	
7440-70-2	Calcium	**720**	20	
7440-43-9	Cadmium	ND	1.0	
7440-48-4	Cobalt	**4.7**	2.0	
7440-47-3	Chromium	**16**	2.0	
7440-50-8	Copper	**82**	2.0	
7439-89-6	Iron	**18000**	4.1	
7439-95-4	Magnesium	**2300**	10	
7439-96-5	Manganese	**190**	2.0	
7440-02-0	Nickel	**23**	2.0	
7439-92-1	Lead	**37**	2.0	
7440-36-0	Antimony	ND	2.0	
7782-49-2	Selenium	ND	4.1	
7440-28-0	Thallium	ND	2.0	
7440-62-2	Vanadium	**24**	2.0	
7440-66-6	Zinc	**54**	4.1	

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0058	Lab Sample ID:	AB57538
Date of Collection:	7/21/2015	Matrix:	Soil
Date of Preparation:	8/10/2015	Amount Prepared:	N/A
Date of Analysis:	8/12/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**63**	1.0	
7429-90-5	Aluminum	**10000**	11	
7440-38-2	Arsenic	**7.0**	2.0	
7440-39-3	Barium	**25**	2.0	
7440-41-7	Beryllium	ND	0.80	
7440-70-2	Calcium	**750**	20	
7440-43-9	Cadmium	ND	1.0	
7440-48-4	Cobalt	**4.6**	2.0	
7440-47-3	Chromium	**21**	2.0	
7440-50-8	Copper	**92**	2.0	
7439-89-6	Iron	**17000**	4.0	
7439-95-4	Magnesium	**2600**	10	
7439-96-5	Manganese	**170**	2.0	
7440-02-0	Nickel	**23**	2.0	
7439-92-1	Lead	**38**	2.0	
7440-36-0	Antimony	ND	2.0	
7782-49-2	Selenium	ND	4.0	
7440-28-0	Thallium	ND	2.0	
7440-62-2	Vanadium	**32**	2.0	
7440-66-6	Zinc	**61**	4.0	

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0059	Lab Sample ID:	AB57539
Date of Collection:	7/22/2015	Matrix:	Soil
Date of Preparation:	8/10/2015	Amount Prepared:	N/A
Date of Analysis:	8/12/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**21**	1.0	
7429-90-5	Aluminum	**12000**	11	
7440-38-2	Arsenic	**4.2**	2.0	
7440-39-3	Barium	**32**	2.0	
7440-41-7	Beryllium	ND	0.82	
7440-70-2	Calcium	**680**	20	
7440-43-9	Cadmium	ND	1.0	
7440-48-4	Cobalt	**3.9**	2.0	
7440-47-3	Chromium	**18**	2.0	
7440-50-8	Copper	**51**	2.0	
7439-89-6	Iron	**16000**	4.1	
7439-95-4	Magnesium	**2100**	10	
7439-96-5	Manganese	**150**	2.0	
7440-02-0	Nickel	**16**	2.0	
7439-92-1	Lead	**27**	2.0	
7440-36-0	Antimony	ND	2.0	
7782-49-2	Selenium	ND	4.1	
7440-28-0	Thallium	ND	2.0	
7440-62-2	Vanadium	**24**	2.0	
7440-66-6	Zinc	**50**	4.1	

Lunt Silversmiths - Greenfield, MA

Laboratory Reagent Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	8/10/2015	Amount Prepared:	N/A
Date of Analysis:	8/12/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
7440-22-4	Silver	ND	10	
7429-90-5	Aluminum	ND	110	
7440-38-2	Arsenic	ND	20	
7440-39-3	Barium	ND	20	
7440-41-7	Beryllium	ND	8.0	
7440-70-2	Calcium	ND	200	
7440-43-9	Cadmium	ND	10	
7440-48-4	Cobalt	ND	20	
7440-47-3	Chromium	ND	20	
7440-50-8	Copper	ND	20	
7439-89-6	Iron	ND	40	
7439-95-4	Magnesium	ND	100	
7439-96-5	Manganese	ND	20	
7440-02-0	Nickel	ND	20	
7439-92-1	Lead	ND	20	
7440-36-0	Antimony	ND	20	
7782-49-2	Selenium	ND	40	
7440-28-0	Thallium	ND	20	
7440-62-2	Vanadium	ND	20	
7440-66-6	Zinc	ND	40	

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB57533

PARAMETER	SPIKE ADDED mg/Kg	SAMPLE CONCENTRATION mg/Kg	MS CONCENTRATION mg/Kg	MS % REC	QC LIMITS (% REC)
Antimony	98.0	15.0	58.2	44	75 - 125
Arsenic	98.0	5.1	106	103	75 - 125
Barium	98.0	25.0	124	101	75 - 125
Beryllium	39.0	ND	41.3	105	75 - 125
Cadmium	49.0	ND	49.5	101	75 - 125
Chromium	98.0	14.0	116	104	75 - 125
Cobalt	98.0	5.2	106	103	75 - 125
Copper	98.0	120	220	102	75 - 125
Lead	98.0	460	474	R	75 - 125
Manganese	98.0	310	352	43	75 - 125
Nickel	98.0	15.0	115	102	75 - 125
Selenium	98.0	ND	99.4	101	75 - 125
Silver	20.0	8.1	28.8	106	75 - 125
Thallium	98.0	ND	99.2	101	75 - 125
Vanadium	98.0	19.0	126	109	75 - 125
Zinc	98.0	90.0	184	96	75 - 125

Laboratory Duplicate Results

Sample ID: AB57532

PARAMETER	SAMPLE RESULT mg/Kg	SAMPLE DUPLICATE RESULT mg/Kg	PRECISION RPD %	QC LIMITS
Aluminum	9400	9000	4.3	30
Antimony	ND	ND	NC	30
Arsenic	6.1	4.1	39	30
Barium	24.0	23	4.3	30
Beryllium	ND	ND	NC	30
Cadmium	ND	ND	NC	30
Calcium	500	480	4.1	30
Chromium	13.0	12	8.0	30
Cobalt	5.2	4.9	5.9	30
Copper	49.0	38	25	30
Iron	17000	15000	12	30
Lead	58.0	36	47	30
Magnesium	2700	2700	0.0	30
Manganese	260	240	8.0	30
Nickel	15.0	15	0.0	30
Selenium	ND	ND	NC	30
Silver	42.0	37	13	30
Thallium	ND	ND	NC	30
Vanadium	21.0	18	15	30
Zinc	51.0	45	12	30

Lunt Silversmiths - Greenfield, MA

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/L	LFB RESULT ug/L	LFB RECOVERY %	QC LIMITS %
Aluminum	1000	1030	103	85 - 115
Antimony	1000	1010	101	85 - 115
Arsenic	1000	1000	100	85 - 115
Barium	1000	1010	101	85 - 115
Beryllium	400	405	101	85 - 115
Cadmium	500	502	100	85 - 115
Calcium	10000	10100	101	85 - 115
Chromium	1000	1040	104	85 - 115
Cobalt	1000	1020	102	85 - 115
Copper	1000	1040	104	85 - 115
Iron	1000	1010	101	85 - 115
Lead	1000	1010	101	85 - 115
Magnesium	10000	10000	100	85 - 115
Manganese	1000	994	99	85 - 115
Nickel	1000	1020	102	85 - 115
Selenium	1000	979	98	85 - 115
Silver	200	204	102	85 - 115
Thallium	1000	1020	102	85 - 115
Vanadium	1000	1060	106	85 - 115
Zinc	1000	1020	102	85 - 115

Comments:

Lunt Silversmiths - Greenfield, MA

Solid Laboratory Control Sample (LCS) Results

PARAMETER	LCS RESULTS mg/Kg	CONTROL LIMITS mg/Kg
Aluminum	7990	2780 - 12100
Antimony	46.6	19.5 - 230
Arsenic	145	97.8 - 195
Barium	201	149 - 258
Beryllium	98.7	71.6 - 121
Cadmium	96.7	70.3 - 122
Calcium	6150	4460 - 7630
Chromium	138	95.1 - 176
Cobalt	152	110 - 185
Copper	178	127 - 210
Iron	13600	4930 - 23300
Lead	127	97.0 - 170
Magnesium	2890	1820 - 3780
Manganese	290	221 - 373
Nickel	126	89.9 - 158
Selenium	181	120 - 233
Silver	40.3	26.6 - 53.9
Thallium	145	94.0 - 182
Vanadium	111	71.1 - 143
Zinc	194	132 - 247

Comments:

Samples in Batch: AB57532, AB57533, AB57535, AB57538, AB57539

PN: 150700 40

Weston Solutions, Inc.
Andover, MA

CHAIN OF CUSTODY RECORD
Lunt Silversmiths/MA Greenfield MA
Contact Name:
Contact Phone:

No: 07/24/15-0010
Cooler #:
Lab: NERL
Lab Phone:

15070040 $VOAHS
15070040 $METMS_PE

Lab #	Sample #	Location	Analyses	Matrix	EventID	Numb Cont	Container	Depth_to	Depth Units	Final Weight (g)
	R120150528WC-0048	Grid-C5	Metals	Soil	7/21/2015	1	4 oz	1	feet	
	R120150528WC-0048	Grid-C5	VOC	Soil	7/21/2015	1	40 mL	1	feet	9.42
	R120150528WC-0049	Grid-B2-4	Metals	Soil	7/21/2015	1	4 oz	1	feet	
	R120150528WC-0050	Grid-B2-4	VOC	Soil	7/21/2015	1	40 mL	1	feet	8.15
	R120150528WC-0051	Grid-6	Metals	Soil	7/21/2015	1	4 oz	2	feet	
	R120150528WC-0052	Grid-6	VOC	Soil	7/21/2015	1	40 mL	2	feet	11.07
	R120150528WC-0057	LBlank-03	VOC	Soil	7/21/2015	1	40 mL			
	R120150528WC-0058	Grid-106	Metals	Soil	7/21/2015	1	4 oz	2	feet	
	R120150528WC-0059	Grid-6	Metals	Soil	7/22/2015	1	4 oz	3	feet	
	R120150528WC-0060	Grid-6	VOC	Soil	7/22/2015	1	40 mL	3	feet	13.76

Special Instructions: Please forward results to OSC Wing Chau

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
	John Bates	7/24/15		7/24/15	1129			7/24/15		7/24/15	13:24

Wing Chau - OSC

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

July 30, 2015

Wing Chau - Mail Code OSRR02-2
US EPA New England R1

Project Number: 15070040
Project: Lunt Silversmiths - Greenfield, MA
Analysis: VOAs in Soil High Level Method
EPA Chemist: Joseph Montanaro

Date Samples Received by the Laboratory: 07/24/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-VOAGCMS9.

Samples were analyzed by GC/MS. Samples were introduced to the GC via a Tekmar preconcentrator and an Archon auto-sampler. The analysis SOP is based on US EPA Method 8260B, revision 2.0, 1996 and Method 5035A, draft revision 1, 2002, from SW-846.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA, email=boudreau.dan@epa.gov, c=US
Date: 2015.07.30 11:24:28 -04'00'

15070040$VOAHS

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0048	Lab Sample ID:	AB57532
Date of Collection:	7/21/2015	Matrix:	Soil
Date of Preparation:	7/27/2015	Amount Prepared:	5 mL
Date of Analysis:	7/27/2015	Percent Solids:	91%
Dry Weight Prepared:	8.57 grams	Extract Dilution:	50
Wet Weight Prepared:	9.42 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	63	
75-01-4	Vinyl Chloride	ND	63	
74-83-9	Bromomethane	ND	63	
75-00-3	Chloroethane	ND	63	
75-69-4	Trichlorofluoromethane	ND	63	
60-29-7	Ethyl Ether	ND	63	
67-64-1	2-Propanone (acetone)	ND	63	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	63	
75-35-4	1,1-Dichloroethylene	ND	63	
75-15-0	Carbon Disulfide	ND	63	
75-71-8	Dichlorodifluoromethane	ND	63	
75-09-2	Methylene Chloride	ND	63	
107-13-1	Acrylonitrile	ND	63	
1634-04-4	Methyl-t-Butyl Ether	ND	63	
156-60-5	Trans-1,2-Dichloroethylene	ND	63	
75-34-3	1,1-dichloroethane	ND	63	
108-05-4	Vinyl Acetate	ND	63	
78-93-3	2-Butanone (MEK)	ND	63	
594-20-7	2,2-Dichloropropane	ND	63	
156-59-2	cis-1,2-Dichloroethylene	ND	63	
67-66-3	Chloroform	ND	63	
74-97-5	Bromochloromethane	ND	63	
109-99-9	Tetrahydrofuran	ND	63	
71-55-6	1,1,1-Trichloroethane	ND	63	
107-06-2	1,2-Dichloroethane	ND	63	
56-23-5	Carbon tetrachloride	ND	63	
71-43-2	Benzene	ND	63	
10061-01-5	c-1,3-dichloropropene	ND	63	
108-88-3	Toluene	ND	63	
10061-02-6	t-1,3-Dichloropropene	ND	63	
79-00-5	1,1,2-Trichloroethane	ND	63	
124-48-1	Dibromochloromethane	ND	63	
108-90-7	Chlorobenzene	ND	63	
563-58-6	1,1-Dichloropropene	ND	63	
79-01-6	Trichloroethylene	ND	63	
78-87-5	1,2-Dichloropropane	ND	63	
75-27-4	Bromodichloromethane	ND	63	
74-95-3	Dibromomethane	ND	63	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	63	
142-28-9	1,3-Dichloropropane	ND	63	
127-18-4	Tetrachloroethylene	ND	63	
106-93-4	1,2-Dibromoethane	ND	63	
591-78-6	2-Hexanone	ND	63	
630-20-6	1,1,1,2-Tetrachloroethane	ND	63	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0048	Lab Sample ID:	AB57532
Date of Collection:	7/21/2015	Matrix:	Soil
Date of Preparation:	7/27/2015	Amount Prepared:	5 mL
Date of Analysis:	7/27/2015	Percent Solids:	91%
Dry Weight Prepared:	8.57 grams	Extract Dilution:	50
Wet Weight Prepared:	9.42 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	63	
108-38-3/106-42-3	M/P Xylene	ND	130	
95-47-6	Ortho Xylene	ND	63	
100-42-5	Styrene	ND	63	
75-25-2	Bromoform	ND	63	
79-34-5	1,1,2,2-Tetrachloroethane	ND	63	
98-82-8	Isopropylbenzene	ND	63	
108-86-1	Bromobenzene	ND	63	
96-18-4	1,2,3-Trichloropropane	ND	63	
103-65-1	N-Propylbenzene	ND	63	
95-49-8	2-Chlorotoluene	ND	63	
106-43-4	4-Chlorotoluene	ND	63	
98-06-6	Tert-Butylbenzene	ND	63	
108-67-8	1,3,5-Trimethylbenzene	ND	63	
95-63-6	1,2,4-Trimethylbenzene	ND	63	
135-98-8	Sec-Butylbenzene	ND	63	
541-73-1	1,3-Dichlorobenzene	ND	63	
99-87-6	Para-Isopropyltoluene	ND	63	
106-46-7	1,4-Dichlorobenzene	ND	63	
95-50-1	1,2-Dichlorobenzene	ND	63	
104-51-8	N-Butylbenzene	ND	63	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	63	
120-82-1	1,2,4-Trichlorobenzene	ND	63	
87-68-3	Hexachlorobutadiene	ND	63	
91-20-3	Naphthalene	ND	63	
87-61-6	1,2,3-Trichlorobenzene	ND	63	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	96	74 - 136
Toluene-D8	97	85 - 118
1,4-Bromofluorobenzene	95	78 - 111

Lunt Silversmiths - Greenfield, MA

Laboratory Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	7/27/2015	Amount Prepared:	5 mL
Date of Analysis:	7/27/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	~6

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
74-87-3	Chloromethane	ND	1.0	
75-01-4	Vinyl Chloride	ND	1.0	
74-83-9	Bromomethane	ND	1.0	
75-00-3	Chloroethane	ND	1.0	
75-69-4	Trichlorofluoromethane	ND	1.0	
60-29-7	Ethyl Ether	ND	1.0	
67-64-1	2-Propanone (acetone)	ND	1.0	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	1.0	
75-35-4	1,1-Dichloroethylene	ND	1.0	
75-15-0	Carbon Disulfide	ND	1.0	
75-71-8	Dichlorodifluoromethane	ND	1.0	
75-09-2	Methylene Chloride	ND	1.0	
107-13-1	Acrylonitrile	ND	1.0	
1634-04-4	Methyl-t-Butyl Ether	ND	1.0	
156-60-5	Trans-1,2-Dichloroethylene	ND	1.0	
75-34-3	1,1-dichloroethane	ND	1.0	
108-05-4	Vinyl Acetate	ND	1.0	
78-93-3	2-Butanone (MEK)	ND	1.0	
594-20-7	2,2-Dichloropropane	ND	1.0	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	
67-66-3	Chloroform	ND	1.0	
74-97-5	Bromochloromethane	ND	1.0	
109-99-9	Tetrahydrofuran	ND	1.0	
71-55-6	1,1,1-Trichloroethane	ND	1.0	
107-06-2	1,2-Dichloroethane	ND	1.0	
56-23-5	Carbon tetrachloride	ND	1.0	
71-43-2	Benzene	ND	1.0	
10061-01-5	c-1,3-dichloropropene	ND	1.0	
108-88-3	Toluene	ND	1.0	
10061-02-6	t-1,3-Dichloropropene	ND	1.0	
79-00-5	1,1,2-Trichloroethane	ND	1.0	
124-48-1	Dibromochloromethane	ND	1.0	
108-90-7	Chlorobenzene	ND	1.0	
563-58-6	1,1-Dichloropropene	ND	1.0	
79-01-6	Trichloroethylene	ND	1.0	
78-87-5	1,2-Dichloropropane	ND	1.0	
75-27-4	Bromodichloromethane	ND	1.0	
74-95-3	Dibromomethane	ND	1.0	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	1.0	
142-28-9	1,3-Dichloropropane	ND	1.0	
127-18-4	Tetrachloroethylene	ND	1.0	
106-93-4	1,2-Dibromoethane	ND	1.0	
591-78-6	2-Hexanone	ND	1.0	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	

Lunt Silversmiths - Greenfield, MA

Laboratory Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	7/27/2015	Amount Prepared:	5 mL
Date of Analysis:	7/27/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	~6

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
100-41-4	Ethylbenzene	ND	1.0	
108-38-3/106-42-3	M/P Xylene	ND	2.0	
95-47-6	Ortho Xylene	ND	1.0	
100-42-5	Styrene	ND	1.0	
75-25-2	Bromoform	ND	1.0	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	
98-82-8	Isopropylbenzene	ND	1.0	
108-86-1	Bromobenzene	ND	1.0	
96-18-4	1,2,3-Trichloropropane	ND	1.0	
103-65-1	N-Propylbenzene	ND	1.0	
95-49-8	2-Chlorotoluene	ND	1.0	
106-43-4	4-Chlorotoluene	ND	1.0	
98-06-6	Tert-Butylbenzene	ND	1.0	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	
135-98-8	Sec-Butylbenzene	ND	1.0	
541-73-1	1,3-Dichlorobenzene	ND	1.0	
99-87-6	Para-Isopropyltoluene	ND	1.0	
106-46-7	1,4-Dichlorobenzene	ND	1.0	
95-50-1	1,2-Dichlorobenzene	ND	1.0	
104-51-8	N-Butylbenzene	ND	1.0	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	1.0	
120-82-1	1,2,4-Trichlorobenzene	ND	1.0	
87-68-3	Hexachlorobutadiene	ND	1.0	
91-20-3	Naphthalene	ND	1.0	
87-61-6	1,2,3-Trichlorobenzene	ND	1.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	103	74 - 136
Toluene-D8	98	85 - 118
1,4-Bromofluorobenzene	95	78 - 111

Comments: Laboratory blank is reported in ug/L.

Laboratory blank is associatted with all samples in this project.

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0050	Lab Sample ID:	AB57534
Date of Collection:	7/21/2015	Matrix:	Soil
Date of Preparation:	7/27/2015	Amount Prepared:	5 mL
Date of Analysis:	7/27/2015	Percent Solids:	88%
Dry Weight Prepared:	7.15 grams	Extract Dilution:	50
Wet Weight Prepared:	8.15 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	77	
75-01-4	Vinyl Chloride	ND	77	
74-83-9	Bromomethane	ND	77	
75-00-3	Chloroethane	ND	77	
75-69-4	Trichlorofluoromethane	ND	77	
60-29-7	Ethyl Ether	ND	77	
67-64-1	2-Propanone (acetone)	ND	77	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	77	
75-35-4	1,1-Dichloroethylene	ND	77	
75-15-0	Carbon Disulfide	ND	77	
75-71-8	Dichlorodifluoromethane	ND	77	
75-09-2	Methylene Chloride	ND	77	
107-13-1	Acrylonitrile	ND	77	
1634-04-4	Methyl-t-Butyl Ether	ND	77	
156-60-5	Trans-1,2-Dichloroethylene	ND	77	
75-34-3	1,1-dichloroethane	ND	77	
108-05-4	Vinyl Acetate	ND	77	
78-93-3	2-Butanone (MEK)	ND	77	
594-20-7	2,2-Dichloropropane	ND	77	
156-59-2	cis-1,2-Dichloroethylene	ND	77	
67-66-3	Chloroform	ND	77	
74-97-5	Bromochloromethane	ND	77	
109-99-9	Tetrahydrofuran	ND	77	
71-55-6	1,1,1-Trichloroethane	ND	77	
107-06-2	1,2-Dichloroethane	ND	77	
56-23-5	Carbon tetrachloride	ND	77	
71-43-2	Benzene	ND	77	
10061-01-5	c-1,3-dichloropropene	ND	77	
108-88-3	Toluene	ND	77	
10061-02-6	t-1,3-Dichloropropene	ND	77	
79-00-5	1,1,2-Trichloroethane	ND	77	
124-48-1	Dibromochloromethane	ND	77	
108-90-7	Chlorobenzene	ND	77	
563-58-6	1,1-Dichloropropene	ND	77	
79-01-6	Trichloroethylene	ND	77	
78-87-5	1,2-Dichloropropane	ND	77	
75-27-4	Bromodichloromethane	ND	77	
74-95-3	Dibromomethane	ND	77	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	77	
142-28-9	1,3-Dichloropropane	ND	77	
127-18-4	Tetrachloroethylene	ND	77	
106-93-4	1,2-Dibromoethane	ND	77	
591-78-6	2-Hexanone	ND	77	
630-20-6	1,1,1,2-Tetrachloroethane	ND	77	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0050	Lab Sample ID:	AB57534
Date of Collection:	7/21/2015	Matrix:	Soil
Date of Preparation:	7/27/2015	Amount Prepared:	5 mL
Date of Analysis:	7/27/2015	Percent Solids:	88%
Dry Weight Prepared:	7.15 grams	Extract Dilution:	50
Wet Weight Prepared:	8.15 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	77	
108-38-3/106-42-3	M/P Xylene	ND	150	
95-47-6	Ortho Xylene	ND	77	
100-42-5	Styrene	ND	77	
75-25-2	Bromoform	ND	77	
79-34-5	1,1,2,2-Tetrachloroethane	ND	77	
98-82-8	Isopropylbenzene	ND	77	
108-86-1	Bromobenzene	ND	77	
96-18-4	1,2,3-Trichloropropane	ND	77	
103-65-1	N-Propylbenzene	ND	77	
95-49-8	2-Chlorotoluene	ND	77	
106-43-4	4-Chlorotoluene	ND	77	
98-06-6	Tert-Butylbenzene	ND	77	
108-67-8	1,3,5-Trimethylbenzene	ND	77	
95-63-6	1,2,4-Trimethylbenzene	ND	77	
135-98-8	Sec-Butylbenzene	ND	77	
541-73-1	1,3-Dichlorobenzene	ND	77	
99-87-6	Para-Isopropyltoluene	ND	77	
106-46-7	1,4-Dichlorobenzene	ND	77	
95-50-1	1,2-Dichlorobenzene	ND	77	
104-51-8	N-Butylbenzene	ND	77	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	77	
120-82-1	1,2,4-Trichlorobenzene	ND	77	
87-68-3	Hexachlorobutadiene	ND	77	
91-20-3	Naphthalene	ND	77	
87-61-6	1,2,3-Trichlorobenzene	ND	77	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	97	74 - 136
Toluene-D8	99	85 - 118
1,4-Bromofluorobenzene	94	78 - 111

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0052	Lab Sample ID:	AB57536
Date of Collection:	7/21/2015	Matrix:	Soil
Date of Preparation:	7/27/2015	Amount Prepared:	5 mL
Date of Analysis:	7/27/2015	Percent Solids:	86%
Dry Weight Prepared:	9.56 grams	Extract Dilution:	2000
Wet Weight Prepared:	11.07 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	2400	
75-01-4	Vinyl Chloride	ND	2400	
74-83-9	Bromomethane	ND	2400	
75-00-3	Chloroethane	ND	2400	
75-69-4	Trichlorofluoromethane	ND	2400	
60-29-7	Ethyl Ether	ND	2400	
67-64-1	2-Propanone (acetone)	ND	2400	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	2400	
75-35-4	1,1-Dichloroethylene	ND	2400	
75-15-0	Carbon Disulfide	ND	2400	
75-71-8	Dichlorodifluoromethane	ND	2400	
75-09-2	Methylene Chloride	ND	2400	
107-13-1	Acrylonitrile	ND	2400	
1634-04-4	Methyl-t-Butyl Ether	ND	2400	
156-60-5	Trans-1,2-Dichloroethylene	ND	2400	
75-34-3	1,1-dichloroethane	ND	2400	
108-05-4	Vinyl Acetate	ND	2400	
78-93-3	2-Butanone (MEK)	ND	2400	
594-20-7	2,2-Dichloropropane	ND	2400	
156-59-2	cis-1,2-Dichloroethylene	**37000**	2400	
67-66-3	Chloroform	ND	2400	
74-97-5	Bromochloromethane	ND	2400	
109-99-9	Tetrahydrofuran	ND	2400	
71-55-6	1,1,1-Trichloroethane	ND	2400	
107-06-2	1,2-Dichloroethane	ND	2400	
56-23-5	Carbon tetrachloride	ND	2400	
71-43-2	Benzene	ND	2400	
10061-01-5	c-1,3-dichloropropene	ND	2400	
108-88-3	Toluene	ND	2400	
10061-02-6	t-1,3-Dichloropropene	ND	2400	
79-00-5	1,1,2-Trichloroethane	ND	2400	
124-48-1	Dibromochloromethane	ND	2400	
108-90-7	Chlorobenzene	ND	2400	
563-58-6	1,1-Dichloropropene	ND	2400	
79-01-6	Trichloroethylene	**25000**	2400	
78-87-5	1,2-Dichloropropane	ND	2400	
75-27-4	Bromodichloromethane	ND	2400	
74-95-3	Dibromomethane	ND	2400	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	2400	
142-28-9	1,3-Dichloropropane	ND	2400	
127-18-4	Tetrachloroethylene	**13000**	2400	
106-93-4	1,2-Dibromoethane	ND	2400	
591-78-6	2-Hexanone	ND	2400	
630-20-6	1,1,1,2-Tetrachloroethane	ND	2400	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0052	Lab Sample ID:	AB57536
Date of Collection:	7/21/2015	Matrix:	Soil
Date of Preparation:	7/27/2015	Amount Prepared:	5 mL
Date of Analysis:	7/27/2015	Percent Solids:	86%
Dry Weight Prepared:	9.56 grams	Extract Dilution:	2000
Wet Weight Prepared:	11.07 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	2400	
108-38-3/106-42-3	M/P Xylene	ND	4800	
95-47-6	Ortho Xylene	ND	2400	
100-42-5	Styrene	ND	2400	
75-25-2	Bromoform	ND	2400	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2400	
98-82-8	Isopropylbenzene	ND	2400	
108-86-1	Bromobenzene	ND	2400	
96-18-4	1,2,3-Trichloropropane	ND	2400	
103-65-1	N-Propylbenzene	ND	2400	
95-49-8	2-Chlorotoluene	ND	2400	
106-43-4	4-Chlorotoluene	ND	2400	
98-06-6	Tert-Butylbenzene	ND	2400	
108-67-8	1,3,5-Trimethylbenzene	ND	2400	
95-63-6	1,2,4-Trimethylbenzene	ND	2400	
135-98-8	Sec-Butylbenzene	ND	2400	
541-73-1	1,3-Dichlorobenzene	ND	2400	
99-87-6	Para-Isopropyltoluene	ND	2400	
106-46-7	1,4-Dichlorobenzene	ND	2400	
95-50-1	1,2-Dichlorobenzene	ND	2400	
104-51-8	N-Butylbenzene	ND	2400	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	2400	
120-82-1	1,2,4-Trichlorobenzene	ND	2400	
87-68-3	Hexachlorobutadiene	ND	2400	
91-20-3	Naphthalene	ND	2400	
87-61-6	1,2,3-Trichlorobenzene	ND	2400	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	99	74 - 136
Toluene-D8	99	85 - 118
1,4-Bromofluorobenzene	97	78 - 111

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0057	Lab Sample ID:	AB57537
Date of Collection:	7/21/2015	Matrix:	Soil
Date of Preparation:	7/27/2015	Amount Prepared:	5 mL
Date of Analysis:	7/27/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	50
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	50	
75-01-4	Vinyl Chloride	ND	50	
74-83-9	Bromomethane	ND	50	
75-00-3	Chloroethane	ND	50	
75-69-4	Trichlorofluoromethane	ND	50	
60-29-7	Ethyl Ether	ND	50	
67-64-1	2-Propanone (acetone)	ND	50	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	50	
75-35-4	1,1-Dichloroethylene	ND	50	
75-15-0	Carbon Disulfide	ND	50	
75-71-8	Dichlorodifluoromethane	ND	50	
75-09-2	Methylene Chloride	ND	50	
107-13-1	Acrylonitrile	ND	50	
1634-04-4	Methyl-t-Butyl Ether	ND	50	
156-60-5	Trans-1,2-Dichloroethylene	ND	50	
75-34-3	1,1-dichloroethane	ND	50	
108-05-4	Vinyl Acetate	ND	50	
78-93-3	2-Butanone (MEK)	ND	50	
594-20-7	2,2-Dichloropropane	ND	50	
156-59-2	cis-1,2-Dichloroethylene	ND	50	
67-66-3	Chloroform	ND	50	
74-97-5	Bromochloromethane	ND	50	
109-99-9	Tetrahydrofuran	ND	50	
71-55-6	1,1,1-Trichloroethane	ND	50	
107-06-2	1,2-Dichloroethane	ND	50	
56-23-5	Carbon tetrachloride	ND	50	
71-43-2	Benzene	ND	50	
10061-01-5	c-1,3-dichloropropene	ND	50	
108-88-3	Toluene	ND	50	
10061-02-6	t-1,3-Dichloropropene	ND	50	
79-00-5	1,1,2-Trichloroethane	ND	50	
124-48-1	Dibromochloromethane	ND	50	
108-90-7	Chlorobenzene	ND	50	
563-58-6	1,1-Dichloropropene	ND	50	
79-01-6	Trichloroethylene	ND	50	
78-87-5	1,2-Dichloropropane	ND	50	
75-27-4	Bromodichloromethane	ND	50	
74-95-3	Dibromomethane	ND	50	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	50	
142-28-9	1,3-Dichloropropane	ND	50	
127-18-4	Tetrachloroethylene	ND	50	
106-93-4	1,2-Dibromoethane	ND	50	
591-78-6	2-Hexanone	ND	50	
630-20-6	1,1,1,2-Tetrachloroethane	ND	50	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0057	Lab Sample ID:	AB57537
Date of Collection:	7/21/2015	Matrix:	Soil
Date of Preparation:	7/27/2015	Amount Prepared:	5 mL
Date of Analysis:	7/27/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	50
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	50	
108-38-3/106-42-3	M/P Xylene	ND	100	
95-47-6	Ortho Xylene	ND	50	
100-42-5	Styrene	ND	50	
75-25-2	Bromoform	ND	50	
79-34-5	1,1,2,2-Tetrachloroethane	ND	50	
98-82-8	Isopropylbenzene	ND	50	
108-86-1	Bromobenzene	ND	50	
96-18-4	1,2,3-Trichloropropane	ND	50	
103-65-1	N-Propylbenzene	ND	50	
95-49-8	2-Chlorotoluene	ND	50	
106-43-4	4-Chlorotoluene	ND	50	
98-06-6	Tert-Butylbenzene	ND	50	
108-67-8	1,3,5-Trimethylbenzene	ND	50	
95-63-6	1,2,4-Trimethylbenzene	ND	50	
135-98-8	Sec-Butylbenzene	ND	50	
541-73-1	1,3-Dichlorobenzene	ND	50	
99-87-6	Para-Isopropyltoluene	ND	50	
106-46-7	1,4-Dichlorobenzene	ND	50	
95-50-1	1,2-Dichlorobenzene	ND	50	
104-51-8	N-Butylbenzene	ND	50	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	50	
120-82-1	1,2,4-Trichlorobenzene	ND	50	
87-68-3	Hexachlorobutadiene	ND	50	
91-20-3	Naphthalene	ND	50	
87-61-6	1,2,3-Trichlorobenzene	ND	50	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	100	74 - 136
Toluene-D8	99	85 - 118
1,4-Bromofluorobenzene	94	78 - 111

Comments: Methanol blank sample is reported in ug/L.

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0060	Lab Sample ID:	AB57540
Date of Collection:	7/22/2015	Matrix:	Soil
Date of Preparation:	7/27/2015	Amount Prepared:	5 mL
Date of Analysis:	7/27/2015	Percent Solids:	83%
Dry Weight Prepared:	11.36 grams	Extract Dilution:	250
Wet Weight Prepared:	13.76 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	270	
75-01-4	Vinyl Chloride	ND	270	
74-83-9	Bromomethane	ND	270	
75-00-3	Chloroethane	ND	270	
75-69-4	Trichlorofluoromethane	ND	270	
60-29-7	Ethyl Ether	ND	270	
67-64-1	2-Propanone (acetone)	ND	270	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	270	
75-35-4	1,1-Dichloroethylene	ND	270	
75-15-0	Carbon Disulfide	ND	270	
75-71-8	Dichlorodifluoromethane	ND	270	
75-09-2	Methylene Chloride	ND	270	
107-13-1	Acrylonitrile	ND	270	
1634-04-4	Methyl-t-Butyl Ether	ND	270	
156-60-5	Trans-1,2-Dichloroethylene	ND	270	
75-34-3	1,1-dichloroethane	ND	270	
108-05-4	Vinyl Acetate	ND	270	
78-93-3	2-Butanone (MEK)	ND	270	
594-20-7	2,2-Dichloropropane	ND	270	
156-59-2	cis-1,2-Dichloroethylene	**320**	270	
67-66-3	Chloroform	ND	270	
74-97-5	Bromochloromethane	ND	270	
109-99-9	Tetrahydrofuran	ND	270	
71-55-6	1,1,1-Trichloroethane	ND	270	
107-06-2	1,2-Dichloroethane	ND	270	
56-23-5	Carbon tetrachloride	ND	270	
71-43-2	Benzene	ND	270	
10061-01-5	c-1,3-dichloropropene	ND	270	
108-88-3	Toluene	ND	270	
10061-02-6	t-1,3-Dichloropropene	ND	270	
79-00-5	1,1,2-Trichloroethane	ND	270	
124-48-1	Dibromochloromethane	ND	270	
108-90-7	Chlorobenzene	ND	270	
563-58-6	1,1-Dichloropropene	ND	270	
79-01-6	Trichloroethylene	**15000**	270	
78-87-5	1,2-Dichloropropane	ND	270	
75-27-4	Bromodichloromethane	ND	270	
74-95-3	Dibromomethane	ND	270	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	270	
142-28-9	1,3-Dichloropropane	ND	270	
127-18-4	Tetrachloroethylene	**3700**	270	
106-93-4	1,2-Dibromoethane	ND	270	
591-78-6	2-Hexanone	ND	270	
630-20-6	1,1,1,2-Tetrachloroethane	ND	270	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0060	Lab Sample ID:	AB57540
Date of Collection:	7/22/2015	Matrix:	Soil
Date of Preparation:	7/27/2015	Amount Prepared:	5 mL
Date of Analysis:	7/27/2015	Percent Solids:	83%
Dry Weight Prepared:	11.36 grams	Extract Dilution:	250
Wet Weight Prepared:	13.76 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	270	
108-38-3/106-42-3	M/P Xylene	ND	540	
95-47-6	Ortho Xylene	ND	270	
100-42-5	Styrene	ND	270	
75-25-2	Bromoform	ND	270	
79-34-5	1,1,2,2-Tetrachloroethane	ND	270	
98-82-8	Isopropylbenzene	ND	270	
108-86-1	Bromobenzene	ND	270	
96-18-4	1,2,3-Trichloropropane	ND	270	
103-65-1	N-Propylbenzene	ND	270	
95-49-8	2-Chlorotoluene	ND	270	
106-43-4	4-Chlorotoluene	ND	270	
98-06-6	Tert-Butylbenzene	ND	270	
108-67-8	1,3,5-Trimethylbenzene	ND	270	
95-63-6	1,2,4-Trimethylbenzene	ND	270	
135-98-8	Sec-Butylbenzene	ND	270	
541-73-1	1,3-Dichlorobenzene	ND	270	
99-87-6	Para-Isopropyltoluene	ND	270	
106-46-7	1,4-Dichlorobenzene	ND	270	
95-50-1	1,2-Dichlorobenzene	ND	270	
104-51-8	N-Butylbenzene	ND	270	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	270	
120-82-1	1,2,4-Trichlorobenzene	ND	270	
87-68-3	Hexachlorobutadiene	ND	270	
91-20-3	Naphthalene	ND	270	
87-61-6	1,2,3-Trichlorobenzene	ND	270	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	99	74 - 136
Toluene-D8	99	85 - 118
1,4-Bromofluorobenzene	96	78 - 111

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB57532

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
1,1,1,2-Tetrachloroethane	1266	ND	1200	95	74 - 124
1,1,1-Trichloroethane	1266	ND	1300	100	76 - 132
1,1,2,2-Tetrachloroethane	1266	ND	1300	100	69 - 125
1,1,2-Trichloro-1,2,2-Trifluoroetha	1266	ND	1300	100	68 - 144
1,1,2-Trichloroethane	1266	ND	1400	110	75 - 126
1,1-Dichloroethylene	1266	ND	1400	110	65 - 140
1,1-Dichloropropene	1266	ND	1200	95	81 - 125
1,1-dichloroethane	1266	ND	1300	100	77 - 130
1,2,3-Trichlorobenzene	1266	ND	1300	100	64 - 125
1,2,3-Trichloropropane	1266	ND	1300	100	68 - 122
1,2,4-Trichlorobenzene	1266	ND	1300	100	72 - 120
1,2,4-Trimethylbenzene	1266	ND	1300	100	81 - 125
1,2-Dibromo-3-Chloropropane	1266	ND	1200	95	54 - 125
1,2-Dibromoethane	1266	ND	1300	100	73 - 124
1,2-Dichlorobenzene	1266	ND	1200	95	81 - 116
1,2-Dichloroethane	1266	ND	1300	100	74 - 130
1,2-Dichloropropane	1266	ND	1300	100	78 - 120
1,3,5-Trimethylbenzene	1266	ND	1300	100	81 - 125
1,3-Dichlorobenzene	1266	ND	1200	95	82 - 117
1,3-Dichloropropane	1266	ND	1300	100	76 - 123
1,4-Dichlorobenzene	1266	ND	1200	95	80 - 116
2,2-Dichloropropane	1266	ND	1200	95	57 - 147
2-Butanone (MEK)	1266	ND	1400	110	41 - 151
2-Chlorotoluene	1266	ND	1300	100	82 - 119
2-Hexanone	1266	ND	1400	110	51 - 148
2-Propanone (acetone)	1266	ND	1200	95	25 - 161
4-Chlorotoluene	1266	ND	1200	95	82 - 119
4-Methyl-2-Pentanone(MIBK)	1266	ND	1300	100	62 - 130
Acrylonitrile	1266	ND	1500	120	67 - 130
Benzene	1266	ND	1400	110	82 - 124
Bromobenzene	1266	ND	1300	100	79 - 119
Bromochloromethane	1266	ND	1400	110	79 - 125
Bromodichloromethane	1266	ND	1200	95	71 - 126
Bromoform	1266	ND	1200	95	56 - 119
Bromomethane	1266	ND	1200	95	37 - 161
Carbon Disulfide	1266	ND	1300	100	63 - 134
Carbon tetrachloride	1266	ND	1300	100	68 - 136
Chlorobenzene	1266	ND	1300	100	82 - 126
Chloroethane	1266	ND	1300	100	57 - 148
Chloroform	1266	ND	1400	110	78 - 130
Chloromethane	1266	ND	1200	95	56 - 147
Dibromochloromethane	1266	ND	1300	100	62 - 131
Dibromomethane	1266	ND	1300	100	75 - 122
Dichlorodifluoromethane	1266	ND	1400	110	59 - 131
Ethyl Ether	1266	ND	1400	110	65 - 138
Ethylbenzene	1266	ND	1300	100	82 - 122
Hexachlorobutadiene	1266	ND	1200	95	70 - 130

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB57532

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
Isopropylbenzene	1266	ND	1300	100	82 - 125
M/P Xylene	2532	ND	2600	100	85 - 120
Methyl-t-Butyl Ether	1266	ND	1400	110	74 - 125
Methylene Chloride	1266	ND	1300	100	67 - 139
N-Butylbenzene	1266	ND	1300	100	80 - 129
N-Propylbenzene	1266	ND	1300	100	81 - 122
Naphthalene	1266	ND	1300	100	59 - 129
Ortho Xylene	1266	ND	1300	100	84 - 122
Para-Isopropyltoluene	1266	ND	1300	100	79 - 129
Sec-Butylbenzene	1266	ND	1300	100	81 - 126
Styrene	1266	ND	1300	100	82 - 125
Tert-Butylbenzene	1266	ND	1300	100	81 - 126
Tetrachloroethylene	1266	ND	1400	110	74 - 133
Tetrahydrofuran	1266	ND	1400	110	60 - 132
Toluene	1266	ND	1300	100	82 - 124
Trans-1,2-Dichloroethylene	1266	ND	1400	110	79 - 127
Trichloroethylene	1266	ND	1300	100	76 - 124
Trichlorofluoromethane	1266	ND	1200	95	65 - 144
Vinyl Acetate	1266	ND	1400	110	14 - 152
Vinyl Chloride	1266	ND	1100	87	34 - 142
c-1,3-dichloropropene	1266	ND	1400	110	68 - 133
cis-1,2-Dichloroethylene	1266	ND	1400	110	79 - 131
t-1,3-Dichloropropene	1266	ND	1400	110	65 - 126

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE DUPLICATE (MSD) RECOVERY

Sample ID:AB57532

PARAMETER	MSD SPIKE ADDED	MSD CONCENTRATION ug/Kg	MSD % REC	RPD %	QC LIMITS RPD
1,1,1,2-Tetrachloroethane	1266	1200	95	0	40
1,1,1-Trichloroethane	1266	1400	110	10	40
1,1,2,2-Tetrachloroethane	1266	1300	100	0	40
1,1,2-Trichloro-1,2,2-Trifluoroetha	1266	1400	110	10	40
1,1,2-Trichloroethane	1266	1400	110	0	40
1,1-Dichloroethylene	1266	1500	120	9	52
1,1-Dichloropropene	1266	1300	100	5	40
1,1-dichloroethane	1266	1400	110	10	40
1,2,3-Trichlorobenzene	1266	1300	100	0	40
1,2,3-Trichloropropane	1266	1300	100	0	40
1,2,4-Trichlorobenzene	1266	1300	100	0	40
1,2,4-Trimethylbenzene	1266	1300	100	0	40
1,2-Dibromo-3-Chloropropane	1266	1300	100	5	40
1,2-Dibromoethane	1266	1300	100	0	40
1,2-Dichlorobenzene	1266	1300	100	5	40
1,2-Dichloroethane	1266	1300	100	0	40
1,2-Dichloropropane	1266	1300	100	0	40
1,3,5-Trimethylbenzene	1266	1400	110	10	40
1,3-Dichlorobenzene	1266	1300	100	5	40
1,3-Dichloropropane	1266	1300	100	0	40
1,4-Dichlorobenzene	1266	1200	95	0	40
2,2-Dichloropropane	1266	1200	95	0	40
2-Butanone (MEK)	1266	1400	110	0	40
2-Chlorotoluene	1266	1300	100	0	40
2-Hexanone	1266	1300	100	10	40
2-Propanone (acetone)	1266	1200	95	0	40
4-Chlorotoluene	1266	1300	100	5	40
4-Methyl-2-Pentanone(MIBK)	1266	1300	100	0	40
Acrylonitrile	1266	1400	110	9	40
Benzene	1266	1400	110	0	24
Bromobenzene	1266	1300	100	0	40
Bromochloromethane	1266	1400	110	0	40
Bromodichloromethane	1266	1200	95	0	40
Bromoform	1266	1200	95	0	40
Bromomethane	1266	1300	100	5	40
Carbon Disulfide	1266	1400	110	10	40
Carbon tetrachloride	1266	1300	100	0	40
Chlorobenzene	1266	1400	110	10	34
Chloroethane	1266	1300	100	0	40
Chloroform	1266	1400	110	0	40
Chloromethane	1266	1300	100	5	40
Dibromochloromethane	1266	1300	100	0	40
Dibromomethane	1266	1300	100	0	40
Dichlorodifluoromethane	1266	1400	110	0	40
Ethyl Ether	1266	1400	110	0	40
Ethylbenzene	1266	1300	100	0	40
Hexachlorobutadiene	1266	1200	95	0	40
Isopropylbenzene	1266	1400	110	10	40

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE DUPLICATE (MSD) RECOVERY

Sample ID:AB57532

PARAMETER	MSD SPIKE ADDED	MSD CONCENTRATION ug/Kg	MSD % REC	RPD %	QC LIMITS RPD
M/P Xylene	2532	2600	100	0	40
Methyl-t-Butyl Ether	1266	1400	110	0	40
Methylene Chloride	1266	1400	110	10	40
N-Butylbenzene	1266	1300	100	0	40
N-Propylbenzene	1266	1300	100	0	40
Naphthalene	1266	1400	110	10	40
Ortho Xylene	1266	1300	100	0	40
Para-Isopropyltoluene	1266	1400	110	10	40
Sec-Butylbenzene	1266	1300	100	0	40
Styrene	1266	1400	110	10	40
Tert-Butylbenzene	1266	1400	110	10	40
Tetrachloroethylene	1266	1400	110	0	40
Tetrahydrofuran	1266	1400	110	0	40
Toluene	1266	1400	110	10	33
Trans-1,2-Dichloroethylene	1266	1400	110	0	40
Trichloroethylene	1266	1300	100	0	27
Trichlorofluoromethane	1266	1200	95	0	40
Vinyl Acetate	1266	1400	110	0	40
Vinyl Chloride	1266	1100	87	0	40
c-1,3-dichloropropene	1266	1400	110	0	40
cis-1,2-Dichloroethylene	1266	1500	120	9	40
t-1,3-Dichloropropene	1266	1400	110	0	40

Lunt Silversmiths - Greenfield, MA

Laboratory Duplicate Results

Sample ID: AB57532

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
1,1,1,2-Tetrachloroethane	ND	ND	NC	40
1,1,1-Trichloroethane	ND	ND	NC	40
1,1,2,2-Tetrachloroethane	ND	ND	NC	40
1,1,2-Trichloro-1,2,2-Trifluoroeth	ND	ND	NC	40
1,1,2-Trichloroethane	ND	ND	NC	40
1,1-Dichloroethylene	ND	ND	NC	40
1,1-Dichloropropene	ND	ND	NC	40
1,1-dichloroethane	ND	ND	NC	40
1,2,3-Trichlorobenzene	ND	ND	NC	40
1,2,3-Trichloropropane	ND	ND	NC	40
1,2,4-Trichlorobenzene	ND	ND	NC	40
1,2,4-Trimethylbenzene	ND	ND	NC	40
1,2-Dibromo-3-Chloropropane	ND	ND	NC	40
1,2-Dibromoethane	ND	ND	NC	40
1,2-Dichlorobenzene	ND	ND	NC	40
1,2-Dichloroethane	ND	ND	NC	40
1,2-Dichloropropane	ND	ND	NC	40
1,3,5-Trimethylbenzene	ND	ND	NC	40
1,3-Dichlorobenzene	ND	ND	NC	40
1,3-Dichloropropane	ND	ND	NC	40
1,4-Dichlorobenzene	ND	ND	NC	40
2,2-Dichloropropane	ND	ND	NC	40
2-Butanone (MEK)	ND	ND	NC	40
2-Chlorotoluene	ND	ND	NC	40
2-Hexanone	ND	ND	NC	40
2-Propanone (acetone)	ND	ND	NC	40
4-Chlorotoluene	ND	ND	NC	40
4-Methyl-2-Pentanone(MIBK)	ND	ND	NC	40
Acrylonitrile	ND	ND	NC	40
Benzene	ND	ND	NC	40
Bromobenzene	ND	ND	NC	40
Bromochloromethane	ND	ND	NC	40
Bromodichloromethane	ND	ND	NC	40
Bromoform	ND	ND	NC	40
Bromomethane	ND	ND	NC	40
Carbon Disulfide	ND	ND	NC	40
Carbon tetrachloride	ND	ND	NC	40
Chlorobenzene	ND	ND	NC	40
Chloroethane	ND	ND	NC	40
Chloroform	ND	ND	NC	40
Chloromethane	ND	ND	NC	40
Dibromochloromethane	ND	ND	NC	40
Dibromomethane	ND	ND	NC	40
Dichlorodifluoromethane	ND	ND	NC	40
Ethyl Ether	ND	ND	NC	40
Ethylbenzene	ND	ND	NC	40
Hexachlorobutadiene	ND	ND	NC	40
Isopropylbenzene	ND	ND	NC	40
M/P Xylene	ND	ND	NC	40
Methyl-t-Butyl Ether	ND	ND	NC	40

Lunt Silversmiths - Greenfield, MA

Laboratory Duplicate Results

Sample ID: AB57532

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
Methylene Chloride	ND	ND	NC	40
N-Butylbenzene	ND	ND	NC	40
N-Propylbenzene	ND	ND	NC	40
Naphthalene	ND	ND	NC	40
Ortho Xylene	ND	ND	NC	40
Para-Isopropyltoluene	ND	ND	NC	40
Sec-Butylbenzene	ND	ND	NC	40
Styrene	ND	ND	NC	40
Tert-Butylbenzene	ND	ND	NC	40
Tetrachloroethylene	ND	ND	NC	40
Tetrahydrofuran	ND	ND	NC	40
Toluene	ND	ND	NC	40
Trans-1,2-Dichloroethylene	ND	ND	NC	40
Trichloroethylene	ND	ND	NC	40
Trichlorofluoromethane	ND	ND	NC	40
Vinyl Acetate	ND	ND	NC	40
Vinyl Chloride	ND	ND	NC	40
c-1,3-dichloropropene	ND	ND	NC	40
cis-1,2-Dichloroethylene	ND	ND	NC	40
t-1,3-Dichloropropene	ND	ND	NC	40

Lunt Silversmiths - Greenfield, MA

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/Kg	LFB RESULT ug/Kg	LFB RECOVERY %	QC LIMITS %
1,1,1,2-Tetrachloroethane	20	19.9	100	77 - 122
1,1,1-Trichloroethane	20	21.3	107	80 - 128
1,1,2,2-Tetrachloroethane	20	20.7	104	73 - 118
1,1,2-Trichloro-1,2,2-Trifluoroeth	20	22.0	110	59 - 146
1,1,2-Trichloroethane	20	21.4	107	79 - 117
1,1-Dichloroethylene	20	21.6	108	70 - 130
1,1-Dichloropropene	20	19.6	98	79 - 123
1,1-dichloroethane	20	21.4	107	81 - 122
1,2,3-Trichlorobenzene	20	19.8	99	70 - 119
1,2,3-Trichloropropane	20	19.5	98	73 - 114
1,2,4-Trichlorobenzene	20	19.8	99	74 - 120
1,2,4-Trimethylbenzene	20	20.0	100	79 - 123
1,2-Dibromo-3-Chloropropane	20	19.9	100	63 - 124
1,2-Dibromoethane	20	19.6	98	79 - 116
1,2-Dichlorobenzene	20	18.9	95	77 - 117
1,2-Dichloroethane	20	20.1	101	75 - 124
1,2-Dichloropropane	20	19.5	98	80 - 117
1,3,5-Trimethylbenzene	20	20.1	101	80 - 122
1,3-Dichlorobenzene	20	18.9	95	78 - 117
1,3-Dichloropropane	20	19.8	99	79 - 116
1,4-Dichlorobenzene	20	18.7	94	77 - 115
2,2-Dichloropropane	20	20.9	105	64 - 152
2-Butanone (MEK)	20	24.0	120	55 - 144
2-Chlorotoluene	20	19.5	98	79 - 119
2-Hexanone	20	21.8	109	58 - 147
2-Propanone (acetone)	20	23.1	116	37 - 168
4-Chlorotoluene	20	19.2	96	78 - 120
4-Methyl-2-Pentanone(MIBK)	20	20.8	104	68 - 125
Acrylonitrile	20	22.2	111	68 - 124
Benzene	20	21.2	106	80 - 120
Bromobenzene	20	19.5	98	80 - 115
Bromochloromethane	20	22.0	110	81 - 120
Bromodichloromethane	20	19.5	98	77 - 125
Bromoform	20	20.5	103	62 - 127
Bromomethane	20	20.9	105	60 - 139
Carbon Disulfide	20	22.4	112	73 - 129
Carbon tetrachloride	20	21.0	105	73 - 136
Chlorobenzene	20	21.1	106	82 - 119
Chloroethane	20	21.0	105	69 - 130
Chloroform	20	21.6	108	80 - 122
Chloromethane	20	20.7	104	65 - 129
Dibromochloromethane	20	21.4	107	71 - 129
Dibromomethane	20	19.8	99	79 - 115
Dichlorodifluoromethane	20	23.3	117	69 - 126
Ethyl Ether	20	21.9	110	69 - 127
Ethylbenzene	20	19.8	99	80 - 121
Hexachlorobutadiene	20	18.6	93	72 - 124
Isopropylbenzene	20	20.0	100	79 - 124
M/P Xylene	40	39.8	100	81 - 120
Methyl-t-Butyl Ether	20	22.4	112	78 - 120
Methylene Chloride	20	21.1	106	73 - 129
N-Butylbenzene	20	20.1	101	78 - 126
N-Propylbenzene	20	19.9	100	78 - 122

Lunt Silversmiths - Greenfield, MA

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/Kg	LFB RESULT ug/Kg	LFB RECOVERY %	QC LIMITS %
Naphthalene	20	20.9	105	66 - 124
Ortho Xylene	20	20.5	103	81 - 121
Para-Isopropyltoluene	20	20.4	102	77 - 127
Sec-Butylbenzene	20	19.9	100	79 - 124
Styrene	20	20.6	103	82 - 122
Tert-Butylbenzene	20	19.9	100	78 - 124
Tetrachloroethylene	20	18.6	93	77 - 125
Tetrahydrofuran	20	21.6	108	67 - 124
Toluene	20	21.2	106	81 - 120
Trans-1,2-Dichloroethylene	20	21.4	107	80 - 121
Trichloroethylene	20	19.1	96	80 - 117
Trichlorofluoromethane	20	21.6	108	68 - 137
Vinyl Acetate	20	21.9	110	25 - 150
Vinyl Chloride	20	20.7	104	67 - 134
c-1,3-dichloropropene	20	22.9	115	73 - 133
cis-1,2-Dichloroethylene	20	22.4	112	82 - 122
t-1,3-Dichloropropene	20	22.7	114	69 - 127

Comments:

Lunt Silversmiths - Greenfield, MA

LABORATORY FORTIFIED DUPLICATE (LFB Dup) RECOVERY

COMPOUND	LFB Dup CONCENTRATION ug/Kg	LFB Dup RECOVERY %	RPD %	QC LIMITS RPD
1,1,1,2-Tetrachloroethane	18.0	90	10	50
1,1,1-Trichloroethane	18.7	94	13	50
1,1,2,2-Tetrachloroethane	19.7	99	5	50
1,1,2-Trichloro-1,2,2-Trifluoroetha	18.7	94	16	50
1,1,2-Trichloroethane	20.3	102	5	50
1,1-Dichloroethylene	19.3	97	11	52
1,1-Dichloropropene	17.2	86	13	50
1,1-dichloroethane	18.9	95	12	50
1,2,3-Trichlorobenzene	19.4	97	2	50
1,2,3-Trichloropropane	19.2	96	2	50
1,2,4-Trichlorobenzene	18.4	92	7	50
1,2,4-Trimethylbenzene	18.6	93	7	50
1,2-Dibromo-3-Chloropropane	20.2	101	2	50
1,2-Dibromoethane	18.8	94	4	50
1,2-Dichlorobenzene	18.1	91	4	50
1,2-Dichloroethane	18.3	92	9	50
1,2-Dichloropropane	17.7	89	10	50
1,3,5-Trimethylbenzene	18.1	91	11	50
1,3-Dichlorobenzene	17.6	88	7	50
1,3-Dichloropropane	18.5	93	7	50
1,4-Dichlorobenzene	17.3	87	8	50
2,2-Dichloropropane	17.7	89	17	50
2-Butanone (MEK)	23.6	118	2	50
2-Chlorotoluene	17.7	89	10	50
2-Hexanone	22.1	111	1	50
2-Propanone (acetone)	22.4	112	3	50
4-Chlorotoluene	17.6	88	9	50
4-Methyl-2-Pentanone(MIBK)	20.7	104	1	50
Acrylonitrile	21.7	109	2	50
Benzene	18.7	94	13	50
Bromobenzene	17.7	89	10	50
Bromochloromethane	19.9	100	10	50
Bromodichloromethane	17.9	90	9	50
Bromoform	20.2	101	2	50
Bromomethane	19.4	97	7	50
Carbon Disulfide	19.5	98	14	50
Carbon tetrachloride	17.9	90	16	50
Chlorobenzene	18.8	94	12	34
Chloroethane	17.9	90	16	50
Chloroform	19.6	98	10	50
Chloromethane	18.1	91	13	50
Dibromochloromethane	19.6	98	9	50
Dibromomethane	18.4	92	7	50
Dichlorodifluoromethane	20.4	102	13	50
Ethyl Ether	20.2	101	8	50
Ethylbenzene	17.4	87	13	50
Hexachlorobutadiene	15.9	80	16	50
Isopropylbenzene	18.2	91	9	50
M/P Xylene	35.5	89	11	50
Methyl-t-Butyl Ether	21.7	109	3	50
Methylene Chloride	19.2	96	9	50

Lunt Silversmiths - Greenfield, MA

LABORATORY FORTIFIED DUPLICATE (LFB Dup) RECOVERY

COMPOUND	LFB Dup CONCENTRATION ug/Kg	LFB Dup RECOVERY %	RPD %	QC LIMITS RPD
N-Butylbenzene	18.0	90	11	50
N-Propylbenzene	17.9	90	11	50
Naphthalene	20.6	103	1	50
Ortho Xylene	18.8	94	9	50
Para-Isopropyltoluene	18.1	91	12	50
Sec-Butylbenzene	17.8	89	11	50
Styrene	18.5	93	11	50
Tert-Butylbenzene	18.1	91	10	50
Tetrachloroethylene	17.4	87	7	50
Tetrahydrofuran	21.9	110	1	50
Toluene	18.5	93	14	50
Trans-1,2-Dichloroethylene	18.6	93	14	50
Trichloroethylene	17.4	87	9	27
Trichlorofluoromethane	17.9	90	19	50
Vinyl Acetate	21.4	107	2	50
Vinyl Chloride	18.1	91	13	50
c-1,3-dichloropropene	20.4	102	12	50
cis-1,2-Dichloroethylene	20.3	102	10	50
t-1,3-Dichloropropene	20.6	103	10	50

Samples in Batch: AB57532, AB57534, AB57536, AB57537, AB57540

PN: 150700 40

Weston Solutions, Inc.
Andover, MA

CHAIN OF CUSTODY RECORD
Lunt Silversmiths/MA Greenfield MA
Contact Name:
Contact Phone:

No: 07/24/15-0010
Cooler #:
Lab: NERL
Lab Phone:

15070040 $VOAHS
15070040 $METMS_PE

Lab #	Sample #	Location	Analyses	Matrix	EventID	Numb Cont	Container	Depth_to	Depth Units	Final Weight (g)
	R120150528WC-0048	Grid-C5	Metals	Soil	7/21/2015	1	4 oz	1	feet	
	R120150528WC-0048	Grid-C5	VOC	Soil	7/21/2015	1	40 mL	1	feet	9.42
	R120150528WC-0049	Grid-B2-4	Metals	Soil	7/21/2015	1	4 oz	1	feet	
	R120150528WC-0050	Grid-B2-4	VOC	Soil	7/21/2015	1	40 mL	1	feet	8.15
	R120150528WC-0051	Grid-6	Metals	Soil	7/21/2015	1	4 oz	2	feet	
	R120150528WC-0052	Grid-6	VOC	Soil	7/21/2015	1	40 mL	2	feet	11.07
	R120150528WC-0057	LBlank-03	VOC	Soil	7/21/2015	1	40 mL			
	R120150528WC-0058	Grid-106	Metals	Soil	7/21/2015	1	4 oz	2	feet	
	R120150528WC-0059	Grid-6	Metals	Soil	7/22/2015	1	4 oz	3	feet	
	R120150528WC-0060	Grid-6	VOC	Soil	7/22/2015	1	40 mL	3	feet	13.76

Special Instructions: Please forward results to OSC Wing Chau

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
	John Bates	7/24/15	[signature]	7/24/15	1129		[signature]	7/24/15	[signature]	7/24/15	13:24

Wing Chau - OSC

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

August 10, 2015

Wing Chau - Mail Code OSRR02-2
US EPA New England R1

Project Number: 15070044
Project: Lunt Silversmiths - Greenfield, MA
Analysis: Field Analysis of Metals by XRF
Analyst: Scott Clifford

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIA-FLDXRFNITON4.

Samples were analyzed using a Niton XL3t 600 x-ray fluorescence (XRF) instrument equipped with a 50 kV X-ray tube and a high resolution Si pin detector.

Samples were placed into XRF cups for analysis.

Date Samples Received by the Laboratory: 7/24/15

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

Results for soil samples are reported on a dry weight basis.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA, email=boudreau.dan@epa.gov, c=US
Date: 2015.08.10 13:48:52 -04'00'

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Lunt Silversmiths - Greenfield, MA

Field Analysis of Metals by XRF

Lab Sample ID	Client Sample ID	Arsenic mg/Kg	Lead mg/Kg
AB57554	Grid-A1	46	1500
AB57555	Grid-A1 Lab Dup	41	1700
AB57556	Grid-C5	ND (7)	40
AB57557	Grid-B-2-4	19	450
AB57558	Grid-6	ND (7)	45
AB57559	Grid-6 Lab Dup	11	55
AB57560	Grid-G, 1-5	ND (30)	1300
AB57561	Grid C,D,E-1,2	ND (15)	300
AB57562	Grid C,D,E-1,2 Lab [	ND (14)	290
AB57563	Grid-6 3ft	ND (5)	26
AB57564	Grid-F1	ND (22)	650
AB57565	Grid-F1 Lab dup	ND (21)	620

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

August 10, 2015

Wing Chau - Mail Code OSRR02-2
US EPA New England R1

Project Number: 15070044
Project: Lunt Silversmiths - Greenfield, MA
Analysis: Volatile Organic Analysis of Soil
Analyst: Scott Clifford

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-FLDVOA2.

Soil samples were collected in 40 mL vials, and preserved in methanol. The samples were analyzed using a Shimadzu gas chromatograph equipped with a 30 meter, 0.53 mm id. column, with electron capture and photoionization detectors. Concentrations of volatile organics were calculated using the external standard technique. Results are reported on a wet weight basis.

Analytes reported by this field method should be treated as tentatively identified compounds and concentrations are approximate.

Date Samples Received by the Laboratory: 7/24/15

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

Results for soil samples are reported on a dry weight basis.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA,
email=boudreau.dan@epa.gov, c=US
Date: 2015.08.10 13:51:01 -04'00'

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.

Lunt Silversmiths - Greenfield, MA

Volatile Organic Analysis of Soil

Lab Sample ID	Client Sample ID	Tetrachloroethylene ug/Kg	Trichloroethylene ug/Kg
AB57566	L Blank-03	ND (10)	ND (20)
AB57567	Grid-A1	ND (10)	ND (20)
AB57568	Grid-C5	ND (10)	ND (20)
AB57569	Grid-B 2-4	ND (10)	ND (20)
AB57570	Grid-6	19000	31000
AB57571	Grid G, 1-5	ND (10)	ND (20)
AB57572	Grid C,D,E-1,2	ND (10)	ND (20)
AB57573	Grid 6 3ft	1900	7400
AB57574	Grid-F1	ND (10)	ND (20)

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

August 13, 2015

Wing Chau - Mail Code OSRR02-2
US EPA New England R1

Project Number: 15080015
Project: Lunt Silversmiths - Greenfield, MA
Analysis: VOAs in Soil High Level Method
EPA Chemist: Joseph Montanaro

Date Samples Received by the Laboratory: 08/07/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-VOAGCMS9.

Samples were analyzed by GC/MS. Samples were introduced to the GC via a Tekmar preconcentrator and an Archon auto-sampler. The analysis SOP is based on US EPA Method 8260B, revision 2.0, 1996 and Method 5035A, draft revision 1, 2002, from SW-846.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA, email=boudreau.dan@epa.gov, c=US
Date: 2015.08.13 10:16:54 -04'00'

15080015$VOAHS

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0048	Lab Sample ID:	AB57772
Date of Collection:	8/04/2015	Matrix:	Soil
Date of Preparation:	8/10/2015	Amount Prepared:	5 mL
Date of Analysis:	8/10/2015	Percent Solids:	83%
Dry Weight Prepared:	5.34 grams	Extract Dilution:	10000
Wet Weight Prepared:	6.40 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	21000	
75-01-4	Vinyl Chloride	ND	21000	
74-83-9	Bromomethane	ND	21000	
75-00-3	Chloroethane	ND	21000	
75-69-4	Trichlorofluoromethane	ND	21000	
60-29-7	Ethyl Ether	ND	21000	
67-64-1	2-Propanone (acetone)	**25000**	21000	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	21000	
75-35-4	1,1-Dichloroethylene	ND	21000	
75-15-0	Carbon Disulfide	ND	21000	
75-71-8	Dichlorodifluoromethane	ND	21000	
75-09-2	Methylene Chloride	ND	21000	
107-13-1	Acrylonitrile	ND	21000	
1634-04-4	Methyl-t-Butyl Ether	ND	21000	
156-60-5	Trans-1,2-Dichloroethylene	ND	21000	
75-34-3	1,1-dichloroethane	ND	21000	
108-05-4	Vinyl Acetate	ND	21000	
78-93-3	2-Butanone (MEK)	ND	21000	
594-20-7	2,2-Dichloropropane	ND	21000	
156-59-2	cis-1,2-Dichloroethylene	ND	21000	
67-66-3	Chloroform	ND	21000	
74-97-5	Bromochloromethane	ND	21000	
109-99-9	Tetrahydrofuran	ND	21000	
71-55-6	1,1,1-Trichloroethane	ND	21000	
107-06-2	1,2-Dichloroethane	ND	21000	
56-23-5	Carbon tetrachloride	ND	21000	
71-43-2	Benzene	ND	21000	
10061-01-5	c-1,3-dichloropropene	ND	21000	
108-88-3	Toluene	ND	21000	
10061-02-6	t-1,3-Dichloropropene	ND	21000	
79-00-5	1,1,2-Trichloroethane	ND	21000	
124-48-1	Dibromochloromethane	ND	21000	
108-90-7	Chlorobenzene	ND	21000	
563-58-6	1,1-Dichloropropene	ND	21000	
79-01-6	Trichloroethylene	**560000**	21000	
78-87-5	1,2-Dichloropropane	ND	21000	
75-27-4	Bromodichloromethane	ND	21000	
74-95-3	Dibromomethane	ND	21000	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	21000	
142-28-9	1,3-Dichloropropane	ND	21000	
127-18-4	Tetrachloroethylene	ND	21000	
106-93-4	1,2-Dibromoethane	ND	21000	
591-78-6	2-Hexanone	ND	21000	
630-20-6	1,1,1,2-Tetrachloroethane	ND	21000	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0048	Lab Sample ID:	AB57772
Date of Collection:	8/04/2015	Matrix:	Soil
Date of Preparation:	8/10/2015	Amount Prepared:	5 mL
Date of Analysis:	8/10/2015	Percent Solids:	83%
Dry Weight Prepared:	5.34 grams	Extract Dilution:	10000
Wet Weight Prepared:	6.40 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	21000	
108-38-3/106-42-3	M/P Xylene	ND	41000	
95-47-6	Ortho Xylene	ND	21000	
100-42-5	Styrene	ND	21000	
75-25-2	Bromoform	ND	21000	
79-34-5	1,1,2,2-Tetrachloroethane	ND	21000	
98-82-8	Isopropylbenzene	ND	21000	
108-86-1	Bromobenzene	ND	21000	
96-18-4	1,2,3-Trichloropropane	ND	21000	
103-65-1	N-Propylbenzene	ND	21000	
95-49-8	2-Chlorotoluene	ND	21000	
106-43-4	4-Chlorotoluene	ND	21000	
98-06-6	Tert-Butylbenzene	ND	21000	
108-67-8	1,3,5-Trimethylbenzene	ND	21000	
95-63-6	1,2,4-Trimethylbenzene	ND	21000	
135-98-8	Sec-Butylbenzene	ND	21000	
541-73-1	1,3-Dichlorobenzene	ND	21000	
99-87-6	Para-Isopropyltoluene	ND	21000	
106-46-7	1,4-Dichlorobenzene	ND	21000	
95-50-1	1,2-Dichlorobenzene	ND	21000	
104-51-8	N-Butylbenzene	ND	21000	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	21000	
120-82-1	1,2,4-Trichlorobenzene	ND	21000	
87-68-3	Hexachlorobutadiene	ND	21000	
91-20-3	Naphthalene	ND	21000	
87-61-6	1,2,3-Trichlorobenzene	ND	21000	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	102	74 - 136
1,4-Bromofluorobenzene	92	78 - 111
Toluene-D8	96	85 - 118

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0049	Lab Sample ID:	AB57773
Date of Collection:	8/05/2015	Matrix:	Soil
Date of Preparation:	8/10/2015	Amount Prepared:	5 mL
Date of Analysis:	8/10/2015	Percent Solids:	76%
Dry Weight Prepared:	5.67 grams	Extract Dilution:	50
Wet Weight Prepared:	7.49 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	100	
75-01-4	Vinyl Chloride	ND	100	
74-83-9	Bromomethane	ND	100	
75-00-3	Chloroethane	ND	100	
75-69-4	Trichlorofluoromethane	ND	100	
60-29-7	Ethyl Ether	ND	100	
67-64-1	2-Propanone (acetone)	ND	100	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	100	
75-35-4	1,1-Dichloroethylene	ND	100	
75-15-0	Carbon Disulfide	ND	100	
75-71-8	Dichlorodifluoromethane	ND	100	
75-09-2	Methylene Chloride	ND	100	
107-13-1	Acrylonitrile	ND	100	
1634-04-4	Methyl-t-Butyl Ether	ND	100	
156-60-5	Trans-1,2-Dichloroethylene	**170**	100	
75-34-3	1,1-dichloroethane	ND	100	
108-05-4	Vinyl Acetate	ND	100	
78-93-3	2-Butanone (MEK)	ND	100	
594-20-7	2,2-Dichloropropane	ND	100	
156-59-2	cis-1,2-Dichloroethylene	**460**	100	
67-66-3	Chloroform	ND	100	
74-97-5	Bromochloromethane	ND	100	
109-99-9	Tetrahydrofuran	ND	100	
71-55-6	1,1,1-Trichloroethane	ND	100	
107-06-2	1,2-Dichloroethane	ND	100	
56-23-5	Carbon tetrachloride	ND	100	
71-43-2	Benzene	ND	100	
10061-01-5	c-1,3-dichloropropene	ND	100	
108-88-3	Toluene	ND	100	
10061-02-6	t-1,3-Dichloropropene	ND	100	
79-00-5	1,1,2-Trichloroethane	ND	100	
124-48-1	Dibromochloromethane	ND	100	
108-90-7	Chlorobenzene	ND	100	
563-58-6	1,1-Dichloropropene	ND	100	
79-01-6	Trichloroethylene	**1500**	100	
78-87-5	1,2-Dichloropropane	ND	100	
75-27-4	Bromodichloromethane	ND	100	
74-95-3	Dibromomethane	ND	100	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	100	
142-28-9	1,3-Dichloropropane	ND	100	
127-18-4	Tetrachloroethylene	ND	100	
106-93-4	1,2-Dibromoethane	ND	100	
591-78-6	2-Hexanone	ND	100	
630-20-6	1,1,1,2-Tetrachloroethane	ND	100	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0049	Lab Sample ID:	AB57773
Date of Collection:	8/05/2015	Matrix:	Soil
Date of Preparation:	8/10/2015	Amount Prepared:	5 mL
Date of Analysis:	8/10/2015	Percent Solids:	76%
Dry Weight Prepared:	5.67 grams	Extract Dilution:	50
Wet Weight Prepared:	7.49 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	100	
108-38-3/106-42-3	M/P Xylene	ND	210	
95-47-6	Ortho Xylene	ND	100	
100-42-5	Styrene	ND	100	
75-25-2	Bromoform	ND	100	
79-34-5	1,1,2,2-Tetrachloroethane	ND	100	
98-82-8	Isopropylbenzene	ND	100	
108-86-1	Bromobenzene	ND	100	
96-18-4	1,2,3-Trichloropropane	ND	100	
103-65-1	N-Propylbenzene	ND	100	
95-49-8	2-Chlorotoluene	ND	100	
106-43-4	4-Chlorotoluene	ND	100	
98-06-6	Tert-Butylbenzene	ND	100	
108-67-8	1,3,5-Trimethylbenzene	ND	100	
95-63-6	1,2,4-Trimethylbenzene	ND	100	
135-98-8	Sec-Butylbenzene	ND	100	
541-73-1	1,3-Dichlorobenzene	ND	100	
99-87-6	Para-Isopropyltoluene	ND	100	
106-46-7	1,4-Dichlorobenzene	ND	100	
95-50-1	1,2-Dichlorobenzene	ND	100	
104-51-8	N-Butylbenzene	ND	100	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	100	
120-82-1	1,2,4-Trichlorobenzene	ND	100	
87-68-3	Hexachlorobutadiene	ND	100	
91-20-3	Naphthalene	ND	100	
87-61-6	1,2,3-Trichlorobenzene	ND	100	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	99	74 - 136
1,4-Bromofluorobenzene	94	78 - 111
Toluene-D8	97	85 - 118

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0050	Lab Sample ID:	AB57774
Date of Collection:	8/04/2015	Matrix:	Soil
Date of Preparation:	8/10/2015	Amount Prepared:	5 mL
Date of Analysis:	8/10/2015	Percent Solids:	82%
Dry Weight Prepared:	9.12 grams	Extract Dilution:	1000
Wet Weight Prepared:	11.13 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	1200	
75-01-4	Vinyl Chloride	ND	1200	
74-83-9	Bromomethane	ND	1200	
75-00-3	Chloroethane	ND	1200	
75-69-4	Trichlorofluoromethane	ND	1200	
60-29-7	Ethyl Ether	ND	1200	
67-64-1	2-Propanone (acetone)	ND	1200	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	1200	
75-35-4	1,1-Dichloroethylene	ND	1200	
75-15-0	Carbon Disulfide	ND	1200	
75-71-8	Dichlorodifluoromethane	ND	1200	
75-09-2	Methylene Chloride	ND	1200	
107-13-1	Acrylonitrile	ND	1200	
1634-04-4	Methyl-t-Butyl Ether	ND	1200	
156-60-5	Trans-1,2-Dichloroethylene	ND	1200	
75-34-3	1,1-dichloroethane	ND	1200	
108-05-4	Vinyl Acetate	ND	1200	
78-93-3	2-Butanone (MEK)	ND	1200	
594-20-7	2,2-Dichloropropane	ND	1200	
156-59-2	cis-1,2-Dichloroethylene	**7200**	1200	
67-66-3	Chloroform	ND	1200	
74-97-5	Bromochloromethane	ND	1200	
109-99-9	Tetrahydrofuran	ND	1200	
71-55-6	1,1,1-Trichloroethane	ND	1200	
107-06-2	1,2-Dichloroethane	ND	1200	
56-23-5	Carbon tetrachloride	ND	1200	
71-43-2	Benzene	ND	1200	
10061-01-5	c-1,3-dichloropropene	ND	1200	
108-88-3	Toluene	ND	1200	
10061-02-6	t-1,3-Dichloropropene	ND	1200	
79-00-5	1,1,2-Trichloroethane	ND	1200	
124-48-1	Dibromochloromethane	ND	1200	
108-90-7	Chlorobenzene	ND	1200	
563-58-6	1,1-Dichloropropene	ND	1200	
79-01-6	Trichloroethylene	**110000**	6150	
78-87-5	1,2-Dichloropropane	ND	1200	
75-27-4	Bromodichloromethane	ND	1200	
74-95-3	Dibromomethane	ND	1200	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	1200	
142-28-9	1,3-Dichloropropane	ND	1200	
127-18-4	Tetrachloroethylene	**1400**	1200	
106-93-4	1,2-Dibromoethane	ND	1200	
591-78-6	2-Hexanone	ND	1200	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1200	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0050	Lab Sample ID:	AB57774
Date of Collection:	8/04/2015	Matrix:	Soil
Date of Preparation:	8/10/2015	Amount Prepared:	5 mL
Date of Analysis:	8/10/2015	Percent Solids:	82%
Dry Weight Prepared:	9.12 grams	Extract Dilution:	1000
Wet Weight Prepared:	11.13 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	1200	
108-38-3/106-42-3	M/P Xylene	ND	2500	
95-47-6	Ortho Xylene	ND	1200	
100-42-5	Styrene	ND	1200	
75-25-2	Bromoform	ND	1200	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1200	
98-82-8	Isopropylbenzene	ND	1200	
108-86-1	Bromobenzene	ND	1200	
96-18-4	1,2,3-Trichloropropane	ND	1200	
103-65-1	N-Propylbenzene	ND	1200	
95-49-8	2-Chlorotoluene	ND	1200	
106-43-4	4-Chlorotoluene	ND	1200	
98-06-6	Tert-Butylbenzene	ND	1200	
108-67-8	1,3,5-Trimethylbenzene	ND	1200	
95-63-6	1,2,4-Trimethylbenzene	ND	1200	
135-98-8	Sec-Butylbenzene	ND	1200	
541-73-1	1,3-Dichlorobenzene	ND	1200	
99-87-6	Para-Isopropyltoluene	ND	1200	
106-46-7	1,4-Dichlorobenzene	ND	1200	
95-50-1	1,2-Dichlorobenzene	ND	1200	
104-51-8	N-Butylbenzene	ND	1200	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	1200	
120-82-1	1,2,4-Trichlorobenzene	ND	1200	
87-68-3	Hexachlorobutadiene	ND	1200	
91-20-3	Naphthalene	ND	1200	
87-61-6	1,2,3-Trichlorobenzene	ND	1200	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	102	74 - 136
1,4-Bromofluorobenzene	96	78 - 111
Toluene-D8	96	85 - 118

Comments: Trichloroethylene is reported from a five-thousand fold dilution.

Lunt Silversmiths - Greenfield, MA

Laboratory Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	8/11/2015	Amount Prepared:	5 mL
Date of Analysis:	8/11/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	~6

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
74-87-3	Chloromethane	ND	1.0	
75-01-4	Vinyl Chloride	ND	1.0	
74-83-9	Bromomethane	ND	1.0	
75-00-3	Chloroethane	ND	1.0	
75-69-4	Trichlorofluoromethane	ND	1.0	
60-29-7	Ethyl Ether	ND	1.0	
67-64-1	2-Propanone (acetone)	ND	1.0	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	1.0	
75-35-4	1,1-Dichloroethylene	ND	1.0	
75-15-0	Carbon Disulfide	ND	1.0	
75-71-8	Dichlorodifluoromethane	ND	1.0	
75-09-2	Methylene Chloride	ND	1.0	
107-13-1	Acrylonitrile	ND	1.0	
1634-04-4	Methyl-t-Butyl Ether	ND	1.0	
156-60-5	Trans-1,2-Dichloroethylene	ND	1.0	
75-34-3	1,1-dichloroethane	ND	1.0	
108-05-4	Vinyl Acetate	ND	1.0	
78-93-3	2-Butanone (MEK)	ND	1.0	
594-20-7	2,2-Dichloropropane	ND	1.0	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	
67-66-3	Chloroform	ND	1.0	
74-97-5	Bromochloromethane	ND	1.0	
109-99-9	Tetrahydrofuran	ND	1.0	
71-55-6	1,1,1-Trichloroethane	ND	1.0	
107-06-2	1,2-Dichloroethane	ND	1.0	
56-23-5	Carbon tetrachloride	ND	1.0	
71-43-2	Benzene	ND	1.0	
10061-01-5	c-1,3-dichloropropene	ND	1.0	
108-88-3	Toluene	ND	1.0	
10061-02-6	t-1,3-Dichloropropene	ND	1.0	
79-00-5	1,1,2-Trichloroethane	ND	1.0	
124-48-1	Dibromochloromethane	ND	1.0	
108-90-7	Chlorobenzene	ND	1.0	
563-58-6	1,1-Dichloropropene	ND	1.0	
79-01-6	Trichloroethylene	ND	1.0	
78-87-5	1,2-Dichloropropane	ND	1.0	
75-27-4	Bromodichloromethane	ND	1.0	
74-95-3	Dibromomethane	ND	1.0	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	1.0	
142-28-9	1,3-Dichloropropane	ND	1.0	
127-18-4	Tetrachloroethylene	ND	1.0	
106-93-4	1,2-Dibromoethane	ND	1.0	
591-78-6	2-Hexanone	ND	1.0	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	

Lunt Silversmiths - Greenfield, MA

Laboratory Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	8/11/2015	Amount Prepared:	5 mL
Date of Analysis:	8/11/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	~6

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
100-41-4	Ethylbenzene	ND	1.0	
108-38-3/106-42-3	M/P Xylene	ND	2.0	
95-47-6	Ortho Xylene	ND	1.0	
100-42-5	Styrene	ND	1.0	
75-25-2	Bromoform	ND	1.0	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	
98-82-8	Isopropylbenzene	ND	1.0	
108-86-1	Bromobenzene	ND	1.0	
96-18-4	1,2,3-Trichloropropane	ND	1.0	
103-65-1	N-Propylbenzene	ND	1.0	
95-49-8	2-Chlorotoluene	ND	1.0	
106-43-4	4-Chlorotoluene	ND	1.0	
98-06-6	Tert-Butylbenzene	ND	1.0	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	
135-98-8	Sec-Butylbenzene	ND	1.0	
541-73-1	1,3-Dichlorobenzene	ND	1.0	
99-87-6	Para-Isopropyltoluene	ND	1.0	
106-46-7	1,4-Dichlorobenzene	ND	1.0	
95-50-1	1,2-Dichlorobenzene	ND	1.0	
104-51-8	N-Butylbenzene	ND	1.0	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	1.0	
120-82-1	1,2,4-Trichlorobenzene	ND	1.0	
87-68-3	Hexachlorobutadiene	ND	1.0	
91-20-3	Naphthalene	ND	1.0	
87-61-6	1,2,3-Trichlorobenzene	ND	1.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	106	74 - 136
1,4-Bromofluorobenzene	96	78 - 111
Toluene-D8	97	85 - 118

Comments: Laboratory blank is reported in ug/L.

Laboratory blank is associated with sample AB57774 (five-thousand fold dilution).

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0051	Lab Sample ID:	AB57775
Date of Collection:	8/06/2015	Matrix:	Soil
Date of Preparation:	8/10/2015	Amount Prepared:	5 mL
Date of Analysis:	8/10/2015	Percent Solids:	78%
Dry Weight Prepared:	7.19 grams	Extract Dilution:	2000
Wet Weight Prepared:	9.26 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	3400	
75-01-4	Vinyl Chloride	ND	3400	
74-83-9	Bromomethane	ND	3400	
75-00-3	Chloroethane	ND	3400	
75-69-4	Trichlorofluoromethane	ND	3400	
60-29-7	Ethyl Ether	ND	3400	
67-64-1	2-Propanone (acetone)	ND	3400	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	3400	
75-35-4	1,1-Dichloroethylene	ND	3400	
75-15-0	Carbon Disulfide	ND	3400	
75-71-8	Dichlorodifluoromethane	ND	3400	
75-09-2	Methylene Chloride	ND	3400	
107-13-1	Acrylonitrile	ND	3400	
1634-04-4	Methyl-t-Butyl Ether	ND	3400	
156-60-5	Trans-1,2-Dichloroethylene	ND	3400	
75-34-3	1,1-dichloroethane	ND	3400	
108-05-4	Vinyl Acetate	ND	3400	
78-93-3	2-Butanone (MEK)	ND	3400	
594-20-7	2,2-Dichloropropane	ND	3400	
156-59-2	cis-1,2-Dichloroethylene	**12000**	3400	
67-66-3	Chloroform	ND	3400	
74-97-5	Bromochloromethane	ND	3400	
109-99-9	Tetrahydrofuran	ND	3400	
71-55-6	1,1,1-Trichloroethane	ND	3400	
107-06-2	1,2-Dichloroethane	ND	3400	
56-23-5	Carbon tetrachloride	ND	3400	
71-43-2	Benzene	ND	3400	
10061-01-5	c-1,3-dichloropropene	ND	3400	
108-88-3	Toluene	ND	3400	
10061-02-6	t-1,3-Dichloropropene	ND	3400	
79-00-5	1,1,2-Trichloroethane	ND	3400	
124-48-1	Dibromochloromethane	ND	3400	
108-90-7	Chlorobenzene	ND	3400	
563-58-6	1,1-Dichloropropene	ND	3400	
79-01-6	Trichloroethylene	**240000**	3400	
78-87-5	1,2-Dichloropropane	ND	3400	
75-27-4	Bromodichloromethane	ND	3400	
74-95-3	Dibromomethane	ND	3400	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	3400	
142-28-9	1,3-Dichloropropane	ND	3400	
127-18-4	Tetrachloroethylene	ND	3400	
106-93-4	1,2-Dibromoethane	ND	3400	
591-78-6	2-Hexanone	ND	3400	
630-20-6	1,1,1,2-Tetrachloroethane	ND	3400	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0051	Lab Sample ID:	AB57775
Date of Collection:	8/06/2015	Matrix:	Soil
Date of Preparation:	8/10/2015	Amount Prepared:	5 mL
Date of Analysis:	8/10/2015	Percent Solids:	78%
Dry Weight Prepared:	7.19 grams	Extract Dilution:	2000
Wet Weight Prepared:	9.26 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	3400	
108-38-3/106-42-3	M/P Xylene	ND	6700	
95-47-6	Ortho Xylene	ND	3400	
100-42-5	Styrene	ND	3400	
75-25-2	Bromoform	ND	3400	
79-34-5	1,1,2,2-Tetrachloroethane	ND	3400	
98-82-8	Isopropylbenzene	ND	3400	
108-86-1	Bromobenzene	ND	3400	
96-18-4	1,2,3-Trichloropropane	ND	3400	
103-65-1	N-Propylbenzene	ND	3400	
95-49-8	2-Chlorotoluene	ND	3400	
106-43-4	4-Chlorotoluene	ND	3400	
98-06-6	Tert-Butylbenzene	ND	3400	
108-67-8	1,3,5-Trimethylbenzene	ND	3400	
95-63-6	1,2,4-Trimethylbenzene	ND	3400	
135-98-8	Sec-Butylbenzene	ND	3400	
541-73-1	1,3-Dichlorobenzene	ND	3400	
99-87-6	Para-Isopropyltoluene	ND	3400	
106-46-7	1,4-Dichlorobenzene	ND	3400	
95-50-1	1,2-Dichlorobenzene	ND	3400	
104-51-8	N-Butylbenzene	ND	3400	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	3400	
120-82-1	1,2,4-Trichlorobenzene	ND	3400	
87-68-3	Hexachlorobutadiene	ND	3400	
91-20-3	Naphthalene	ND	3400	
87-61-6	1,2,3-Trichlorobenzene	ND	3400	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	104	74 - 136
1,4-Bromofluorobenzene	95	78 - 111
Toluene-D8	99	85 - 118

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0052	Lab Sample ID:	AB57776
Date of Collection:	8/07/2015	Matrix:	Soil
Date of Preparation:	8/10/2015	Amount Prepared:	5 mL
Date of Analysis:	8/10/2015	Percent Solids:	83%
Dry Weight Prepared:	10.25 grams	Extract Dilution:	5000
Wet Weight Prepared:	12.37 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	5900	
75-01-4	Vinyl Chloride	ND	5900	
74-83-9	Bromomethane	ND	5900	
75-00-3	Chloroethane	ND	5900	
75-69-4	Trichlorofluoromethane	ND	5900	
60-29-7	Ethyl Ether	ND	5900	
67-64-1	2-Propanone (acetone)	ND	5900	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	5900	
75-35-4	1,1-Dichloroethylene	ND	5900	
75-15-0	Carbon Disulfide	ND	5900	
75-71-8	Dichlorodifluoromethane	ND	5900	
75-09-2	Methylene Chloride	ND	5900	
107-13-1	Acrylonitrile	ND	5900	
1634-04-4	Methyl-t-Butyl Ether	ND	5900	
156-60-5	Trans-1,2-Dichloroethylene	ND	5900	
75-34-3	1,1-dichloroethane	ND	5900	
108-05-4	Vinyl Acetate	ND	5900	
78-93-3	2-Butanone (MEK)	ND	5900	
594-20-7	2,2-Dichloropropane	ND	5900	
156-59-2	cis-1,2-Dichloroethylene	**22000**	5900	
67-66-3	Chloroform	ND	5900	
74-97-5	Bromochloromethane	ND	5900	
109-99-9	Tetrahydrofuran	ND	5900	
71-55-6	1,1,1-Trichloroethane	ND	5900	
107-06-2	1,2-Dichloroethane	ND	5900	
56-23-5	Carbon tetrachloride	ND	5900	
71-43-2	Benzene	ND	5900	
10061-01-5	c-1,3-dichloropropene	ND	5900	
108-88-3	Toluene	ND	5900	
10061-02-6	t-1,3-Dichloropropene	ND	5900	
79-00-5	1,1,2-Trichloroethane	ND	5900	
124-48-1	Dibromochloromethane	ND	5900	
108-90-7	Chlorobenzene	ND	5900	
563-58-6	1,1-Dichloropropene	ND	5900	
79-01-6	Trichloroethylene	**300000**	5900	
78-87-5	1,2-Dichloropropane	ND	5900	
75-27-4	Bromodichloromethane	ND	5900	
74-95-3	Dibromomethane	ND	5900	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	5900	
142-28-9	1,3-Dichloropropane	ND	5900	
127-18-4	Tetrachloroethylene	ND	5900	
106-93-4	1,2-Dibromoethane	ND	5900	
591-78-6	2-Hexanone	ND	5900	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5900	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0052	Lab Sample ID:	AB57776
Date of Collection:	8/07/2015	Matrix:	Soil
Date of Preparation:	8/10/2015	Amount Prepared:	5 mL
Date of Analysis:	8/10/2015	Percent Solids:	83%
Dry Weight Prepared:	10.25 grams	Extract Dilution:	5000
Wet Weight Prepared:	12.37 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	5900	
108-38-3/106-42-3	M/P Xylene	ND	12000	
95-47-6	Ortho Xylene	ND	5900	
100-42-5	Styrene	ND	5900	
75-25-2	Bromoform	ND	5900	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5900	
98-82-8	Isopropylbenzene	ND	5900	
108-86-1	Bromobenzene	ND	5900	
96-18-4	1,2,3-Trichloropropane	ND	5900	
103-65-1	N-Propylbenzene	ND	5900	
95-49-8	2-Chlorotoluene	ND	5900	
106-43-4	4-Chlorotoluene	ND	5900	
98-06-6	Tert-Butylbenzene	ND	5900	
108-67-8	1,3,5-Trimethylbenzene	ND	5900	
95-63-6	1,2,4-Trimethylbenzene	ND	5900	
135-98-8	Sec-Butylbenzene	ND	5900	
541-73-1	1,3-Dichlorobenzene	ND	5900	
99-87-6	Para-Isopropyltoluene	ND	5900	
106-46-7	1,4-Dichlorobenzene	ND	5900	
95-50-1	1,2-Dichlorobenzene	ND	5900	
104-51-8	N-Butylbenzene	ND	5900	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	5900	
120-82-1	1,2,4-Trichlorobenzene	ND	5900	
87-68-3	Hexachlorobutadiene	ND	5900	
91-20-3	Naphthalene	ND	5900	
87-61-6	1,2,3-Trichlorobenzene	ND	5900	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	108	74 - 136
1,4-Bromofluorobenzene	95	78 - 111
Toluene-D8	97	85 - 118

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0053	Lab Sample ID:	AB57777
Date of Collection:	8/03/2015	Matrix:	Methanol Blank
Date of Preparation:	8/10/2015	Amount Prepared:	5 mL
Date of Analysis:	8/10/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	50
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	50	
75-01-4	Vinyl Chloride	ND	50	
74-83-9	Bromomethane	ND	50	
75-00-3	Chloroethane	ND	50	
75-69-4	Trichlorofluoromethane	ND	50	
60-29-7	Ethyl Ether	ND	50	
67-64-1	2-Propanone (acetone)	ND	50	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	50	
75-35-4	1,1-Dichloroethylene	ND	50	
75-15-0	Carbon Disulfide	ND	50	
75-71-8	Dichlorodifluoromethane	ND	50	
75-09-2	Methylene Chloride	ND	50	
107-13-1	Acrylonitrile	ND	50	
1634-04-4	Methyl-t-Butyl Ether	ND	50	
156-60-5	Trans-1,2-Dichloroethylene	ND	50	
75-34-3	1,1-dichloroethane	ND	50	
108-05-4	Vinyl Acetate	ND	50	
78-93-3	2-Butanone (MEK)	ND	50	
594-20-7	2,2-Dichloropropane	ND	50	
156-59-2	cis-1,2-Dichloroethylene	ND	50	
67-66-3	Chloroform	ND	50	
74-97-5	Bromochloromethane	ND	50	
109-99-9	Tetrahydrofuran	ND	50	
71-55-6	1,1,1-Trichloroethane	ND	50	
107-06-2	1,2-Dichloroethane	ND	50	
56-23-5	Carbon tetrachloride	ND	50	
71-43-2	Benzene	ND	50	
10061-01-5	c-1,3-dichloropropene	ND	50	
108-88-3	Toluene	ND	50	
10061-02-6	t-1,3-Dichloropropene	ND	50	
79-00-5	1,1,2-Trichloroethane	ND	50	
124-48-1	Dibromochloromethane	ND	50	
108-90-7	Chlorobenzene	ND	50	
563-58-6	1,1-Dichloropropene	ND	50	
79-01-6	Trichloroethylene	ND	50	
78-87-5	1,2-Dichloropropane	ND	50	
75-27-4	Bromodichloromethane	ND	50	
74-95-3	Dibromomethane	ND	50	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	50	
142-28-9	1,3-Dichloropropane	ND	50	
127-18-4	Tetrachloroethylene	ND	50	
106-93-4	1,2-Dibromoethane	ND	50	
591-78-6	2-Hexanone	ND	50	
630-20-6	1,1,1,2-Tetrachloroethane	ND	50	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0053	Lab Sample ID:	AB57777
Date of Collection:	8/03/2015	Matrix:	Methanol Blank
Date of Preparation:	8/10/2015	Amount Prepared:	5 mL
Date of Analysis:	8/10/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	50
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	50	
108-38-3/106-42-3	M/P Xylene	ND	100	
95-47-6	Ortho Xylene	ND	50	
100-42-5	Styrene	ND	50	
75-25-2	Bromoform	ND	50	
79-34-5	1,1,2,2-Tetrachloroethane	ND	50	
98-82-8	Isopropylbenzene	ND	50	
108-86-1	Bromobenzene	ND	50	
96-18-4	1,2,3-Trichloropropane	ND	50	
103-65-1	N-Propylbenzene	ND	50	
95-49-8	2-Chlorotoluene	ND	50	
106-43-4	4-Chlorotoluene	ND	50	
98-06-6	Tert-Butylbenzene	ND	50	
108-67-8	1,3,5-Trimethylbenzene	ND	50	
95-63-6	1,2,4-Trimethylbenzene	ND	50	
135-98-8	Sec-Butylbenzene	ND	50	
541-73-1	1,3-Dichlorobenzene	ND	50	
99-87-6	Para-Isopropyltoluene	ND	50	
106-46-7	1,4-Dichlorobenzene	ND	50	
95-50-1	1,2-Dichlorobenzene	ND	50	
104-51-8	N-Butylbenzene	ND	50	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	50	
120-82-1	1,2,4-Trichlorobenzene	ND	50	
87-68-3	Hexachlorobutadiene	ND	50	
91-20-3	Naphthalene	ND	50	
87-61-6	1,2,3-Trichlorobenzene	ND	50	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	103	74 - 136
1,4-Bromofluorobenzene	93	78 - 111
Toluene-D8	97	85 - 118

Comments: Methanol blank sample is reported in ug/L.

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0047	Lab Sample ID:	AB57778
Date of Collection:	8/03/2015	Matrix:	Soil
Date of Preparation:	8/10/2015	Amount Prepared:	5 mL
Date of Analysis:	8/10/2015	Percent Solids:	86%
Dry Weight Prepared:	10.39 grams	Extract Dilution:	500
Wet Weight Prepared:	12.11 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	560	
75-01-4	Vinyl Chloride	ND	560	
74-83-9	Bromomethane	ND	560	
75-00-3	Chloroethane	ND	560	
75-69-4	Trichlorofluoromethane	ND	560	
60-29-7	Ethyl Ether	ND	560	
67-64-1	2-Propanone (acetone)	ND	560	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	560	
75-35-4	1,1-Dichloroethylene	ND	560	
75-15-0	Carbon Disulfide	ND	560	
75-71-8	Dichlorodifluoromethane	ND	560	
75-09-2	Methylene Chloride	ND	560	
107-13-1	Acrylonitrile	ND	560	
1634-04-4	Methyl-t-Butyl Ether	ND	560	
156-60-5	Trans-1,2-Dichloroethylene	ND	560	
75-34-3	1,1-dichloroethane	ND	560	
108-05-4	Vinyl Acetate	ND	560	
78-93-3	2-Butanone (MEK)	ND	560	
594-20-7	2,2-Dichloropropane	ND	560	
156-59-2	cis-1,2-Dichloroethylene	**7700**	560	
67-66-3	Chloroform	ND	560	
74-97-5	Bromochloromethane	ND	560	
109-99-9	Tetrahydrofuran	ND	560	
71-55-6	1,1,1-Trichloroethane	ND	560	
107-06-2	1,2-Dichloroethane	ND	560	
56-23-5	Carbon tetrachloride	ND	560	
71-43-2	Benzene	ND	560	
10061-01-5	c-1,3-dichloropropene	ND	560	
108-88-3	Toluene	ND	560	
10061-02-6	t-1,3-Dichloropropene	ND	560	
79-00-5	1,1,2-Trichloroethane	ND	560	
124-48-1	Dibromochloromethane	ND	560	
108-90-7	Chlorobenzene	ND	560	
563-58-6	1,1-Dichloropropene	ND	560	
79-01-6	Trichloroethylene	**30000**	560	
78-87-5	1,2-Dichloropropane	ND	560	
75-27-4	Bromodichloromethane	ND	560	
74-95-3	Dibromomethane	ND	560	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	560	
142-28-9	1,3-Dichloropropane	ND	560	
127-18-4	Tetrachloroethylene	ND	560	
106-93-4	1,2-Dibromoethane	ND	560	
591-78-6	2-Hexanone	ND	560	
630-20-6	1,1,1,2-Tetrachloroethane	ND	560	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0047	Lab Sample ID:	AB57778
Date of Collection:	8/03/2015	Matrix:	Soil
Date of Preparation:	8/10/2015	Amount Prepared:	5 mL
Date of Analysis:	8/10/2015	Percent Solids:	86%
Dry Weight Prepared:	10.39 grams	Extract Dilution:	500
Wet Weight Prepared:	12.11 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	560	
108-38-3/106-42-3	M/P Xylene	ND	1100	
95-47-6	Ortho Xylene	ND	560	
100-42-5	Styrene	ND	560	
75-25-2	Bromoform	ND	560	
79-34-5	1,1,2,2-Tetrachloroethane	ND	560	
98-82-8	Isopropylbenzene	ND	560	
108-86-1	Bromobenzene	ND	560	
96-18-4	1,2,3-Trichloropropane	ND	560	
103-65-1	N-Propylbenzene	ND	560	
95-49-8	2-Chlorotoluene	ND	560	
106-43-4	4-Chlorotoluene	ND	560	
98-06-6	Tert-Butylbenzene	ND	560	
108-67-8	1,3,5-Trimethylbenzene	ND	560	
95-63-6	1,2,4-Trimethylbenzene	ND	560	
135-98-8	Sec-Butylbenzene	ND	560	
541-73-1	1,3-Dichlorobenzene	ND	560	
99-87-6	Para-Isopropyltoluene	ND	560	
106-46-7	1,4-Dichlorobenzene	ND	560	
95-50-1	1,2-Dichlorobenzene	ND	560	
104-51-8	N-Butylbenzene	ND	560	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	560	
120-82-1	1,2,4-Trichlorobenzene	ND	560	
87-68-3	Hexachlorobutadiene	ND	560	
91-20-3	Naphthalene	ND	560	
87-61-6	1,2,3-Trichlorobenzene	ND	560	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	104	74 - 136
1,4-Bromofluorobenzene	95	78 - 111
Toluene-D8	97	85 - 118

Lunt Silversmiths - Greenfield, MA

Laboratory Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	8/10/2015	Amount Prepared:	N/A
Date of Analysis:	8/10/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
74-87-3	Chloromethane	ND	1.0	
75-01-4	Vinyl Chloride	ND	1.0	
74-83-9	Bromomethane	ND	1.0	
75-00-3	Chloroethane	ND	1.0	
75-69-4	Trichlorofluoromethane	ND	1.0	
60-29-7	Ethyl Ether	ND	1.0	
67-64-1	2-Propanone (acetone)	ND	1.0	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	1.0	
75-35-4	1,1-Dichloroethylene	ND	1.0	
75-15-0	Carbon Disulfide	ND	1.0	
75-71-8	Dichlorodifluoromethane	ND	1.0	
75-09-2	Methylene Chloride	ND	1.0	
107-13-1	Acrylonitrile	ND	1.0	
1634-04-4	Methyl-t-Butyl Ether	ND	1.0	
156-60-5	Trans-1,2-Dichloroethylene	ND	1.0	
75-34-3	1,1-dichloroethane	ND	1.0	
108-05-4	Vinyl Acetate	ND	1.0	
78-93-3	2-Butanone (MEK)	ND	1.0	
594-20-7	2,2-Dichloropropane	ND	1.0	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	
67-66-3	Chloroform	ND	1.0	
74-97-5	Bromochloromethane	ND	1.0	
109-99-9	Tetrahydrofuran	ND	1.0	
71-55-6	1,1,1-Trichloroethane	ND	1.0	
107-06-2	1,2-Dichloroethane	ND	1.0	
56-23-5	Carbon tetrachloride	ND	1.0	
71-43-2	Benzene	ND	1.0	
10061-01-5	c-1,3-dichloropropene	ND	1.0	
108-88-3	Toluene	ND	1.0	
10061-02-6	t-1,3-Dichloropropene	ND	1.0	
79-00-5	1,1,2-Trichloroethane	ND	1.0	
124-48-1	Dibromochloromethane	ND	1.0	
108-90-7	Chlorobenzene	ND	1.0	
563-58-6	1,1-Dichloropropene	ND	1.0	
79-01-6	Trichloroethylene	ND	1.0	
78-87-5	1,2-Dichloropropane	ND	1.0	
75-27-4	Bromodichloromethane	ND	1.0	
74-95-3	Dibromomethane	ND	1.0	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	1.0	
142-28-9	1,3-Dichloropropane	ND	1.0	
127-18-4	Tetrachloroethylene	ND	1.0	
106-93-4	1,2-Dibromoethane	ND	1.0	
591-78-6	2-Hexanone	ND	1.0	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	

Lunt Silversmiths - Greenfield, MA

Laboratory Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	8/10/2015	Amount Prepared:	N/A
Date of Analysis:	8/10/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	N/A
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
100-41-4	Ethylbenzene	ND	1.0	
108-38-3/106-42-3	M/P Xylene	ND	2.0	
95-47-6	Ortho Xylene	ND	1.0	
100-42-5	Styrene	ND	1.0	
75-25-2	Bromoform	ND	1.0	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	
98-82-8	Isopropylbenzene	ND	1.0	
108-86-1	Bromobenzene	ND	1.0	
96-18-4	1,2,3-Trichloropropane	ND	1.0	
103-65-1	N-Propylbenzene	ND	1.0	
95-49-8	2-Chlorotoluene	ND	1.0	
106-43-4	4-Chlorotoluene	ND	1.0	
98-06-6	Tert-Butylbenzene	ND	1.0	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	
135-98-8	Sec-Butylbenzene	ND	1.0	
541-73-1	1,3-Dichlorobenzene	ND	1.0	
99-87-6	Para-Isopropyltoluene	ND	1.0	
106-46-7	1,4-Dichlorobenzene	ND	1.0	
95-50-1	1,2-Dichlorobenzene	ND	1.0	
104-51-8	N-Butylbenzene	ND	1.0	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	1.0	
120-82-1	1,2,4-Trichlorobenzene	ND	1.0	
87-68-3	Hexachlorobutadiene	ND	1.0	
91-20-3	Naphthalene	ND	1.0	
87-61-6	1,2,3-Trichlorobenzene	ND	1.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	102	74 - 136
1,4-Bromofluorobenzene	94	78 - 111
Toluene-D8	96	85 - 118

Comments: Laboratory blank is reported in ug/L.

Laboratory blank is associated with all samples in this project.

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB57778

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
1,1,1,2-Tetrachloroethane	11300	ND	12000	110	74 - 124
1,1,1-Trichloroethane	11300	ND	13000	120	76 - 132
1,1,2,2-Tetrachloroethane	11300	ND	13000	120	69 - 125
1,1,2-Trichloro-1,2,2-Trifluoroetha	11300	ND	13000	120	68 - 144
1,1,2-Trichloroethane	11300	ND	12000	110	75 - 126
1,1-Dichloroethylene	11300	ND	13000	120	65 - 140
1,1-Dichloropropene	11300	ND	12000	110	81 - 125
1,1-dichloroethane	11300	ND	12000	110	77 - 130
1,2,3-Trichlorobenzene	11300	ND	13000	120	64 - 125
1,2,3-Trichloropropane	11300	ND	12000	110	68 - 122
1,2,4-Trichlorobenzene	11300	ND	12000	110	72 - 120
1,2,4-Trimethylbenzene	11300	ND	13000	120	81 - 125
1,2-Dibromo-3-Chloropropane	11300	ND	12000	110	54 - 125
1,2-Dibromoethane	11300	ND	12000	110	73 - 124
1,2-Dichlorobenzene	11300	ND	12000	110	81 - 116
1,2-Dichloroethane	11300	ND	12000	110	74 - 130
1,2-Dichloropropane	11300	ND	12000	110	78 - 120
1,3,5-Trimethylbenzene	11300	ND	12000	110	81 - 125
1,3-Dichlorobenzene	11300	ND	12000	110	82 - 117
1,3-Dichloropropane	11300	ND	12000	110	76 - 123
1,4-Dichlorobenzene	11300	ND	12000	110	80 - 116
2,2-Dichloropropane	11300	ND	12000	110	57 - 147
2-Butanone (MEK)	11300	ND	13000	120	41 - 151
2-Chlorotoluene	11300	ND	12000	110	82 - 119
2-Hexanone	11300	ND	13000	120	51 - 148
2-Propanone (acetone)	11300	ND	11000	97	25 - 161
4-Chlorotoluene	11300	ND	12000	110	82 - 119
4-Methyl-2-Pentanone(MIBK)	11300	ND	13000	120	62 - 130
Acrylonitrile	11300	ND	13000	120	67 - 130
Benzene	11300	ND	13000	120	82 - 124
Bromobenzene	11300	ND	12000	110	79 - 119
Bromochloromethane	11300	ND	12000	110	79 - 125
Bromodichloromethane	11300	ND	12000	110	71 - 126
Bromoform	11300	ND	12000	110	56 - 119
Bromomethane	11300	ND	13000	120	37 - 161
Carbon Disulfide	11300	ND	12000	110	63 - 134
Carbon tetrachloride	11300	ND	13000	120	68 - 136
Chlorobenzene	11300	ND	12000	110	82 - 126
Chloroethane	11300	ND	12000	110	57 - 148
Chloroform	11300	ND	13000	120	78 - 130
Chloromethane	11300	ND	11000	97	56 - 147
Dibromochloromethane	11300	ND	13000	120	62 - 131
Dibromomethane	11300	ND	12000	110	75 - 122
Dichlorodifluoromethane	11300	ND	12000	110	59 - 131
Ethyl Ether	11300	ND	12000	110	65 - 138
Ethylbenzene	11300	ND	12000	110	82 - 122
Hexachlorobutadiene	11300	ND	13000	120	70 - 130

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB57778

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
Isopropylbenzene	11300	ND	12000	110	82 - 125
M/P Xylene	22600	ND	25000	110	85 - 120
Methyl-t-Butyl Ether	11300	ND	12000	110	74 - 125
Methylene Chloride	11300	ND	13000	120	67 - 139
N-Butylbenzene	11300	ND	13000	120	80 - 129
N-Propylbenzene	11300	ND	13000	120	81 - 122
Naphthalene	11300	ND	13000	120	59 - 129
Ortho Xylene	11300	ND	13000	120	84 - 122
Para-Isopropyltoluene	11300	ND	13000	120	79 - 129
Sec-Butylbenzene	11300	ND	13000	120	81 - 126
Styrene	11300	ND	13000	120	82 - 125
Tert-Butylbenzene	11300	ND	12000	110	81 - 126
Tetrachloroethylene	11300	ND	12000	110	74 - 133
Tetrahydrofuran	11300	ND	13000	120	60 - 132
Toluene	11300	ND	13000	120	82 - 124
Trans-1,2-Dichloroethylene	11300	ND	13000	120	79 - 127
Trichloroethylene	11300	30000	37000	62	76 - 124
Trichlorofluoromethane	11300	ND	13000	120	65 - 144
Vinyl Acetate	11300	ND	13000	120	14 - 152
Vinyl Chloride	11300	ND	12000	110	34 - 142
c-1,3-dichloropropene	11300	ND	13000	120	68 - 133
cis-1,2-Dichloroethylene	11300	7700	19000	100	79 - 131
t-1,3-Dichloropropene	11300	ND	13000	120	65 - 126

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE DUPLICATE (MSD) RECOVERY

Sample ID:AB57778

PARAMETER	MSD SPIKE ADDED	MSD CONCENTRATION ug/Kg	MSD % REC	RPD %	QC LIMITS RPD
1,1,1,2-Tetrachloroethane	11300	11000	97	13	40
1,1,1-Trichloroethane	11300	12000	110	9	40
1,1,2,2-Tetrachloroethane	11300	12000	110	9	40
1,1,2-Trichloro-1,2,2-Trifluoroetha	11300	12000	110	9	40
1,1,2-Trichloroethane	11300	12000	110	0	40
1,1-Dichloroethylene	11300	12000	110	9	52
1,1-Dichloropropene	11300	12000	110	0	40
1,1-dichloroethane	11300	12000	110	0	40
1,2,3-Trichlorobenzene	11300	12000	110	9	40
1,2,3-Trichloropropane	11300	12000	110	0	40
1,2,4-Trichlorobenzene	11300	12000	110	0	40
1,2,4-Trimethylbenzene	11300	12000	110	9	40
1,2-Dibromo-3-Chloropropane	11300	12000	110	0	40
1,2-Dibromoethane	11300	12000	110	0	40
1,2-Dichlorobenzene	11300	12000	110	0	40
1,2-Dichloroethane	11300	12000	110	0	40
1,2-Dichloropropane	11300	12000	110	0	40
1,3,5-Trimethylbenzene	11300	12000	110	0	40
1,3-Dichlorobenzene	11300	11000	97	13	40
1,3-Dichloropropane	11300	12000	110	0	40
1,4-Dichlorobenzene	11300	12000	110	0	40
2,2-Dichloropropane	11300	12000	110	0	40
2-Butanone (MEK)	11300	12000	110	9	40
2-Chlorotoluene	11300	12000	110	0	40
2-Hexanone	11300	13000	120	0	40
2-Propanone (acetone)	11300	11000	97	0	40
4-Chlorotoluene	11300	12000	110	0	40
4-Methyl-2-Pentanone(MIBK)	11300	13000	120	0	40
Acrylonitrile	11300	12000	110	9	40
Benzene	11300	12000	110	9	24
Bromobenzene	11300	12000	110	0	40
Bromochloromethane	11300	12000	110	0	40
Bromodichloromethane	11300	12000	110	0	40
Bromoform	11300	12000	110	0	40
Bromomethane	11300	11000	97	21	40
Carbon Disulfide	11300	12000	110	0	40
Carbon tetrachloride	11300	12000	110	9	40
Chlorobenzene	11300	11000	97	13	34
Chloroethane	11300	11000	97	13	40
Chloroform	11300	12000	110	9	40
Chloromethane	11300	10000	88	10	40
Dibromochloromethane	11300	12000	110	9	40
Dibromomethane	11300	12000	110	0	40
Dichlorodifluoromethane	11300	12000	110	0	40
Ethyl Ether	11300	11000	97	13	40
Ethylbenzene	11300	12000	110	0	40
Hexachlorobutadiene	11300	12000	110	9	40
Isopropylbenzene	11300	12000	110	0	40

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE DUPLICATE (MSD) RECOVERY

Sample ID:AB57778

PARAMETER	MSD SPIKE ADDED	MSD CONCENTRATION ug/Kg	MSD % REC	RPD %	QC LIMITS RPD
M/P Xylene	22600	24000	110	0	40
Methyl-t-Butyl Ether	11300	12000	110	0	40
Methylene Chloride	11300	12000	110	9	40
N-Butylbenzene	11300	12000	110	9	40
N-Propylbenzene	11300	12000	110	9	40
Naphthalene	11300	13000	120	0	40
Ortho Xylene	11300	12000	110	9	40
Para-Isopropyltoluene	11300	12000	110	9	40
Sec-Butylbenzene	11300	12000	110	9	40
Styrene	11300	12000	110	9	40
Tert-Butylbenzene	11300	12000	110	0	40
Tetrachloroethylene	11300	11000	97	13	40
Tetrahydrofuran	11300	12000	110	9	40
Toluene	11300	12000	110	9	33
Trans-1,2-Dichloroethylene	11300	12000	110	9	40
Trichloroethylene	11300	36000	53	16	27
Trichlorofluoromethane	11300	12000	110	9	40
Vinyl Acetate	11300	12000	110	9	40
Vinyl Chloride	11300	10000	88	22	40
c-1,3-dichloropropene	11300	12000	110	9	40
cis-1,2-Dichloroethylene	11300	19000	100	0	40
t-1,3-Dichloropropene	11300	12000	110	9	40

Lunt Silversmiths - Greenfield, MA

Laboratory Duplicate Results

Sample ID: AB57778

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
1,1,1,2-Tetrachloroethane	ND	ND	NC	40
1,1,1-Trichloroethane	ND	ND	NC	40
1,1,2,2-Tetrachloroethane	ND	ND	NC	40
1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	ND	NC	40
1,1,2-Trichloroethane	ND	ND	NC	40
1,1-Dichloroethylene	ND	ND	NC	40
1,1-Dichloropropene	ND	ND	NC	40
1,1-dichloroethane	ND	ND	NC	40
1,2,3-Trichlorobenzene	ND	ND	NC	40
1,2,3-Trichloropropane	ND	ND	NC	40
1,2,4-Trichlorobenzene	ND	ND	NC	40
1,2,4-Trimethylbenzene	ND	ND	NC	40
1,2-Dibromo-3-Chloropropane	ND	ND	NC	40
1,2-Dibromoethane	ND	ND	NC	40
1,2-Dichlorobenzene	ND	ND	NC	40
1,2-Dichloroethane	ND	ND	NC	40
1,2-Dichloropropane	ND	ND	NC	40
1,3,5-Trimethylbenzene	ND	ND	NC	40
1,3-Dichlorobenzene	ND	ND	NC	40
1,3-Dichloropropane	ND	ND	NC	40
1,4-Dichlorobenzene	ND	ND	NC	40
2,2-Dichloropropane	ND	ND	NC	40
2-Butanone (MEK)	ND	ND	NC	40
2-Chlorotoluene	ND	ND	NC	40
2-Hexanone	ND	ND	NC	40
2-Propanone (acetone)	ND	ND	NC	40
4-Chlorotoluene	ND	ND	NC	40
4-Methyl-2-Pentanone(MIBK)	ND	ND	NC	40
Acrylonitrile	ND	ND	NC	40
Benzene	ND	ND	NC	40
Bromobenzene	ND	ND	NC	40
Bromochloromethane	ND	ND	NC	40
Bromodichloromethane	ND	ND	NC	40
Bromoform	ND	ND	NC	40
Bromomethane	ND	ND	NC	40
Carbon Disulfide	ND	ND	NC	40
Carbon tetrachloride	ND	ND	NC	40
Chlorobenzene	ND	ND	NC	40
Chloroethane	ND	ND	NC	40
Chloroform	ND	ND	NC	40
Chloromethane	ND	ND	NC	40
Dibromochloromethane	ND	ND	NC	40
Dibromomethane	ND	ND	NC	40
Dichlorodifluoromethane	ND	ND	NC	40
Ethyl Ether	ND	ND	NC	40
Ethylbenzene	ND	ND	NC	40
Hexachlorobutadiene	ND	ND	NC	40
Isopropylbenzene	ND	ND	NC	40
M/P Xylene	ND	ND	NC	40
Methyl-t-Butyl Ether	ND	ND	NC	40

Lunt Silversmiths - Greenfield, MA

Laboratory Duplicate Results

Sample ID: AB57778

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
Methylene Chloride	ND	ND	NC	40
N-Butylbenzene	ND	ND	NC	40
N-Propylbenzene	ND	ND	NC	40
Naphthalene	ND	ND	NC	40
Ortho Xylene	ND	ND	NC	40
Para-Isopropyltoluene	ND	ND	NC	40
Sec-Butylbenzene	ND	ND	NC	40
Styrene	ND	ND	NC	40
Tert-Butylbenzene	ND	ND	NC	40
Tetrachloroethylene	ND	ND	NC	40
Tetrahydrofuran	ND	ND	NC	40
Toluene	ND	ND	NC	40
Trans-1,2-Dichloroethylene	ND	ND	NC	40
Trichloroethylene	30000	29000	3.4	40
Trichlorofluoromethane	ND	ND	NC	40
Vinyl Acetate	ND	ND	NC	40
Vinyl Chloride	ND	ND	NC	40
c-1,3-dichloropropene	ND	ND	NC	40
cis-1,2-Dichloroethylene	7700	7300	5.3	40
t-1,3-Dichloropropene	ND	ND	NC	40

Lunt Silversmiths - Greenfield, MA

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/Kg	LFB RESULT ug/Kg	LFB RECOVERY %	QC LIMITS %
1,1,1,2-Tetrachloroethane	20	21.2	106	77 - 122
1,1,1-Trichloroethane	20	21.2	106	80 - 128
1,1,2,2-Tetrachloroethane	20	21.3	107	73 - 118
1,1,2-Trichloro-1,2,2-Trifluoroeth	20	22.1	111	59 - 146
1,1,2-Trichloroethane	20	20.6	103	79 - 117
1,1-Dichloroethylene	20	21.4	107	70 - 130
1,1-Dichloropropene	20	21.4	107	79 - 123
1,1-dichloroethane	20	21.1	106	81 - 122
1,2,3-Trichlorobenzene	20	21.6	108	70 - 119
1,2,3-Trichloropropane	20	20.0	100	73 - 114
1,2,4-Trichlorobenzene	20	20.9	105	74 - 120
1,2,4-Trimethylbenzene	20	21.4	107	79 - 123
1,2-Dibromo-3-Chloropropane	20	21.8	109	63 - 124
1,2-Dibromoethane	20	21.5	108	79 - 116
1,2-Dichlorobenzene	20	20.1	101	77 - 117
1,2-Dichloroethane	20	20.6	103	75 - 124
1,2-Dichloropropane	20	20.2	101	80 - 117
1,3,5-Trimethylbenzene	20	21.2	106	80 - 122
1,3-Dichlorobenzene	20	20.2	101	78 - 117
1,3-Dichloropropane	20	20.7	104	79 - 116
1,4-Dichlorobenzene	20	20.1	101	77 - 115
2,2-Dichloropropane	20	20.5	103	64 - 152
2-Butanone (MEK)	20	21.2	106	55 - 144
2-Chlorotoluene	20	20.6	103	79 - 119
2-Hexanone	20	22.5	113	58 - 147
2-Propanone (acetone)	20	21.2	106	37 - 168
4-Chlorotoluene	20	20.6	103	78 - 120
4-Methyl-2-Pentanone(MIBK)	20	21.3	107	68 - 125
Acrylonitrile	20	21.9	110	68 - 124
Benzene	20	20.8	104	80 - 120
Bromobenzene	20	20.5	103	80 - 115
Bromochloromethane	20	20.7	104	81 - 120
Bromodichloromethane	20	21.5	108	77 - 125
Bromoform	20	22.2	111	62 - 127
Bromomethane	20	19.6	98	60 - 139
Carbon Disulfide	20	21.3	107	73 - 129
Carbon tetrachloride	20	22.2	111	73 - 136
Chlorobenzene	20	20.5	103	82 - 119
Chloroethane	20	20.2	101	69 - 130
Chloroform	20	21.5	108	80 - 122
Chloromethane	20	18.9	95	65 - 129
Dibromochloromethane	20	21.9	110	71 - 129
Dibromomethane	20	21.6	108	79 - 115
Dichlorodifluoromethane	20	20.8	104	69 - 126
Ethyl Ether	20	19.7	99	69 - 127
Ethylbenzene	20	20.6	103	80 - 121
Hexachlorobutadiene	20	20.7	104	72 - 124
Isopropylbenzene	20	21.2	106	79 - 124
M/P Xylene	40	41.8	105	81 - 120
Methyl-t-Butyl Ether	20	21.4	107	78 - 120
Methylene Chloride	20	21.0	105	73 - 129
N-Butylbenzene	20	21.8	109	78 - 126
N-Propylbenzene	20	21.2	106	78 - 122

Lunt Silversmiths - Greenfield, MA

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/Kg	LFB RESULT ug/Kg	LFB RECOVERY %	QC LIMITS %
Naphthalene	20	22.0	110	66 - 124
Ortho Xylene	20	21.4	107	81 - 121
Para-Isopropyltoluene	20	21.6	108	77 - 127
Sec-Butylbenzene	20	21.1	106	79 - 124
Styrene	20	22.1	111	82 - 122
Tert-Butylbenzene	20	21.3	107	78 - 124
Tetrachloroethylene	20	19.3	97	77 - 125
Tetrahydrofuran	20	20.9	105	67 - 124
Toluene	20	20.8	104	81 - 120
Trans-1,2-Dichloroethylene	20	21.5	108	80 - 121
Trichloroethylene	20	20.5	103	80 - 117
Trichlorofluoromethane	20	23.6	118	68 - 137
Vinyl Acetate	20	21.1	106	25 - 150
Vinyl Chloride	20	19.8	99	67 - 134
c-1,3-dichloropropene	20	22.1	111	73 - 133
cis-1,2-Dichloroethylene	20	20.8	104	82 - 122
t-1,3-Dichloropropene	20	21.6	108	69 - 127

Comments:

Lunt Silversmiths - Greenfield, MA

LABORATORY FORTIFIED DUPLICATE (LFB Dup) RECOVERY

COMPOUND	LFB Dup CONCENTRATION ug/Kg	LFB Dup RECOVERY %	RPD %	QC LIMITS RPD
1,1,1,2-Tetrachloroethane	20.9	105	1	50
1,1,1-Trichloroethane	21.7	109	2	50
1,1,2,2-Tetrachloroethane	21.6	108	1	50
1,1,2-Trichloro-1,2,2-Trifluoroetha	22.7	114	3	50
1,1,2-Trichloroethane	21.4	107	4	50
1,1-Dichloroethylene	22.5	113	5	52
1,1-Dichloropropene	22.1	111	3	50
1,1-dichloroethane	21.6	108	2	50
1,2,3-Trichlorobenzene	22.2	111	3	50
1,2,3-Trichloropropane	21.0	105	5	50
1,2,4-Trichlorobenzene	22.6	113	8	50
1,2,4-Trimethylbenzene	21.9	110	2	50
1,2-Dibromo-3-Chloropropane	22.6	113	4	50
1,2-Dibromoethane	21.6	108	1	50
1,2-Dichlorobenzene	20.8	104	3	50
1,2-Dichloroethane	21.2	106	3	50
1,2-Dichloropropane	20.7	104	2	50
1,3,5-Trimethylbenzene	21.9	110	3	50
1,3-Dichlorobenzene	20.6	103	2	50
1,3-Dichloropropane	20.8	104	1	50
1,4-Dichlorobenzene	20.7	104	3	50
2,2-Dichloropropane	22.3	112	8	50
2-Butanone (MEK)	22.4	112	6	50
2-Chlorotoluene	21.2	106	3	50
2-Hexanone	22.8	114	1	50
2-Propanone (acetone)	20.7	104	2	50
4-Chlorotoluene	21.1	106	2	50
4-Methyl-2-Pentanone(MIBK)	22.4	112	5	50
Acrylonitrile	22.3	112	2	50
Benzene	21.5	108	3	50
Bromobenzene	21.1	106	3	50
Bromochloromethane	20.8	104	1	50
Bromodichloromethane	21.7	109	1	50
Bromoform	22.1	111	1	50
Bromomethane	19.8	99	1	50
Carbon Disulfide	21.7	109	2	50
Carbon tetrachloride	22.8	114	3	50
Chlorobenzene	20.9	105	2	34
Chloroethane	20.6	103	2	50
Chloroform	21.6	108	1	50
Chloromethane	19.4	97	3	50
Dibromochloromethane	22.2	111	1	50
Dibromomethane	21.0	105	3	50
Dichlorodifluoromethane	21.0	105	1	50
Ethyl Ether	20.0	100	2	50
Ethylbenzene	21.5	108	4	50
Hexachlorobutadiene	22.8	114	10	50
Isopropylbenzene	22.3	112	5	50
M/P Xylene	43.3	108	4	50
Methyl-t-Butyl Ether	21.5	108	1	50
Methylene Chloride	21.1	106	1	50

Lunt Silversmiths - Greenfield, MA

LABORATORY FORTIFIED DUPLICATE (LFB Dup) RECOVERY

COMPOUND	LFB Dup CONCENTRATION ug/Kg	LFB Dup RECOVERY %	RPD %	QC LIMITS RPD
N-Butylbenzene	22.6	113	4	50
N-Propylbenzene	22.2	111	5	50
Naphthalene	23.2	116	5	50
Ortho Xylene	21.8	109	2	50
Para-Isopropyltoluene	22.7	114	5	50
Sec-Butylbenzene	22.5	113	6	50
Styrene	22.4	112	1	50
Tert-Butylbenzene	22.2	111	4	50
Tetrachloroethylene	19.9	100	3	50
Tetrahydrofuran	21.6	108	3	50
Toluene	21.3	107	2	50
Trans-1,2-Dichloroethylene	21.9	110	2	50
Trichloroethylene	20.8	104	2	27
Trichlorofluoromethane	23.9	120	1	50
Vinyl Acetate	22.2	111	5	50
Vinyl Chloride	20.2	101	2	50
c-1,3-dichloropropene	22.8	114	3	50
cis-1,2-Dichloroethylene	21.5	108	3	50
t-1,3-Dichloropropene	22.3	112	3	50

Samples in Batch: AB57772, AB57773, AB57774, AB57775, AB57776, AB57777, AB57778

PN 15080015

Weston Solutions, Inc.
Andover, MA

CHAIN OF CUSTODY RECORD
Lunt Silversmiths/MA
Contact Name: Ken Robinson
Contact Phone: (978) 621-1208

No: 08/07/15-0007
Cooler #:
Lab: NERL
Lab Phone:

15080015 METMS_PE
15080015 VOAHS

Lab #	Sample #	Location	Analyses	Matrix	EventID	Numb Cont	Container
	R120150528WC-0048	Grid-10-B	VOCs	Soil	8/4/2015	1	40 mL
	R120150528WC-0048	Grid-10-B	Metals	Soil	8/4/2015	1	4 oz
	R120150528WC-0049	Grid-10-D	VOCs	Soil	8/5/2015	1	40 mL
	R120150528WC-0049	Grid-10-D	Metals	Soil	8/5/2015	1	4 oz
	R120150528WC-0050	Grid-11-B	VOCs	Soil	8/4/2015	1	40 mL
	R120150528WC-0050	Grid-11-B	Metals	Soil	8/4/2015	1	4 oz
	R120150528WC-0051	Grid-12-B	VOCs	Soil	8/6/2015	1	40 mL
	R120150528WC-0051	Grid-12-B	Metals	Soil	8/6/2015	1	4 oz
	R120150528WC-0052	Grid-14-B	VOCs	Soil	8/7/2015	1	40 mL
	R120150528WC-0052	Grid-14-B	Metals	Soil	8/7/2015	1	4 oz
	R120150528WC-0053	MB-04	VOCs	MeOH	8/3/2015	1	40 mL
	R120150528WC-0047	Grid-09-B	VOCs	Soil	8/3/2015	1	40 mL
	R120150528WC-0047	Grid-09-B	Metals	Soil	8/3/2015	1	4 oz

Special Instructions: Please forward results to OSC Wing Chau. Thank you.

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	Kenneth Robinson / Weston	7 AUG 2015 1115 hrs	Matt Cahill / EPA RI	8/7/15 1115 hr	
	Matt Cahill / EPA	8/7/15 1406	ESAT	8/7/15 14:06	4°C

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

September 08, 2015

Wing Chau - Mail Code OSRR02-2
US EPA New England R1

Project Number: 15080015
Project: Lunt Silversmiths - Greenfield, MA
Analysis: Metals in Soil Medium Level by ICP
EPA Chemist: Michael Dowling

Date Samples Received by the Laboratory: 08/07/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-OPTIMASO1.

Samples were prepared following the EPA Region I SOP, EIASOP-INGMETALSPREP8

Preparation and analysis SOP's are based on "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, Revision 2, Final Update III, Methods 3050B and 6010B," respectively. Samples were analyzed using a Perkin Elmer Dual View Inductively Coupled Plasma - Optical Emission Spectrometer.

Samples were prepared and analyzed by ESAT contractors working at the USEPA New England Laboratory.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA, email=boudreau.dan@epa.gov, c=US
Date: 2015.09.08 07:49:44 -04'00'

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

Sample results reported in mg/Kg, dry weight units.

Note: All lead (Pb) results reported from the analysis of 8/24/2015.

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0048	Lab Sample ID:	AB57772
Date of Collection:	8/04/2015	Matrix:	Soil
Date of Preparation:	8/18/2015	Amount Prepared:	N/A
Date of Analysis:	8/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	2
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**36**	2.0	
7429-90-5	Aluminum	**6800**	22	
7440-38-2	Arsenic	**42**	4.0	
7440-39-3	Barium	**120**	4.0	
7440-41-7	Beryllium	ND	1.6	
7440-70-2	Calcium	**2600**	20	
7440-43-9	Cadmium	ND	2.0	
7440-48-4	Cobalt	**7.5**	4.0	
7440-47-3	Chromium	**15**	4.0	
7440-50-8	Copper	**540**	4.0	
7439-89-6	Iron	**25000**	8.0	
7439-95-4	Magnesium	**2000**	20	
7439-96-5	Manganese	**200**	4.0	
7440-02-0	Nickel	**24**	4.0	
7439-92-1	Lead	**3400**	10	
7440-36-0	Antimony	**110**	4.0	J1
7782-49-2	Selenium	ND	8.0	
7440-28-0	Thallium	ND	8.0	
7440-62-2	Vanadium	**29**	4.0	
7440-66-6	Zinc	**140**	4.0	

Comments: Result for lead (Pb) reported from the 5x dilution of 8/24/2015.

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0049	Lab Sample ID:	AB57773
Date of Collection:	8/05/2015	Matrix:	Soil
Date of Preparation:	8/18/2015	Amount Prepared:	N/A
Date of Analysis:	8/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	2
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	ND	2.0	
7429-90-5	Aluminum	**33000**	22	
7440-38-2	Arsenic	**8.3**	4.0	
7440-39-3	Barium	**180**	4.0	
7440-41-7	Beryllium	ND	1.6	
7440-70-2	Calcium	**3600**	20	
7440-43-9	Cadmium	ND	2.0	
7440-48-4	Cobalt	**23**	4.0	
7440-47-3	Chromium	**55**	4.0	
7440-50-8	Copper	**49**	4.0	
7439-89-6	Iron	**44000**	8.0	
7439-95-4	Magnesium	**13000**	20	
7439-96-5	Manganese	**800**	4.0	
7440-02-0	Nickel	**50**	4.0	
7439-92-1	Lead	**13**	4.0	
7440-36-0	Antimony	ND	4.0	
7782-49-2	Selenium	ND	8.0	
7440-28-0	Thallium	ND	8.0	
7440-62-2	Vanadium	**74**	4.0	
7440-66-6	Zinc	**110**	4.0	

Comments: Result for lead (Pb) reported from the 2x dilution of 8/24/2015.

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0050	Lab Sample ID:	AB57774
Date of Collection:	8/04/2015	Matrix:	Soil
Date of Preparation:	8/18/2015	Amount Prepared:	N/A
Date of Analysis:	8/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	2
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**35**	1.9	
7429-90-5	Aluminum	**5900**	21	
7440-38-2	Arsenic	**39**	3.8	
7440-39-3	Barium	**110**	3.8	
7440-41-7	Beryllium	ND	1.5	
7440-70-2	Calcium	**2400**	19	
7440-43-9	Cadmium	ND	1.9	
7440-48-4	Cobalt	**7.0**	3.8	
7440-47-3	Chromium	**13**	3.8	
7440-50-8	Copper	**490**	3.8	
7439-89-6	Iron	**23000**	7.7	
7439-95-4	Magnesium	**1900**	19	
7439-96-5	Manganese	**170**	3.8	
7440-02-0	Nickel	**29**	3.8	
7439-92-1	Lead	**3100**	9.6	
7440-36-0	Antimony	**110**	3.8	
7782-49-2	Selenium	ND	7.7	
7440-28-0	Thallium	ND	7.7	
7440-62-2	Vanadium	**29**	3.8	
7440-66-6	Zinc	**120**	3.8	

Comments: Result for lead (Pb) reported from the 5x dilution of 8/24/2015.

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0051	Lab Sample ID:	AB57775
Date of Collection:	8/06/2015	Matrix:	Soil
Date of Preparation:	8/18/2015	Amount Prepared:	N/A
Date of Analysis:	8/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	3
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**14**	3.1	
7429-90-5	Aluminum	**9400**	34	
7440-38-2	Arsenic	**28**	6.1	
7440-39-3	Barium	**110**	6.1	
7440-41-7	Beryllium	ND	2.4	
7440-70-2	Calcium	**2400**	31	
7440-43-9	Cadmium	ND	3.1	
7440-48-4	Cobalt	**9.1**	6.1	
7440-47-3	Chromium	**17**	6.1	
7440-50-8	Copper	**770**	6.1	
7439-89-6	Iron	**21000**	12	
7439-95-4	Magnesium	**2000**	31	
7439-96-5	Manganese	**130**	6.1	
7440-02-0	Nickel	**31**	6.1	
7439-92-1	Lead	**4200**	10	
7440-36-0	Antimony	**66**	6.1	
7782-49-2	Selenium	ND	12	
7440-28-0	Thallium	ND	12	
7440-62-2	Vanadium	**28**	6.1	
7440-66-6	Zinc	**150**	6.1	

Comments: Result for lead (Pb) reported from the 5x dilution of 8/24/2015.

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0052	Lab Sample ID:	AB57776
Date of Collection:	8/07/2015	Matrix:	Soil
Date of Preparation:	8/18/2015	Amount Prepared:	N/A
Date of Analysis:	8/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	3
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**9.1**	3.0	
7429-90-5	Aluminum	**8700**	33	
7440-38-2	Arsenic	**86**	6.0	
7440-39-3	Barium	**110**	6.0	
7440-41-7	Beryllium	ND	2.4	
7440-70-2	Calcium	**2200**	30	
7440-43-9	Cadmium	ND	3.0	
7440-48-4	Cobalt	**6.1**	6.0	
7440-47-3	Chromium	**24**	6.0	
7440-50-8	Copper	**1000**	6.0	
7439-89-6	Iron	**32000**	12	
7439-95-4	Magnesium	**1900**	30	
7439-96-5	Manganese	**100**	6.0	
7440-02-0	Nickel	**22**	6.0	
7439-92-1	Lead	**5700**	20	
7440-36-0	Antimony	**140**	6.0	
7782-49-2	Selenium	ND	12	
7440-28-0	Thallium	ND	12	
7440-62-2	Vanadium	**32**	6.0	
7440-66-6	Zinc	**160**	6.0	

Comments: Result for lead (Pb) reported from the 10x dilution of 8/24/2015.

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0047	Lab Sample ID:	AB57778
Date of Collection:	8/03/2015	Matrix:	Soil
Date of Preparation:	8/18/2015	Amount Prepared:	N/A
Date of Analysis:	8/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**44**	1.0	
7429-90-5	Aluminum	**16000**	11	
7440-38-2	Arsenic	**11**	2.0	
7440-39-3	Barium	**180**	2.0	
7440-41-7	Beryllium	ND	0.80	
7440-70-2	Calcium	**1900**	10	
7440-43-9	Cadmium	ND	1.0	
7440-48-4	Cobalt	**11**	2.0	
7440-47-3	Chromium	**37**	2.0	
7440-50-8	Copper	**190**	2.0	
7439-89-6	Iron	**24000**	4.0	
7439-95-4	Magnesium	**5700**	10	
7439-96-5	Manganese	**380**	2.0	
7440-02-0	Nickel	**40**	2.0	
7439-92-1	Lead	**540**	2.0	
7440-36-0	Antimony	**11**	2.0	
7782-49-2	Selenium	ND	4.0	
7440-28-0	Thallium	ND	4.0	
7440-62-2	Vanadium	**38**	2.0	
7440-66-6	Zinc	**200**	2.0	

Comments: Result for lead (Pb) reported from the 1x analysis of 8/24/2015.

Lunt Silversmiths - Greenfield, MA

Laboratory Reagent Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	8/18/2015	Amount Prepared:	N/A
Date of Analysis:	8/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
7440-22-4	Silver	ND	10	
7429-90-5	Aluminum	ND	110	
7440-38-2	Arsenic	ND	20	
7440-39-3	Barium	ND	20	
7440-41-7	Beryllium	ND	8.0	
7440-70-2	Calcium	ND	100	
7440-43-9	Cadmium	ND	10	
7440-48-4	Cobalt	ND	20	
7440-47-3	Chromium	ND	20	
7440-50-8	Copper	ND	20	
7439-89-6	Iron	ND	40	
7439-95-4	Magnesium	ND	100	
7439-96-5	Manganese	ND	20	
7440-02-0	Nickel	ND	20	
7439-92-1	Lead	ND	20	
7440-36-0	Antimony	ND	20	
7782-49-2	Selenium	ND	40	
7440-28-0	Thallium	ND	40	
7440-62-2	Vanadium	ND	20	
7440-66-6	Zinc	ND	20	

Comments: Result for lead (Pb) reported from the analysis of 8/24/2015.

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB57772

PARAMETER	SPIKE ADDED mg/Kg	SAMPLE CONCENTRATION mg/Kg	MS CONCENTRATION mg/Kg	MS % REC	QC LIMITS (% REC)
Antimony	100	110	157	47	75 - 125
Arsenic	100	42.0	147	105	75 - 125
Barium	100	120	218	98	75 - 125
Beryllium	40.0	ND	42.4	106	75 - 125
Cadmium	50.0	ND	50.5	101	75 - 125
Chromium	100	15.0	116	101	75 - 125
Cobalt	100	7.5	111	104	75 - 125
Copper	100	540	612	R	75 - 125
Lead	100	3400	3650	R	75 - 125
Manganese	100	200	298	98	75 - 125
Nickel	100	24.0	127	103	75 - 125
Selenium	100	ND	101	101	75 - 125
Silver	20.0	36.0	55.8	99	75 - 125
Thallium	100	ND	82.1	82	75 - 125
Vanadium	100	29.0	131	102	75 - 125
Zinc	100	140	241	101	75 - 125

Lunt Silversmiths - Greenfield, MA

Laboratory Duplicate Results

Sample ID: AB57773

PARAMETER	SAMPLE RESULT mg/Kg	SAMPLE DUPLICATE RESULT mg/Kg	PRECISION RPD %	QC LIMITS
Aluminum	33000	34000	3.0	30
Antimony	ND	ND	NC	30
Arsenic	8.3	8.7	4.7	30
Barium	180	180	0	30
Beryllium	ND	ND	NC	30
Cadmium	ND	ND	NC	30
Calcium	3600	3600	0	30
Chromium	55.0	55	0	30
Cobalt	23.0	23	0	30
Copper	49.0	49	0	30
Iron	44000	45000	2.2	30
Lead	13.0	13	0	30
Magnesium	13000	13000	0	30
Manganese	800	800	0	30
Nickel	50.0	50	0	30
Selenium	ND	ND	NC	30
Silver	ND	ND	NC	30
Thallium	ND	ND	NC	30
Vanadium	74.0	74	0	30
Zinc	110	110	0	30

Lunt Silversmiths - Greenfield, MA

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/L	LFB RESULT ug/L	LFB RECOVERY %	QC LIMITS %
Aluminum	1000	1040	104	85 - 115
Antimony	1000	985	99	85 - 115
Arsenic	1000	984	98	85 - 115
Barium	1000	999	100	85 - 115
Beryllium	400	403	101	85 - 115
Cadmium	500	503	101	85 - 115
Calcium	10000	9940	99	85 - 115
Chromium	1000	1030	103	85 - 115
Cobalt	1000	1020	102	85 - 115
Copper	1000	1050	105	85 - 115
Iron	1000	1030	103	85 - 115
Lead	1000	1010	101	85 - 115
Magnesium	10000	9980	100	85 - 115
Manganese	1000	1010	101	85 - 115
Nickel	1000	1020	102	85 - 115
Selenium	1000	955	96	85 - 115
Silver	200	200	100	85 - 115
Thallium	1000	1020	102	85 - 115
Vanadium	1000	1040	104	85 - 115
Zinc	1000	1010	101	85 - 115

Comments:

Lunt Silversmiths - Greenfield, MA

Solid Laboratory Control Sample (LCS) Results

PARAMETER	LCS RESULTS mg/Kg	CONTROL LIMITS mg/Kg
Aluminum	9280	2780 - 12100
Antimony	68.3	19.5 - 230
Arsenic	145	97.8 - 195
Barium	204	149 - 258
Beryllium	98.1	71.6 - 121
Cadmium	93.2	70.3 - 122
Calcium	6160	4460 - 7630
Chromium	143	95.1 - 176
Cobalt	152	110 - 185
Copper	180	127 - 210
Iron	16600	4930 - 23300
Lead	131	97.0 - 170
Magnesium	3030	1820 - 3780
Manganese	301	221 - 373
Nickel	126	89.9 - 158
Selenium	179	120 - 233
Silver	40.8	26.6 - 53.9
Thallium	139	94.0 - 182
Vanadium	119	71.1 - 143
Zinc	196	132 - 247

Comments:

Samples in Batch: AB57772, AB57773, AB57774, AB57775, AB57776, AB57778

PN 15080015

Weston Solutions, Inc.
Andover, MA

CHAIN OF CUSTODY RECORD
Lunt Silversmiths/MA
Contact Name: Ken Robinson
Contact Phone: (978) 621-1208

No: 08/07/15-0007
Cooler #:
Lab: NERL
Lab Phone:

15080015 METMS_PE
15080015 VOAHS

Lab #	Sample #	Location	Analyses	Matrix	EventID	Numb Cont	Container
	R120150528WC-0048	Grid-10-B	VOCs	Soil	8/4/2015	1	40 mL
	R120150528WC-0048	Grid-10-B	Metals	Soil	8/4/2015	1	4 oz
	R120150528WC-0049	Grid-10-D	VOCs	Soil	8/5/2015	1	40 mL
	R120150528WC-0049	Grid-10-D	Metals	Soil	8/5/2015	1	4 oz
	R120150528WC-0050	Grid-11-B	VOCs	Soil	8/4/2015	1	40 mL
	R120150528WC-0050	Grid-11-B	Metals	Soil	8/4/2015	1	4 oz
	R120150528WC-0051	Grid-12-B	VOCs	Soil	8/6/2015	1	40 mL
	R120150528WC-0051	Grid-12-B	Metals	Soil	8/6/2015	1	4 oz
	R120150528WC-0052	Grid-14-B	VOCs	Soil	8/7/2015	1	40 mL
	R120150528WC-0052	Grid-14-B	Metals	Soil	8/7/2015	1	4 oz
	R120150528WC-0053	MB-04	VOCs	MeOH	8/3/2015	1	40 mL
	R120150528WC-0047	Grid-09-B	VOCs	Soil	8/3/2015	1	40 mL
	R120150528WC-0047	Grid-09-B	Metals	Soil	8/3/2015	1	4 oz

Special Instructions: Please forward results to OSC Wing Chau. Thank you.

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	Kenneth Robinson / Weston	7 AUG 2015 1115 hrs	Matt Cahill / EPA RI	8/7/15 1115 hr	
	Matt Cahill / EPA	8/7/15 1406	ESAT	8/7/15 14:06	4°C

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

August 10, 2015

Wing Chau - Mail Code OSRR02-2
US EPA New England R1

Project Number: 15080017
Project: Lunt Silversmiths - Greenfield, MA
Analysis: Field Analysis of Metals by XRF
Analyst: Scott Clifford

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIA-FLDXRFNITON4.

Samples were analyzed using a Niton XL3t 600 x-ray fluorescence (XRF) instrument equipped with a 50 kV X-ray tube and a high resolution Si pin detector.

Samples were placed into XRF cups for analysis.

Date Samples Received by the Laboratory: 8/7/15

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

Results for soil samples are reported on a dry weight basis.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA, email=boudreau.dan@epa.gov, c=US
Date: 2015.08.10 14:28:39 -04'00'

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Lunt Silversmiths - Greenfield, MA

Field Analysis of Metals by XRF

Lab Sample ID	Client Sample ID	Arsenic mg/Kg	Lead mg/Kg
AB57779	Grid-F5 1ft	ND (7)	67
AB57780	Grid-08B 2ft	12	62
AB57781	Grid-07B 2ft	46	140
AB57782	Grid-07C	18	66
AB57783	Grid F1	32	840
AB57784	Grid F2	40	1700
AB57785	Grid F2 Lab Dup	62	1800
AB57786	Grid-09B	21	330
AB57787	Grid-11B	100	2600
AB57788	Grid-11B Lab Dup	130	2500
AB57789	Grid-10B	15	260
AB57790	Grid-10D	6	20
AB57791	Grid-10D Lab Dup	ND (6)	20
AB57792	JO Floor	ND (6)	29
AB57793	KR Floor	ND (6)	27
AB57794	Grid-12B	100	2000
AB57795	Grid-12B Lab Dup	64	1600
AB57796	Grid-14B	220	400
AB57797	Grid-14B Lab Dup	170	3200

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

August 10, 2015

Wing Chau - Mail Code OSRR02-2
US EPA New England R1

Project Number: 15080017
Project: Lunt Silversmiths - Greenfield, MA
Analysis: Volatile Organic Analysis of Soil
Analyst: Scott Clifford

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-FLDVOA2.

Soil samples were collected in 40 mL vials, and preserved in methanol. The samples were analyzed using a Shimadzu gas chromatograph equipped with a 30 meter, 0.53 mm id. column, with electron capture and photoionization detectors. Concentrations of volatile organics were calculated using the external standard technique. Results are reported on a wet weight basis.

Analytes reported by this field method should be treated as tentatively identified compounds and concentrations are approximate.

Date Samples Received by the Laboratory: 8/7/15

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

Results for soil samples are reported on a dry weight basis.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA, email=boudreau.dan@epa.gov, c=US
Date: 2015.08.10 14:30:54 -04'00'

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Lunt Silversmiths - Greenfield, MA

Volatile Organic Analysis of Soil

Lab Sample ID	Client Sample ID	Tetrachloroethylene ug/Kg	Trichloroethylene ug/Kg
AB57798	MB-04	ND (10)	ND (20)
AB57799	Grid-08B	ND (10)	ND (20)
AB57800	Grid-F5	ND (10)	ND (20)
AB57801	Grid-07C	520	6300
AB57802	Grid-07B	1100	32000
AB57803	Grid-09B	170	14000
AB57804	Grid-11B	350	26000
AB57805	Grid-10B	1400	240000
AB57806	Grid-10D	ND (35)	620
AB57807	Grid-12B	350	57000
AB57808	Grid-14B	510	84000

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

August 18, 2015

Wing Chau - Mail Code OSRR02-2
US EPA New England R1

Project Number: 15080026
Project: Lunt Silversmiths - Greenfield, MA
Analysis: VOAs in Soil High Level Method
EPA Chemist: Joseph Montanaro

Date Samples Received by the Laboratory: 08/14/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-VOAGCMS9.

Samples were analyzed by GC/MS. Samples were introduced to the GC via a Tekmar preconcentrator and an Archon auto-sampler. The analysis SOP is based on US EPA Method 8260B, revision 2.0, 1996 and Method 5035A, draft revision 1, 2002, from SW-846.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA, email=boudreau.dan@epa.gov, c=US
Date: 2015.08.18 15:43:20 -04'00'

15080026$VOAHS

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0066	Lab Sample ID:	AB57902
Date of Collection:	8/11/2015	Matrix:	Soil
Date of Preparation:	8/16/2015	Amount Prepared:	5 mL
Date of Analysis:	8/16/2015	Percent Solids:	82%
Dry Weight Prepared:	14.18 grams	Extract Dilution:	250
Wet Weight Prepared:	17.38 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	230	
75-01-4	Vinyl Chloride	ND	230	
74-83-9	Bromomethane	ND	230	
75-00-3	Chloroethane	ND	230	
75-69-4	Trichlorofluoromethane	ND	230	
60-29-7	Ethyl Ether	ND	230	
67-64-1	2-Propanone (acetone)	ND	230	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	230	
75-35-4	1,1-Dichloroethylene	ND	230	
75-15-0	Carbon Disulfide	ND	230	
75-71-8	Dichlorodifluoromethane	ND	230	
75-09-2	Methylene Chloride	ND	230	
107-13-1	Acrylonitrile	ND	230	
1634-04-4	Methyl-t-Butyl Ether	ND	230	
156-60-5	Trans-1,2-Dichloroethylene	**440**	230	
75-34-3	1,1-dichloroethane	ND	230	
108-05-4	Vinyl Acetate	ND	230	
78-93-3	2-Butanone (MEK)	ND	230	
594-20-7	2,2-Dichloropropane	ND	230	
156-59-2	cis-1,2-Dichloroethylene	ND	230	
67-66-3	Chloroform	ND	230	
74-97-5	Bromochloromethane	ND	230	
109-99-9	Tetrahydrofuran	ND	230	
71-55-6	1,1,1-Trichloroethane	ND	230	
107-06-2	1,2-Dichloroethane	ND	230	
56-23-5	Carbon tetrachloride	ND	230	
71-43-2	Benzene	ND	230	
10061-01-5	c-1,3-dichloropropene	ND	230	
108-88-3	Toluene	ND	230	
10061-02-6	t-1,3-Dichloropropene	ND	230	
79-00-5	1,1,2-Trichloroethane	ND	230	
124-48-1	Dibromochloromethane	ND	230	
108-90-7	Chlorobenzene	ND	230	
563-58-6	1,1-Dichloropropene	ND	230	
79-01-6	Trichloroethylene	**16000**	920	
78-87-5	1,2-Dichloropropane	ND	230	
75-27-4	Bromodichloromethane	ND	230	
74-95-3	Dibromomethane	ND	230	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	230	
142-28-9	1,3-Dichloropropane	ND	230	
127-18-4	Tetrachloroethylene	ND	230	
106-93-4	1,2-Dibromoethane	ND	230	
591-78-6	2-Hexanone	ND	230	
630-20-6	1,1,1,2-Tetrachloroethane	ND	230	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0066	Lab Sample ID:	AB57902
Date of Collection:	8/11/2015	Matrix:	Soil
Date of Preparation:	8/16/2015	Amount Prepared:	5 mL
Date of Analysis:	8/16/2015	Percent Solids:	82%
Dry Weight Prepared:	14.18 grams	Extract Dilution:	250
Wet Weight Prepared:	17.38 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	230	
108-38-3/106-42-3	M/P Xylene	ND	460	
95-47-6	Ortho Xylene	ND	230	
100-42-5	Styrene	ND	230	
75-25-2	Bromoform	ND	230	
79-34-5	1,1,2,2-Tetrachloroethane	ND	230	
98-82-8	Isopropylbenzene	ND	230	
108-86-1	Bromobenzene	ND	230	
96-18-4	1,2,3-Trichloropropane	ND	230	
103-65-1	N-Propylbenzene	ND	230	
95-49-8	2-Chlorotoluene	ND	230	
106-43-4	4-Chlorotoluene	ND	230	
98-06-6	Tert-Butylbenzene	ND	230	
108-67-8	1,3,5-Trimethylbenzene	ND	230	
95-63-6	1,2,4-Trimethylbenzene	ND	230	
135-98-8	Sec-Butylbenzene	ND	230	
541-73-1	1,3-Dichlorobenzene	ND	230	
99-87-6	Para-Isopropyltoluene	ND	230	
106-46-7	1,4-Dichlorobenzene	ND	230	
95-50-1	1,2-Dichlorobenzene	ND	230	
104-51-8	N-Butylbenzene	ND	230	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	230	
120-82-1	1,2,4-Trichlorobenzene	ND	230	
87-68-3	Hexachlorobutadiene	ND	230	
91-20-3	Naphthalene	**290**	230	B
87-61-6	1,2,3-Trichlorobenzene	ND	230	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	104	74 - 136
1,4-Bromofluorobenzene	95	78 - 111
Toluene-D8	99	85 - 118

Comments: Trichloroethylene was derived from a one-thousand fold dilution.

Lunt Silversmiths - Greenfield, MA

Laboratory Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	8/17/2015	Amount Prepared:	5 mL
Date of Analysis:	8/17/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	~6

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
74-87-3	Chloromethane	ND	1.0	
75-01-4	Vinyl Chloride	ND	1.0	
74-83-9	Bromomethane	ND	1.0	
75-00-3	Chloroethane	ND	1.0	
75-69-4	Trichlorofluoromethane	ND	1.0	
60-29-7	Ethyl Ether	ND	1.0	
67-64-1	2-Propanone (acetone)	ND	1.0	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	1.0	
75-35-4	1,1-Dichloroethylene	ND	1.0	
75-15-0	Carbon Disulfide	ND	1.0	
75-71-8	Dichlorodifluoromethane	ND	1.0	
75-09-2	Methylene Chloride	ND	1.0	
107-13-1	Acrylonitrile	ND	1.0	
1634-04-4	Methyl-t-Butyl Ether	ND	1.0	
156-60-5	Trans-1,2-Dichloroethylene	ND	1.0	
75-34-3	1,1-dichloroethane	ND	1.0	
108-05-4	Vinyl Acetate	ND	1.0	
78-93-3	2-Butanone (MEK)	ND	1.0	
594-20-7	2,2-Dichloropropane	ND	1.0	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	
67-66-3	Chloroform	ND	1.0	
74-97-5	Bromochloromethane	ND	1.0	
109-99-9	Tetrahydrofuran	ND	1.0	
71-55-6	1,1,1-Trichloroethane	ND	1.0	
107-06-2	1,2-Dichloroethane	ND	1.0	
56-23-5	Carbon tetrachloride	ND	1.0	
71-43-2	Benzene	ND	1.0	
10061-01-5	c-1,3-dichloropropene	ND	1.0	
108-88-3	Toluene	ND	1.0	
10061-02-6	t-1,3-Dichloropropene	ND	1.0	
79-00-5	1,1,2-Trichloroethane	ND	1.0	
124-48-1	Dibromochloromethane	ND	1.0	
108-90-7	Chlorobenzene	ND	1.0	
563-58-6	1,1-Dichloropropene	ND	1.0	
79-01-6	Trichloroethylene	ND	1.0	
78-87-5	1,2-Dichloropropane	ND	1.0	
75-27-4	Bromodichloromethane	ND	1.0	
74-95-3	Dibromomethane	ND	1.0	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	1.0	
142-28-9	1,3-Dichloropropane	ND	1.0	
127-18-4	Tetrachloroethylene	ND	1.0	
106-93-4	1,2-Dibromoethane	ND	1.0	
591-78-6	2-Hexanone	ND	1.0	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	

Lunt Silversmiths - Greenfield, MA

Laboratory Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	8/17/2015	Amount Prepared:	5 mL
Date of Analysis:	8/17/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	~6

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
100-41-4	Ethylbenzene	ND	1.0	
108-38-3/106-42-3	M/P Xylene	ND	2.0	
95-47-6	Ortho Xylene	ND	1.0	
100-42-5	Styrene	ND	1.0	
75-25-2	Bromoform	ND	1.0	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	
98-82-8	Isopropylbenzene	ND	1.0	
108-86-1	Bromobenzene	ND	1.0	
96-18-4	1,2,3-Trichloropropane	ND	1.0	
103-65-1	N-Propylbenzene	ND	1.0	
95-49-8	2-Chlorotoluene	ND	1.0	
106-43-4	4-Chlorotoluene	ND	1.0	
98-06-6	Tert-Butylbenzene	ND	1.0	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	
135-98-8	Sec-Butylbenzene	ND	1.0	
541-73-1	1,3-Dichlorobenzene	ND	1.0	
99-87-6	Para-Isopropyltoluene	ND	1.0	
106-46-7	1,4-Dichlorobenzene	ND	1.0	
95-50-1	1,2-Dichlorobenzene	ND	1.0	
104-51-8	N-Butylbenzene	ND	1.0	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	1.0	
120-82-1	1,2,4-Trichlorobenzene	ND	1.0	
87-68-3	Hexachlorobutadiene	ND	1.0	
91-20-3	Naphthalene	ND	1.0	
87-61-6	1,2,3-Trichlorobenzene	ND	1.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	101	74 - 136
1,4-Bromofluorobenzene	95	78 - 111
Toluene-D8	99	85 - 118

Comments: Laboratory blank is reported in ug/L.

Laboratory blank is associated with sample 1000x dilution of AB57902.

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0068	Lab Sample ID:	AB57903
Date of Collection:	8/12/2015	Matrix:	Soil
Date of Preparation:	8/16/2015	Amount Prepared:	5 mL
Date of Analysis:	8/16/2015	Percent Solids:	71%
Dry Weight Prepared:	12.89 grams	Extract Dilution:	250
Wet Weight Prepared:	18.27 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	300	
75-01-4	Vinyl Chloride	ND	300	
74-83-9	Bromomethane	ND	300	
75-00-3	Chloroethane	ND	300	
75-69-4	Trichlorofluoromethane	ND	300	
60-29-7	Ethyl Ether	ND	300	
67-64-1	2-Propanone (acetone)	ND	300	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	300	
75-35-4	1,1-Dichloroethylene	ND	300	
75-15-0	Carbon Disulfide	ND	300	
75-71-8	Dichlorodifluoromethane	ND	300	
75-09-2	Methylene Chloride	ND	300	
107-13-1	Acrylonitrile	ND	300	
1634-04-4	Methyl-t-Butyl Ether	ND	300	
156-60-5	Trans-1,2-Dichloroethylene	ND	300	
75-34-3	1,1-dichloroethane	ND	300	
108-05-4	Vinyl Acetate	ND	300	
78-93-3	2-Butanone (MEK)	ND	300	
594-20-7	2,2-Dichloropropane	ND	300	
156-59-2	cis-1,2-Dichloroethylene	**580**	300	
67-66-3	Chloroform	ND	300	
74-97-5	Bromochloromethane	ND	300	
109-99-9	Tetrahydrofuran	ND	300	
71-55-6	1,1,1-Trichloroethane	ND	300	
107-06-2	1,2-Dichloroethane	ND	300	
56-23-5	Carbon tetrachloride	ND	300	
71-43-2	Benzene	ND	300	
10061-01-5	c-1,3-dichloropropene	ND	300	
108-88-3	Toluene	ND	300	
10061-02-6	t-1,3-Dichloropropene	ND	300	
79-00-5	1,1,2-Trichloroethane	ND	300	
124-48-1	Dibromochloromethane	ND	300	
108-90-7	Chlorobenzene	ND	300	
563-58-6	1,1-Dichloropropene	ND	300	
79-01-6	Trichloroethylene	**24000**	300	
78-87-5	1,2-Dichloropropane	ND	300	
75-27-4	Bromodichloromethane	ND	300	
74-95-3	Dibromomethane	ND	300	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	300	
142-28-9	1,3-Dichloropropane	ND	300	
127-18-4	Tetrachloroethylene	**340**	300	
106-93-4	1,2-Dibromoethane	ND	300	
591-78-6	2-Hexanone	ND	300	
630-20-6	1,1,1,2-Tetrachloroethane	ND	300	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0068	Lab Sample ID:	AB57903
Date of Collection:	8/12/2015	Matrix:	Soil
Date of Preparation:	8/16/2015	Amount Prepared:	5 mL
Date of Analysis:	8/16/2015	Percent Solids:	71%
Dry Weight Prepared:	12.89 grams	Extract Dilution:	250
Wet Weight Prepared:	18.27 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	300	
108-38-3/106-42-3	M/P Xylene	ND	600	
95-47-6	Ortho Xylene	ND	300	
100-42-5	Styrene	ND	300	
75-25-2	Bromoform	ND	300	
79-34-5	1,1,2,2-Tetrachloroethane	ND	300	
98-82-8	Isopropylbenzene	ND	300	
108-86-1	Bromobenzene	ND	300	
96-18-4	1,2,3-Trichloropropane	ND	300	
103-65-1	N-Propylbenzene	ND	300	
95-49-8	2-Chlorotoluene	ND	300	
106-43-4	4-Chlorotoluene	ND	300	
98-06-6	Tert-Butylbenzene	ND	300	
108-67-8	1,3,5-Trimethylbenzene	ND	300	
95-63-6	1,2,4-Trimethylbenzene	ND	300	
135-98-8	Sec-Butylbenzene	ND	300	
541-73-1	1,3-Dichlorobenzene	ND	300	
99-87-6	Para-Isopropyltoluene	ND	300	
106-46-7	1,4-Dichlorobenzene	ND	300	
95-50-1	1,2-Dichlorobenzene	ND	300	
104-51-8	N-Butylbenzene	ND	300	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	300	
120-82-1	1,2,4-Trichlorobenzene	ND	300	
87-68-3	Hexachlorobutadiene	ND	300	
91-20-3	Naphthalene	ND	300	
87-61-6	1,2,3-Trichlorobenzene	ND	300	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	106	74 - 136
1,4-Bromofluorobenzene	95	78 - 111
Toluene-D8	100	85 - 118

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0070	Lab Sample ID:	AB57904
Date of Collection:	8/10/2015	Matrix:	Soil
Date of Preparation:	8/16/2015	Amount Prepared:	5 mL
Date of Analysis:	8/16/2015	Percent Solids:	82%
Dry Weight Prepared:	11.74 grams	Extract Dilution:	500
Wet Weight Prepared:	14.40 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	540	
75-01-4	Vinyl Chloride	ND	540	
74-83-9	Bromomethane	ND	540	
75-00-3	Chloroethane	ND	540	
75-69-4	Trichlorofluoromethane	ND	540	
60-29-7	Ethyl Ether	ND	540	
67-64-1	2-Propanone (acetone)	ND	540	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	540	
75-35-4	1,1-Dichloroethylene	ND	540	
75-15-0	Carbon Disulfide	ND	540	
75-71-8	Dichlorodifluoromethane	ND	540	
75-09-2	Methylene Chloride	ND	540	
107-13-1	Acrylonitrile	ND	540	
1634-04-4	Methyl-t-Butyl Ether	ND	540	
156-60-5	Trans-1,2-Dichloroethylene	ND	540	
75-34-3	1,1-dichloroethane	ND	540	
108-05-4	Vinyl Acetate	ND	540	
78-93-3	2-Butanone (MEK)	ND	540	
594-20-7	2,2-Dichloropropane	ND	540	
156-59-2	cis-1,2-Dichloroethylene	**640**	540	
67-66-3	Chloroform	ND	540	
74-97-5	Bromochloromethane	ND	540	
109-99-9	Tetrahydrofuran	ND	540	
71-55-6	1,1,1-Trichloroethane	ND	540	
107-06-2	1,2-Dichloroethane	ND	540	
56-23-5	Carbon tetrachloride	ND	540	
71-43-2	Benzene	ND	540	
10061-01-5	c-1,3-dichloropropene	ND	540	
108-88-3	Toluene	ND	540	
10061-02-6	t-1,3-Dichloropropene	ND	540	
79-00-5	1,1,2-Trichloroethane	ND	540	
124-48-1	Dibromochloromethane	ND	540	
108-90-7	Chlorobenzene	ND	540	
563-58-6	1,1-Dichloropropene	ND	540	
79-01-6	Trichloroethylene	**25000**	540	
78-87-5	1,2-Dichloropropane	ND	540	
75-27-4	Bromodichloromethane	ND	540	
74-95-3	Dibromomethane	ND	540	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	540	
142-28-9	1,3-Dichloropropane	ND	540	
127-18-4	Tetrachloroethylene	ND	540	
106-93-4	1,2-Dibromoethane	ND	540	
591-78-6	2-Hexanone	ND	540	
630-20-6	1,1,1,2-Tetrachloroethane	ND	540	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0070	Lab Sample ID:	AB57904
Date of Collection:	8/10/2015	Matrix:	Soil
Date of Preparation:	8/16/2015	Amount Prepared:	5 mL
Date of Analysis:	8/16/2015	Percent Solids:	82%
Dry Weight Prepared:	11.74 grams	Extract Dilution:	500
Wet Weight Prepared:	14.40 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	540	
108-38-3/106-42-3	M/P Xylene	ND	1100	
95-47-6	Ortho Xylene	ND	540	
100-42-5	Styrene	ND	540	
75-25-2	Bromoform	ND	540	
79-34-5	1,1,2,2-Tetrachloroethane	ND	540	
98-82-8	Isopropylbenzene	ND	540	
108-86-1	Bromobenzene	ND	540	
96-18-4	1,2,3-Trichloropropane	ND	540	
103-65-1	N-Propylbenzene	ND	540	
95-49-8	2-Chlorotoluene	ND	540	
106-43-4	4-Chlorotoluene	ND	540	
98-06-6	Tert-Butylbenzene	ND	540	
108-67-8	1,3,5-Trimethylbenzene	ND	540	
95-63-6	1,2,4-Trimethylbenzene	ND	540	
135-98-8	Sec-Butylbenzene	ND	540	
541-73-1	1,3-Dichlorobenzene	ND	540	
99-87-6	Para-Isopropyltoluene	ND	540	
106-46-7	1,4-Dichlorobenzene	ND	540	
95-50-1	1,2-Dichlorobenzene	ND	540	
104-51-8	N-Butylbenzene	ND	540	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	540	
120-82-1	1,2,4-Trichlorobenzene	ND	540	
87-68-3	Hexachlorobutadiene	ND	540	
91-20-3	Naphthalene	ND	540	
87-61-6	1,2,3-Trichlorobenzene	ND	540	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	107	74 - 136
1,4-Bromofluorobenzene	96	78 - 111
Toluene-D8	100	85 - 118

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0067	Lab Sample ID:	AB57905
Date of Collection:	8/12/2015	Matrix:	Soil
Date of Preparation:	8/16/2015	Amount Prepared:	5 mL
Date of Analysis:	8/16/2015	Percent Solids:	83%
Dry Weight Prepared:	12.82 grams	Extract Dilution:	500
Wet Weight Prepared:	15.51 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	490	
75-01-4	Vinyl Chloride	ND	490	
74-83-9	Bromomethane	ND	490	
75-00-3	Chloroethane	ND	490	
75-69-4	Trichlorofluoromethane	ND	490	
60-29-7	Ethyl Ether	ND	490	
67-64-1	2-Propanone (acetone)	ND	490	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	490	
75-35-4	1,1-Dichloroethylene	ND	490	
75-15-0	Carbon Disulfide	ND	490	
75-71-8	Dichlorodifluoromethane	ND	490	
75-09-2	Methylene Chloride	ND	490	
107-13-1	Acrylonitrile	ND	490	
1634-04-4	Methyl-t-Butyl Ether	ND	490	
156-60-5	Trans-1,2-Dichloroethylene	ND	490	
75-34-3	1,1-dichloroethane	ND	490	
108-05-4	Vinyl Acetate	ND	490	
78-93-3	2-Butanone (MEK)	ND	490	
594-20-7	2,2-Dichloropropane	ND	490	
156-59-2	cis-1,2-Dichloroethylene	ND	490	
67-66-3	Chloroform	ND	490	
74-97-5	Bromochloromethane	ND	490	
109-99-9	Tetrahydrofuran	ND	490	
71-55-6	1,1,1-Trichloroethane	ND	490	
107-06-2	1,2-Dichloroethane	ND	490	
56-23-5	Carbon tetrachloride	ND	490	
71-43-2	Benzene	ND	490	
10061-01-5	c-1,3-dichloropropene	ND	490	
108-88-3	Toluene	ND	490	
10061-02-6	t-1,3-Dichloropropene	ND	490	
79-00-5	1,1,2-Trichloroethane	ND	490	
124-48-1	Dibromochloromethane	ND	490	
108-90-7	Chlorobenzene	ND	490	
563-58-6	1,1-Dichloropropene	ND	490	
79-01-6	Trichloroethylene	**34000**	490	
78-87-5	1,2-Dichloropropane	ND	490	
75-27-4	Bromodichloromethane	ND	490	
74-95-3	Dibromomethane	ND	490	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	490	
142-28-9	1,3-Dichloropropane	ND	490	
127-18-4	Tetrachloroethylene	ND	490	
106-93-4	1,2-Dibromoethane	ND	490	
591-78-6	2-Hexanone	ND	490	
630-20-6	1,1,1,2-Tetrachloroethane	ND	490	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0067	Lab Sample ID:	AB57905
Date of Collection:	8/12/2015	Matrix:	Soil
Date of Preparation:	8/16/2015	Amount Prepared:	5 mL
Date of Analysis:	8/16/2015	Percent Solids:	83%
Dry Weight Prepared:	12.82 grams	Extract Dilution:	500
Wet Weight Prepared:	15.51 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	490	
108-38-3/106-42-3	M/P Xylene	ND	980	
95-47-6	Ortho Xylene	ND	490	
100-42-5	Styrene	ND	490	
75-25-2	Bromoform	ND	490	
79-34-5	1,1,2,2-Tetrachloroethane	ND	490	
98-82-8	Isopropylbenzene	ND	490	
108-86-1	Bromobenzene	ND	490	
96-18-4	1,2,3-Trichloropropane	ND	490	
103-65-1	N-Propylbenzene	ND	490	
95-49-8	2-Chlorotoluene	ND	490	
106-43-4	4-Chlorotoluene	ND	490	
98-06-6	Tert-Butylbenzene	ND	490	
108-67-8	1,3,5-Trimethylbenzene	ND	490	
95-63-6	1,2,4-Trimethylbenzene	ND	490	
135-98-8	Sec-Butylbenzene	ND	490	
541-73-1	1,3-Dichlorobenzene	ND	490	
99-87-6	Para-Isopropyltoluene	ND	490	
106-46-7	1,4-Dichlorobenzene	ND	490	
95-50-1	1,2-Dichlorobenzene	ND	490	
104-51-8	N-Butylbenzene	ND	490	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	490	
120-82-1	1,2,4-Trichlorobenzene	ND	490	
87-68-3	Hexachlorobutadiene	ND	490	
91-20-3	Naphthalene	ND	490	
87-61-6	1,2,3-Trichlorobenzene	ND	490	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	110	74 - 136
1,4-Bromofluorobenzene	96	78 - 111
Toluene-D8	100	85 - 118

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0065	Lab Sample ID:	AB57906
Date of Collection:	8/12/2015	Matrix:	Soil
Date of Preparation:	8/16/2015	Amount Prepared:	5 mL
Date of Analysis:	8/16/2015	Percent Solids:	75%
Dry Weight Prepared:	14.18 grams	Extract Dilution:	50
Wet Weight Prepared:	19.02 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	52	
75-01-4	Vinyl Chloride	ND	52	
74-83-9	Bromomethane	ND	52	
75-00-3	Chloroethane	ND	52	
75-69-4	Trichlorofluoromethane	ND	52	
60-29-7	Ethyl Ether	ND	52	
67-64-1	2-Propanone (acetone)	ND	52	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	52	
75-35-4	1,1-Dichloroethylene	ND	52	
75-15-0	Carbon Disulfide	ND	52	
75-71-8	Dichlorodifluoromethane	ND	52	
75-09-2	Methylene Chloride	ND	52	
107-13-1	Acrylonitrile	ND	52	
1634-04-4	Methyl-t-Butyl Ether	ND	52	
156-60-5	Trans-1,2-Dichloroethylene	ND	52	
75-34-3	1,1-dichloroethane	ND	52	
108-05-4	Vinyl Acetate	ND	52	
78-93-3	2-Butanone (MEK)	ND	52	
594-20-7	2,2-Dichloropropane	ND	52	
156-59-2	cis-1,2-Dichloroethylene	ND	52	
67-66-3	Chloroform	ND	52	
74-97-5	Bromochloromethane	ND	52	
109-99-9	Tetrahydrofuran	ND	52	
71-55-6	1,1,1-Trichloroethane	ND	52	
107-06-2	1,2-Dichloroethane	ND	52	
56-23-5	Carbon tetrachloride	ND	52	
71-43-2	Benzene	ND	52	
10061-01-5	c-1,3-dichloropropene	ND	52	
108-88-3	Toluene	ND	52	
10061-02-6	t-1,3-Dichloropropene	ND	52	
79-00-5	1,1,2-Trichloroethane	ND	52	
124-48-1	Dibromochloromethane	ND	52	
108-90-7	Chlorobenzene	ND	52	
563-58-6	1,1-Dichloropropene	ND	52	
79-01-6	Trichloroethylene	**150**	52	
78-87-5	1,2-Dichloropropane	ND	52	
75-27-4	Bromodichloromethane	ND	52	
74-95-3	Dibromomethane	ND	52	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	52	
142-28-9	1,3-Dichloropropane	ND	52	
127-18-4	Tetrachloroethylene	ND	52	
106-93-4	1,2-Dibromoethane	ND	52	
591-78-6	2-Hexanone	ND	52	
630-20-6	1,1,1,2-Tetrachloroethane	ND	52	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0065	Lab Sample ID:	AB57906
Date of Collection:	8/12/2015	Matrix:	Soil
Date of Preparation:	8/16/2015	Amount Prepared:	5 mL
Date of Analysis:	8/16/2015	Percent Solids:	75%
Dry Weight Prepared:	14.18 grams	Extract Dilution:	50
Wet Weight Prepared:	19.02 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	52	
108-38-3/106-42-3	M/P Xylene	ND	100	
95-47-6	Ortho Xylene	ND	52	
100-42-5	Styrene	ND	52	
75-25-2	Bromoform	ND	52	
79-34-5	1,1,2,2-Tetrachloroethane	ND	52	
98-82-8	Isopropylbenzene	ND	52	
108-86-1	Bromobenzene	ND	52	
96-18-4	1,2,3-Trichloropropane	ND	52	
103-65-1	N-Propylbenzene	ND	52	
95-49-8	2-Chlorotoluene	ND	52	
106-43-4	4-Chlorotoluene	ND	52	
98-06-6	Tert-Butylbenzene	ND	52	
108-67-8	1,3,5-Trimethylbenzene	ND	52	
95-63-6	1,2,4-Trimethylbenzene	ND	52	
135-98-8	Sec-Butylbenzene	ND	52	
541-73-1	1,3-Dichlorobenzene	ND	52	
99-87-6	Para-Isopropyltoluene	ND	52	
106-46-7	1,4-Dichlorobenzene	ND	52	
95-50-1	1,2-Dichlorobenzene	ND	52	
104-51-8	N-Butylbenzene	ND	52	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	52	
120-82-1	1,2,4-Trichlorobenzene	ND	52	
87-68-3	Hexachlorobutadiene	ND	52	
91-20-3	Naphthalene	ND	52	
87-61-6	1,2,3-Trichlorobenzene	ND	52	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	105	74 - 136
1,4-Bromofluorobenzene	92	78 - 111
Toluene-D8	99	85 - 118

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0064	Lab Sample ID:	AB57907
Date of Collection:	8/13/2015	Matrix:	Soil
Date of Preparation:	8/16/2015	Amount Prepared:	5 mL
Date of Analysis:	8/16/2015	Percent Solids:	87%
Dry Weight Prepared:	9.38 grams	Extract Dilution:	50
Wet Weight Prepared:	10.80 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	61	
75-01-4	Vinyl Chloride	ND	61	
74-83-9	Bromomethane	ND	61	
75-00-3	Chloroethane	ND	61	
75-69-4	Trichlorofluoromethane	ND	61	
60-29-7	Ethyl Ether	ND	61	
67-64-1	2-Propanone (acetone)	ND	61	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	61	
75-35-4	1,1-Dichloroethylene	ND	61	
75-15-0	Carbon Disulfide	ND	61	
75-71-8	Dichlorodifluoromethane	ND	61	
75-09-2	Methylene Chloride	ND	61	
107-13-1	Acrylonitrile	ND	61	
1634-04-4	Methyl-t-Butyl Ether	ND	61	
156-60-5	Trans-1,2-Dichloroethylene	ND	61	
75-34-3	1,1-dichloroethane	ND	61	
108-05-4	Vinyl Acetate	ND	61	
78-93-3	2-Butanone (MEK)	ND	61	
594-20-7	2,2-Dichloropropane	ND	61	
156-59-2	cis-1,2-Dichloroethylene	ND	61	
67-66-3	Chloroform	ND	61	
74-97-5	Bromochloromethane	ND	61	
109-99-9	Tetrahydrofuran	ND	61	
71-55-6	1,1,1-Trichloroethane	ND	61	
107-06-2	1,2-Dichloroethane	ND	61	
56-23-5	Carbon tetrachloride	ND	61	
71-43-2	Benzene	ND	61	
10061-01-5	c-1,3-dichloropropene	ND	61	
108-88-3	Toluene	ND	61	
10061-02-6	t-1,3-Dichloropropene	ND	61	
79-00-5	1,1,2-Trichloroethane	ND	61	
124-48-1	Dibromochloromethane	ND	61	
108-90-7	Chlorobenzene	ND	61	
563-58-6	1,1-Dichloropropene	ND	61	
79-01-6	Trichloroethylene	**950**	61	
78-87-5	1,2-Dichloropropane	ND	61	
75-27-4	Bromodichloromethane	ND	61	
74-95-3	Dibromomethane	ND	61	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	61	
142-28-9	1,3-Dichloropropane	ND	61	
127-18-4	Tetrachloroethylene	ND	61	
106-93-4	1,2-Dibromoethane	ND	61	
591-78-6	2-Hexanone	ND	61	
630-20-6	1,1,1,2-Tetrachloroethane	ND	61	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0064	Lab Sample ID:	AB57907
Date of Collection:	8/13/2015	Matrix:	Soil
Date of Preparation:	8/16/2015	Amount Prepared:	5 mL
Date of Analysis:	8/16/2015	Percent Solids:	87%
Dry Weight Prepared:	9.38 grams	Extract Dilution:	50
Wet Weight Prepared:	10.80 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	61	
108-38-3/106-42-3	M/P Xylene	ND	120	
95-47-6	Ortho Xylene	ND	61	
100-42-5	Styrene	ND	61	
75-25-2	Bromoform	ND	61	
79-34-5	1,1,2,2-Tetrachloroethane	ND	61	
98-82-8	Isopropylbenzene	ND	61	
108-86-1	Bromobenzene	ND	61	
96-18-4	1,2,3-Trichloropropane	ND	61	
103-65-1	N-Propylbenzene	ND	61	
95-49-8	2-Chlorotoluene	ND	61	
106-43-4	4-Chlorotoluene	ND	61	
98-06-6	Tert-Butylbenzene	ND	61	
108-67-8	1,3,5-Trimethylbenzene	ND	61	
95-63-6	1,2,4-Trimethylbenzene	ND	61	
135-98-8	Sec-Butylbenzene	ND	61	
541-73-1	1,3-Dichlorobenzene	ND	61	
99-87-6	Para-Isopropyltoluene	ND	61	
106-46-7	1,4-Dichlorobenzene	ND	61	
95-50-1	1,2-Dichlorobenzene	ND	61	
104-51-8	N-Butylbenzene	ND	61	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	61	
120-82-1	1,2,4-Trichlorobenzene	ND	61	
87-68-3	Hexachlorobutadiene	ND	61	
91-20-3	Naphthalene	ND	61	
87-61-6	1,2,3-Trichlorobenzene	ND	61	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	102	74 - 136
1,4-Bromofluorobenzene	92	78 - 111
Toluene-D8	100	85 - 118

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0063	Lab Sample ID:	AB57908
Date of Collection:	8/13/2015	Matrix:	Soil
Date of Preparation:	8/16/2015	Amount Prepared:	5 mL
Date of Analysis:	8/16/2015	Percent Solids:	86%
Dry Weight Prepared:	15.10 grams	Extract Dilution:	50
Wet Weight Prepared:	17.56 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	41	
75-01-4	Vinyl Chloride	ND	41	
74-83-9	Bromomethane	ND	41	
75-00-3	Chloroethane	ND	41	
75-69-4	Trichlorofluoromethane	ND	41	
60-29-7	Ethyl Ether	ND	41	
67-64-1	2-Propanone (acetone)	ND	41	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	41	
75-35-4	1,1-Dichloroethylene	ND	41	
75-15-0	Carbon Disulfide	ND	41	
75-71-8	Dichlorodifluoromethane	ND	41	
75-09-2	Methylene Chloride	ND	41	
107-13-1	Acrylonitrile	ND	41	
1634-04-4	Methyl-t-Butyl Ether	ND	41	
156-60-5	Trans-1,2-Dichloroethylene	ND	41	
75-34-3	1,1-dichloroethane	ND	41	
108-05-4	Vinyl Acetate	ND	41	
78-93-3	2-Butanone (MEK)	ND	41	
594-20-7	2,2-Dichloropropane	ND	41	
156-59-2	cis-1,2-Dichloroethylene	ND	41	
67-66-3	Chloroform	ND	41	
74-97-5	Bromochloromethane	ND	41	
109-99-9	Tetrahydrofuran	ND	41	
71-55-6	1,1,1-Trichloroethane	ND	41	
107-06-2	1,2-Dichloroethane	ND	41	
56-23-5	Carbon tetrachloride	ND	41	
71-43-2	Benzene	ND	41	
10061-01-5	c-1,3-dichloropropene	ND	41	
108-88-3	Toluene	ND	41	
10061-02-6	t-1,3-Dichloropropene	ND	41	
79-00-5	1,1,2-Trichloroethane	ND	41	
124-48-1	Dibromochloromethane	ND	41	
108-90-7	Chlorobenzene	ND	41	
563-58-6	1,1-Dichloropropene	ND	41	
79-01-6	Trichloroethylene	ND	41	
78-87-5	1,2-Dichloropropane	ND	41	
75-27-4	Bromodichloromethane	ND	41	
74-95-3	Dibromomethane	ND	41	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	41	
142-28-9	1,3-Dichloropropane	ND	41	
127-18-4	Tetrachloroethylene	ND	41	
106-93-4	1,2-Dibromoethane	ND	41	
591-78-6	2-Hexanone	ND	41	
630-20-6	1,1,1,2-Tetrachloroethane	ND	41	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0063	Lab Sample ID:	AB57908
Date of Collection:	8/13/2015	Matrix:	Soil
Date of Preparation:	8/16/2015	Amount Prepared:	5 mL
Date of Analysis:	8/16/2015	Percent Solids:	86%
Dry Weight Prepared:	15.10 grams	Extract Dilution:	50
Wet Weight Prepared:	17.56 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	41	
108-38-3/106-42-3	M/P Xylene	ND	82	
95-47-6	Ortho Xylene	ND	41	
100-42-5	Styrene	ND	41	
75-25-2	Bromoform	ND	41	
79-34-5	1,1,2,2-Tetrachloroethane	ND	41	
98-82-8	Isopropylbenzene	ND	41	
108-86-1	Bromobenzene	ND	41	
96-18-4	1,2,3-Trichloropropane	ND	41	
103-65-1	N-Propylbenzene	ND	41	
95-49-8	2-Chlorotoluene	ND	41	
106-43-4	4-Chlorotoluene	ND	41	
98-06-6	Tert-Butylbenzene	ND	41	
108-67-8	1,3,5-Trimethylbenzene	ND	41	
95-63-6	1,2,4-Trimethylbenzene	ND	41	
135-98-8	Sec-Butylbenzene	ND	41	
541-73-1	1,3-Dichlorobenzene	ND	41	
99-87-6	Para-Isopropyltoluene	ND	41	
106-46-7	1,4-Dichlorobenzene	ND	41	
95-50-1	1,2-Dichlorobenzene	ND	41	
104-51-8	N-Butylbenzene	ND	41	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	41	
120-82-1	1,2,4-Trichlorobenzene	ND	41	
87-68-3	Hexachlorobutadiene	ND	41	
91-20-3	Naphthalene	ND	41	
87-61-6	1,2,3-Trichlorobenzene	ND	41	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	106	74 - 136
1,4-Bromofluorobenzene	96	78 - 111
Toluene-D8	100	85 - 118

Lunt Silversmiths - Greenfield, MA

Laboratory Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	8/16/2015	Amount Prepared:	5 mL
Date of Analysis:	8/16/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	~6

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
74-87-3	Chloromethane	ND	1.0	
75-01-4	Vinyl Chloride	ND	1.0	
74-83-9	Bromomethane	ND	1.0	
75-00-3	Chloroethane	ND	1.0	
75-69-4	Trichlorofluoromethane	ND	1.0	
60-29-7	Ethyl Ether	ND	1.0	
67-64-1	2-Propanone (acetone)	**1.4**	1.0	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	1.0	
75-35-4	1,1-Dichloroethylene	ND	1.0	
75-15-0	Carbon Disulfide	ND	1.0	
75-71-8	Dichlorodifluoromethane	ND	1.0	
75-09-2	Methylene Chloride	ND	1.0	
107-13-1	Acrylonitrile	ND	1.0	
1634-04-4	Methyl-t-Butyl Ether	ND	1.0	
156-60-5	Trans-1,2-Dichloroethylene	ND	1.0	
75-34-3	1,1-dichloroethane	ND	1.0	
108-05-4	Vinyl Acetate	ND	1.0	
78-93-3	2-Butanone (MEK)	ND	1.0	
594-20-7	2,2-Dichloropropane	ND	1.0	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	
67-66-3	Chloroform	ND	1.0	
74-97-5	Bromochloromethane	ND	1.0	
109-99-9	Tetrahydrofuran	ND	1.0	
71-55-6	1,1,1-Trichloroethane	ND	1.0	
107-06-2	1,2-Dichloroethane	ND	1.0	
56-23-5	Carbon tetrachloride	ND	1.0	
71-43-2	Benzene	ND	1.0	
10061-01-5	c-1,3-dichloropropene	ND	1.0	
108-88-3	Toluene	ND	1.0	
10061-02-6	t-1,3-Dichloropropene	ND	1.0	
79-00-5	1,1,2-Trichloroethane	ND	1.0	
124-48-1	Dibromochloromethane	ND	1.0	
108-90-7	Chlorobenzene	ND	1.0	
563-58-6	1,1-Dichloropropene	ND	1.0	
79-01-6	Trichloroethylene	ND	1.0	
78-87-5	1,2-Dichloropropane	ND	1.0	
75-27-4	Bromodichloromethane	ND	1.0	
74-95-3	Dibromomethane	ND	1.0	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	1.0	
142-28-9	1,3-Dichloropropane	ND	1.0	
127-18-4	Tetrachloroethylene	ND	1.0	
106-93-4	1,2-Dibromoethane	ND	1.0	
591-78-6	2-Hexanone	ND	1.0	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	

Lunt Silversmiths - Greenfield, MA

Laboratory Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	8/16/2015	Amount Prepared:	5 mL
Date of Analysis:	8/16/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	~6

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
100-41-4	Ethylbenzene	ND	1.0	
108-38-3/106-42-3	M/P Xylene	ND	2.0	
95-47-6	Ortho Xylene	ND	1.0	
100-42-5	Styrene	ND	1.0	
75-25-2	Bromoform	ND	1.0	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	
98-82-8	Isopropylbenzene	ND	1.0	
108-86-1	Bromobenzene	ND	1.0	
96-18-4	1,2,3-Trichloropropane	ND	1.0	
103-65-1	N-Propylbenzene	ND	1.0	
95-49-8	2-Chlorotoluene	ND	1.0	
106-43-4	4-Chlorotoluene	ND	1.0	
98-06-6	Tert-Butylbenzene	ND	1.0	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	
135-98-8	Sec-Butylbenzene	ND	1.0	
541-73-1	1,3-Dichlorobenzene	ND	1.0	
99-87-6	Para-Isopropyltoluene	ND	1.0	
106-46-7	1,4-Dichlorobenzene	ND	1.0	
95-50-1	1,2-Dichlorobenzene	ND	1.0	
104-51-8	N-Butylbenzene	ND	1.0	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	1.0	
120-82-1	1,2,4-Trichlorobenzene	ND	1.0	
87-68-3	Hexachlorobutadiene	ND	1.0	
91-20-3	Naphthalene	**1.1**	1.0	
87-61-6	1,2,3-Trichlorobenzene	ND	1.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	106	74 - 136
1,4-Bromofluorobenzene	97	78 - 111
Toluene-D8	99	85 - 118

Comments: Laboratory blank is reported in ug/L.

Laboratory blank is associated with all samples in this project.

Acetone and naphthalene were reported in this sample. Observations of these compounds in samples are qualified with a B.

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0069	Lab Sample ID:	AB57909
Date of Collection:	8/13/2015	Matrix:	Blank
Date of Preparation:	8/16/2015	Amount Prepared:	5 mL
Date of Analysis:	8/16/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	50
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	50	
75-01-4	Vinyl Chloride	ND	50	
74-83-9	Bromomethane	ND	50	
75-00-3	Chloroethane	ND	50	
75-69-4	Trichlorofluoromethane	ND	50	
60-29-7	Ethyl Ether	ND	50	
67-64-1	2-Propanone (acetone)	ND	50	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	50	
75-35-4	1,1-Dichloroethylene	ND	50	
75-15-0	Carbon Disulfide	ND	50	
75-71-8	Dichlorodifluoromethane	ND	50	
75-09-2	Methylene Chloride	ND	50	
107-13-1	Acrylonitrile	ND	50	
1634-04-4	Methyl-t-Butyl Ether	ND	50	
156-60-5	Trans-1,2-Dichloroethylene	ND	50	
75-34-3	1,1-dichloroethane	ND	50	
108-05-4	Vinyl Acetate	ND	50	
78-93-3	2-Butanone (MEK)	ND	50	
594-20-7	2,2-Dichloropropane	ND	50	
156-59-2	cis-1,2-Dichloroethylene	ND	50	
67-66-3	Chloroform	ND	50	
74-97-5	Bromochloromethane	ND	50	
109-99-9	Tetrahydrofuran	ND	50	
71-55-6	1,1,1-Trichloroethane	ND	50	
107-06-2	1,2-Dichloroethane	ND	50	
56-23-5	Carbon tetrachloride	ND	50	
71-43-2	Benzene	ND	50	
10061-01-5	c-1,3-dichloropropene	ND	50	
108-88-3	Toluene	ND	50	
10061-02-6	t-1,3-Dichloropropene	ND	50	
79-00-5	1,1,2-Trichloroethane	ND	50	
124-48-1	Dibromochloromethane	ND	50	
108-90-7	Chlorobenzene	ND	50	
563-58-6	1,1-Dichloropropene	ND	50	
79-01-6	Trichloroethylene	ND	50	
78-87-5	1,2-Dichloropropane	ND	50	
75-27-4	Bromodichloromethane	ND	50	
74-95-3	Dibromomethane	ND	50	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	50	
142-28-9	1,3-Dichloropropane	ND	50	
127-18-4	Tetrachloroethylene	ND	50	
106-93-4	1,2-Dibromoethane	ND	50	
591-78-6	2-Hexanone	ND	50	
630-20-6	1,1,1,2-Tetrachloroethane	ND	50	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0069	Lab Sample ID:	AB57909
Date of Collection:	8/13/2015	Matrix:	Blank
Date of Preparation:	8/16/2015	Amount Prepared:	5 mL
Date of Analysis:	8/16/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	50
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	50	
108-38-3/106-42-3	M/P Xylene	ND	100	
95-47-6	Ortho Xylene	ND	50	
100-42-5	Styrene	ND	50	
75-25-2	Bromoform	ND	50	
79-34-5	1,1,2,2-Tetrachloroethane	ND	50	
98-82-8	Isopropylbenzene	ND	50	
108-86-1	Bromobenzene	ND	50	
96-18-4	1,2,3-Trichloropropane	ND	50	
103-65-1	N-Propylbenzene	ND	50	
95-49-8	2-Chlorotoluene	ND	50	
106-43-4	4-Chlorotoluene	ND	50	
98-06-6	Tert-Butylbenzene	ND	50	
108-67-8	1,3,5-Trimethylbenzene	ND	50	
95-63-6	1,2,4-Trimethylbenzene	ND	50	
135-98-8	Sec-Butylbenzene	ND	50	
541-73-1	1,3-Dichlorobenzene	ND	50	
99-87-6	Para-Isopropyltoluene	ND	50	
106-46-7	1,4-Dichlorobenzene	ND	50	
95-50-1	1,2-Dichlorobenzene	ND	50	
104-51-8	N-Butylbenzene	ND	50	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	50	
120-82-1	1,2,4-Trichlorobenzene	ND	50	
87-68-3	Hexachlorobutadiene	ND	50	
91-20-3	Naphthalene	ND	50	
87-61-6	1,2,3-Trichlorobenzene	ND	50	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	103	74 - 136
1,4-Bromofluorobenzene	91	78 - 111
Toluene-D8	99	85 - 118

Comments: Methanol blank sample is reported in ug/L.

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB57908

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
1,1,1,2-Tetrachloroethane	824	ND	900	110	74 - 124
1,1,1-Trichloroethane	824	ND	910	110	76 - 132
1,1,2,2-Tetrachloroethane	824	ND	910	110	69 - 125
1,1,2-Trichloro-1,2,2-Trifluoroetha	824	ND	920	110	68 - 144
1,1,2-Trichloroethane	824	ND	920	110	75 - 126
1,1-Dichloroethylene	824	ND	880	110	65 - 140
1,1-Dichloropropene	824	ND	860	100	81 - 125
1,1-dichloroethane	824	ND	900	110	77 - 130
1,2,3-Trichlorobenzene	824	ND	820	100	64 - 125
1,2,3-Trichloropropane	824	ND	750	91	68 - 122
1,2,4-Trichlorobenzene	824	ND	800	97	72 - 120
1,2,4-Trimethylbenzene	824	ND	840	100	81 - 125
1,2-Dibromo-3-Chloropropane	824	ND	890	110	54 - 125
1,2-Dibromoethane	824	ND	870	110	73 - 124
1,2-Dichlorobenzene	824	ND	830	100	81 - 116
1,2-Dichloroethane	824	ND	910	110	74 - 130
1,2-Dichloropropane	824	ND	870	110	78 - 120
1,3,5-Trimethylbenzene	824	ND	850	100	81 - 125
1,3-Dichlorobenzene	824	ND	820	100	82 - 117
1,3-Dichloropropane	824	ND	880	110	76 - 123
1,4-Dichlorobenzene	824	ND	810	98	80 - 116
2,2-Dichloropropane	824	ND	890	110	57 - 147
2-Butanone (MEK)	824	ND	910	110	41 - 151
2-Chlorotoluene	824	ND	820	100	82 - 119
2-Hexanone	824	ND	910	110	51 - 148
2-Propanone (acetone)	824	ND	1000	120	25 - 161
4-Chlorotoluene	824	ND	840	100	82 - 119
4-Methyl-2-Pentanone(MIBK)	824	ND	910	110	62 - 130
Acrylonitrile	824	ND	1000	120	67 - 130
Benzene	824	ND	890	110	82 - 124
Bromobenzene	824	ND	820	100	79 - 119
Bromochloromethane	824	ND	890	110	79 - 125
Bromodichloromethane	824	ND	890	110	71 - 126
Bromoform	824	ND	950	120	56 - 119
Bromomethane	824	ND	830	100	37 - 161
Carbon Disulfide	824	ND	870	110	63 - 134
Carbon tetrachloride	824	ND	920	110	68 - 136
Chlorobenzene	824	ND	900	110	82 - 126
Chloroethane	824	ND	890	110	57 - 148
Chloroform	824	ND	900	110	78 - 130
Chloromethane	824	ND	860	100	56 - 147
Dibromochloromethane	824	ND	970	120	62 - 131
Dibromomethane	824	ND	880	110	75 - 122
Dichlorodifluoromethane	824	ND	780	95	59 - 131
Ethyl Ether	824	ND	840	100	65 - 138
Ethylbenzene	824	ND	870	110	82 - 122
Hexachlorobutadiene	824	ND	820	100	70 - 130

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB57908

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
Isopropylbenzene	824	ND	840	100	82 - 125
M/P Xylene	1648	ND	1700	100	85 - 120
Methyl-t-Butyl Ether	824	ND	890	110	74 - 125
Methylene Chloride	824	ND	940	110	67 - 139
N-Butylbenzene	824	ND	840	100	80 - 129
N-Propylbenzene	824	ND	830	100	81 - 122
Naphthalene	824	ND	780	95	59 - 129
Ortho Xylene	824	ND	880	110	84 - 122
Para-Isopropyltoluene	824	ND	850	100	79 - 129
Sec-Butylbenzene	824	ND	850	100	81 - 126
Styrene	824	ND	900	110	82 - 125
Tert-Butylbenzene	824	ND	840	100	81 - 126
Tetrachloroethylene	824	ND	840	100	74 - 133
Tetrahydrofuran	824	ND	960	120	60 - 132
Toluene	824	ND	890	110	82 - 124
Trans-1,2-Dichloroethylene	824	ND	880	110	79 - 127
Trichloroethylene	824	ND	860	100	76 - 124
Trichlorofluoromethane	824	ND	920	110	65 - 144
Vinyl Acetate	824	ND	940	110	14 - 152
Vinyl Chloride	824	ND	870	110	34 - 142
c-1,3-dichloropropene	824	ND	940	110	68 - 133
cis-1,2-Dichloroethylene	824	ND	900	110	79 - 131
t-1,3-Dichloropropene	824	ND	960	120	65 - 126

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE DUPLICATE (MSD) RECOVERY

Sample ID:AB57908

PARAMETER	MSD SPIKE ADDED	MSD CONCENTRATION ug/Kg	MSD % REC	RPD %	QC LIMITS RPD
1,1,1,2-Tetrachloroethane	824	850	100	10	40
1,1,1-Trichloroethane	824	850	100	10	40
1,1,2,2-Tetrachloroethane	824	880	110	0	40
1,1,2-Trichloro-1,2,2-Trifluoroetha	824	850	100	10	40
1,1,2-Trichloroethane	824	870	110	0	40
1,1-Dichloroethylene	824	840	100	10	52
1,1-Dichloropropene	824	820	100	0	40
1,1-dichloroethane	824	860	100	10	40
1,2,3-Trichlorobenzene	824	800	97	3	40
1,2,3-Trichloropropane	824	740	90	1	40
1,2,4-Trichlorobenzene	824	780	95	2	40
1,2,4-Trimethylbenzene	824	820	100	0	40
1,2-Dibromo-3-Chloropropane	824	850	100	10	40
1,2-Dibromoethane	824	850	100	10	40
1,2-Dichlorobenzene	824	800	97	3	40
1,2-Dichloroethane	824	870	110	0	40
1,2-Dichloropropane	824	840	100	10	40
1,3,5-Trimethylbenzene	824	810	98	2	40
1,3-Dichlorobenzene	824	790	96	4	40
1,3-Dichloropropane	824	850	100	10	40
1,4-Dichlorobenzene	824	790	96	2	40
2,2-Dichloropropane	824	830	100	10	40
2-Butanone (MEK)	824	880	110	0	40
2-Chlorotoluene	824	780	95	5	40
2-Hexanone	824	880	110	0	40
2-Propanone (acetone)	824	950	120	0	40
4-Chlorotoluene	824	820	100	0	40
4-Methyl-2-Pentanone(MIBK)	824	890	110	0	40
Acrylonitrile	824	980	120	0	40
Benzene	824	840	100	10	24
Bromobenzene	824	800	97	3	40
Bromochloromethane	824	850	100	10	40
Bromodichloromethane	824	860	100	10	40
Bromoform	824	910	110	9	40
Bromomethane	824	810	98	2	40
Carbon Disulfide	824	820	100	10	40
Carbon tetrachloride	824	870	110	0	40
Chlorobenzene	824	840	100	10	34
Chloroethane	824	830	100	10	40
Chloroform	824	860	100	10	40
Chloromethane	824	810	98	2	40
Dibromochloromethane	824	930	110	9	40
Dibromomethane	824	840	100	10	40
Dichlorodifluoromethane	824	750	91	4	40
Ethyl Ether	824	830	100	0	40
Ethylbenzene	824	830	100	10	40
Hexachlorobutadiene	824	780	95	5	40
Isopropylbenzene	824	810	98	2	40

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE DUPLICATE (MSD) RECOVERY

Sample ID:AB57908

PARAMETER	MSD SPIKE ADDED	MSD CONCENTRATION ug/Kg	MSD % REC	RPD %	QC LIMITS RPD
M/P Xylene	1648	1700	100	0	40
Methyl-t-Butyl Ether	824	860	100	10	40
Methylene Chloride	824	880	110	0	40
N-Butylbenzene	824	790	96	4	40
N-Propylbenzene	824	800	97	3	40
Naphthalene	824	800	97	2	40
Ortho Xylene	824	840	100	10	40
Para-Isopropyltoluene	824	820	100	0	40
Sec-Butylbenzene	824	810	98	2	40
Styrene	824	870	110	0	40
Tert-Butylbenzene	824	810	98	2	40
Tetrachloroethylene	824	810	98	2	40
Tetrahydrofuran	824	940	110	9	40
Toluene	824	840	100	10	33
Trans-1,2-Dichloroethylene	824	830	100	10	40
Trichloroethylene	824	810	98	2	27
Trichlorofluoromethane	824	860	100	10	40
Vinyl Acetate	824	920	110	0	40
Vinyl Chloride	824	810	98	12	40
c-1,3-dichloropropene	824	900	110	0	40
cis-1,2-Dichloroethylene	824	850	100	10	40
t-1,3-Dichloropropene	824	920	110	9	40

Laboratory Duplicate Results

Sample ID: AB57908

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
1,1,1,2-Tetrachloroethane	ND	ND	NC	40
1,1,1-Trichloroethane	ND	ND	NC	40
1,1,2,2-Tetrachloroethane	ND	ND	NC	40
1,1,2-Trichloro-1,2,2-Trifluoroeth	ND	ND	NC	40
1,1,2-Trichloroethane	ND	ND	NC	40
1,1-Dichloroethylene	ND	ND	NC	40
1,1-Dichloropropene	ND	ND	NC	40
1,1-dichloroethane	ND	ND	NC	40
1,2,3-Trichlorobenzene	ND	ND	NC	40
1,2,3-Trichloropropane	ND	ND	NC	40
1,2,4-Trichlorobenzene	ND	ND	NC	40
1,2,4-Trimethylbenzene	ND	ND	NC	40
1,2-Dibromo-3-Chloropropane	ND	ND	NC	40
1,2-Dibromoethane	ND	ND	NC	40
1,2-Dichlorobenzene	ND	ND	NC	40
1,2-Dichloroethane	ND	ND	NC	40
1,2-Dichloropropane	ND	ND	NC	40

Lunt Silversmiths - Greenfield, MA

Laboratory Duplicate Results

Sample ID: AB57908

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
1,3,5-Trimethylbenzene	ND	ND	NC	40
1,3-Dichlorobenzene	ND	ND	NC	40
1,3-Dichloropropane	ND	ND	NC	40
1,4-Dichlorobenzene	ND	ND	NC	40
2,2-Dichloropropane	ND	ND	NC	40
2-Butanone (MEK)	ND	ND	NC	40
2-Chlorotoluene	ND	ND	NC	40
2-Hexanone	ND	ND	NC	40
2-Propanone (acetone)	ND	ND	NC	40
4-Chlorotoluene	ND	ND	NC	40
4-Methyl-2-Pentanone(MIBK)	ND	ND	NC	40
Acrylonitrile	ND	ND	NC	40
Benzene	ND	ND	NC	40
Bromobenzene	ND	ND	NC	40
Bromochloromethane	ND	ND	NC	40
Bromodichloromethane	ND	ND	NC	40
Bromoform	ND	ND	NC	40
Bromomethane	ND	ND	NC	40
Carbon Disulfide	ND	ND	NC	40
Carbon tetrachloride	ND	ND	NC	40
Chlorobenzene	ND	ND	NC	40
Chloroethane	ND	ND	NC	40
Chloroform	ND	ND	NC	40
Chloromethane	ND	ND	NC	40
Dibromochloromethane	ND	ND	NC	40
Dibromomethane	ND	ND	NC	40
Dichlorodifluoromethane	ND	ND	NC	40
Ethyl Ether	ND	ND	NC	40
Ethylbenzene	ND	ND	NC	40
Hexachlorobutadiene	ND	ND	NC	40
Isopropylbenzene	ND	ND	NC	40
M/P Xylene	ND	ND	NC	40
Methyl-t-Butyl Ether	ND	ND	NC	40
Methylene Chloride	ND	ND	NC	40
N-Butylbenzene	ND	ND	NC	40
N-Propylbenzene	ND	ND	NC	40
Naphthalene	ND	ND	NC	40
Ortho Xylene	ND	ND	NC	40
Para-Isopropyltoluene	ND	ND	NC	40
Sec-Butylbenzene	ND	ND	NC	40
Styrene	ND	ND	NC	40
Tert-Butylbenzene	ND	ND	NC	40
Tetrachloroethylene	ND	ND	NC	40
Tetrahydrofuran	ND	ND	NC	40
Toluene	ND	ND	NC	40
Trans-1,2-Dichloroethylene	ND	ND	NC	40
Trichloroethylene	ND	ND	NC	40
Trichlorofluoromethane	ND	ND	NC	40
Vinyl Acetate	ND	ND	NC	40
Vinyl Chloride	ND	ND	NC	40
c-1,3-dichloropropene	ND	ND	NC	40

Lunt Silversmiths - Greenfield, MA

Laboratory Duplicate Results

Sample ID: AB57908

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
cis-1,2-Dichloroethylene	ND	ND	NC	40
t-1,3-Dichloropropene	ND	ND	NC	40

Lunt Silversmiths - Greenfield, MA

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/Kg	LFB RESULT ug/Kg	LFB RECOVERY %	QC LIMITS %
1,1,1,2-Tetrachloroethane	20	20.4	102	77 - 122
1,1,1-Trichloroethane	20	20.1	101	80 - 128
1,1,2,2-Tetrachloroethane	20	20.4	102	73 - 118
1,1,2-Trichloro-1,2,2-Trifluoroeth	20	19.4	97	59 - 146
1,1,2-Trichloroethane	20	20.7	104	79 - 117
1,1-Dichloroethylene	20	19.4	97	70 - 130
1,1-Dichloropropene	20	18.5	93	79 - 123
1,1-dichloroethane	20	19.8	99	81 - 122
1,2,3-Trichlorobenzene	20	18.3	92	70 - 119
1,2,3-Trichloropropane	20	16.4	82	73 - 114
1,2,4-Trichlorobenzene	20	18.1	91	74 - 120
1,2,4-Trimethylbenzene	20	18.8	94	79 - 123
1,2-Dibromo-3-Chloropropane	20	19.9	100	63 - 124
1,2-Dibromoethane	20	19.8	99	79 - 116
1,2-Dichlorobenzene	20	18.6	93	77 - 117
1,2-Dichloroethane	20	20.2	101	75 - 124
1,2-Dichloropropane	20	19.3	97	80 - 117
1,3,5-Trimethylbenzene	20	18.7	94	80 - 122
1,3-Dichlorobenzene	20	18.6	93	78 - 117
1,3-Dichloropropane	20	19.6	98	79 - 116
1,4-Dichlorobenzene	20	18.1	91	77 - 115
2,2-Dichloropropane	20	20.3	102	64 - 152
2-Butanone (MEK)	20	20.5	103	55 - 144
2-Chlorotoluene	20	18.1	91	79 - 119
2-Hexanone	20	20.1	101	58 - 147
2-Propanone (acetone)	20	26.2	131	37 - 168
4-Chlorotoluene	20	18.7	94	78 - 120
4-Methyl-2-Pentanone(MIBK)	20	20.3	102	68 - 125
Acrylonitrile	20	23.8	119	68 - 124
Benzene	20	19.7	99	80 - 120
Bromobenzene	20	18.6	93	80 - 115
Bromochloromethane	20	20.1	101	81 - 120
Bromodichloromethane	20	20.3	102	77 - 125
Bromoform	20	21.6	108	62 - 127
Bromomethane	20	17.0	85	60 - 139
Carbon Disulfide	20	19.2	96	73 - 129
Carbon tetrachloride	20	20.1	101	73 - 136
Chlorobenzene	20	20.1	101	82 - 119
Chloroethane	20	18.8	94	69 - 130
Chloroform	20	20.4	102	80 - 122
Chloromethane	20	18.8	94	65 - 129
Dibromochloromethane	20	22.0	110	71 - 129
Dibromomethane	20	19.6	98	79 - 115
Dichlorodifluoromethane	20	17.2	86	69 - 126
Ethyl Ether	20	19.4	97	69 - 127
Ethylbenzene	20	19.1	96	80 - 121
Hexachlorobutadiene	20	18.5	93	72 - 124
Isopropylbenzene	20	18.4	92	79 - 124
M/P Xylene	40	38.5	96	81 - 120
Methyl-t-Butyl Ether	20	20.5	103	78 - 120
Methylene Chloride	20	21.0	105	73 - 129
N-Butylbenzene	20	18.2	91	78 - 126
N-Propylbenzene	20	18.2	91	78 - 122

Lunt Silversmiths - Greenfield, MA

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/Kg	LFB RESULT ug/Kg	LFB RECOVERY %	QC LIMITS %
Naphthalene	20	17.2	86	66 - 124
Ortho Xylene	20	19.6	98	81 - 121
Para-Isopropyltoluene	20	18.8	94	77 - 127
Sec-Butylbenzene	20	18.5	93	79 - 124
Styrene	20	20.3	102	82 - 122
Tert-Butylbenzene	20	18.4	92	78 - 124
Tetrachloroethylene	20	17.5	88	77 - 125
Tetrahydrofuran	20	21.1	106	67 - 124
Toluene	20	19.6	98	81 - 120
Trans-1,2-Dichloroethylene	20	19.1	96	80 - 121
Trichloroethylene	20	18.3	92	80 - 117
Trichlorofluoromethane	20	19.6	98	68 - 137
Vinyl Acetate	20	21.2	106	25 - 150
Vinyl Chloride	20	19.1	96	67 - 134
c-1,3-dichloropropene	20	21.4	107	73 - 133
cis-1,2-Dichloroethylene	20	19.8	99	82 - 122
t-1,3-Dichloropropene	20	21.8	109	69 - 127

Comments:

Lunt Silversmiths - Greenfield, MA

LABORATORY FORTIFIED DUPLICATE (LFB Dup) RECOVERY

COMPOUND	LFB Dup CONCENTRATION ug/Kg	LFB Dup RECOVERY %	RPD %	QC LIMITS RPD
1,1,1,2-Tetrachloroethane	20.1	101	2	50
1,1,1-Trichloroethane	20.6	103	3	50
1,1,2,2-Tetrachloroethane	19.4	97	5	50
1,1,2-Trichloro-1,2,2-Trifluoroetha	19.8	99	2	50
1,1,2-Trichloroethane	20.0	100	3	50
1,1-Dichloroethylene	19.8	99	2	52
1,1-Dichloropropene	19.4	97	5	50
1,1-dichloroethane	20.1	101	2	50
1,2,3-Trichlorobenzene	18.7	94	2	50
1,2,3-Trichloropropane	16.1	81	2	50
1,2,4-Trichlorobenzene	18.6	93	3	50
1,2,4-Trimethylbenzene	19.5	98	4	50
1,2-Dibromo-3-Chloropropane	19.1	96	4	50
1,2-Dibromoethane	19.0	95	4	50
1,2-Dichlorobenzene	18.8	94	1	50
1,2-Dichloroethane	19.7	99	3	50
1,2-Dichloropropane	19.3	97	0	50
1,3,5-Trimethylbenzene	19.2	96	3	50
1,3-Dichlorobenzene	19.0	95	2	50
1,3-Dichloropropane	19.2	96	2	50
1,4-Dichlorobenzene	18.6	93	3	50
2,2-Dichloropropane	21.1	106	4	50
2-Butanone (MEK)	19.5	98	5	50
2-Chlorotoluene	18.6	93	3	50
2-Hexanone	19.7	99	2	50
2-Propanone (acetone)	23.5	118	11	50
4-Chlorotoluene	19.4	97	4	50
4-Methyl-2-Pentanone(MIBK)	19.6	98	4	50
Acrylonitrile	22.6	113	5	50
Benzene	20.0	100	2	50
Bromobenzene	18.8	94	1	50
Bromochloromethane	19.4	97	4	50
Bromodichloromethane	19.9	100	2	50
Bromoform	20.8	104	4	50
Bromomethane	18.0	90	6	50
Carbon Disulfide	19.8	99	3	50
Carbon tetrachloride	21.0	105	4	50
Chlorobenzene	20.1	101	0	34
Chloroethane	19.0	95	1	50
Chloroform	20.2	101	1	50
Chloromethane	19.0	95	1	50
Dibromochloromethane	21.3	107	3	50
Dibromomethane	18.6	93	5	50
Dichlorodifluoromethane	17.6	88	2	50
Ethyl Ether	17.9	90	8	50
Ethylbenzene	19.6	98	3	50
Hexachlorobutadiene	19.4	97	5	50
Isopropylbenzene	19.3	97	5	50
M/P Xylene	39.6	99	3	50
Methyl-t-Butyl Ether	22.3	112	8	50
Methylene Chloride	20.4	102	3	50

Lunt Silversmiths - Greenfield, MA

LABORATORY FORTIFIED DUPLICATE (LFB Dup) RECOVERY

COMPOUND	LFB Dup CONCENTRATION ug/Kg	LFB Dup RECOVERY %	RPD %	QC LIMITS RPD
N-Butylbenzene	19.2	96	5	50
N-Propylbenzene	19.1	96	5	50
Naphthalene	17.5	88	2	50
Ortho Xylene	19.8	99	1	50
Para-Isopropyltoluene	19.6	98	4	50
Sec-Butylbenzene	19.3	97	4	50
Styrene	20.4	102	1	50
Tert-Butylbenzene	19.2	96	4	50
Tetrachloroethylene	18.6	93	6	50
Tetrahydrofuran	20.1	101	5	50
Toluene	20.0	100	2	50
Trans-1,2-Dichloroethylene	21.5	108	12	50
Trichloroethylene	18.8	94	3	27
Trichlorofluoromethane	19.9	100	2	50
Vinyl Acetate	20.2	101	5	50
Vinyl Chloride	19.6	98	3	50
c-1,3-dichloropropene	21.0	105	2	50
cis-1,2-Dichloroethylene	20.0	100	1	50
t-1,3-Dichloropropene	21.3	107	2	50

Samples in Batch: AB57902, AB57903, AB57904, AB57905, AB57906, AB57907, AB57908, AB57909

PN 15080026

Weston Solutions, Inc.
Andover, MA

CHAIN OF CUSTODY RECORD
Lunt Silversmiths/MA
Contact Name: Ken Robinson
Contact Phone: (978) 621-1208

No: 08/14/15-0011
Cooler #:
Lab: NERL
Lab Phone:

15080026 $VOAHS
15080026 $METMS_PE

Lab #	Sample #	Location	Analyses	Matrix	EventID	Numb Cont	Container	Volume (Methanol / mS)	UOM / gms
	R120150528WC-0066	Grid-13-B	Metals	Soil	8/11/2015	1	4 oz		
	R120150528WC-0066	Grid-13-B	VOC	Soil	8/11/2015	1	40 mL	10	17.38
	R120150528WC-0068	Grid-13-D	Metals	Soil	8/12/2015	1	4 oz		
	R120150528WC-0068	Grid-13-D	VOC	Soil	8/12/2015	1	40 mL	10	18.27
	R120150528WC-0070	Grid-14-D	Metals	Soil	8/10/2015	1	4 oz		
	R120150528WC-0070	Grid-14-D	VOC	Soil	8/10/2015	1	40 mL	10	14.40
	R120150528WC-0067	Grid-15-B	Metals	Soil	8/12/2015	1	4 oz		
	R120150528WC-0067	Grid-15-B	VOC	Soil	8/12/2015	1	40 mL	10	15.51
	R120150528WC-0065	Grid-16-D	Metals	Soil	8/12/2015	1	4 oz		
	R120150528WC-0065	Grid-16-D	VOC	Soil	8/12/2015	1	40 mL	10	19.62
	R120150528WC-0064	Grid-17-B	Metals	Soil	8/13/2015	1	4 oz		
	R120150528WC-0064	Grid-17-B	VOC	Soil	8/13/2015	1	40 mL	10	10.80
	R120150528WC-0063	Grid-18-B	Metals	Soil	8/13/2015	1	4 oz		
	R120150528WC-0063	Grid-18-B	VOC	Soil	8/13/2015	1	40 mL	10	17.56
	R120150528WC-0069	MB-05	VOC	Blank	8/13/2015	1	40mL	10	—

Special Instructions: Please forward results to OSC Wing Chau. Thank you.

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	Weston	14 AUG 2015 0852		14 Aug. 2015 0853	
		8/14/15 1114hrs	ESAT	8/14/15 11:14 DG	3°C

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

September 08, 2015

Wing Chau - Mail Code OSRR02-2
US EPA New England R1

Project Number: 15080026
Project: Lunt Silversmiths - Greenfield, MA
Analysis: Metals in Soil Medium Level by ICP
EPA Chemist: Michael Dowling

Date Samples Received by the Laboratory: 08/14/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-OPTIMASO1.

Samples were prepared following the EPA Region I SOP, EIASOP-INGMETALSPREP8

Preparation and analysis SOP's are based on "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, Revision 2, Final Update III, Methods 3050B and 6010B," respectively. Samples were analyzed using a Perkin Elmer Dual View Inductively Coupled Plasma - Optical Emission Spectrometer.

Samples were prepared and analyzed by ESAT contractors working at the USEPA New England Laboratory.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA, email=boudreau.dan@epa.gov, c=US
Date: 2015.09.08 09:17:11 -04'00'

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

Sample results reported in mg/Kg, dry weight units.

Note: All lead (Pb) results reported from the analysis of 8/24/2015.

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0066	Lab Sample ID:	AB57902
Date of Collection:	8/11/2015	Matrix:	Soil
Date of Preparation:	8/18/2015	Amount Prepared:	N/A
Date of Analysis:	8/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**2.4**	1.0	
7429-90-5	Aluminum	**8900**	11	
7440-38-2	Arsenic	**29**	2.0	
7440-39-3	Barium	**41**	2.0	
7440-41-7	Beryllium	ND	0.80	
7440-70-2	Calcium	**1400**	10	
7440-43-9	Cadmium	ND	1.0	
7440-48-4	Cobalt	**4.5**	2.0	
7440-47-3	Chromium	**16**	2.0	
7440-50-8	Copper	**570**	2.0	
7439-89-6	Iron	**21000**	4.0	
7439-95-4	Magnesium	**2200**	10	
7439-96-5	Manganese	**98**	2.0	J1
7440-02-0	Nickel	**15**	2.0	
7439-92-1	Lead	**2500**	10	
7440-36-0	Antimony	**86**	2.0	J1
7782-49-2	Selenium	ND	4.0	
7440-28-0	Thallium	ND	4.0	
7440-62-2	Vanadium	**24**	2.0	
7440-66-6	Zinc	**45**	2.0	

Comments: Result for lead (Pb) reported from the 5x dilution of 8/24/2015.

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0068	Lab Sample ID:	AB57903
Date of Collection:	8/12/2015	Matrix:	Soil
Date of Preparation:	8/18/2015	Amount Prepared:	N/A
Date of Analysis:	8/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	15
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	ND	16	
7429-90-5	Aluminum	**10000**	170	
7440-38-2	Arsenic	**32**	32	
7440-39-3	Barium	**59**	32	
7440-41-7	Beryllium	ND	13	
7440-70-2	Calcium	**2200**	160	
7440-43-9	Cadmium	ND	16	
7440-48-4	Cobalt	ND	32	
7440-47-3	Chromium	ND	32	
7440-50-8	Copper	**1700**	32	
7439-89-6	Iron	**15000**	64	
7439-95-4	Magnesium	**2500**	160	
7439-96-5	Manganese	**91**	32	
7440-02-0	Nickel	ND	32	
7439-92-1	Lead	**28000**	42	
7440-36-0	Antimony	**670**	32	J3
7782-49-2	Selenium	ND	64	
7440-28-0	Thallium	ND	64	
7440-62-2	Vanadium	**23**	32	
7440-66-6	Zinc	**170**	32	J3

Comments: Result for lead (Pb) reported from the20x dilution of 8/24/2015.

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0070	Lab Sample ID:	AB57904
Date of Collection:	8/10/2015	Matrix:	Soil
Date of Preparation:	8/18/2015	Amount Prepared:	N/A
Date of Analysis:	8/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**3.2**	1.1	
7429-90-5	Aluminum	**7400**	12	
7440-38-2	Arsenic	**16**	2.1	
7440-39-3	Barium	**46**	2.1	
7440-41-7	Beryllium	ND	0.85	
7440-70-2	Calcium	**1200**	11	
7440-43-9	Cadmium	ND	1.1	
7440-48-4	Cobalt	**3.9**	2.1	
7440-47-3	Chromium	**14**	2.1	
7440-50-8	Copper	**350**	2.1	
7439-89-6	Iron	**15000**	4.2	
7439-95-4	Magnesium	**2600**	11	
7439-96-5	Manganese	**95**	2.1	
7440-02-0	Nickel	**33**	2.1	
7439-92-1	Lead	**1100**	4.2	
7440-36-0	Antimony	**26**	2.1	
7782-49-2	Selenium	ND	4.2	
7440-28-0	Thallium	ND	4.2	
7440-62-2	Vanadium	**17**	2.1	
7440-66-6	Zinc	**56**	2.1	

Comments: Result for lead (Pb) reported from the 2x dilution of 8/24/2015.

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0067	Lab Sample ID:	AB57905
Date of Collection:	8/12/2015	Matrix:	Soil
Date of Preparation:	8/18/2015	Amount Prepared:	N/A
Date of Analysis:	8/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**43**	1.0	
7429-90-5	Aluminum	**6500**	11	
7440-38-2	Arsenic	**77**	2.0	
7440-39-3	Barium	**58**	2.0	
7440-41-7	Beryllium	ND	0.82	
7440-70-2	Calcium	**1100**	10	
7440-43-9	Cadmium	**1.1**	1.0	
7440-48-4	Cobalt	**4.4**	2.0	
7440-47-3	Chromium	**15**	2.0	
7440-50-8	Copper	**290**	2.0	
7439-89-6	Iron	**24000**	4.1	
7439-95-4	Magnesium	**2300**	10	
7439-96-5	Manganese	**130**	2.0	
7440-02-0	Nickel	**18**	2.0	
7439-92-1	Lead	**1500**	6.1	
7440-36-0	Antimony	**52**	2.0	
7782-49-2	Selenium	ND	4.1	
7440-28-0	Thallium	ND	4.1	
7440-62-2	Vanadium	**68**	2.0	
7440-66-6	Zinc	**110**	2.0	

Comments: Result for lead (Pb) reported from the 3x dilution of 8/24/2015.

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0065	Lab Sample ID:	AB57906
Date of Collection:	8/12/2015	Matrix:	Soil
Date of Preparation:	8/18/2015	Amount Prepared:	N/A
Date of Analysis:	8/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	5
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	ND	5.4	
7429-90-5	Aluminum	**23000**	60	
7440-38-2	Arsenic	**39**	11	
7440-39-3	Barium	**130**	11	
7440-41-7	Beryllium	ND	4.4	
7440-70-2	Calcium	**1700**	54	
7440-43-9	Cadmium	ND	5.4	
7440-48-4	Cobalt	ND	11	
7440-47-3	Chromium	**33**	11	
7440-50-8	Copper	**50**	11	
7439-89-6	Iron	**41000**	22	
7439-95-4	Magnesium	**7700**	54	
7439-96-5	Manganese	**230**	11	
7440-02-0	Nickel	**42**	11	
7439-92-1	Lead	**39**	8.7	
7440-36-0	Antimony	ND	11	
7782-49-2	Selenium	ND	22	
7440-28-0	Thallium	ND	22	
7440-62-2	Vanadium	**47**	11	
7440-66-6	Zinc	**110**	11	

Comments: Result for lead (Pb) reported from the 4x dilution of 8/24/2015.

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0064	Lab Sample ID:	AB57907
Date of Collection:	8/13/2015	Matrix:	Soil
Date of Preparation:	8/18/2015	Amount Prepared:	N/A
Date of Analysis:	8/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**9.0**	0.98	
7429-90-5	Aluminum	**5800**	11	
7440-38-2	Arsenic	**49**	2.0	
7440-39-3	Barium	**28**	2.0	
7440-41-7	Beryllium	ND	0.78	
7440-70-2	Calcium	**900**	9.8	
7440-43-9	Cadmium	**37**	0.98	
7440-48-4	Cobalt	**3.1**	2.0	
7440-47-3	Chromium	**12**	2.0	
7440-50-8	Copper	**37**	2.0	
7439-89-6	Iron	**17000**	3.9	
7439-95-4	Magnesium	**2300**	9.8	
7439-96-5	Manganese	**100**	2.0	
7440-02-0	Nickel	**13**	2.0	
7439-92-1	Lead	**130**	2.0	
7440-36-0	Antimony	**7.7**	2.0	
7782-49-2	Selenium	ND	3.9	
7440-28-0	Thallium	ND	3.9	
7440-62-2	Vanadium	**17**	2.0	
7440-66-6	Zinc	**69**	2.0	

Comments: Result for lead (Pb) reported from the 1x analysis of 8/24/2015.

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0063	Lab Sample ID:	AB57908
Date of Collection:	8/13/2015	Matrix:	Soil
Date of Preparation:	8/18/2015	Amount Prepared:	N/A
Date of Analysis:	8/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	2
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**6.7**	2.0	
7429-90-5	Aluminum	**9800**	22	
7440-38-2	Arsenic	**44**	4.0	
7440-39-3	Barium	**63**	4.0	
7440-41-7	Beryllium	ND	1.6	
7440-70-2	Calcium	**1300**	20	
7440-43-9	Cadmium	ND	2.0	
7440-48-4	Cobalt	**6.0**	4.0	
7440-47-3	Chromium	**18**	4.0	
7440-50-8	Copper	**880**	4.0	
7439-89-6	Iron	**31000**	8.0	
7439-95-4	Magnesium	**2600**	20	
7439-96-5	Manganese	**160**	4.0	
7440-02-0	Nickel	**24**	4.0	
7439-92-1	Lead	**2600**	10	
7440-36-0	Antimony	**44**	4.0	
7782-49-2	Selenium	ND	8.0	
7440-28-0	Thallium	ND	8.0	
7440-62-2	Vanadium	**32**	4.0	
7440-66-6	Zinc	**66**	4.0	

Comments: Result for lead (Pb) reported from the 5x dilution of 8/24/2015.

Lunt Silversmiths - Greenfield, MA

Laboratory Reagent Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	8/18/2015	Amount Prepared:	N/A
Date of Analysis:	8/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
7440-22-4	Silver	ND	10	
7429-90-5	Aluminum	ND	110	
7440-38-2	Arsenic	ND	20	
7440-39-3	Barium	ND	20	
7440-41-7	Beryllium	ND	8.0	
7440-70-2	Calcium	ND	100	
7440-43-9	Cadmium	ND	10	
7440-48-4	Cobalt	ND	20	
7440-47-3	Chromium	ND	20	
7440-50-8	Copper	ND	20	
7439-89-6	Iron	ND	40	
7439-95-4	Magnesium	ND	100	
7439-96-5	Manganese	ND	20	
7440-02-0	Nickel	ND	20	
7439-92-1	Lead	ND	20	
7440-36-0	Antimony	ND	20	
7782-49-2	Selenium	ND	40	
7440-28-0	Thallium	ND	40	
7440-62-2	Vanadium	ND	20	
7440-66-6	Zinc	ND	20	

Comments: Result for lead (Pb) reported from the analysis of 8/24/2015.

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB57902

PARAMETER	SPIKE ADDED mg/Kg	SAMPLE CONCENTRATION mg/Kg	MS CONCENTRATION mg/Kg	MS % REC	QC LIMITS (% REC)
Antimony	100	86.0	94.5	9	75 - 125
Arsenic	100	29.0	138	109	75 - 125
Barium	100	41.0	161	120	75 - 125
Beryllium	40.0	ND	41.4	104	75 - 125
Cadmium	50.0	ND	48.9	98	75 - 125
Chromium	100	16.0	117	101	75 - 125
Cobalt	100	4.5	106	102	75 - 125
Copper	100	570	628	R	75 - 125
Lead	100	2500	1900	R	75 - 125
Manganese	100	98.0	259	161	75 - 125
Nickel	100	15.0	116	101	75 - 125
Selenium	100	ND	97.9	98	75 - 125
Silver	20.0	2.4	23.1	104	75 - 125
Thallium	100	ND	97.7	98	75 - 125
Vanadium	100	24.0	128	104	75 - 125
Zinc	100	45.0	140	95	75 - 125

Lunt Silversmiths - Greenfield, MA

Laboratory Duplicate Results

Sample ID: AB57903

PARAMETER	SAMPLE RESULT mg/Kg	SAMPLE DUPLICATE RESULT mg/Kg	PRECISION RPD %	QC LIMITS
Aluminum	10000	11000	9.5	30
Antimony	670	360	60	30
Arsenic	32.0	ND	NC	30
Barium	59.0	57	3.4	30
Beryllium	ND	ND	NC	30
Cadmium	ND	ND	NC	30
Calcium	2200	2200	0	30
Chromium	ND	ND	NC	30
Cobalt	ND	ND	NC	30
Copper	1700	2100	21	30
Iron	15000	15000	0	30
Lead	28000	25000	11	30
Magnesium	2500	2300	8.3	30
Manganese	91.0	92	1.1	30
Nickel	ND	ND	NC	30
Selenium	ND	ND	NC	30
Silver	ND	ND	NC	30
Thallium	ND	ND	NC	30
Vanadium	23.0	ND	NC	30
Zinc	170	580	110	30

Lunt Silversmiths - Greenfield, MA

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/L	LFB RESULT ug/L	LFB RECOVERY %	QC LIMITS %
Aluminum	1000	1040	104	85 - 115
Antimony	1000	985	99	85 - 115
Arsenic	1000	984	98	85 - 115
Barium	1000	999	100	85 - 115
Beryllium	400	403	101	85 - 115
Cadmium	500	503	101	85 - 115
Calcium	10000	9940	99	85 - 115
Chromium	1000	1030	103	85 - 115
Cobalt	1000	1020	102	85 - 115
Copper	1000	1050	105	85 - 115
Iron	1000	1030	103	85 - 115
Lead	1000	1010	101	85 - 115
Magnesium	10000	9980	100	85 - 115
Manganese	1000	1010	101	85 - 115
Nickel	1000	1020	102	85 - 115
Selenium	1000	955	96	85 - 115
Silver	200	200	100	85 - 115
Thallium	1000	1020	102	85 - 115
Vanadium	1000	1040	104	85 - 115
Zinc	1000	1010	101	85 - 115

Comments:

Lunt Silversmiths - Greenfield, MA

Solid Laboratory Control Sample (LCS) Results

PARAMETER	LCS RESULTS mg/Kg	CONTROL LIMITS mg/Kg
Aluminum	9280	2780 - 12100
Antimony	68.3	19.5 - 230
Arsenic	145	97.8 - 195
Barium	204	149 - 258
Beryllium	98.1	71.6 - 121
Cadmium	93.2	70.3 - 122
Calcium	6160	4460 - 7630
Chromium	143	95.1 - 176
Cobalt	152	110 - 185
Copper	180	127 - 210
Iron	16600	4930 - 23300
Lead	131	97.0 - 170
Magnesium	3030	1820 - 3780
Manganese	301	221 - 373
Nickel	126	89.9 - 158
Selenium	179	120 - 233
Silver	40.8	26.6 - 53.9
Thallium	139	94.0 - 182
Vanadium	119	71.1 - 143
Zinc	196	132 - 247

Comments:

Samples in Batch: AB57902, AB57903, AB57904, AB57905, AB57906, AB57907, AB57908

PN 15080026

Weston Solutions, Inc.
Andover, MA

CHAIN OF CUSTODY RECORD
Lunt Silversmiths/MA
Contact Name: Ken Robinson
Contact Phone: (978) 621-1208

No: 08/14/15-0011
Cooler #:
Lab: NERL
Lab Phone:

15080026 $VOAHS
15080026 $METMS_PE

Lab #	Sample #	Location	Analyses	Matrix	EventID	Numb Cont	Container	Volume (Methanol / ~~Volumes~~ mls)	UOM (g/mls)
	R120150528WC-0066	Grid-13-B	Metals	Soil	8/11/2015	1	4 oz		
	R120150528WC-0066	Grid-13-B	VOC	Soil	8/11/2015	1	40 mL	10	17.38
	R120150528WC-0068	Grid-13-D	Metals	Soil	8/12/2015	1	4 oz		
	R120150528WC-0068	Grid-13-D	VOC	Soil	8/12/2015	1	40 mL	10	18.27
	R120150528WC-0070	Grid-14-D	Metals	Soil	8/10/2015	1	4 oz		
	R120150528WC-0070	Grid-14-D	VOC	Soil	8/10/2015	1	40 mL	10	14.40
	R120150528WC-0067	Grid-15-B	Metals	Soil	8/12/2015	1	4 oz		
	R120150528WC-0067	Grid-15-B	VOC	Soil	8/12/2015	1	40 mL	10	15.51
	R120150528WC-0065	Grid-16-D	Metals	Soil	8/12/2015	1	4 oz		
	R120150528WC-0065	Grid-16-D	VOC	Soil	8/12/2015	1	40 mL	10	19.62
	R120150528WC-0064	Grid-17-B	Metals	Soil	8/13/2015	1	4 oz		
	R120150528WC-0064	Grid-17-B	VOC	Soil	8/13/2015	1	40 mL	10	10.80
	R120150528WC-0063	Grid-18-B	Metals	Soil	8/13/2015	1	4 oz		
	R120150528WC-0063	Grid-18-B	VOC	Soil	8/13/2015	1	40 mL	10	17.56
	R120150528WC-0069	MB-05	VOC	Blank	8/13/2015	1	40mL	10	—

Special Instructions: Please forward results to OSC Wing Chau. Thank you.

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	Weston	14 AUG 2015 0852		14 Aug. 2015 0853	
		8/14/15 1114hrs	ESAT	8/14/15 11:14 DG	3°C

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

August 31, 2015

Wing Chau - Mail Code OSRR02-2
US EPA New England R1

Project Number: 15080027
Project: Lunt Silversmiths - Greenfield, MA
Analysis: Volatile Organic Analysis of Soil
Analyst: Scott Clifford

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-FLDVOA2.

Soil samples were collected in 40 mL vials, and preserved in methanol. The samples were analyzed using a Shimadzu gas chromatograph equipped with a 30 meter, 0.53 mm id. column, with electron capture and photoionization detectors. Concentrations of volatile organics were calculated using the external standard technique. Results are reported on a wet weight basis.

Analytes reported by this field method should be treated as tentatively identified compounds and concentrations are approximate.

Date Samples Received by the Laboratory: 8/14/15

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

Results for soil samples are reported on a dry weight basis.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA, email=boudreau.dan@epa.gov, c=US
Date: 2015.08.31 09:45:43 -04'00'

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Lunt Silversmiths - Greenfield, MA

Volatile Organic Analysis of Soil

Lab Sample ID	Client Sample ID	Tetrachloroethylene ug/Kg	Trichloroethylene ug/Kg
AB57928	Grid-14D	93	5800
AB57929	Grid-13B	10	4100
AB57930	Grid-13D	65	3600
AB57931	Grid-15B	8	7300
AB57932	Grid-16B	63	19000
AB57933	Grid-16D	ND (35)	130
AB57934	Grid-17B	ND (35)	310
AB57935	Grid-18B	ND (35)	25
AB57936	MB-05	ND (35)	ND (25)
AB57937	Grid-20B	ND (35)	120
AB57938	Grid-19B	ND (35)	270
AB57939	19 sidewall	ND (35)	84
AB57940	20 sidewall	ND (35)	2700

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

August 31, 2015

Wing Chau - Mail Code OSRR02-2
US EPA New England R1

Project Number: 15080040
Project: Lunt Silversmiths - Greenfield, MA
Analysis: VOAs in Soil High Level Method
EPA Chemist: Joseph Montanaro

Date Samples Received by the Laboratory: 08/20/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-VOAGCMS9.

Samples were analyzed by GC/MS. Samples were introduced to the GC via a Tekmar preconcentrator and an Archon auto-sampler. The analysis SOP is based on US EPA Method 8260B, revision 2.0, 1996 and Method 5035A, draft revision 1, 2002, from SW-846.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA, email=boudreau.dan@epa.gov, c=US
Date: 2015.08.31 09:23:05 -04'00'

15080040$VOAHS

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0076	Lab Sample ID:	AB58059
Date of Collection:	8/19/2015	Matrix:	Soil
Date of Preparation:	8/22/2015	Amount Prepared:	5 mL
Date of Analysis:	8/22/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	50
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	50	
75-01-4	Vinyl Chloride	ND	50	
74-83-9	Bromomethane	ND	50	
75-00-3	Chloroethane	ND	50	
75-69-4	Trichlorofluoromethane	ND	50	
60-29-7	Ethyl Ether	ND	50	
67-64-1	2-Propanone (acetone)	ND	50	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	50	
75-35-4	1,1-Dichloroethylene	ND	50	
75-15-0	Carbon Disulfide	ND	50	
75-71-8	Dichlorodifluoromethane	ND	50	
75-09-2	Methylene Chloride	ND	50	
107-13-1	Acrylonitrile	ND	50	
1634-04-4	Methyl-t-Butyl Ether	ND	50	
156-60-5	Trans-1,2-Dichloroethylene	ND	50	
75-34-3	1,1-dichloroethane	ND	50	
108-05-4	Vinyl Acetate	ND	50	
78-93-3	2-Butanone (MEK)	ND	50	
594-20-7	2,2-Dichloropropane	ND	50	
156-59-2	cis-1,2-Dichloroethylene	ND	50	
67-66-3	Chloroform	ND	50	
74-97-5	Bromochloromethane	ND	50	
109-99-9	Tetrahydrofuran	ND	50	
71-55-6	1,1,1-Trichloroethane	ND	50	
107-06-2	1,2-Dichloroethane	ND	50	
56-23-5	Carbon tetrachloride	ND	50	
71-43-2	Benzene	ND	50	
10061-01-5	c-1,3-dichloropropene	ND	50	
108-88-3	Toluene	ND	50	
10061-02-6	t-1,3-Dichloropropene	ND	50	
79-00-5	1,1,2-Trichloroethane	ND	50	
124-48-1	Dibromochloromethane	ND	50	
108-90-7	Chlorobenzene	ND	50	
563-58-6	1,1-Dichloropropene	ND	50	
79-01-6	Trichloroethylene	ND	50	
78-87-5	1,2-Dichloropropane	ND	50	
75-27-4	Bromodichloromethane	ND	50	
74-95-3	Dibromomethane	ND	50	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	50	
142-28-9	1,3-Dichloropropane	ND	50	
127-18-4	Tetrachloroethylene	ND	50	
106-93-4	1,2-Dibromoethane	ND	50	
591-78-6	2-Hexanone	ND	50	
630-20-6	1,1,1,2-Tetrachloroethane	ND	50	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0076	Lab Sample ID:	AB58059
Date of Collection:	8/19/2015	Matrix:	Soil
Date of Preparation:	8/22/2015	Amount Prepared:	5 mL
Date of Analysis:	8/22/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	50
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	50	
108-38-3/106-42-3	M/P Xylene	ND	100	
95-47-6	Ortho Xylene	ND	50	
100-42-5	Styrene	ND	50	
75-25-2	Bromoform	ND	50	
79-34-5	1,1,2,2-Tetrachloroethane	ND	50	
98-82-8	Isopropylbenzene	ND	50	
108-86-1	Bromobenzene	ND	50	
96-18-4	1,2,3-Trichloropropane	ND	50	
103-65-1	N-Propylbenzene	ND	50	
95-49-8	2-Chlorotoluene	ND	50	
106-43-4	4-Chlorotoluene	ND	50	
98-06-6	Tert-Butylbenzene	ND	50	
108-67-8	1,3,5-Trimethylbenzene	ND	50	
95-63-6	1,2,4-Trimethylbenzene	ND	50	
135-98-8	Sec-Butylbenzene	ND	50	
541-73-1	1,3-Dichlorobenzene	ND	50	
99-87-6	Para-Isopropyltoluene	ND	50	
106-46-7	1,4-Dichlorobenzene	ND	50	
95-50-1	1,2-Dichlorobenzene	ND	50	
104-51-8	N-Butylbenzene	ND	50	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	50	
120-82-1	1,2,4-Trichlorobenzene	ND	50	
87-68-3	Hexachlorobutadiene	ND	50	
91-20-3	Naphthalene	ND	50	
87-61-6	1,2,3-Trichlorobenzene	ND	50	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	104	74 - 136
Toluene-D8	108	85 - 118
1,4-Bromofluorobenzene	104	78 - 111

Comments: Methanol blank sample is reported in ug/L.

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0071	Lab Sample ID:	AB58060
Date of Collection:	8/18/2015	Matrix:	Soil
Date of Preparation:	8/22/2015	Amount Prepared:	5 mL
Date of Analysis:	8/22/2015	Percent Solids:	73%
Dry Weight Prepared:	13.62 grams	Extract Dilution:	50
Wet Weight Prepared:	18.67 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	55	
75-01-4	Vinyl Chloride	ND	55	
74-83-9	Bromomethane	ND	55	
75-00-3	Chloroethane	ND	55	
75-69-4	Trichlorofluoromethane	ND	55	
60-29-7	Ethyl Ether	ND	55	
67-64-1	2-Propanone (acetone)	ND	55	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	55	
75-35-4	1,1-Dichloroethylene	ND	55	
75-15-0	Carbon Disulfide	ND	55	
75-71-8	Dichlorodifluoromethane	ND	55	
75-09-2	Methylene Chloride	ND	55	
107-13-1	Acrylonitrile	ND	55	
1634-04-4	Methyl-t-Butyl Ether	ND	55	
156-60-5	Trans-1,2-Dichloroethylene	ND	55	
75-34-3	1,1-dichloroethane	ND	55	
108-05-4	Vinyl Acetate	ND	55	
78-93-3	2-Butanone (MEK)	ND	55	
594-20-7	2,2-Dichloropropane	ND	55	
156-59-2	cis-1,2-Dichloroethylene	ND	55	
67-66-3	Chloroform	ND	55	
74-97-5	Bromochloromethane	ND	55	
109-99-9	Tetrahydrofuran	ND	55	
71-55-6	1,1,1-Trichloroethane	ND	55	
107-06-2	1,2-Dichloroethane	ND	55	
56-23-5	Carbon tetrachloride	ND	55	
71-43-2	Benzene	ND	55	
10061-01-5	c-1,3-dichloropropene	ND	55	
108-88-3	Toluene	ND	55	
10061-02-6	t-1,3-Dichloropropene	ND	55	
79-00-5	1,1,2-Trichloroethane	ND	55	
124-48-1	Dibromochloromethane	ND	55	
108-90-7	Chlorobenzene	ND	55	
563-58-6	1,1-Dichloropropene	ND	55	
79-01-6	Trichloroethylene	**130**	55	
78-87-5	1,2-Dichloropropane	ND	55	
75-27-4	Bromodichloromethane	ND	55	
74-95-3	Dibromomethane	ND	55	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	55	
142-28-9	1,3-Dichloropropane	ND	55	
127-18-4	Tetrachloroethylene	ND	55	
106-93-4	1,2-Dibromoethane	ND	55	
591-78-6	2-Hexanone	ND	55	
630-20-6	1,1,1,2-Tetrachloroethane	ND	55	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0071	Lab Sample ID:	AB58060
Date of Collection:	8/18/2015	Matrix:	Soil
Date of Preparation:	8/22/2015	Amount Prepared:	5 mL
Date of Analysis:	8/22/2015	Percent Solids:	73%
Dry Weight Prepared:	13.62 grams	Extract Dilution:	50
Wet Weight Prepared:	18.67 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	55	
108-38-3/106-42-3	M/P Xylene	ND	110	
95-47-6	Ortho Xylene	ND	55	
100-42-5	Styrene	ND	55	
75-25-2	Bromoform	ND	55	
79-34-5	1,1,2,2-Tetrachloroethane	ND	55	
98-82-8	Isopropylbenzene	ND	55	
108-86-1	Bromobenzene	ND	55	
96-18-4	1,2,3-Trichloropropane	ND	55	
103-65-1	N-Propylbenzene	ND	55	
95-49-8	2-Chlorotoluene	ND	55	
106-43-4	4-Chlorotoluene	ND	55	
98-06-6	Tert-Butylbenzene	ND	55	
108-67-8	1,3,5-Trimethylbenzene	ND	55	
95-63-6	1,2,4-Trimethylbenzene	ND	55	
135-98-8	Sec-Butylbenzene	ND	55	
541-73-1	1,3-Dichlorobenzene	ND	55	
99-87-6	Para-Isopropyltoluene	ND	55	
106-46-7	1,4-Dichlorobenzene	ND	55	
95-50-1	1,2-Dichlorobenzene	ND	55	
104-51-8	N-Butylbenzene	ND	55	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	55	
120-82-1	1,2,4-Trichlorobenzene	ND	55	
87-68-3	Hexachlorobutadiene	ND	55	
91-20-3	Naphthalene	ND	55	
87-61-6	1,2,3-Trichlorobenzene	ND	55	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	102	74 - 136
Toluene-D8	98	85 - 118
1,4-Bromofluorobenzene	94	78 - 111

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0072	Lab Sample ID:	AB58061
Date of Collection:	8/18/2015	Matrix:	Soil
Date of Preparation:	8/22/2015	Amount Prepared:	5 mL
Date of Analysis:	8/22/2015	Percent Solids:	83%
Dry Weight Prepared:	14.52 grams	Extract Dilution:	50
Wet Weight Prepared:	17.42 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	45	
75-01-4	Vinyl Chloride	ND	45	
74-83-9	Bromomethane	ND	45	
75-00-3	Chloroethane	ND	45	
75-69-4	Trichlorofluoromethane	ND	45	
60-29-7	Ethyl Ether	ND	45	
67-64-1	2-Propanone (acetone)	ND	45	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	45	
75-35-4	1,1-Dichloroethylene	ND	45	
75-15-0	Carbon Disulfide	ND	45	
75-71-8	Dichlorodifluoromethane	ND	45	
75-09-2	Methylene Chloride	ND	45	
107-13-1	Acrylonitrile	ND	45	
1634-04-4	Methyl-t-Butyl Ether	ND	45	
156-60-5	Trans-1,2-Dichloroethylene	ND	45	
75-34-3	1,1-dichloroethane	ND	45	
108-05-4	Vinyl Acetate	ND	45	
78-93-3	2-Butanone (MEK)	ND	45	
594-20-7	2,2-Dichloropropane	ND	45	
156-59-2	cis-1,2-Dichloroethylene	ND	45	
67-66-3	Chloroform	ND	45	
74-97-5	Bromochloromethane	ND	45	
109-99-9	Tetrahydrofuran	ND	45	
71-55-6	1,1,1-Trichloroethane	ND	45	
107-06-2	1,2-Dichloroethane	ND	45	
56-23-5	Carbon tetrachloride	ND	45	
71-43-2	Benzene	ND	45	
10061-01-5	c-1,3-dichloropropene	ND	45	
108-88-3	Toluene	ND	45	
10061-02-6	t-1,3-Dichloropropene	ND	45	
79-00-5	1,1,2-Trichloroethane	ND	45	
124-48-1	Dibromochloromethane	ND	45	
108-90-7	Chlorobenzene	ND	45	
563-58-6	1,1-Dichloropropene	ND	45	
79-01-6	Trichloroethylene	ND	45	
78-87-5	1,2-Dichloropropane	ND	45	
75-27-4	Bromodichloromethane	ND	45	
74-95-3	Dibromomethane	ND	45	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	45	
142-28-9	1,3-Dichloropropane	ND	45	
127-18-4	Tetrachloroethylene	ND	45	
106-93-4	1,2-Dibromoethane	ND	45	
591-78-6	2-Hexanone	ND	45	
630-20-6	1,1,1,2-Tetrachloroethane	ND	45	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0072	Lab Sample ID:	AB58061
Date of Collection:	8/18/2015	Matrix:	Soil
Date of Preparation:	8/22/2015	Amount Prepared:	5 mL
Date of Analysis:	8/22/2015	Percent Solids:	83%
Dry Weight Prepared:	14.52 grams	Extract Dilution:	50
Wet Weight Prepared:	17.42 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	45	
108-38-3/106-42-3	M/P Xylene	ND	89	
95-47-6	Ortho Xylene	ND	45	
100-42-5	Styrene	ND	45	
75-25-2	Bromoform	ND	45	
79-34-5	1,1,2,2-Tetrachloroethane	ND	45	
98-82-8	Isopropylbenzene	ND	45	
108-86-1	Bromobenzene	ND	45	
96-18-4	1,2,3-Trichloropropane	ND	45	
103-65-1	N-Propylbenzene	ND	45	
95-49-8	2-Chlorotoluene	ND	45	
106-43-4	4-Chlorotoluene	ND	45	
98-06-6	Tert-Butylbenzene	ND	45	
108-67-8	1,3,5-Trimethylbenzene	ND	45	
95-63-6	1,2,4-Trimethylbenzene	ND	45	
135-98-8	Sec-Butylbenzene	ND	45	
541-73-1	1,3-Dichlorobenzene	ND	45	
99-87-6	Para-Isopropyltoluene	ND	45	
106-46-7	1,4-Dichlorobenzene	ND	45	
95-50-1	1,2-Dichlorobenzene	ND	45	
104-51-8	N-Butylbenzene	ND	45	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	45	
120-82-1	1,2,4-Trichlorobenzene	ND	45	
87-68-3	Hexachlorobutadiene	ND	45	
91-20-3	Naphthalene	ND	45	
87-61-6	1,2,3-Trichlorobenzene	ND	45	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	105	74 - 136
Toluene-D8	116	85 - 118
1,4-Bromofluorobenzene	97	78 - 111

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0073	Lab Sample ID:	AB58062
Date of Collection:	8/18/2015	Matrix:	Soil
Date of Preparation:	8/22/2015	Amount Prepared:	5 mL
Date of Analysis:	8/22/2015	Percent Solids:	83%
Dry Weight Prepared:	13.79 grams	Extract Dilution:	50
Wet Weight Prepared:	16.63 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	47	
75-01-4	Vinyl Chloride	ND	47	
74-83-9	Bromomethane	ND	47	
75-00-3	Chloroethane	ND	47	
75-69-4	Trichlorofluoromethane	ND	47	
60-29-7	Ethyl Ether	ND	47	
67-64-1	2-Propanone (acetone)	ND	47	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	47	
75-35-4	1,1-Dichloroethylene	ND	47	
75-15-0	Carbon Disulfide	ND	47	
75-71-8	Dichlorodifluoromethane	ND	47	
75-09-2	Methylene Chloride	ND	47	
107-13-1	Acrylonitrile	ND	47	
1634-04-4	Methyl-t-Butyl Ether	ND	47	
156-60-5	Trans-1,2-Dichloroethylene	ND	47	
75-34-3	1,1-dichloroethane	ND	47	
108-05-4	Vinyl Acetate	ND	47	
78-93-3	2-Butanone (MEK)	ND	47	
594-20-7	2,2-Dichloropropane	ND	47	
156-59-2	cis-1,2-Dichloroethylene	ND	47	
67-66-3	Chloroform	ND	47	
74-97-5	Bromochloromethane	ND	47	
109-99-9	Tetrahydrofuran	ND	47	
71-55-6	1,1,1-Trichloroethane	ND	47	
107-06-2	1,2-Dichloroethane	ND	47	
56-23-5	Carbon tetrachloride	ND	47	
71-43-2	Benzene	ND	47	
10061-01-5	c-1,3-dichloropropene	ND	47	
108-88-3	Toluene	ND	47	
10061-02-6	t-1,3-Dichloropropene	ND	47	
79-00-5	1,1,2-Trichloroethane	ND	47	
124-48-1	Dibromochloromethane	ND	47	
108-90-7	Chlorobenzene	ND	47	
563-58-6	1,1-Dichloropropene	ND	47	
79-01-6	Trichloroethylene	ND	47	
78-87-5	1,2-Dichloropropane	ND	47	
75-27-4	Bromodichloromethane	ND	47	
74-95-3	Dibromomethane	ND	47	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	47	
142-28-9	1,3-Dichloropropane	ND	47	
127-18-4	Tetrachloroethylene	ND	47	
106-93-4	1,2-Dibromoethane	ND	47	
591-78-6	2-Hexanone	ND	47	
630-20-6	1,1,1,2-Tetrachloroethane	ND	47	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0073	Lab Sample ID:	AB58062
Date of Collection:	8/18/2015	Matrix:	Soil
Date of Preparation:	8/22/2015	Amount Prepared:	5 mL
Date of Analysis:	8/22/2015	Percent Solids:	83%
Dry Weight Prepared:	13.79 grams	Extract Dilution:	50
Wet Weight Prepared:	16.63 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	47	
108-38-3/106-42-3	M/P Xylene	ND	93	
95-47-6	Ortho Xylene	ND	47	
100-42-5	Styrene	ND	47	
75-25-2	Bromoform	ND	47	
79-34-5	1,1,2,2-Tetrachloroethane	ND	47	
98-82-8	Isopropylbenzene	ND	47	
108-86-1	Bromobenzene	ND	47	
96-18-4	1,2,3-Trichloropropane	ND	47	
103-65-1	N-Propylbenzene	ND	47	
95-49-8	2-Chlorotoluene	ND	47	
106-43-4	4-Chlorotoluene	ND	47	
98-06-6	Tert-Butylbenzene	ND	47	
108-67-8	1,3,5-Trimethylbenzene	ND	47	
95-63-6	1,2,4-Trimethylbenzene	ND	47	
135-98-8	Sec-Butylbenzene	ND	47	
541-73-1	1,3-Dichlorobenzene	ND	47	
99-87-6	Para-Isopropyltoluene	ND	47	
106-46-7	1,4-Dichlorobenzene	ND	47	
95-50-1	1,2-Dichlorobenzene	ND	47	
104-51-8	N-Butylbenzene	ND	47	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	47	
120-82-1	1,2,4-Trichlorobenzene	ND	47	
87-68-3	Hexachlorobutadiene	ND	47	
91-20-3	Naphthalene	ND	47	
87-61-6	1,2,3-Trichlorobenzene	ND	47	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	103	74 - 136
Toluene-D8	102	85 - 118
1,4-Bromofluorobenzene	105	78 - 111

Lunt Silversmiths - Greenfield, MA

Laboratory Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	8/22/2015	Amount Prepared:	5 mL
Date of Analysis:	8/22/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	~6

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
74-87-3	Chloromethane	ND	1.0	
75-01-4	Vinyl Chloride	ND	1.0	
74-83-9	Bromomethane	ND	1.0	
75-00-3	Chloroethane	ND	1.0	
75-69-4	Trichlorofluoromethane	ND	1.0	
60-29-7	Ethyl Ether	ND	1.0	
67-64-1	2-Propanone (acetone)	ND	1.0	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	1.0	
75-35-4	1,1-Dichloroethylene	ND	1.0	
75-15-0	Carbon Disulfide	ND	1.0	
75-71-8	Dichlorodifluoromethane	ND	1.0	
75-09-2	Methylene Chloride	ND	1.0	
107-13-1	Acrylonitrile	ND	1.0	
1634-04-4	Methyl-t-Butyl Ether	ND	1.0	
156-60-5	Trans-1,2-Dichloroethylene	ND	1.0	
75-34-3	1,1-dichloroethane	ND	1.0	
108-05-4	Vinyl Acetate	ND	1.0	
78-93-3	2-Butanone (MEK)	ND	1.0	
594-20-7	2,2-Dichloropropane	ND	1.0	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	
67-66-3	Chloroform	ND	1.0	
74-97-5	Bromochloromethane	ND	1.0	
109-99-9	Tetrahydrofuran	ND	1.0	
71-55-6	1,1,1-Trichloroethane	ND	1.0	
107-06-2	1,2-Dichloroethane	ND	1.0	
56-23-5	Carbon tetrachloride	ND	1.0	
71-43-2	Benzene	ND	1.0	
10061-01-5	c-1,3-dichloropropene	ND	1.0	
108-88-3	Toluene	ND	1.0	
10061-02-6	t-1,3-Dichloropropene	ND	1.0	
79-00-5	1,1,2-Trichloroethane	ND	1.0	
124-48-1	Dibromochloromethane	ND	1.0	
108-90-7	Chlorobenzene	ND	1.0	
563-58-6	1,1-Dichloropropene	ND	1.0	
79-01-6	Trichloroethylene	ND	1.0	
78-87-5	1,2-Dichloropropane	ND	1.0	
75-27-4	Bromodichloromethane	ND	1.0	
74-95-3	Dibromomethane	ND	1.0	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	1.0	
142-28-9	1,3-Dichloropropane	ND	1.0	
127-18-4	Tetrachloroethylene	ND	1.0	
106-93-4	1,2-Dibromoethane	ND	1.0	
591-78-6	2-Hexanone	ND	1.0	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	

Lunt Silversmiths - Greenfield, MA

Laboratory Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	8/22/2015	Amount Prepared:	5 mL
Date of Analysis:	8/22/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	~6

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
100-41-4	Ethylbenzene	ND	1.0	
108-38-3/106-42-3	M/P Xylene	ND	2.0	
95-47-6	Ortho Xylene	ND	1.0	
100-42-5	Styrene	ND	1.0	
75-25-2	Bromoform	ND	1.0	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	
98-82-8	Isopropylbenzene	ND	1.0	
108-86-1	Bromobenzene	ND	1.0	
96-18-4	1,2,3-Trichloropropane	ND	1.0	
103-65-1	N-Propylbenzene	ND	1.0	
95-49-8	2-Chlorotoluene	ND	1.0	
106-43-4	4-Chlorotoluene	ND	1.0	
98-06-6	Tert-Butylbenzene	ND	1.0	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	
135-98-8	Sec-Butylbenzene	ND	1.0	
541-73-1	1,3-Dichlorobenzene	ND	1.0	
99-87-6	Para-Isopropyltoluene	ND	1.0	
106-46-7	1,4-Dichlorobenzene	ND	1.0	
95-50-1	1,2-Dichlorobenzene	ND	1.0	
104-51-8	N-Butylbenzene	ND	1.0	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	1.0	
120-82-1	1,2,4-Trichlorobenzene	ND	1.0	
87-68-3	Hexachlorobutadiene	ND	1.0	
91-20-3	Naphthalene	ND	1.0	
87-61-6	1,2,3-Trichlorobenzene	ND	1.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	102	74 - 136
Toluene-D8	102	85 - 118
1,4-Bromofluorobenzene	94	78 - 111

Comments: Laboratory blank is associated with all samples in this project.

Laboratory blank is reported in ug/L.

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0074	Lab Sample ID:	AB58063
Date of Collection:	8/18/2015	Matrix:	Soil
Date of Preparation:	8/22/2015	Amount Prepared:	5 mL
Date of Analysis:	8/22/2015	Percent Solids:	85%
Dry Weight Prepared:	15.70 grams	Extract Dilution:	50
Wet Weight Prepared:	18.53 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	41	
75-01-4	Vinyl Chloride	ND	41	
74-83-9	Bromomethane	ND	41	
75-00-3	Chloroethane	ND	41	
75-69-4	Trichlorofluoromethane	ND	41	
60-29-7	Ethyl Ether	ND	41	
67-64-1	2-Propanone (acetone)	ND	41	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	41	
75-35-4	1,1-Dichloroethylene	ND	41	
75-15-0	Carbon Disulfide	ND	41	
75-71-8	Dichlorodifluoromethane	ND	41	
75-09-2	Methylene Chloride	ND	41	
107-13-1	Acrylonitrile	ND	41	
1634-04-4	Methyl-t-Butyl Ether	ND	41	
156-60-5	Trans-1,2-Dichloroethylene	ND	41	
75-34-3	1,1-dichloroethane	ND	41	
108-05-4	Vinyl Acetate	ND	41	
78-93-3	2-Butanone (MEK)	ND	41	
594-20-7	2,2-Dichloropropane	ND	41	
156-59-2	cis-1,2-Dichloroethylene	ND	41	
67-66-3	Chloroform	ND	41	
74-97-5	Bromochloromethane	ND	41	
109-99-9	Tetrahydrofuran	ND	41	
71-55-6	1,1,1-Trichloroethane	ND	41	
107-06-2	1,2-Dichloroethane	ND	41	
56-23-5	Carbon tetrachloride	ND	41	
71-43-2	Benzene	ND	41	
10061-01-5	c-1,3-dichloropropene	ND	41	
108-88-3	Toluene	ND	41	
10061-02-6	t-1,3-Dichloropropene	ND	41	
79-00-5	1,1,2-Trichloroethane	ND	41	
124-48-1	Dibromochloromethane	ND	41	
108-90-7	Chlorobenzene	ND	41	
563-58-6	1,1-Dichloropropene	ND	41	
79-01-6	Trichloroethylene	**400**	41	
78-87-5	1,2-Dichloropropane	ND	41	
75-27-4	Bromodichloromethane	ND	41	
74-95-3	Dibromomethane	ND	41	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	41	
142-28-9	1,3-Dichloropropane	ND	41	
127-18-4	Tetrachloroethylene	ND	41	
106-93-4	1,2-Dibromoethane	ND	41	
591-78-6	2-Hexanone	ND	41	
630-20-6	1,1,1,2-Tetrachloroethane	ND	41	

Lunt Silversmiths - Greenfield, MA

VOAs in Soil High Level Method

Client Sample ID:	R120150528WC-0074	Lab Sample ID:	AB58063
Date of Collection:	8/18/2015	Matrix:	Soil
Date of Preparation:	8/22/2015	Amount Prepared:	5 mL
Date of Analysis:	8/22/2015	Percent Solids:	85%
Dry Weight Prepared:	15.70 grams	Extract Dilution:	50
Wet Weight Prepared:	18.53 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
100-41-4	Ethylbenzene	ND	41	
108-38-3/106-42-3	M/P Xylene	ND	81	
95-47-6	Ortho Xylene	ND	41	
100-42-5	Styrene	ND	41	
75-25-2	Bromoform	ND	41	
79-34-5	1,1,2,2-Tetrachloroethane	ND	41	
98-82-8	Isopropylbenzene	ND	41	
108-86-1	Bromobenzene	ND	41	
96-18-4	1,2,3-Trichloropropane	ND	41	
103-65-1	N-Propylbenzene	ND	41	
95-49-8	2-Chlorotoluene	ND	41	
106-43-4	4-Chlorotoluene	ND	41	
98-06-6	Tert-Butylbenzene	ND	41	
108-67-8	1,3,5-Trimethylbenzene	ND	41	
95-63-6	1,2,4-Trimethylbenzene	ND	41	
135-98-8	Sec-Butylbenzene	ND	41	
541-73-1	1,3-Dichlorobenzene	ND	41	
99-87-6	Para-Isopropyltoluene	ND	41	
106-46-7	1,4-Dichlorobenzene	ND	41	
95-50-1	1,2-Dichlorobenzene	ND	41	
104-51-8	N-Butylbenzene	ND	41	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	41	
120-82-1	1,2,4-Trichlorobenzene	ND	41	
87-68-3	Hexachlorobutadiene	ND	41	
91-20-3	Naphthalene	ND	41	
87-61-6	1,2,3-Trichlorobenzene	ND	41	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	102	74 - 136
Toluene-D8	113	85 - 118
1,4-Bromofluorobenzene	93	78 - 111

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB58062

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
1,1,1,2-Tetrachloroethane	923	ND	970	100	74 - 124
1,1,1-Trichloroethane	923	ND	1000	110	76 - 132
1,1,2,2-Tetrachloroethane	923	ND	970	100	69 - 125
1,1,2-Trichloro-1,2,2-Trifluoroetha	923	ND	980	110	68 - 144
1,1,2-Trichloroethane	923	ND	960	100	75 - 126
1,1-Dichloroethylene	923	ND	990	110	65 - 140
1,1-Dichloropropene	923	ND	980	110	81 - 125
1,1-dichloroethane	923	ND	1000	110	77 - 130
1,2,3-Trichlorobenzene	923	ND	770	83	64 - 125
1,2,3-Trichloropropane	923	ND	1000	110	68 - 122
1,2,4-Trichlorobenzene	923	ND	750	81	72 - 120
1,2,4-Trimethylbenzene	923	ND	950	100	81 - 125
1,2-Dibromo-3-Chloropropane	923	ND	970	100	54 - 125
1,2-Dibromoethane	923	ND	940	100	73 - 124
1,2-Dichlorobenzene	923	ND	890	96	81 - 116
1,2-Dichloroethane	923	ND	960	100	74 - 130
1,2-Dichloropropane	923	ND	940	100	78 - 120
1,3,5-Trimethylbenzene	923	ND	840	91	81 - 125
1,3-Dichlorobenzene	923	ND	910	99	82 - 117
1,3-Dichloropropane	923	ND	1100	120	76 - 123
1,4-Dichlorobenzene	923	ND	850	92	80 - 116
2,2-Dichloropropane	923	ND	1100	120	57 - 147
2-Butanone (MEK)	923	ND	920	100	41 - 151
2-Chlorotoluene	923	ND	950	100	82 - 119
2-Hexanone	923	ND	1000	110	51 - 148
2-Propanone (acetone)	923	ND	690	75	25 - 161
4-Chlorotoluene	923	ND	860	93	82 - 119
4-Methyl-2-Pentanone(MIBK)	923	ND	1000	110	62 - 130
Acrylonitrile	923	ND	1100	120	67 - 130
Benzene	923	ND	1000	110	82 - 124
Bromobenzene	923	ND	920	100	79 - 119
Bromochloromethane	923	ND	930	100	79 - 125
Bromodichloromethane	923	ND	840	91	71 - 126
Bromoform	923	ND	930	100	56 - 119
Bromomethane	923	ND	850	92	37 - 161
Carbon Disulfide	923	ND	990	110	63 - 134
Carbon tetrachloride	923	ND	900	98	68 - 136
Chlorobenzene	923	ND	940	100	82 - 126
Chloroethane	923	ND	960	100	57 - 148
Chloroform	923	ND	990	110	78 - 130
Chloromethane	923	ND	900	98	56 - 147
Dibromochloromethane	923	ND	940	100	62 - 131
Dibromomethane	923	ND	850	92	75 - 122
Dichlorodifluoromethane	923	ND	930	100	59 - 131
Ethyl Ether	923	ND	890	96	65 - 138
Ethylbenzene	923	ND	880	95	82 - 122
Hexachlorobutadiene	923	ND	790	86	70 - 130

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB58062

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
Isopropylbenzene	923	ND	970	100	82 - 125
M/P Xylene	1846	ND	2200	120	85 - 120
Methyl-t-Butyl Ether	923	ND	1100	120	74 - 125
Methylene Chloride	923	ND	1000	110	67 - 139
N-Butylbenzene	923	ND	790	86	80 - 129
N-Propylbenzene	923	ND	830	90	81 - 122
Naphthalene	923	ND	890	96	59 - 129
Ortho Xylene	923	ND	940	100	84 - 122
Para-Isopropyltoluene	923	ND	960	100	79 - 129
Sec-Butylbenzene	923	ND	900	98	81 - 126
Styrene	923	ND	870	94	82 - 125
Tert-Butylbenzene	923	ND	780	84	81 - 126
Tetrachloroethylene	923	ND	820	89	74 - 133
Tetrahydrofuran	923	ND	1100	120	60 - 132
Toluene	923	ND	990	110	82 - 124
Trans-1,2-Dichloroethylene	923	ND	970	100	79 - 127
Trichloroethylene	923	ND	890	96	76 - 124
Trichlorofluoromethane	923	ND	930	100	65 - 144
Vinyl Acetate	923	ND	1200	130	14 - 152
Vinyl Chloride	923	ND	840	91	34 - 142
c-1,3-dichloropropene	923	ND	1100	120	68 - 133
cis-1,2-Dichloroethylene	923	ND	1100	120	79 - 131
t-1,3-Dichloropropene	923	ND	1000	110	65 - 126

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE DUPLICATE (MSD) RECOVERY

Sample ID:AB58062

PARAMETER	MSD SPIKE ADDED	MSD CONCENTRATION ug/Kg	MSD % REC	RPD %	QC LIMITS RPD
1,1,1,2-Tetrachloroethane	923	980	110	10	40
1,1,1-Trichloroethane	923	980	110	0	40
1,1,2,2-Tetrachloroethane	923	990	110	10	40
1,1,2-Trichloro-1,2,2-Trifluoroetha	923	980	110	0	40
1,1,2-Trichloroethane	923	980	110	10	40
1,1-Dichloroethylene	923	1000	110	0	52
1,1-Dichloropropene	923	990	110	0	40
1,1-dichloroethane	923	1000	110	0	40
1,2,3-Trichlorobenzene	923	860	93	11	40
1,2,3-Trichloropropane	923	970	100	10	40
1,2,4-Trichlorobenzene	923	900	98	19	40
1,2,4-Trimethylbenzene	923	950	100	0	40
1,2-Dibromo-3-Chloropropane	923	960	100	0	40
1,2-Dibromoethane	923	910	99	1	40
1,2-Dichlorobenzene	923	910	99	3	40
1,2-Dichloroethane	923	1000	110	10	40
1,2-Dichloropropane	923	1000	110	10	40
1,3,5-Trimethylbenzene	923	910	99	8	40
1,3-Dichlorobenzene	923	880	95	4	40
1,3-Dichloropropane	923	1000	110	9	40
1,4-Dichlorobenzene	923	900	98	6	40
2,2-Dichloropropane	923	1200	130	8	40
2-Butanone (MEK)	923	780	84	17	40
2-Chlorotoluene	923	1100	120	18	40
2-Hexanone	923	980	110	0	40
2-Propanone (acetone)	923	650	70	7	40
4-Chlorotoluene	923	930	100	7	40
4-Methyl-2-Pentanone(MIBK)	923	1100	120	9	40
Acrylonitrile	923	1200	130	8	40
Benzene	923	1000	110	0	24
Bromobenzene	923	930	100	0	40
Bromochloromethane	923	900	98	2	40
Bromodichloromethane	923	930	100	9	40
Bromoform	923	940	100	0	40
Bromomethane	923	890	96	4	40
Carbon Disulfide	923	980	110	0	40
Carbon tetrachloride	923	880	95	3	40
Chlorobenzene	923	1000	110	10	34
Chloroethane	923	960	100	0	40
Chloroform	923	940	100	10	40
Chloromethane	923	950	100	2	40
Dibromochloromethane	923	960	100	0	40
Dibromomethane	923	870	94	2	40
Dichlorodifluoromethane	923	830	90	11	40
Ethyl Ether	923	930	100	4	40
Ethylbenzene	923	900	98	3	40
Hexachlorobutadiene	923	850	92	7	40
Isopropylbenzene	923	940	100	0	40

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE DUPLICATE (MSD) RECOVERY

Sample ID:AB58062

PARAMETER	MSD SPIKE ADDED	MSD CONCENTRATION ug/Kg	MSD % REC	RPD %	QC LIMITS RPD
M/P Xylene	1846	2100	110	9	40
Methyl-t-Butyl Ether	923	1000	110	9	40
Methylene Chloride	923	990	110	0	40
N-Butylbenzene	923	870	94	9	40
N-Propylbenzene	923	860	93	3	40
Naphthalene	923	1200	130	30	40
Ortho Xylene	923	1100	120	18	40
Para-Isopropyltoluene	923	1000	110	10	40
Sec-Butylbenzene	923	920	100	2	40
Styrene	923	860	93	1	40
Tert-Butylbenzene	923	760	82	2	40
Tetrachloroethylene	923	860	93	4	40
Tetrahydrofuran	923	1100	120	0	40
Toluene	923	950	100	10	33
Trans-1,2-Dichloroethylene	923	980	110	10	40
Trichloroethylene	923	940	100	4	27
Trichlorofluoromethane	923	920	100	0	40
Vinyl Acetate	923	1200	130	0	40
Vinyl Chloride	923	900	98	7	40
c-1,3-dichloropropene	923	1100	120	0	40
cis-1,2-Dichloroethylene	923	1100	120	0	40
t-1,3-Dichloropropene	923	1000	110	0	40

Laboratory Duplicate Results

Sample ID: AB58062

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
1,1,1,2-Tetrachloroethane	ND	ND	NC	40
1,1,1-Trichloroethane	ND	ND	NC	40
1,1,2,2-Tetrachloroethane	ND	ND	NC	40
1,1,2-Trichloro-1,2,2-Trifluoroeth	ND	ND	NC	40
1,1,2-Trichloroethane	ND	ND	NC	40
1,1-Dichloroethylene	ND	ND	NC	40
1,1-Dichloropropene	ND	ND	NC	40
1,1-dichloroethane	ND	ND	NC	40
1,2,3-Trichlorobenzene	ND	ND	NC	40
1,2,3-Trichloropropane	ND	ND	NC	40
1,2,4-Trichlorobenzene	ND	ND	NC	40
1,2,4-Trimethylbenzene	ND	ND	NC	40
1,2-Dibromo-3-Chloropropane	ND	ND	NC	40
1,2-Dibromoethane	ND	ND	NC	40
1,2-Dichlorobenzene	ND	ND	NC	40
1,2-Dichloroethane	ND	ND	NC	40
1,2-Dichloropropane	ND	ND	NC	40

Lunt Silversmiths - Greenfield, MA

Laboratory Duplicate Results

Sample ID: AB58062

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
1,3,5-Trimethylbenzene	ND	ND	NC	40
1,3-Dichlorobenzene	ND	ND	NC	40
1,3-Dichloropropane	ND	ND	NC	40
1,4-Dichlorobenzene	ND	ND	NC	40
2,2-Dichloropropane	ND	ND	NC	40
2-Butanone (MEK)	ND	ND	NC	40
2-Chlorotoluene	ND	ND	NC	40
2-Hexanone	ND	ND	NC	40
2-Propanone (acetone)	ND	ND	NC	40
4-Chlorotoluene	ND	ND	NC	40
4-Methyl-2-Pentanone(MIBK)	ND	ND	NC	40
Acrylonitrile	ND	ND	NC	40
Benzene	ND	ND	NC	40
Bromobenzene	ND	ND	NC	40
Bromochloromethane	ND	ND	NC	40
Bromodichloromethane	ND	ND	NC	40
Bromoform	ND	ND	NC	40
Bromomethane	ND	ND	NC	40
Carbon Disulfide	ND	ND	NC	40
Carbon tetrachloride	ND	ND	NC	40
Chlorobenzene	ND	ND	NC	40
Chloroethane	ND	ND	NC	40
Chloroform	ND	ND	NC	40
Chloromethane	ND	ND	NC	40
Dibromochloromethane	ND	ND	NC	40
Dibromomethane	ND	ND	NC	40
Dichlorodifluoromethane	ND	ND	NC	40
Ethyl Ether	ND	ND	NC	40
Ethylbenzene	ND	ND	NC	40
Hexachlorobutadiene	ND	ND	NC	40
Isopropylbenzene	ND	ND	NC	40
M/P Xylene	ND	ND	NC	40
Methyl-t-Butyl Ether	ND	ND	NC	40
Methylene Chloride	ND	ND	NC	40
N-Butylbenzene	ND	ND	NC	40
N-Propylbenzene	ND	ND	NC	40
Naphthalene	ND	ND	NC	40
Ortho Xylene	ND	ND	NC	40
Para-Isopropyltoluene	ND	ND	NC	40
Sec-Butylbenzene	ND	ND	NC	40
Styrene	ND	ND	NC	40
Tert-Butylbenzene	ND	ND	NC	40
Tetrachloroethylene	ND	ND	NC	40
Tetrahydrofuran	ND	ND	NC	40
Toluene	ND	ND	NC	40
Trans-1,2-Dichloroethylene	ND	ND	NC	40
Trichloroethylene	ND	ND	NC	40
Trichlorofluoromethane	ND	ND	NC	40
Vinyl Acetate	ND	ND	NC	40
Vinyl Chloride	ND	ND	NC	40
c-1,3-dichloropropene	ND	ND	NC	40

Lunt Silversmiths - Greenfield, MA

Laboratory Duplicate Results

Sample ID: AB58062

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
cis-1,2-Dichloroethylene	ND	ND	NC	40
t-1,3-Dichloropropene	ND	ND	NC	40

Lunt Silversmiths - Greenfield, MA

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/Kg	LFB RESULT ug/Kg	LFB RECOVERY %	QC LIMITS %
1,1,1,2-Tetrachloroethane	20	19.9	100	77 - 122
1,1,1-Trichloroethane	20	20.6	103	80 - 128
1,1,2,2-Tetrachloroethane	20	22.1	111	73 - 118
1,1,2-Trichloro-1,2,2-Trifluoroeth	20	21.7	109	59 - 146
1,1,2-Trichloroethane	20	21.8	109	79 - 117
1,1-Dichloroethylene	20	21.7	109	70 - 130
1,1-Dichloropropene	20	19.8	99	79 - 123
1,1-dichloroethane	20	22.7	114	81 - 122
1,2,3-Trichlorobenzene	20	17.5	88	70 - 119
1,2,3-Trichloropropane	20	20.1	101	73 - 114
1,2,4-Trichlorobenzene	20	16.7	84	74 - 120
1,2,4-Trimethylbenzene	20	19.4	97	79 - 123
1,2-Dibromo-3-Chloropropane	20	21.9	110	63 - 124
1,2-Dibromoethane	20	18.5	93	79 - 116
1,2-Dichlorobenzene	20	18.7	94	77 - 117
1,2-Dichloroethane	20	21.9	110	75 - 124
1,2-Dichloropropane	20	19.8	99	80 - 117
1,3,5-Trimethylbenzene	20	19.4	97	80 - 122
1,3-Dichlorobenzene	20	19.9	100	78 - 117
1,3-Dichloropropane	20	20.7	104	79 - 116
1,4-Dichlorobenzene	20	18.3	92	77 - 115
2,2-Dichloropropane	20	25.6	128	64 - 152
2-Butanone (MEK)	20	20.8	104	55 - 144
2-Chlorotoluene	20	21.1	106	79 - 119
2-Hexanone	20	23.3	117	58 - 147
2-Propanone (acetone)	20	19.6	98	37 - 168
4-Chlorotoluene	20	19.1	96	78 - 120
4-Methyl-2-Pentanone(MIBK)	20	22.2	111	68 - 125
Acrylonitrile	20	24.4	122	68 - 124
Benzene	20	21.5	108	80 - 120
Bromobenzene	20	19.6	98	80 - 115
Bromochloromethane	20	21.4	107	81 - 120
Bromodichloromethane	20	17.0	85	77 - 125
Bromoform	20	19.9	100	62 - 127
Bromomethane	20	20.0	100	60 - 139
Carbon Disulfide	20	22.2	111	73 - 129
Carbon tetrachloride	20	19.6	98	73 - 136
Chlorobenzene	20	20.5	103	82 - 119
Chloroethane	20	20.7	104	69 - 130
Chloroform	20	21.5	108	80 - 122
Chloromethane	20	20.0	100	65 - 129
Dibromochloromethane	20	21.1	106	71 - 129
Dibromomethane	20	18.3	92	79 - 115
Dichlorodifluoromethane	20	20.0	100	69 - 126
Ethyl Ether	20	20.8	104	69 - 127
Ethylbenzene	20	19.8	99	80 - 121
Hexachlorobutadiene	20	17.1	86	72 - 124
Isopropylbenzene	20	18.7	94	79 - 124
M/P Xylene	40	45.2	113	81 - 120
Methyl-t-Butyl Ether	20	23.8	119	78 - 120
Methylene Chloride	20	22.8	114	73 - 129
N-Butylbenzene	20	17.1	86	78 - 126
N-Propylbenzene	20	18.4	92	78 - 122

Lunt Silversmiths - Greenfield, MA

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/Kg	LFB RESULT ug/Kg	LFB RECOVERY %	QC LIMITS %
Naphthalene	20	20.8	104	66 - 124
Ortho Xylene	20	21.2	106	81 - 121
Para-Isopropyltoluene	20	19.4	97	77 - 127
Sec-Butylbenzene	20	18.4	92	79 - 124
Styrene	20	20.5	103	82 - 122
Tert-Butylbenzene	20	16.1	81	78 - 124
Tetrachloroethylene	20	17.4	87	77 - 125
Tetrahydrofuran	20	25.8	129	67 - 124
Toluene	20	20.2	101	81 - 120
Trans-1,2-Dichloroethylene	20	21.6	108	80 - 121
Trichloroethylene	20	18.5	93	80 - 117
Trichlorofluoromethane	20	20.8	104	68 - 137
Vinyl Acetate	20	27.0	135	25 - 150
Vinyl Chloride	20	22.0	110	67 - 134
c-1,3-dichloropropene	20	23.1	116	73 - 133
cis-1,2-Dichloroethylene	20	21.0	105	82 - 122
t-1,3-Dichloropropene	20	22.5	113	69 - 127

Comments:

Lunt Silversmiths - Greenfield, MA

LABORATORY FORTIFIED DUPLICATE (LFB Dup) RECOVERY

COMPOUND	LFB Dup CONCENTRATION ug/Kg	LFB Dup RECOVERY %	RPD %	QC LIMITS RPD
1,1,1,2-Tetrachloroethane	21.0	105	5	50
1,1,1-Trichloroethane	21.4	107	4	50
1,1,2,2-Tetrachloroethane	21.1	106	5	50
1,1,2-Trichloro-1,2,2-Trifluoroetha	19.9	100	9	50
1,1,2-Trichloroethane	21.8	109	0	50
1,1-Dichloroethylene	22.4	112	3	52
1,1-Dichloropropene	21.7	109	9	50
1,1-dichloroethane	23.0	115	1	50
1,2,3-Trichlorobenzene	17.0	85	3	50
1,2,3-Trichloropropane	21.4	107	6	50
1,2,4-Trichlorobenzene	16.8	84	1	50
1,2,4-Trimethylbenzene	22.1	111	13	50
1,2-Dibromo-3-Chloropropane	21.5	108	2	50
1,2-Dibromoethane	17.8	89	4	50
1,2-Dichlorobenzene	19.5	98	4	50
1,2-Dichloroethane	22.3	112	2	50
1,2-Dichloropropane	21.0	105	6	50
1,3,5-Trimethylbenzene	19.3	97	1	50
1,3-Dichlorobenzene	18.4	92	8	50
1,3-Dichloropropane	22.7	114	9	50
1,4-Dichlorobenzene	19.3	97	5	50
2,2-Dichloropropane	24.7	124	4	50
2-Butanone (MEK)	26.2	131	23	50
2-Chlorotoluene	19.4	97	8	50
2-Hexanone	26.0	130	11	50
2-Propanone (acetone)	22.4	112	13	50
4-Chlorotoluene	19.8	99	4	50
4-Methyl-2-Pentanone(MIBK)	23.7	119	7	50
Acrylonitrile	23.5	118	4	50
Benzene	22.4	112	4	50
Bromobenzene	19.5	98	1	50
Bromochloromethane	21.2	106	1	50
Bromodichloromethane	17.9	90	5	50
Bromoform	19.4	97	3	50
Bromomethane	19.8	99	1	50
Carbon Disulfide	21.6	108	3	50
Carbon tetrachloride	20.0	100	2	50
Chlorobenzene	22.1	111	8	34
Chloroethane	21.6	108	4	50
Chloroform	21.4	107	1	50
Chloromethane	20.2	101	1	50
Dibromochloromethane	22.0	110	4	50
Dibromomethane	19.2	96	5	50
Dichlorodifluoromethane	19.8	99	1	50
Ethyl Ether	20.6	103	1	50
Ethylbenzene	18.7	94	6	50
Hexachlorobutadiene	16.9	85	1	50
Isopropylbenzene	18.9	95	1	50
M/P Xylene	40.7	102	10	50
Methyl-t-Butyl Ether	22.6	113	5	50
Methylene Chloride	21.9	110	4	50

Lunt Silversmiths - Greenfield, MA

LABORATORY FORTIFIED DUPLICATE (LFB Dup) RECOVERY

COMPOUND	LFB Dup CONCENTRATION ug/Kg	LFB Dup RECOVERY %	RPD %	QC LIMITS RPD
N-Butylbenzene	17.6	88	3	50
N-Propylbenzene	18.9	95	3	50
Naphthalene	20.1	101	3	50
Ortho Xylene	21.0	105	1	50
Para-Isopropyltoluene	20.4	102	5	50
Sec-Butylbenzene	17.8	89	3	50
Styrene	19.3	97	6	50
Tert-Butylbenzene	18.7	94	15	50
Tetrachloroethylene	16.9	85	3	50
Tetrahydrofuran	25.3	127	2	50
Toluene	22.1	111	9	50
Trans-1,2-Dichloroethylene	21.5	108	1	50
Trichloroethylene	20.2	101	9	27
Trichlorofluoromethane	20.2	101	3	50
Vinyl Acetate	26.5	133	2	50
Vinyl Chloride	22.5	113	2	50
c-1,3-dichloropropene	22.8	114	1	50
cis-1,2-Dichloroethylene	20.9	105	1	50
t-1,3-Dichloropropene	23.7	119	5	50

Samples in Batch: AB58059, AB58060, AB58061, AB58062, AB58063

PN. 15080040

Weston Solutions, Inc.
Andover, MA

CHAIN OF CUSTODY RECORD
Lunt Silversmiths/MA
Contact Name: Ken Robinson
Contact Phone: (978) 621-1208

No: 08/19/15-0012
Cooler #:
Lab: NERL
Lab Phone:

15080040 $VOAHS
15080040 $METMS_PE

Lab #	Sample #	Location	Analyses	Matrix	EventID	Numb Cont	Container	Soil Wet Weight (g)
	R120150528WC-0076	MB-06	VOC	Blank	8/19/2015	1	40mL	
	R120150528WC-0071	Grid-20.5-D	VOC	Soil	8/18/2015	1	40 mL	18.67
	R120150528WC-0071	Grid-20.5-D	Metals	Soil	8/18/2015	1	8 oz	~~18.67~~ KR
	R120150528WC-0072	Sidewall-21-S	VOC	Soil	8/18/2015	1	40 mL	17.42
	R120150528WC-0072	Sidewall-21-S	Metals	Soil	8/18/2015	1	8 oz	~~17.42~~ KR
	R120150528WC-0073	Sidewall-21-W	VOC	Soil	8/18/2015	1	40 mL	16.63
	R120150528WC-0073	Sidewall-21-W	Metals	Soil	8/18/2015	1	8 oz	~~16.63~~ KR
	R120150528WC-0074	Grid-21-B	VOC	Soil	8/18/2015	1	40.mL	18.53
	R120150528WC-0074	Grid-21-B	Metals	Soil	8/18/2015	1	8 oz	~~18.53~~ KR

Special Instructions: Please forward results to OSC Wing Chau. Thank you.

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	Weston	19 AUG 2015 1530		8/19/15 1530 hrs	
		8/20/15 1050	ESAT	8/20/15 10:50	3 °C

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

September 15, 2015

Wing Chau - Mail Code OSRR02-2
US EPA New England R1

Project Number: 15080040
Project: Lunt Silversmiths - Greenfield, MA
Analysis: Metals in Soil Medium Level by ICP
EPA Chemist: Michael Dowling

Date Samples Received by the Laboratory: 08/20/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-OPTIMASO1.

Samples were prepared following the EPA Region I SOP, EIASOP-INGMETALSPREP8

Preparation and analysis SOP's are based on "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, Revision 2, Final Update III, Methods 3050B and 6010B," respectively. Samples were analyzed using a Perkin Elmer Dual View Inductively Coupled Plasma - Optical Emission Spectrometer.

Samples were prepared and analyzed by ESAT contractors working at the USEPA New England Laboratory.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA, email=boudreau.dan@epa.gov, c=US
Date: 2015.09.15 09:19:56 -04'00'

15080040$METMS_PE

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

Sample results reported mg/Kg, dry weight basis.

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0071	Lab Sample ID:	AB58060
Date of Collection:	8/18/2015	Matrix:	Soil
Date of Preparation:	8/31/2015	Amount Prepared:	N/A
Date of Analysis:	9/04/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	2
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**7.4**	3.9	
7429-90-5	Aluminum	**17000**	22	
7440-38-2	Arsenic	**15**	3.9	
7440-39-3	Barium	**110**	3.9	
7440-41-7	Beryllium	ND	1.6	
7440-70-2	Calcium	**1800**	20	
7440-43-9	Cadmium	ND	2.0	
7440-48-4	Cobalt	**15**	3.9	
7440-47-3	Chromium	**30**	3.9	
7440-50-8	Copper	**210**	3.9	
7439-89-6	Iron	**34000**	7.8	
7439-95-4	Magnesium	**7100**	20	
7439-96-5	Manganese	**340**	3.9	
7440-02-0	Nickel	**31**	3.9	
7439-92-1	Lead	**630**	3.9	
7440-36-0	Antimony	**15**	3.9	J1
7782-49-2	Selenium	ND	7.8	
7440-28-0	Thallium	ND	7.8	
7440-62-2	Vanadium	**41**	3.9	
7440-66-6	Zinc	**120**	3.9	

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0072	Lab Sample ID:	AB58061
Date of Collection:	8/18/2015	Matrix:	Soil
Date of Preparation:	8/31/2015	Amount Prepared:	N/A
Date of Analysis:	9/04/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	ND	2.0	
7429-90-5	Aluminum	**8700**	11	
7440-38-2	Arsenic	**2.8**	2.0	
7440-39-3	Barium	**19**	2.0	
7440-41-7	Beryllium	ND	0.80	
7440-70-2	Calcium	**840**	10	
7440-43-9	Cadmium	ND	1.0	
7440-48-4	Cobalt	**4.3**	2.0	
7440-47-3	Chromium	**13**	2.0	
7440-50-8	Copper	**64**	2.0	
7439-89-6	Iron	**14000**	4.0	
7439-95-4	Magnesium	**3200**	10	
7439-96-5	Manganese	**130**	2.0	
7440-02-0	Nickel	**16**	2.0	
7439-92-1	Lead	**17**	2.0	
7440-36-0	Antimony	ND	2.0	
7782-49-2	Selenium	ND	4.0	
7440-28-0	Thallium	ND	4.0	
7440-62-2	Vanadium	**15**	2.0	
7440-66-6	Zinc	**85**	2.0	

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0073	Lab Sample ID:	AB58062
Date of Collection:	8/18/2015	Matrix:	Soil
Date of Preparation:	8/31/2015	Amount Prepared:	N/A
Date of Analysis:	9/04/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**20**	2.0	
7429-90-5	Aluminum	**8800**	11	
7440-38-2	Arsenic	**4.7**	2.0	
7440-39-3	Barium	**27**	2.0	
7440-41-7	Beryllium	ND	0.78	
7440-70-2	Calcium	**670**	9.8	
7440-43-9	Cadmium	ND	0.98	
7440-48-4	Cobalt	**4.6**	2.0	
7440-47-3	Chromium	**13**	2.0	
7440-50-8	Copper	**110**	2.0	
7439-89-6	Iron	**14000**	3.9	
7439-95-4	Magnesium	**2900**	9.8	
7439-96-5	Manganese	**130**	2.0	
7440-02-0	Nickel	**29**	2.0	
7439-92-1	Lead	**200**	2.0	
7440-36-0	Antimony	**3.1**	2.0	
7782-49-2	Selenium	ND	3.9	
7440-28-0	Thallium	ND	3.9	
7440-62-2	Vanadium	**16**	2.0	
7440-66-6	Zinc	**130**	2.0	

Lunt Silversmiths - Greenfield, MA

Metals in Soil Medium Level by ICP

Client Sample ID:	R120150528WC-0074	Lab Sample ID:	AB58063
Date of Collection:	8/18/2015	Matrix:	Soil
Date of Preparation:	8/31/2015	Amount Prepared:	N/A
Date of Analysis:	9/04/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-22-4	Silver	**35**	2.0	
7429-90-5	Aluminum	**7700**	11	
7440-38-2	Arsenic	**4.4**	2.0	
7440-39-3	Barium	**24**	2.0	
7440-41-7	Beryllium	ND	0.78	
7440-70-2	Calcium	**640**	9.8	
7440-43-9	Cadmium	ND	0.98	
7440-48-4	Cobalt	**4.7**	2.0	
7440-47-3	Chromium	**15**	2.0	
7440-50-8	Copper	**100**	2.0	
7439-89-6	Iron	**15000**	3.9	
7439-95-4	Magnesium	**2900**	9.8	
7439-96-5	Manganese	**130**	2.0	
7440-02-0	Nickel	**17**	2.0	
7439-92-1	Lead	**150**	2.0	
7440-36-0	Antimony	**3.3**	2.0	
7782-49-2	Selenium	ND	3.9	
7440-28-0	Thallium	ND	3.9	
7440-62-2	Vanadium	**15**	2.0	
7440-66-6	Zinc	**140**	2.0	

Lunt Silversmiths - Greenfield, MA

Laboratory Reagent Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	8/31/2015	Amount Prepared:	N/A
Date of Analysis:	9/04/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
7440-22-4	Silver	ND	20	
7429-90-5	Aluminum	ND	110	
7440-38-2	Arsenic	ND	20	
7440-39-3	Barium	ND	20	
7440-41-7	Beryllium	ND	8.0	
7440-70-2	Calcium	ND	100	
7440-43-9	Cadmium	ND	10	
7440-48-4	Cobalt	ND	20	
7440-47-3	Chromium	ND	20	
7440-50-8	Copper	ND	20	
7439-89-6	Iron	**46**	40	
7439-95-4	Magnesium	ND	100	
7439-96-5	Manganese	ND	20	
7440-02-0	Nickel	ND	20	
7439-92-1	Lead	ND	20	
7440-36-0	Antimony	ND	20	
7782-49-2	Selenium	ND	40	
7440-28-0	Thallium	ND	40	
7440-62-2	Vanadium	ND	20	
7440-66-6	Zinc	ND	20	

Lunt Silversmiths - Greenfield, MA

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB58060

PARAMETER	SPIKE ADDED mg/Kg	SAMPLE CONCENTRATION mg/Kg	MS CONCENTRATION mg/Kg	MS % REC	QC LIMITS (% REC)
Antimony	98.0	15.0	43.1	29	75 - 125
Arsenic	98.0	15.0	115	102	75 - 125
Barium	98.0	110	196	88	75 - 125
Beryllium	39.0	ND	40.2	103	75 - 125
Cadmium	49.0	ND	48.4	99	75 - 125
Chromium	98.0	30.0	126	98	75 - 125
Cobalt	98.0	15.0	110	97	75 - 125
Copper	98.0	210	292	84	75 - 125
Lead	98.0	630	759	R	75 - 125
Manganese	98.0	340	427	89	75 - 125
Nickel	98.0	31.0	126	97	75 - 125
Selenium	98.0	ND	99.2	101	75 - 125
Silver	20.0	7.4	26.2	96	75 - 125
Thallium	98.0	ND	94.6	97	75 - 125
Vanadium	98.0	41.0	137	98	75 - 125
Zinc	98.0	120	211	93	75 - 125

Lunt Silversmiths - Greenfield, MA

Laboratory Duplicate Results

Sample ID: AB58061

PARAMETER	SAMPLE RESULT mg/Kg	SAMPLE DUPLICATE RESULT mg/Kg	PRECISION RPD %	QC LIMITS
Aluminum	8700	8300	4.7	30
Antimony	ND	ND	NC	30
Arsenic	2.8	3.0	6.9	30
Barium	19.0	18	5.4	30
Beryllium	ND	ND	NC	30
Cadmium	ND	ND	NC	30
Calcium	840	730	14	30
Chromium	13.0	12	8.0	30
Cobalt	4.3	4.0	7.2	30
Copper	64.0	60	6.5	30
Iron	14000	13000	7.4	30
Lead	17.0	17	0	30
Magnesium	3200	3100	3.2	30
Manganese	130	120	8.0	30
Nickel	16.0	16	0	30
Selenium	ND	ND	NC	30
Silver	ND	ND	NC	30
Thallium	ND	ND	NC	30
Vanadium	15.0	14	6.9	30
Zinc	85.0	80	6.1	30

Lunt Silversmiths - Greenfield, MA

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/L	LFB RESULT ug/L	LFB RECOVERY %	QC LIMITS %
Aluminum	1000	998	100	85 - 115
Antimony	1000	971	97	85 - 115
Arsenic	1000	976	98	85 - 115
Barium	1000	966	97	85 - 115
Beryllium	400	389	97	85 - 115
Cadmium	500	487	97	85 - 115
Calcium	10000	9710	97	85 - 115
Chromium	1000	1000	100	85 - 115
Cobalt	1000	982	98	85 - 115
Copper	1000	996	100	85 - 115
Iron	1000	1010	101	85 - 115
Lead	1000	963	96	85 - 115
Magnesium	10000	9900	99	85 - 115
Manganese	1000	989	99	85 - 115
Nickel	1000	979	98	85 - 115
Selenium	1000	946	95	85 - 115
Silver	200	193	97	85 - 115
Thallium	1000	973	97	85 - 115
Vanadium	1000	1020	102	85 - 115
Zinc	1000	976	98	85 - 115

Comments:

Lunt Silversmiths - Greenfield, MA

Solid Laboratory Control Sample (LCS) Results

PARAMETER	LCS RESULTS mg/Kg	CONTROL LIMITS mg/Kg
Aluminum	7860	2780 - 12100
Antimony	57.1	19.5 - 230
Arsenic	137	97.8 - 195
Barium	194	149 - 258
Beryllium	92.8	71.6 - 121
Cadmium	90.3	70.3 - 122
Calcium	5910	4460 - 7630
Chromium	134	95.1 - 176
Cobalt	143	110 - 185
Copper	168	127 - 210
Iron	14000	4930 - 23300
Lead	120	97.0 - 170
Magnesium	2740	1820 - 3780
Manganese	283	221 - 373
Nickel	120	89.9 - 158
Selenium	173	120 - 233
Silver	38.9	26.6 - 53.9
Thallium	132	94.0 - 182
Vanadium	107	71.1 - 143
Zinc	181	132 - 247

Comments:

Samples in Batch: AB58060, AB58061, AB58062, AB58063

PN. 15080040

Weston Solutions, Inc.
Andover, MA

CHAIN OF CUSTODY RECORD
Lunt Silversmiths/MA
Contact Name: Ken Robinson
Contact Phone: (978) 621-1208

No: 08/19/15-0012
Cooler #:
Lab: NERL
Lab Phone:

15080040 $VOAHS
15080040 $METMS_PE

Lab #	Sample #	Location	Analyses	Matrix	EventID	Numb Cont	Container	Soil Wet Weight (g)
	R120150528WC-0076	MB-06	VOC	Blank	8/19/2015	1	40mL	
	R120150528WC-0071	Grid-20.5-D	VOC	Soil	8/18/2015	1	40 mL	18.67
	R120150528WC-0071	Grid-20.5-D	Metals	Soil	8/18/2015	1	8 oz	~~18.67~~ KR
	R120150528WC-0072	Sidewall-21-S	VOC	Soil	8/18/2015	1	40 mL	17.42
	R120150528WC-0072	Sidewall-21-S	Metals	Soil	8/18/2015	1	8 oz	~~17.42~~ KR
	R120150528WC-0073	Sidewall-21-W	VOC	Soil	8/18/2015	1	40 mL	16.63
	R120150528WC-0073	Sidewall-21-W	Metals	Soil	8/18/2015	1	8 oz	~~16.63~~ KR
	R120150528WC-0074	Grid-21-B	VOC	Soil	8/18/2015	1	40.mL	18.53
	R120150528WC-0074	Grid-21-B	Metals	Soil	8/18/2015	1	8 oz	~~18.53~~ KR

Special Instructions: Please forward results to OSC Wing Chau. Thank you.	SAMPLES TRANSFERRED FROM
	CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	Weston	19 AUG 2015 1530		8/19/15 1530 hrs	
		8/20/15 1050	ESAT	8/20/15 10:50	3 °C

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

August 31, 2015

Wing Chau - Mail Code OSRR02-2
US EPA New England R1

Project Number: 15080041
Project: Lunt Silversmiths - Greenfield, MA
Analysis: Volatile Organic Analysis of Soil
Analyst: Scott Clifford

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-FLDVOA2.

Soil samples were collected in 40 mL vials, and preserved in methanol. The samples were analyzed using a Shimadzu gas chromatograph equipped with a 30 meter, 0.53 mm id. column, with electron capture and photoionization detectors. Concentrations of volatile organics were calculated using the external standard technique. Results are reported on a wet weight basis.

Analytes reported by this field method should be treated as tentatively identified compounds and concentrations are approximate.

Date Samples Received by the Laboratory: 8/20/15

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

Results for soil samples are reported on a dry weight basis.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA, email=boudreau.dan@epa.gov, c=US
Date: 2015.08.31 10:00:40 -04'00'

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Lunt Silversmiths - Greenfield, MA

Volatile Organic Analysis of Soil

Lab Sample ID	Client Sample ID	Tetrachloroethylene ug/Kg	Trichloroethylene ug/Kg
AB58073	Grid-19.5B	ND (35)	8400
AB58074	Grid-20.5B	ND (35)	11000
AB58075	Grid-20.5D	ND (35)	150
AB58076	Grid-21B	ND (35)	100
AB58077	Sidewall-21S	ND (35)	ND (25)
AB58078	Sidewall-21W	ND (35)	ND (25)
AB58079	MB-06	ND (35)	ND (25)

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

August 31, 2015

Wing Chau - Mail Code OSRR02-2
US EPA New England R1

Project Number: 15080041
Project: Lunt Silversmiths - Greenfield, MA
Analysis: Field Analysis of Metals by XRF
Analyst: Scott Clifford

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIA-FLDXRFNITON4.

Samples were analyzed using a Niton XL3t 600 x-ray fluorescence (XRF) instrument equipped with a 50 kV X-ray tube and a high resolution Si pin detector.

Samples were placed into XRF cups for analysis.

Date Samples Received by the Laboratory: 8/20/15

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

Results for soil samples are reported on a dry weight basis.

If you have any questions please call me at .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA, email=boudreau.dan@epa.gov, c=US
Date: 2015.08.31 10:01:38 -04'00'

Qualifiers:

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US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Lunt Silversmiths - Greenfield, MA

Field Analysis of Metals by XRF

Lab Sample ID	Client Sample ID	Arsenic mg/Kg	Lead mg/Kg
AB58064	Grid-19.5B	ND (22)	710
AB58065	Grid-19.5B Lab Dup	ND (24)	800
AB58066	Grid-20.5B	330	5800
AB58067	Grid-20.5B Lab Dup	260	5600
AB58068	Grid-20.5D	42	680
AB58069	Grid-21B	ND (11)	180
AB58070	Grid-21B Lab Dup	ND (10)	150
AB58071	Sidewall-21S	ND (6)	29
AB58072	Sidewall-21W	ND (6)	38

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Office of Environmental Measurement & Evaluation
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R = No recovery was calculated since the analyte concentration is greater than four times the spike level.

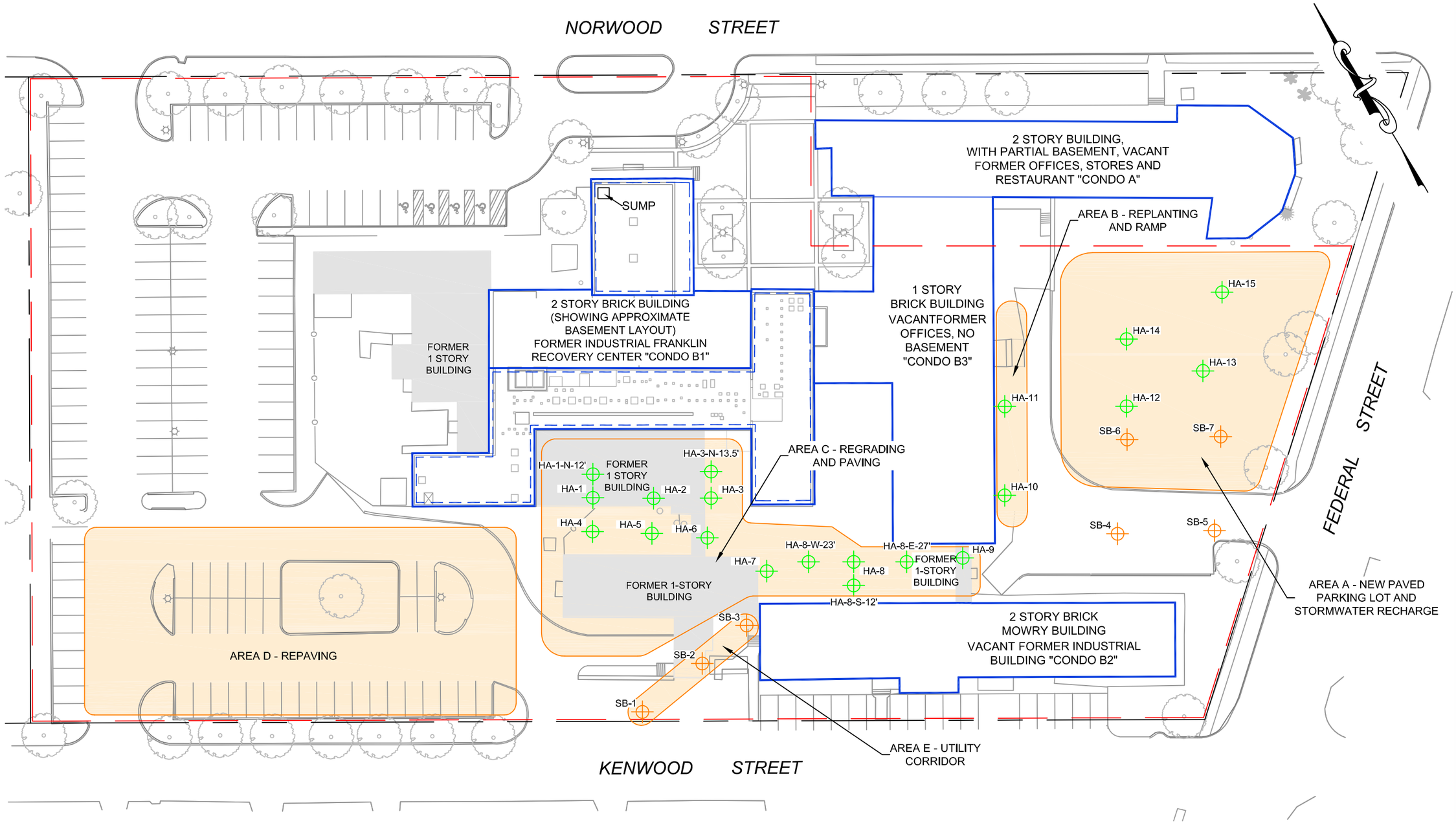
US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Lunt Silversmiths - Greenfield, MA

Field Analysis of Metals by XRF

Lab Sample ID	Client Sample ID	Arsenic mg/Kg	Lead mg/Kg
AB58064	Grid-19.5B	ND (22)	710
AB58065	Grid-19.5B Lab Dup	ND (24)	800
AB58066	Grid-20.5B	330	5800
AB58067	Grid-20.5B Lab Dup	260	5600
AB58068	Grid-20.5D	42	680
AB58069	Grid-21B	ND (11)	180
AB58070	Grid-21B Lab Dup	ND (10)	150
AB58071	Sidewall-21S	ND (6)	29
AB58072	Sidewall-21W	ND (6)	38

APPENDIX H



NOTES:

1. BASE MAP PROVIDED TO OTO IN ELECTRONIC FORMAT; ORIGINAL PLAN ENTITLED "EXISTING CONDITIONS" BY THE BERKSHIRE DESIGN GROUP, INC. (DATED SEPTEMBER, 2015).

LEGEND:

- BASEMENT AREAS
- APPROXIMATE PROPERTY BOUNDARY
- APPROXIMATE SITE BOUNDARY
- OTO HAND AUGER SOIL BORINGS
- OTO SOIL BORINGS

DESIGNED BY: BHN
DRAWN BY: CRL
CHECKED BY: BHN
DATE: AUGUST 2017

O'REILLY, TALBOT & OKUN ASSOCIATES ENGINEERING
293 BRIDGE STREET
SUITE 500
SPRINGFIELD, MA 01103
PHONE:(413) 788-6222
EMAIL: OFFICE@OTO-ENV.COM

SCALE IN FEET
1" = 50'
0' 25' 50' 100'

298 FEDERAL STREET
GREENFIELD, MASSACHUSETTS

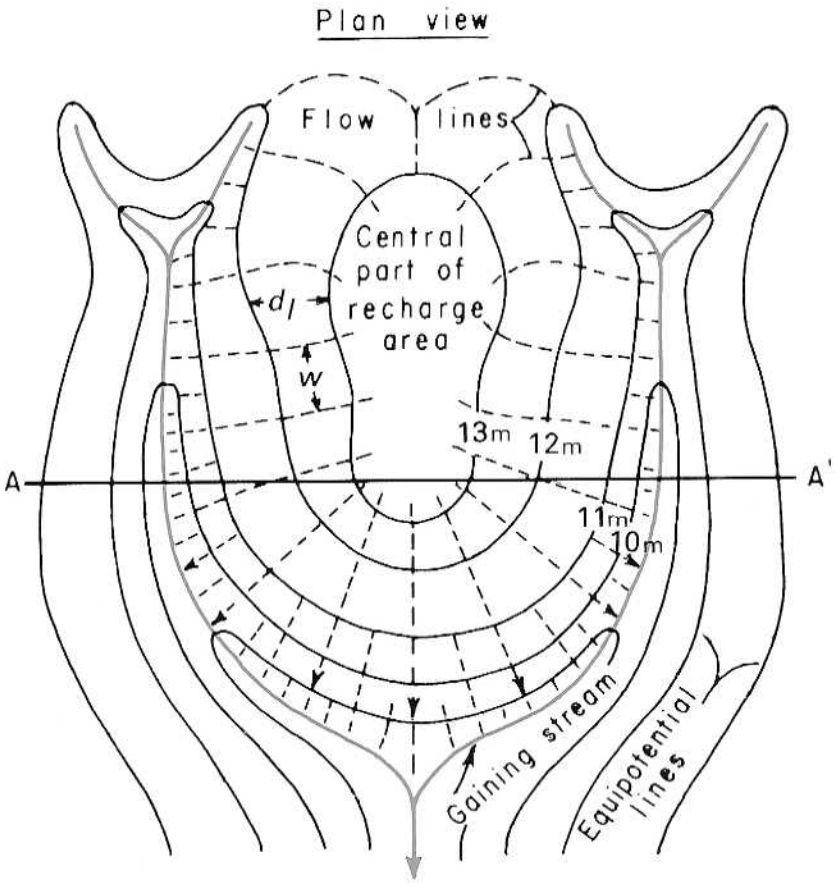
SITE PLAN WITH
SOIL BORING LOCATIONS

PROJECT No.
J2693-01-02

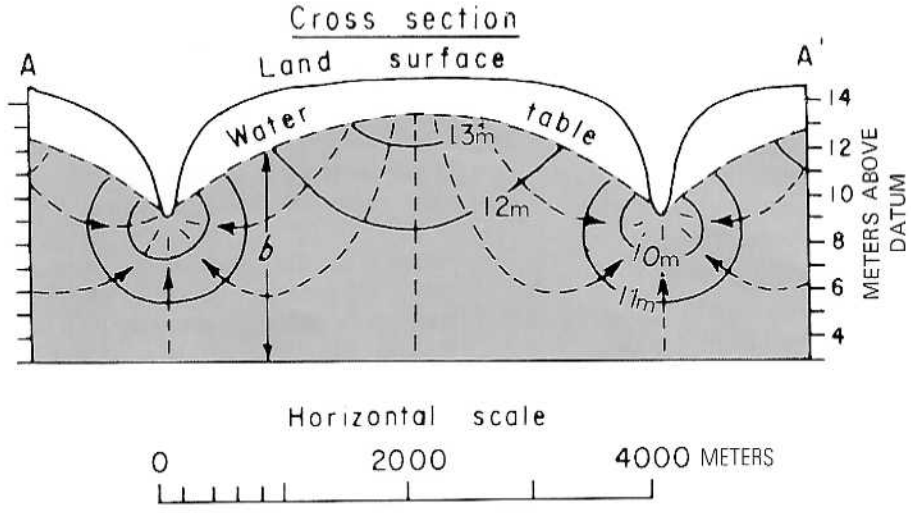
FIGURE No.
2

O:\J2600\2693 401 Liberty LLC - Lunt\01-02 Frmer Lunt Silversmith 298 Federal St Greenfield, MA - Environmental Srvs\CAD\J2693-01-02 298 Federal Street 2016.dwg

APPENDIX I


Plan view
Flow lines
Central part of recharge area
d_l
w
13m
12m
11m
10m
A
A'
Gaining stream
Equipotential lines

(1)


Cross section
A
Land surface
A'
Water table
13m
12m
10m
11m
b
14
12
10
8
6
4
METERS ABOVE DATUM
Horizontal scale
0
2000
4000 METERS

(2)

APPENDIX J

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1.0 INTRODUCTION

This Method 3 Risk Characterization has been prepared by O'Reilly, Talbot & Okun Associates, Inc. (OTO) to assess whether a release of oil and/or hazardous material (OHM) at 298 Federal Street in Greenfield, Massachusetts represents a condition of No Significant Risk within the meaning of the Massachusetts Contingency Plan (MCP: 310 CMR 40.0990).

The Method 3 is included as Appendix J of OTO's Phase II Comprehensive Site Assessment (CSA) for the MCP Disposal Site (the "Site") regulated by the Massachusetts Department of Environmental Protection (MassDEP) under Release Tracking Number (RTN) 1-18869. This release was reported to MassDEP in April 2012 for chlorinated volatile organic compounds (cVOCs - principally trichloroethylene [TCE] and associated cVOCs and metals). The MCP Disposal Site (the "Site") is defined as the former Lunt buildings divided into separate condominiums, so that condominium A1 is the northeast building, and the remaining buildings are condominiums A2, B1, B2, and C (the former "Mowry" building) (CSA Figure 2). The "Site" does not include the northeastern building (condominium A1) where activities were restricted to commercial sales and a restaurant.

Three (3) Risk Characterization methods, which vary in detail and circumstances of use, have been developed under the MCP to evaluate MCP sites, as described in 310 CMR 40.0941(3) and 40.0942. These three (3) methods provide equivalent levels of protection to human health, public welfare, and the environment. A Method 3 approach was considered applicable for the Site because Site-specific methodologies (e.g., exposure assumptions concerning Site use) have been used. As defined in 310 CMR 40.0990, the Method 3 Risk Characterization evaluated the risks to human health, public welfare, safety, and the environment for all current and reasonably foreseeable future site activities and uses.

This Method 3 Risk Characterization has been completed in accordance with the MCP, 310 CMR 40.0900 (MassDEP, 2014a), and applicable Massachusetts Department of Environmental Protection (MassDEP) guidance (MassDEP, 1995 through 2019). Human health risks for the Site are assessed in Section 2.0 of this report. Risk of harm to public welfare, including comparisons to Upper Concentration Limits (UCLs), is presented in Section 3.0. Characterization of risk of harm to safety is described in Section 4.0. The environmental risk characterization is in Section 5.0. Section 6.0 presents conclusions regarding the overall significance of Site risk.

1.1 Site History and Investigations

A detailed description of the Site history, investigations, and remedial actions is presented in OTO's Phase II CSA. Assessment and remedial activities have been conducted at the Site from 2012 through 2019. The Conceptual Site Model (CSM) for the Site is as follows.

Lunt Silversmiths was established as a manufacturer of sterling, silver-plate and stainless-steel flatware, holloware, and giftware in 1902. Manufacturing operations included cutting, stamping, degreasing, smelting, annealing, electroplating, buffing, and polishing. Assessment and remedial activities were performed between approximately 2012 and continued through completion of the redevelopment activities in 2019. The Site has been converted into a commercial medical facility to house patients recovering from substance abuse.

Soils in the Site vicinity are mapped as fine glaciolacustrine deposits over till. Subsurface investigations have found a stratigraphy consisting of two to seven feet of fill, followed by silty sand or clayey silt, followed by two to five feet of glacial till above bedrock. Bedrock in the area is mapped as arkose interbedded with siltstone and arkosic sandstone. Soil borings performed around the Site and in the adjacent downgradient neighborhood indicate bedrock is likely at depths of five to ten feet in the eastern portion of the Site, but drops to depths of approximately 30 feet below ground surface towards the west. Depth to groundwater across the Site is shallow (three to five feet) and groundwater flow directions are towards the south and Kenwood Street. Review of hydrogeologic properties at the Site indicate a relatively slow groundwater flow rate on the order of 3 feet per year. Given the commercial use of the property and the hydrogeologic setting, the applicable Method 1 standards are likely S-2 for soil and GW-2 and GW-3 for groundwater.

Site investigations have identified two release conditions at the Site that stem from former Site manufacturing operations. These are cVOCs (primarily TCE) in soil and groundwater and metals (arsenic, antimony, silver, and lead) in soil. The most highly impacted soils were excavated as part of an EPA removal program in 2015. Excavations were primarily in two areas, termed the west grid and south grid areas. Metals impacted soils below former cyclonic dust collectors were also excavated. EPA also excavated the most highly contaminated Site-wide surficial soils (0 to 0.5 feet).

The concentrations of TCE and metals in remaining surficial and deeper soils exceed the applicable MCP Method 1 S-2 standards.

A cVOCs groundwater plume, sourced from the Site, is intercepted by the storm sewer in Kenwood Street, which prevents the plumes from crossing into the residential properties south of Kenwood Street. Sampling the sewer system water indicates the TCE does not reach the discharge point of the sewer discharge at the Green River.

Two passive subslab venting systems (Passive Exposure Pathway Mitigation Measures or PEPMMs) were constructed at the Site below the buildings at condominium units B1 and C to control cVOCs vapor intrusion. Indoor air monitoring data were used in the Method 3 to demonstrate the effectiveness of these systems to support a condition of No Significant Risk for residential long-term inhalation risk. This is conservative, since the Site is a commercial medical facility, with short-term (less than 90 days) overnight stays for patients.

The manufacturing history and remedial activities associated with Site redevelopment have resulted in a property with residual soil and groundwater that does not support unrestricted Site Use. As concluded in the Method 3 Risk Characterization, the implementation of an Activity and Use Limitation (AUL) that limits direct contact to soil and manages vapor intrusion into buildings would result in a condition of No Significant Risk for current and foreseeable future Site uses and conditions.

1.2 Data Used in the Method 3 Risk Characterization

The objective of the Method 3 Risk Characterization is to determine if concentrations of OHM at the Site represent a Condition of No Significant Risk under current and foreseeable future Site Conditions. The analytical data most representative of current conditions for the subject Site were evaluated for use in the Method 3 Risk Characterization. These data are presented in the CSA in Tables 2 through 22.

2.0 HUMAN HEALTH RISK ASSESSMENT

2.1 Current and Reasonably Foreseeable Future Site Use

Site Description: The Site is a Limited Commercial (LC) zoned property currently used as a commercial medical facility. The current size of the building footprints of the Site (not including off-site condominium unit A1) is estimated as approximately 25,000 square feet. The series of interconnected buildings include one- and two-story portions constructed primarily of brick.

Exterior portions of the Site include paved parking lots and landscaped areas (primarily located around the perimeter of the Site).

Utilities: The Site buildings are serviced by municipal water and sewer systems, and are heated by natural gas.

Surrounding Area: The property containing the Site is bounded by Norwood Street on the north, Federal Street on the east, Kenwood Street, on the south, and baseball fields on the west. Residential neighborhoods are located to the north, south, and west. Development to the east, across Federal Street, is primarily commercial.

Sensitive Receptors: There are no known schools, hospitals, daycare centers, or long-term healthcare facilities located within 500 feet of the Disposal Site.

Foreseeable Future Use: The Site is likely to remain commercial and surrounding areas are expected to remain as a mix of commercial and residential in the foreseeable future.

2.1.1 Soil and Groundwater Categories

Categories for soil and groundwater have been developed by the MassDEP to facilitate the characterization of risk at MCP sites. The identification of applicable groundwater

and soil categories at the Site has been performed in accordance with 310 CMR 40.0993(2).

Soil Category

Identification of the applicable soil category requires an assessment of three (3) factors identified in Section 40.0930 of the MCP. These are (i) accessibility, (ii) frequency of use, and (iii) intensity of use. Each of these factors must be assessed for the current use scenario and for a reasonably foreseeable future use scenario.

Soil analytical data indicates that detected concentrations of OHM were reported in soils located at depths of 0 to 12.5 feet below ground surface (bgs) in landscaped areas and under pavement/concrete. The impacted soils located from 0 to 3 feet bgs in landscaped areas are "accessible" for exposure. The paved soils are categorized in the MCP as "potentially accessible" for exposure.

The Site is currently used as a commercial medical facility. Therefore, adult commercial workers and residential patients are assumed to be present on a high frequency basis inside the building. The intensity of use for soil is likely to be low.

Other Site workers, such as landscapers and maintenance workers, may be present at a low frequency and potentially high intensity of use of soils. Impacted soils are primarily located under pavement and not likely to be accessed by surficial activities of these workers. Impacted soil in the landscaped west grid excavation may serve as an exposure point for these workers. Impacted soil were generally not reported in landscaped areas located around the perimeter of the Site and impacted soils have not been reported at the surface.

Members of the general public, including adults and children, as visitors and trespassers, may be on the Site on a low to high frequency. There is limited potential at the Site for the general public to directly contact the "potentially accessible" soils.

Subsurface excavation for utility work is typically to a depth of 6 feet, while construction work may occur to a depth of 15 feet. Construction work and utility repair may occur at the Site. The frequency of this activity was considered low, and the intensity of use was considered high (i.e., short-term excavation activities occurring at infrequent and irregular intervals).

Under current use, the applicable soil categories are S-2 and S-3. For unrestricted future use of the Site, an S-1 soil category has been assumed for soil located at depths of less than 15 feet bgs.

Groundwater Category

MassDEP has identified three groundwater exposure categories (GW-1, GW-2, and GW-3) under the MCP, each reflective of a type of risk that may be posed by OHM in

groundwater. Different combinations of these criteria are applicable at MCP sites depending upon the relevant site groundwater resource characteristics.

GW-1: The GW-1 category is applicable to locations where groundwater is, or may in the future be, a drinking water source.

The Site is served by municipal water. According to the MassGIS map, the Site is not located within a Potentially Productive Aquifer (PPA), an Interim Wellhead Protection Area (IWPA), a Zone A of a surface water body or a Zone II of a Public Water Supply Well. According to the Town of Greenfield Board of Health, there are no records of any public or private drinking water supply wells located within an approximately 500-foot radius of the Property.

Therefore, the GW-1 category is not applicable to the Site.

GW-2: The GW-2 category applies to locations where OHM may volatilize from the groundwater and migrate into an occupied structure. Wells with an average annual depth to groundwater of fifteen (15) feet or less and located within 30 feet of a currently occupied or future planned building meet the criteria of GW-2.

The depth to groundwater on the Site ranges from approximately 2 to 5 feet below grade. Therefore, the GW-2 category is applicable to the Site within 30 feet of currently occupied buildings.

GW-3: The GW-3 category is intended to protect environmental receptors in surface water that may be exposed to OHM when groundwater from an MCP site discharges to surface water. For all MCP sites, the GW-3 groundwater category is applicable.

No surface water bodies are located on the Site. The nearest surface water body to the Site is the Connecticut River, which is located approximately 4,000 feet to the east of the Site. The Green River is located approximately 5,500 feet to the west. Based on several rounds of gauging and transit surveys conducted during field work in 2012 and 2013, the general groundwater flow direction at the Site is toward the southwest.

Applicable Groundwater Categories: Given this set of circumstances, the applicable groundwater categories for the Site are GW-2 and GW-3.

2.1.2 Background Concentrations for Soil

CVOCs, Volatile Petroleum Hydrocarbons (VPH), Extractable Petroleum Hydrocarbons (EPH), and metals were detected in soil samples collected at the Site. The MassDEP has not formally established background concentrations for these constituents in soil, except for EPH target analytes polycyclic aromatic hydrocarbons (PAHs) and metals. Therefore, in this risk characterization, it is assumed that background concentrations for the detected soil constituents, except for EPH PAHs and metals were the laboratory method reporting limits for the respective analytical parameters.

The detected concentrations of EPH PAHs, in one soil sample (LS-24) that was excavated in 2015, were below MassDEP Background concentrations for "Natural" Soil (MassDEP, 2002a). As such, no PAHs were selected as contaminants of concern (COCs).

In post-excavation soil the concentrations of antimony, arsenic, cadmium, lead, silver, and vanadium in at least one sample exceeded the MassDEP Background concentrations for in "Natural" Soil and Soil Containing Coal/Wood Ash in Fill Material (MassDEP, 2002a). Therefore, these six metals were selected as soil COCs.

2.2 Hazard Identification

2.2.1 Identification of Constituents of Concern

In accordance with MCP guidance (MassDEP, 1995), each detected compound should be considered a COC, unless one (1) of the following conditions is true:

- The chemicals are present at a low frequency of detection and in low concentration; or
- The chemicals are present at levels that are consistent with "background" concentrations for the area and there is no evidence that their presence is related to activities at the site; or
- The chemicals are field or laboratory contaminants.

Soil: Soil analytical data representing current, post-excavation Site conditions were evaluated by the above criteria for the selection of COCs. Compounds selected as soil COCs were the detected cVOCs, VPH and EPH fractions, and six metals (see Section 2.1).

Groundwater: The groundwater analytical data reported for samples collected from Site monitoring wells through December 2019 were used to select groundwater COCs. The COCs are cVOCs.

Indoor Air: The indoor air COCs are the detected cVOCs reported in Condominium Units B1 and C samples.

2.2.2 Toxicity Profiles

Toxicity profiles describe the potential human health effects posed by the constituents of concern, when doses are high enough to elicit an effect. Toxicity profiles for the constituents of concern at the Site are included in Appendix A.

2.2.3 Identification of Applicable or Suitably Analogous Standards

Applicable or suitably analogous standards are formally promulgated standards intended to protect human health and the environment from adverse effects of hazardous agents. Such standards are medium-specific.

There are no applicable or suitably analogous soil standards available for Site COCs. In accordance with MassDEP policy, MCP Method 1 Risk Characterization standards are not considered applicable or suitably analogous standards for Method 3 risk assessments. However, they are included on data tables in this Risk Characterization for reference.

Federal and state drinking water standards (such as Massachusetts Maximum Contaminant Levels [MMCLs]) are applicable or suitably analogous enforceable standards for sites classified as GW-1. Drinking water guidelines (e.g., MassDEP Office of Research and Standards Drinking Water Guidelines [ORSGL]) are not enforceable standards. The drinking water standards are applicable to a site, if the site groundwater is categorized as GW-1. The GW-1 category is not applicable to Site groundwater. Therefore, drinking water standards are not applicable to the subject Site.

Massachusetts Surface Water Quality Standards are applicable or suitably analogous standards to a site, if surface water is present and potentially impacted by a site. The potential for impact to surface water related to the Site has not been identified. Therefore, surface water quality standards are not applicable to the Site.

2.3 Dose-Response Assessment

Dose-response information describes the health effects observed in humans or animals associated with particular doses of a constituent. Based on the observed effect and target organ identified, a numerical value is developed to estimate the magnitude of the health effect associated with a dose. Dose-response values are derived differently for non-carcinogenic and carcinogenic effects, as discussed below.

Toxicity values were compiled for COCs in the media that serve as potential exposure points for human receptors. For this Site, soil serves as a potential exposure point.

The dose-response information for COCs are encoded in the MassDEP Method 3 Shortforms and are presented in the Shortforms Vlookup Version v0315 (MassDEP, 2015). The primary source of the toxicity values used by MassDEP was United States Environmental Protection Agency (USEPA) Integrated Risk Information System (IRIS) as of May 2012. IRIS was checked to identify any toxicity values for COCs that have been updated (USEPA, 2020). The toxicity values for COCs are presented in Table 1.

2.3.1 Threshold (Non-carcinogenic) Effects

For non-carcinogenic effects, there is believed to be a threshold level below which no adverse health effects will occur.

Dose-response values for non-carcinogenic oral effects are referred to as Reference Doses (RfDs). For inhalation effects, these values are referred to as Reference Concentrations (RfCs). RfDs and RfCs represent provisional estimates of the threshold dose that will not pose risk of an adverse health effect to sensitive humans.

RfDs and RfCs are developed by applying uncertainty factors and modifying factors to the critical dose or concentration. This dose or concentration is usually either the Lowest-Observed-Adverse-Effect Level (LOAEL) or the No-Observed-Adverse-Effect Level (NOAEL) from toxicological studies, which are typically performed with test animals.

Uncertainty factors are used to account for interspecies variability, variation in sensitivity within the human population, differences in the route of administration among tests, and other variables that may lend uncertainty to the extrapolation of test data to environmental settings.

Units for RfDs are mg/kg/day, representing a dose of chemical (in milligrams) per receptor body weight (in kilograms) per day. For inhalation exposures, the RfC value is expressed as a concentration in air in mg/m^3 for continuous, 24 hour/day exposure.

Oral RfDs and inhalation RfCs for the COCs were summarized in Table 1.

2.3.2 Non-threshold (Carcinogenic) Effects

In accordance with MCP guidance, we have assumed that for carcinogenic effects there is no threshold level; that is, every non-zero exposure to a carcinogen is believed to be associated with some increased incremental risk. Dose-response values derived for carcinogenic compounds are Cancer Slope Factors (CSFs).

CSFs are calculated as the largest linear slope of the dose-response curve, which is generally extrapolated from the low-dose end of the curve. Oral CSFs are expressed in $(mg/kg/day)^{-1}$, and inhalation unit risks are expressed in $(ug/m^3)^{-1}$. Both values assume that the received dose is averaged over a lifetime.

USEPA's weight-of-evidence cancer classifications for each of the soil COCs at the Site were compiled. These classifications indicate whether existing human and animal data are sufficient to confirm whether there is an association between exposure to the compound and the occurrence of cancer.

Arsenic and nickel (inhalation only) have a weight-of-evidence classification of Group A (i.e., Human Carcinogen - sufficient evidence in epidemiological studies to support causal association between exposure and cancer in humans). Cadmium (inhalation

only) and lead have a Group B1/B2 weight-of-evidence classification (i.e., Probable Human Carcinogen). TCE has a Group C-B2 weight-of-evidence classification (i.e., Probable/Possible Carcinogen). No COCs have a Group C weight-of-evidence classification (i.e., Possible Human Carcinogen). The remaining COCs have been given a classification of D (i.e., Not Classifiable - inadequate or no human and animal evidence of carcinogenicity) or a classification is not available.

Carcinogenic values for inhalation exposures based on oral CSFs, called unit risks, are calculated by dividing the slope factor by the body weight (70 kg) and multiplying by the air inhalation rate (20 cubic meter [m^3]) for risk associated with unit concentration in air. Multiplication by 10^{-3} is necessary to convert mg (milligrams) to µg (micrograms).

Dose-response information for carcinogenic effects associated with COCs were summarized in Table 1.

2.3.3 Relative Absorption Factors

Relative absorption factors (RAFs) are used to account for the differences in absorption likely to occur between exposures under Site conditions and those that occurred under the experimental conditions that form the basis of the toxicity values. Absorption differences may result from matrix effects (e.g., doses absorbed from soil versus water) as well as from routes of administration (e.g., oral versus dermal exposure). RAFs adjust the calculated Site dose to make it comparable to the available toxicity information.

RAFs used in this risk assessment for exposure are encoded in the Method 3 Shortforms (MassDEP, 2015). In the absence of compound-specific data for inhalation exposures, a default RAF of one (1) was used, which conservatively assumes 100% uptake. The RAFs for Site COCs are presented in Table 2.

2.4 Exposure Assessment

The objectives of the Exposure Assessment are to:

1. Qualitatively and quantitatively describe the settings and conditions under which human exposures to Site OHM may reasonably be expected to occur, and
2. Calculate doses of Site OHM that human receptors may receive.

Achieving these goals entails the identification of receptors that may be on-Site, evaluation of exposure pathways, and the calculation of Exposure Point Concentrations (EPCs) to which receptors may be exposed.

2.4.1 Development of Exposure Profiles

Exposure profiles provide a narrative description of how exposures may take place at the Site. The profiles identify factors related to potential exposures and estimate their magnitude.

These factors include variables such as the receptors' body weights, intake rates, frequency of exposure, and duration of exposure. Exposure profiles are provided for each receptor identified under current and reasonably foreseeable future uses of the Site, including unrestricted residential use of the Site in order to evaluate the need for an AUL in accordance with the MCP.

2.4.1.1 Identification of Potential Human Receptors and Exposure Points

Exposure points represent the locations where human or ecological receptors may come into contact with OHM at a site. These locations may be either single discrete points or areas/zones of affected media.

Potential human receptors were identified based on the current and reasonably foreseeable future uses of the Site. The maximum exposed human receptors were identified as construction workers and residents for soil, and building occupants for indoor air.

Under current and foreseeable future conditions, "potentially accessible" and "isolated" soil are present on the Site. The "potentially accessible" soil may serve as a direct contact exposure point if pavement is removed and excavation occurs and made "accessible". "Isolated" soil under buildings would only occur, if buildings are demolished and soil is made "accessible". Therefore, these soils were evaluated for potential exposure under unrestricted Site use.

Direct contact exposures to soils have been evaluated for construction workers and residents for unrestricted future conditions assuming that impacted "potentially accessible" soil become "accessible". Potential exposures by construction workers to Site soils were considered to be health protective of potential soil exposure to lesser-exposed utility workers, landscapers, and commercial workers who would not be conducting intrusive activities on a frequent and regular basis. Potential exposures by residents to Site soils were considered to be health protective of potential soil exposure to lesser-exposed receptors, such as patrons, attendees of schools and day care centers, visitors, and trespassers.

Potable water is supplied to the Site by a municipal source. Therefore, there is no current direct exposure pathway to groundwater as a public or private drinking water supply.

Vapor intrusion from groundwater categorized as GW-2 (located at a depth of 15 feet or less and within 30 feet of an existing or planned future building) and soil (located

within 6 feet horizontally and 10 feet vertically from the building) may be an indirect exposure pathway for building occupants.

There are occupied buildings within the Disposal Site. Groundwater concentrations for cVOCs have been reported to exceed MCP Method 1 GW-2 standards. In addition, soil with detected cVOCs are located in close proximity to occupied buildings. However, buildings in these impacted areas, Condominium Units B1 and C, were constructed with vapor barriers and Passive Exposure Pathway Mitigation Measures (PEPMMs).

Indoor air samples collected in Condominium Units B1 and C with the PEPMMs operational were used to evaluate inhalation risks to Site workers and residential patients. It is noted that the basement in Condominium Unit B is only 4 feet high, therefore, would not be used as space for regular work and residential patient stay.

Although unlikely, groundwater from the Site may reach nearby surface waters and serve as an indirect exposure pathway for aquatic organisms. The potential environmental effect of groundwater discharging into surface water is evaluated for ecological receptors in Section 5.0 - Environmental Risk Characterization.

2.4.1.2 Identification of Exposure Routes

The exposure route describes how a receptor may contact contaminants at a site. The exposure routes identified for quantitative analysis in this Method 3 Risk Characterization are the inadvertent ingestion of constituents in soil and the dermal absorption of constituents from soils in contact with the skin by construction workers and future residents, ingestion of produce grown in soil by future residents, and the inhalation of airborne soil particulates by construction workers. Inhalation risks from indoor air were also evaluated for indoor workers and residential patients.

Other exposure routes that were considered for quantitative analysis in the evaluation of current and unlimited future use, but were determined not to be complete or not to contribute significantly to overall risk, were:

- Incidental ingestion of and dermal contact with soil by Site commercial workers, utility workers, landscapers, trespassers, and visitors;
- Inhalation of fugitive dust by residents, workers and lesser-exposed receptors;
- Inhalation of vapors from groundwater in off-Site downgradient residences; and
- Dermal contact with groundwater and inhalation of volatiles released from groundwater in a trench by construction/utility workers.

Soil exposure is possible for utility workers and landscapers. Commercial workers, patrons, trespassers, and visitors are not expected to be engaged in regular activities that would result in direct contact exposure to soil. Soil exposures were not quantitatively evaluated for these receptors as the evaluation of construction worker

and resident exposure to Site soils, respectively, were considered health protective of these lesser-exposed receptors. In addition, soil boring samples (SB-1 through SB-3) collected in the utility corridor located west of Unit C and extending to Kenwood Street were not reported with elevated concentrations of soil COCs (CSA Table 8).

The inhalation of fugitive dusts by Site workers, residents, and lesser-exposed receptors was not quantitatively evaluated. The inhalation of fugitive dusts was quantitatively evaluated for construction workers. Under the condition that the impacted soils were excavated in the future, it is likely that the construction workers would be the maximum exposed individuals, and potential exposures to commercial and utility workers, residents, and other receptors would be lower.

The impacted soils are primarily located at the surface and depths of less than 3 feet below ground surface (bgs). Soil currently located under pavement would not be expected to be used for gardening under a commercial nonresidential use. Under a future theoretical residential scenario, metals in soil could be uptaken by edible plants that are ingested. However, the use of the Site will be restricted to nonresidential purposes and this exposure pathway would not be complete.

As presented in the CSA (Section 6.7), two rounds of indoor air assessment were conducted in residential homes located south of the Site on Kenwood and Davis Streets and Forest Avenue. MassDEP conducted the sampling in 2013 and EPA conducted the sampling in 2014. The conclusion of the sampling was that no Site-related cVOCs were reported at concentrations that would likely pose a significant vapor intrusion risk.

Pathways for the construction/utility workers that involve groundwater exposures, including dermal contact with groundwater and inhalation of volatiles in ambient air released from groundwater in a trench, were not evaluated quantitatively. Subsurface excavation for utility work is typically to a depth of 6 feet, while construction work may occur to a depth of 15 feet. The depth to groundwater is approximately 2 to 5 feet bgs. Therefore, construction and utility work could potentially occur in the groundwater table.

As presented in the CSA, storm water from the Site flows into storm drains on the north side of Kenwood Street, flows along a vitreous clay pipe and ultimately discharges to the Green River approximately 1.5 miles southwest of the Site. The depth to groundwater monitoring wells along the Site at Kenwood Street (2 to 3 feet bgs) is higher than the invert of the sewer located at 6 to 7 feet bgs; allowing groundwater to infiltrate the sewer. The highest TCE concentrations in the sewer were reported in CB-1N/-1S and CB-2N, located adjacent to the Site along Kenwood Street, and decrease in distance from the Site.

Direct contact with groundwater in trenches and utility conduits would generally be experienced only occasionally by laborers during dewatering and emergency utility repair, an activity that would result in short-term exposure (MassDEP, 1996b). It is not considered standard procedure for workers to enter a confined spaces containing

water without adequate monitoring and personal protection. We assumed that Occupational Safety and Health Administration (OSHA) regulations and standard health and safety procedures regarding sloping of trench excavations, water and atmospheres in confined spaces would be followed, which would limit potential exposure.

For construction and utility excavation in the water table, dermal absorption of volatiles in groundwater and in contact with the skin and inhalation of volatiles by construction and utility workers were not considered significant exposure pathways.

2.4.1.3 Exposure Profile Summary

Exposure profile summaries bring together the different elements of the exposure profile to develop the relevant complete exposure pathways for each receptor.

Receptor (time frame)	Age Group	Time Frame	Medium	Exposure Route
Construction Worker (current/future)	Adult	Subchronic	Soil	Incidental Ingestion
				Dermal Contact
				Inhalation - Gastrointestinal
				Inhalation - Pulmonary
Indoor Worker (current/future)	Adult	Chronic	Indoor Air	Inhalation of Vapors
Resident Patient (current/future)	Adult	Chronic	Indoor Air	Inhalation of Vapors
Resident (future)	Child to Adult	Subchronic to Chronic	Soil	Incidental Ingestion
				Dermal Contact

2.4.2 Development of Exposure Factors

Exposure factors, also referred to as exposure assumptions, are numerical estimates of the magnitude and duration of exposures that receptors may have to Site OHM. For the potential exposure to soil by construction workers and residents, the MassDEP *Shortforms for Human Health Risk Assessment under the MCP (sf12cw*, *sf12rs*, *sf12osa*, *and sf12ra)* with the Vlookup Version v0315 (MassDEP, 2015) were used for exposure assumptions and equations.

The exposure assumptions and equations for estimating exposures are presented in the following tables:

Table 3 - Construction Worker - Incidental Ingestion of and Dermal Contact with Soil, and Inhalation of Airborne Particulates
Table 4 - Resident - Incidental Ingestion of and Dermal Contact with Soil, and Ingestion of Homegrown Produce
Table 5 - Indoor Worker - Inhalation of Vapors

Table 6 - Resident - Inhalation of Vapors

As presented in the CSA Table 1, the duration of stay for patients in Unit B1 may range for 7 to 25 days and in Unit C up to 90 days. As the primary COC, TCE, may exhibit noncarcinogenic effects for short-term exposure and potential carcinogenic effects from long-term exposure, the exposure assumptions in the Shortforms for Residential Indoor Air exposure (sf12ra) were not altered.

2.4.3 Exposure Point Concentrations (EPCs)

EPCs are the concentrations of OHM in Site media that are representative of the concentrations a receptor may be exposed to over the course of an exposure. EPCs are calculated separately for each OHM in each medium. The soil and groundwater analytical data discussed in Section 2.2.1 of this report were evaluated for the development of EPCs.

Groundwater EPCs are generally represented by detected concentrations in each individual well, while soil EPCs may represent an arithmetic average concentration within an affected area or over the entire site. The Site data were first evaluated to determine if a "hot spot" area(s) is (are) present.

Hot Spots

A hot spot is defined as a discrete area where concentrations of OHM or the thickness of LNAPL are substantially higher than those present in the surrounding area. A hot spot can be identified based on consideration of both the concentrations or thickness of an OHM within a contaminated area and the spatial pattern of that contamination.

A discrete area where the average concentration within the area is greater than ten (10) but less than 100 times the average concentration in the immediate surrounding area is a hot spot, unless there is no evidence that the discrete area would be associated with greater exposure potential than the surrounding area. In all cases, a discrete area where the concentration of OHM is greater than 100 times the concentration in the surrounding area is considered a hot spot. In addition, a hot spot cannot be created as a result of a remedial action (MassDEP, 2018), such as soil excavation.

Data from the affected areas of the Site were evaluated to identify potential "hot spots;" none were identified.

Soil

The MCP (310 CMR 40.924(2)(b)(4)) specifies that for current and potential soil exposures, the following depths should be considered, with any applicable Site-specific information, when determining EPCs:

1. 0 to three (3) feet for exposures associated with surficial activity;
2. 0 to six (6) feet for exposures associated with utility installation and repair;
3. 0 to fifteen (15) feet for exposures associated with excavation scenarios and building construction.

Sets of soil EPCs developed for the Site to be used to calculate risks were based on the following impacted areas of the Site, depth in feet bgs of impacted soil, and COCs. The EPCs were developed for those areas of the Site where concentrations of COCs in individual samples exceeded Method 1 S-1/GW-2/GW-3 standards. As such not all samples and areas (e.g., new stormwater recharge area) with lower concentrations were included in the EPC calculations, which is a conservative, health-protective approach.

Surficial Soil

- Central/Manufacturing Area - 0 to 0.5' & 0 to 2' - cVOCs and metals
- Southeastern Area - 0 to 2' - Metals
- Northern Former Cyclone Area - 0 to 2' - Metals
- Western Grid Excavation Area - 2 to 3' - cVOCs and metals
- Southern Grid Excavation Area - 2 to 4' - CVOCs and metals

Subsurface Soil

- North, West and South of buildings - 5 to 12.5 feet - cVOCs and VPH/EPH

The EPCs were generally calculated as the average (arithmetic mean) of the detected concentrations for COCs with exceedances of Method 1 S-1 Standards in a specific sample set. When concentrations of a COC in a sample set did not exceed Method S-1 standards, the EPC was selected as the maximum detected concentration.

This approach is conservative, health-protective, as samples with lower detected concentrations were not included in the EPCs; resulting in higher EPCs.

The EPCs are presented in Table 7. The soil EPCs were used to calculate soil risks for construction workers and residents and compared to Upper Concentration Limits (UCLs) in the Public Welfare Risk Characterization (Section 3.0).

Groundwater

Groundwater EPCs are calculated for individual monitoring wells. For this Site, EPCs were calculated for monitoring wells with detected concentrations of COCs exceeding Method 1 GW-2 and GW-3 standards. These wells include those more recently sampled from August 2018 through December 2019 (LS-19, former LS-20, LS-22, MW-102, MW-103, and MW-104). Groundwater EPCs were also determined for the monitoring wells installed through the basement foundation in Unit B1 and sampled in September 2016 (LWP-101 through LWP-108).

EPCs were selected as the maximum detected concentrations of COCs, if only analyzed once during the above time periods or calculated as the average of the detected concentrations, if samples more than once. One exception was monitoring well MW-104 that was sampled twice (August 2018 and September 2019), where detected concentrations increased significantly in the 2019 sample. In this case, the September 2019 concentrations were selected as the COCs.

The groundwater EPCs for at least one cVOCs (TCE and breakdown products) in each of these wells exceed the applicable MCP Method 1 GW-2 standards. The EPCs for TCE in MW-104 (2018/2019) and LWP-101 (2016) exceeded the MCP Method 1 GW-3 standard (Table 8).

Indoor Air

Indoor air EPCs were calculated for cVOCs reported in Condominium Units B1 and C with the PEPMMs in operations. For Unit B, EPCs were developed for 1st and 2nd floor rooms used by commercial Site workers, 1st floor residential rooms used for patients, and the basement accessed occasionally by Site workers. For Unit C1, EPCs were developed for 1st and 2nd floor commercial Site workers.

The EPCs representing conditions with PEPMMs in operation were calculated as the average of the detected concentrations and a value of the detection limit for Unit B1, where cVOCs were reported to exceed MassDEP Residential Threshold Values (TV_R). For Unit B1 basement and Unit C 1st and 2nd floor, the indoor air EPCs were selected as the maximum detected concentrations (Table 9).

2.4.4 Calculation of Average Daily Doses

The average daily dose (ADD) is a quantitative estimate of how much of each compound is taken into the receptor's body during exposure. The ADD is expressed as milligrams of OHM per kilograms of body weight per day. The general form of the dose equation is:

$$ADD = \frac{(\text{Total Amount of OHM Contacted}) * (RAF)}{(\text{Body Weight}) * (\text{Averaging Period})}$$

ADDs are calculated differently for assessment of carcinogenic and non-carcinogenic effects. For non-carcinogenic effects, the ADD is averaged over the exposure period. The resulting ADD is an estimate of dose experienced during the actual period of exposure.

$$\text{Averaging Period}_{\text{non-carcinogenic}} = \text{Exposure Period}$$

For carcinogenic effects there is assumed to be no threshold level, and exposures are cumulative over a lifetime. The dose received is therefore averaged over a lifetime

(70 years) instead of over just the exposure period. The resulting dose estimate is referred to as a lifetime average daily dose, or LADD.

$$\text{Averaging Period}_{\text{carcinogenic}} = \text{Lifetime (70 years)}$$

For air exposures, instead of an ADD, the average daily exposure (ADE) is estimated. The ADE is a quantitative estimate of the applied concentration of each compound for the receptor during exposure.

The ADE is expressed as ug of OHM per m^3 of air and is based on the EPC and an adjustment for the amount of time the receptor spends in the area with contaminated air. The general form of the exposure equation is:

$$\text{ADE} = \frac{\text{EPC} * \text{Exposure Duration} * \text{Exposure Frequency} * \text{Exposure Period} * \text{Conversion Factors}}{\text{Averaging Period}}$$

As with ADDs, ADEs are calculated differently for assessment of carcinogenic and non-carcinogenic effects. For assessment of non-carcinogenic effects, the ADE is averaged over the exposure period. The resulting ADE is an estimate of dose experienced during the actual period of exposure.

$$\text{Averaging Period}_{\text{non-carcinogenic}} = \text{Exposure Period}$$

For carcinogenic effects there is assumed to be no threshold level, and exposures are cumulative over a lifetime. The exposure received is therefore averaged over a lifetime (70 years) instead of over just the exposure period. The resulting exposure estimate is referred to as a lifetime average daily exposure, or LADE.

The ADDs and ADEs for construction worker and resident soil exposure and indoor air for workers and residents are encoded in the Shortforms (sf12cw, sf12rs, sf12osa, and sf12ra) (Tables 10 through 13).

2.5 Human Health Risk Characterization

Risk characterization is the final step in the risk assessment process. In this step, the results of the Hazard Assessment, Dose-Response Assessment, and Exposure Assessment are combined to yield quantitative estimates of incremental risk posed by potential exposures to environmental media at the Site. Separate estimates of potential cancer and non-cancer risk are made for each receptor and are discussed below.

These estimates are compared to applicable MCP risk management criteria to establish whether a Condition of No Significant Risk is present.

2.5.1 Non-Cancer Risk

The indicator used to describe the potential for non-carcinogenic health effects is the Hazard Quotient (HQ). For a given constituent, an HQ is the ratio of a receptor's exposure level (or dose) to the level of exposure considered safe.

In this Risk Characterization, a safe level of exposure is represented by the RfD or RfC for each compound. An HQ that does not exceed 1 indicates the receptor's exposure to that compound is without risk of adverse health effect.

Hazard Quotient = ADD/RfD or
Hazard Quotient = ADE/RfC

When the Hazard Quotients for each of the compounds of concern and exposure pathway at the Site are summed for each receptor, the result is a total Site Hazard Index (HI). The total Site HI is referred to as a screening HI because it does not segregate different compounds of concern based on their mode of toxicological activity. Thus, when used as an indicator of total Site non-carcinogenic risk, the screening HI is likely to overstate the actual level of non-carcinogenic risk. If the screening level HI is not greater than the noncancer risk limit of an HI of 1, this indicates there is no significant non-carcinogenic health risk associated with Site exposures. If the screening level HI is greater than 1, this HI is segregated by toxicity endpoint.

The hazard indices are presented in Tables 10 through 13 and are summarized in Table 14. The cumulative screening HI values for direct contact soil exposure to construction workers in the Central Manufacturing area of the Site, former northern cyclone, western grid excavation areas, and deeper soil with cVOCs, and to residents for the western grid excavation area and deeper soil with cVOCs do not exceed an HI of 1.

In addition, the HI for Site workers and residential patient inhalation exposures in Units B1 and C with the PEPMMs operational do not exceed an HI of 1. This finding indicates that a condition of No Significant Risk for non-cancer effects exists for these receptors, Site locations, and medium.

The cumulative screening HI values for direct contact exposure to construction workers in the Southeastern area of the Site and the southern grid excavation area, and to residents for the surficial soil in the central/manufacturing area, southeastern portion of the Site, and below the former northern cyclone area, and southern grid excavation area do exceed an HI of 1. This finding indicates that a condition of No Significant Risk for non-cancer effects does not exist for these receptors, Site locations and medium.

2.5.2 Cancer Risk

The potential for carcinogenic health effects is estimated as the Incremental Excess Lifetime Cancer Risk (ELCR). The ELCR represents the incremental probability of an exposed individual developing cancer over a lifetime as a result of exposure. For each chemical, the ELCR is the product of the Lifetime Average Daily Dose (LADD) or Lifetime Average Daily Exposure (LADE) and that compound's carcinogenic potency.

The indicator of carcinogenic potency used in this risk characterization is the USEPA Cancer Slope Factor (CSF) or Unit Risk.

$$ELCR = LADD \times CSF \text{ or}$$
$$ELCR = LADE \times Unit\ Risk$$

As in the case of non-cancer risk, the ELCRs for each of the different compounds and pathways are summed to produce a receptor-specific cumulative ELCR. This cumulative ELCR is compared to the cancer risk limit of 1×10^{-5} (one in one hundred thousand). A cumulative ELCR that does not exceed 1×10^{-5} indicates that no significant carcinogenic risk is present due to OHM at the Site. A cumulative ELCR greater than 1×10^{-5} indicates a potential for significant cancer risk is present as defined by the MCP.

The ELCRs are presented in Tables 10 through 13 and are summarized in Table 14. The calculated ELCRs for direct contact exposure to construction workers and residents, and inhalation exposure to Site workers and residential patients do not exceed 1×10^{-5}. This finding indicates a condition of No Significant Risk for cancer effects exists for these receptors and medium.

For residential ingestion of homegrown produce, the ELCR for the central/manufacturing area, southeastern portion of the Site, and the former northern cyclone exceed 1×10^{-5}.

2.5.3 Summary of Findings

1. A condition of No Significant Risk does not exist for all areas of the Site for direct contact exposure to construction workers.

2. A condition of No Significant Risk exists for inhalation of vapor exposures to current Site workers and residential patients in Units B1 and C with the operation of the PEPMMs. The evaluation of inhalation of vapor exposures was considered to be health protective of lesser-exposed receptors, such as visitors.

3. A condition of No Significant Risk from direct contact soil exposure and ingestion of home grown produce to future residents does not exist for all areas of the Site.

4. A condition of No Significant Risk to direct contact soil exposure to lesser-exposed receptors, such as trespassers and visitors exist with the presence of barrier to prevent such exposures and implementation of a Soil Management Plan (SMP).

5. There were no current complete exposure pathways identified related to Site groundwater as drinking water.

6. There are no exceedances of applicable or suitably analogous standards.

Based on these findings, a condition of No Significant Risk for human health exists for Site use as a commercial medical or similar facility. However, a condition of No Significant Risk does not exist for construction workers and unrestricted future use, including full-time residential. An AUL is required that:

1. Limits current and future use to non-residential;
2. Requires maintenance of building conditions that ensure a condition of No Significant Risk;
3. Maintains the integrity of the PEPMMs;
4. Ensures any future building construction incorporates measures to evaluated the potential for and control of potential vapor intrusion; and
5. Requires any future disturbance of soils below the pavement to be performed under a SMP and Health and Safety Plan.

2.6 Uncertainty Analysis

The risk assessment process uses information from a variety of sources, such as analytical data from the Site investigation and toxicity data from published research. This information is combined with assumptions regarding potential receptors and Site use. Uncertainties may be present in each of these assumptions, and may affect the outcome of the risk assessment.

The risk assessment was developed to be a conservative estimate of potential adverse health effects. Its results should not be interpreted as definitive quantitative values. Uncertainties in the various portions of this risk assessment are discussed below.

A. Hazard Identification

The identification of constituents present in soil and groundwater and their distribution across the Site are dependent upon the sampling and analytical program conducted. Conservative assumptions were made in developing soil and groundwater EPCs that are likely to lead to overestimates of actual exposure point concentrations.

EPCs were based on detected concentrations in samples collected from higher concentration areas. Sampling programs tend to focus on areas of higher concentration, resulting in a high-end estimate of the EPC.

B. Exposure Assessment

There is uncertainty associated with exposure assessment because the range of potential human activity is broad. Variability is associated with differences between individual receptors such as body weight, skin surface area, and rates of soil or water ingestion.

Conservative assumptions that are consistent with those recommended by MassDEP risk guidance documents have been used in developing pathway exposure factors that are anticipated to err on the side of the protection of human health.

C. Dose-Response Assessment

Toxicity information for many of the constituents detected at the Site is associated with varying degrees of uncertainty. Sources of uncertainty for toxicity values (USEPA, 1989) may include:

- Using dose-response information from effects observed at high doses to predict the health effects that may occur following exposure to low levels expected from human contact with the agent in the environment;
- Using dose-response information from short-term exposure to predict the effects of long-term exposures, and vice-versa;
- Using dose-response information from animal studies to predict effects in humans;
- Using dose-response information from homogeneous animal populations or healthy human populations to predict the effects likely to be observed in the general population, which will include individuals with a wide range of sensitivities.

Most of the toxicity values used in this Risk Characterization are USEPA-verified RfDs/RfCs and slope factors. These values, as presented in IRIS, are derived using a number of safety factors and are accompanied by a statement of confidence in the value itself, the critical study, and the overall data base for RfDs/RfCs, and the weight-of-evidence classifications for slope factors.

D. Risk Calculations

The risk calculations were performed using a deterministic methodology as required under MCP guidance. In a deterministic methodology, a single value (point estimate) is used for exposure parameters and exposure point concentrations. The result is that a single risk value is calculated for each scenario and receptor of concern.

However, the use of a mix of mid-range and conservative exposure assumptions is intended to produce realistic upper-end exposure estimates, which will be protective of public health and produce risk estimates that will be valid for comparison to MCP Cumulative Risk Limits (MassDEP, 1995).

3.0 CHARACTERIZATION OF RISK OF HARM TO PUBLIC WELFARE

The MCP (310 CMR 40.0994) defines two (2) purposes for conducting a characterization of risk to public welfare: (a) to identify and evaluate nuisance conditions which may be localized, and (b) to identify and evaluate significant community effects. The characterization of risk to public welfare considers effects that exist or may result from the presence of residual contamination or the implementation of a proposed remedial alternative.

The characterization of the risk of harm to public welfare considers Site, receptor, and exposure information, as well as data collected pursuant to the response action(s) being performed.

The characterization of risk of harm to public welfare also considers such factors as the existence of nuisance conditions, loss of active or passive property use(s), and any non-pecuniary effects not otherwise considered in the characterization of risk of harm to health, safety, and the environment, but which may accrue due to the degradation of public resources directly attributed to the release or threat of release of OHM or the remedial alternative (310 CMR 40.0994(2)).

The risk of harm to public welfare is also characterized by comparing OHM concentrations to the UCLs in soil and groundwater, as defined in 310 CMR 40.0996. In addition, a level of No Significant Risk of harm to public welfare exists or has been achieved if no nuisance conditions, such as noxious odors, persist in the breathing zone of ambient and indoor air in the reasonably foreseeable future.

The EPCs for soil (Table 7) and groundwater (Table 8) do not exceed the numerical UCLs. No LNAPL has been detected in any monitoring wells in the Disposal Site.

The Site has been shown to contain soils that have been affected by constituents that may possess an odor at close range. Intermittent odors may occur if these soils are disturbed.

MassDEP guidance (MassDEP, 2002b) has suggested rules of thumb for determining when an odor condition would generally not be considered a nuisance condition. The rules of thumb that would be applicable to potential intermittent odors are:

1. Odors observed in the subsurface during excavation or boring advancement would generally not be considered a nuisance condition, as long as such odors are not detectable in ambient or indoor air, and as long as there are no plans to excavate or disturb such areas.
2. Odors observed in the breathing zone of the ambient air, or indoor air of an impacted structure, would generally not be considered a nuisance condition, if such odors do not persist for more than three (3) months.
3. Odors observed in the breathing zone of the ambient air would generally not be considered a nuisance condition if they are discernable less than ten (10) days a year.

4. Odors observed in the ambient air or indoor air of an affected structure would generally not be considered a nuisance condition if the occupants of such a structure do not believe such odors significantly affect or degrade their quality of life.

Potential odors are not believed to pose a significant risk to public welfare based on these rules of thumb being met and the infrequent occurrence and low potential for human exposures.

Therefore, there is No Significant Risk to public welfare for soils and groundwater at the Site under current and foreseeable future conditions.

4.0 CHARACTERIZATION OF RISK OF HARM TO SAFETY

The risk of harm to safety, as described in 310 CMR 40.0960, was evaluated for the Site. The following observations concerning the Site apply to release-related conditions at the Site and the relevant criteria set forth in Section 40.0960 of the MCP:

1. There are no rusted or corroded drums or containers, open pits, lagoons, or other dangerous structures at the Site;
2. There is no threat of fire or explosion from the presence of explosive vapors resulting from a release of OHM at the Site; and
3. There are no uncontained materials at the Site exhibiting the characteristics of corrosivity, reactivity, or flammability as described at 310 CMR 40.0347.

Therefore, there is not a risk of harm to safety due to release-related conditions at the Site.

5.0 ENVIRONMENTAL RISK CHARACTERIZATION

In accordance with Section 40.0995 of the MCP, this section of the risk assessment evaluates possible ecological risks due to OHM in soil and groundwater at the Site. For the Site, a Stage I Environmental Risk Screening was conducted. The Stage I Screening steps are:

1. Identify complete Exposure Pathways [310 CMR 40.0995 (3)(a)],
2. Determine whether Readily Apparent Harm Exists [310 CMR 40.0995 (3)(b)], and
3. Establish if Potentially Significant Exposures Exist [310 CMR 40.0995 (3)(c)].

If there are complete exposure pathways then, for each complete exposure, Site conditions are evaluated to determine when significant environmental harm is “readily apparent” and if the potential exposure is significant.

If there are no complete exposure pathways, no further action to assess readily apparent harm and potentially significant exposures is required (MassDEP, 1996a). The Stage I screening for potential ecological receptors has been conducted separately for aquatic and terrestrial habitats.

5.1 Site Environmental Setting

No surface water bodies are located on the Site. The nearest surface water body to the Site is the Connecticut River, which is located approximately 4,000 feet to the east of the Site. The Green River located approximately 5,500 feet to the west. Based on several rounds of gauging and transit surveys conducted during field work in 2012 and 2013, the general groundwater flow direction at the Site is toward the southwest.

5.2 Aquatic Habitat Screening

Complete Exposure Pathways - Four criteria are identified in the MCP (310 CMR 40.0995(3)(a)(1)) to assess whether there is evidence of current or potential future exposures to aquatic environmental receptors:

a. Evidence that OHM have come to be located in a surface water body or wetland,
b. Evidence that OHM have had an adverse impact on aquatic biota,
c. The presence of OHM in a surface water body or wetland as indicated by analytical data, and
d. The potential for transport of OHM in groundwater or surface runoff to aquatic receptors.

The potential for impacts to surface water was evaluated based on groundwater EPCs at the Site (Table 8).

Groundwater constituents may be carried with groundwater flow and be potentially discharged to surface water with dilution of concentrations expected during transport and discharge. This migration pathway was evaluated by comparing groundwater concentrations to the MCP groundwater standards for the protection of environmental receptors, the GW-3 standards.

The GW-3 standards incorporate lowest ecologically based criteria (LOEC) and a simple groundwater/surface water dilution factor of 10 (D_{sw}) based on MassDEP experience writing groundwater and surface water discharge permits (MassDEP, 1995).

However, this factor is conservative and does not consider Site-specific conditions such as soil type, volume of contaminated groundwater, groundwater flow direction, and the actual dilution and attenuation that may occur during groundwater flow and discharge from a site to a surface water body.

The GW-3 standards also incorporate an in-groundwater dilution factor (D_{gw}) based on a chemical property (i.e., k_{oc}) of the constituent to account for some of these factors. The values for the groundwater dilution factor are 2.5, 25 or 100.

As indicated in Table 8, the groundwater EPCs were below the current MCP Method 1 GW-3 standards, except for TCE in monitoring well MW-104. However, groundwater data from downgradient monitoring wells are less than the GW-3 Standard.

In addition, TCE in groundwater that enter the sewer system is reported as not detected at the outfalls at the Green River.

Therefore, there is no evidence that OHM has had an adverse effect on aquatic biota, and the concentrations of OHM in groundwater indicate that there is not currently or in the future a potential for adverse environmental impacts, if the groundwater reaches a surface water body or is present in surface water and sediment.

Therefore, conditions associated with the Site release do not pose a current or future potential for significant risk to ecological aquatic receptors in surface waters. Therefore, no current or potential future exposure is identified and a Condition of "No Significant Risk of Harm" to Site biota and habitats exists or has been achieved.

5.3 Terrestrial Habitat Screening

Natural vegetation on the Site is limited due to the current development of the Site and presence of pavement and buildings covering the Site. Wildlife is limited to suburban biota, such as birds and small mammals. Their presence at the Site is likely to be of a transient and/or seasonal nature. Impacted soils are located under pavement and at depths of greater than 3 feet bgs. Therefore, wildlife is not likely to access these soils.

A further evaluation of the presence of potentially significant exposure pathways was completed. Since no soil screening criteria are available, the terrestrial habitat has been screened on the basis of its size. For the purposes of this screening, the size of undeveloped/open land at the Site determines the specific evaluation of terrestrial environments.

MassDEP (1996a) states that, for the purposes of the screening process, undeveloped/open land is characterized by the presence of native vegetation, and does not include landscaped residential and commercial parcels, landscaped parks, or golf courses.

Based on this MassDEP definition, the open space at the Site is less than two (2) acres in size. Therefore, pursuant to the MCP, no further action to characterize ecological risk is required for such a site unless:

1. Contaminant transport from surface soil to an ACEC is possible, or

2. State-listed threatened or endangered species, or other species of special concern are present.

According to the MassDEP Site Scoring Map, the Site is not:

1. Within an ACEC, nor is contaminant transport from surface soil to an ACEC possible, or
2. The location of state-listed threatened or endangered species, or other species of special concern.

Based on the above information, potentially significant exposures do not exist for terrestrial ecological receptors potentially exposed to soils at the Site.

As a result, in summary, there is currently No Significant Risk to the environment from OHM detected in soil and groundwater at the Site.

6.0 CONCLUSIONS

In accordance with the Massachusetts Contingency Plan, 310 CMR 40.0990, we have conducted a Method 3 Risk Characterization related to the release of OHM for RTN 1-18869 located at 293 Federal Street in Greenfield, Massachusetts.

To assess whether reported concentrations of OHM represent a Condition of No Significant Risk, this Method 3 Risk Characterization was completed. In accordance with the MCP, the Method 3 Risk Characterization included the following components:

1. Assessment of risks to human health,
2. Assessment of risks to public welfare,
3. Assessment of risk of harm to safety, and
4. Assessment of environmental risks.

Based on these findings of the Method 3 Risk Characterization, a condition of No Significant Risk for human health exists for Site use as a commercial medical or similar facility. However, a condition of No Significant Risk does not exist for construction workers and unrestricted future residential use.

An AUL is required to achieve and maintain a condition of No Significant Risk that:

1. Limits current and future use to non-residential;
2. Requires maintenance of building conditions that ensure a condition of No Significant Risk;
3. Maintains the integrity of the PEPMMs;
4. Ensures any future building construction incorporates measures to evaluated the potential for and control of potential vapor intrusion; and
5. Requires any future disturbance of soils below the pavement to be performed under a Soil Management Plan and Health and Safety Plan.

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TABLES

Table 1
Toxicity Values for Site Constituents of Concern (COCs)

Vlookup Version v0315 OIL OR HAZARDOUS MATERIAL	CAS	CHRONIC ORAL REFERENCE DOSE (OR SUBSTITUTE) mg/kg/day	REF	SUBCHRONIC ORAL REFERENCE DOSE (OR SUBSTITUTE) mg/kg/day	REF	Chronic Inhalation Reference Concentration (or substitute) mg/m3	REF	Subchronic Inhalation Reference Concentration (or substitute) mg/m3	REF	Oral Cancer Slope Factor 1/(mg/kg/day)	CLASS	REF	Inhalation Unit Risk 1/(µg/m3)	REF	Subchronic Inhalation Reference Dose (or Substitute) mg/kg/day	REF	Inhalation Cancer Slope Factor $(mg/kg/day)^{-1}$	REF	Chronic Inhalation Reference Dose (or Substitute) mg/kg/day	REF
ANTIMONY	7440-36-0	4.0E-04	1	4.0E-04	6	1.0E-02	3	1.0E-02	7c						2.9E-03	5f			2.9E-03	5f
ARSENIC	7440-38-2	3.0E-04	1	3.0E-04	2	2.0E-05	3	2.0E-05	7c	1.50E+00	A	1	3.0E-03	3	5.7E-06	5f	1.1E+01	5g	5.7E-06	5f
CADMIUM	7440-43-9	5.0E-04	1c	5.0E-04	1d	2.0E-05	3	2.0E-05	7c		B1	1	1.8E-03	3	5.7E-06	5f	6.3E+00	5g	5.7E-06	5f
DICHLOROETHYLENE, CIS-1,2-	156-59-2	2.0E-03	1	2.0E-02	6	6.0E-03	7b	6.0E-02	7b		D	1			1.7E-02	5f			1.7E-03	5f
DICHLOROETHYLENE, TRANS-1,2-	156-60-5	2.0E-02	1	2.0E-01	1i	6.0E-02	6	6.0E-02	7c						1.7E-02	5f			1.7E-02	5f
LEAD	7439-92-1	7.5E-04	4	7.5E-04	4	1.0E-03	3	1.0E-03	7c		B2	1			2.9E-04	5f			2.9E-04	5f
NICKEL	7440-02-0	2.0E-02	1	2.0E-02	2	1.0E-03	3	1.0E-03	7c		A	1	4.8E-04	1	2.9E-04	5f	1.7E+00	5g	2.9E-04	5f
ALIPHATICS C5 to C8	NA	4.0E-02	5c	4.0E-01	5c	2.0E-01	5c	2.0E-01	7c						5.7E-02	5f			5.7E-02	5f
ALIPHATICS C9 to C12	NA	1.0E-01	5c	1.0E+00	5c	2.0E-01	5c	6.0E-01	5c						1.7E-01	5f			5.7E-02	5f
ALIPHATICS C9 to C18	NA	1.0E-01	5c	1.0E+00	5c	2.0E-01	5c	6.0E-01	5c						1.7E-01	5f			5.7E-02	5f
AROMATICS C9 to C10	NA	3.0E-02	5c	3.0E-01	5c	5.0E-02	5c	5.0E-01	5c						1.4E-01	5f			1.4E-02	5f
AROMATICS C11 to C22	NA	3.0E-02	5c	3.0E-01	5c	5.0E-02	5c	5.0E-01	5c						1.4E-01	5f			1.4E-02	5f
SILVER	7440-22-4	5.0E-03	1	5.0E-03	2	1.4E-04	5b	1.4E-04	7c		D	1			4.0E-05	5f			4.0E-05	5f
TETRACHLOROETHYLENE	127-18-4	6.0E-03	1	6.0E-03	1d	4.0E-02	1	4.0E-02	7c	2.00E-02		5h	3.0E-06	5h	1.1E-02	5f	1.1E-02	5g	1.1E-02	5f
TRICHLOROETHYLENE	79-01-6	5.0E-04	1	5.0E-04	1d	2.0E-03	1	2.0E-03	1j	5.00E-02	C-B2	1	5.0E-06	1	5.7E-04	5f	1.8E-02	5g	5.7E-04	5f
VANADIUM	7440-62-2	9.0E-03	1	9.0E-03	1	1.0E-03	3	1.0E-03	7c						2.9E-04	5f			2.9E-04	5f

Reference # Description

Toxicity Values

1 USEPA, Integrated Risk Information System (IRIS). Current as of May 2012.

1c IRIS lists two oral RfDs for cadmium, one for food and one for water exposure. The more conservative is used.

1d The chronic oral RfD (from IRIS) has been used here as a subchronic oral RfD equivalent.

1i The subchronic RfD is based upon the subchronic toxicity data that is the basis of the chronic RfD presented in the IRIS file.

1j The subchronic RfC is set equal to the chronic RfC based on information in the IRIS file.

2 USEPA Health Effects Assessment Summary Tables (HEAST), Annual FY-1996.

3 MassDEP Chemical Health Effects Assessment Methodology and Method to Derive Allowable Ambient Limits (CHEM/AAL) http://www.mass.gov/dep/toxics/stypes/telaal.htm

4 Developed for the Risk Assessment ShortForm - Residential Scenario (MassDEP, 1992) by MassDEP staff. Documentation of this value may be found in Appendix D of that document.

5b The RfCs for silver, thallium, and zinc were developed by MassDEP ORS Air/Water Toxics staff.

5c Final Updated Petroleum Hydrocarbon Fraction Toxicity Values for the VPH/EPH/APH Methodology. See: http://www.mass.gov/dep/cleanup/laws/tphtox03.doc

5f Conversion of the chronic or subchronic Reference Concentration to an inhalation Reference Dose using the equation: RfC x Ventilation Rate/ Body Weight (RfC x V) / BW = (RfC x 20 m3/day) / 70 kg

5g Conversion of the Inhalation Unit Risk Factor to an inhalation Cancer Slope Factor using the equation: URF x Conversion Factor x Body Weight / Ventilation Rate (URF x CF x V) / BW = (URF x 1000 x 20 m^3/day) / 70 kg

5h Developed by MassDEP ORS in 2013, adopted in by MassDEP in January 2014.

6 PPRTVs

6a The chronic values is set equal to the PPRTV subchronic value.

7b Conversion of the oral Reference Dose to a Reference Concentration, using the equation: RfD x BW / Ventilation Rate RfC= (RfD x 70 kg) / 20 m3/day

7c The Subchronic Inhalation Reference Concentration for this chemical is taken to be equal to the chronic value, absent clear chemical-specific information justifying a higher value.

Table 2
Relative Absorption Factors (RAFs) for Site Constituents of Concern (COCs)

Relative Absorption Factors (RAFs)			Soil												Air[1]	
OIL OR HAZARDOUS MATERIAL		CAS	Chronic Ingestion	Ref	Chronic Dermal	Ref	Subchronic Ingestion	Ref	Subchronic Dermal	Ref	Cancer Ingestion	Ref	Cancer Dermal	Ref	NonCancer Inhalation	Cancer
ANTIMONY		7440-36-0	1	9e	0.1	9e	1	9e	0.1	9e	NC		NC		1	
ARSENIC		7440-38-2	0.5	9e	0.03	9f	0.5	9e	0.03	9f	0.5	9e	0.03	9e	1	1
CADMIUM		7440-43-9	0.5	9g	0.01	9e	0.5	9g	0.01	9e	NC		NC		1	1
DICHLOROETHYLENE, CIS-1,2-		156-59-2	1	9e	0.03	9e	1	9e	0.03	9e	NC		NC		1	
DICHLOROETHYLENE, TRANS-1,2-		156-60-5	1	9e	0.03	9e	1	9e	0.03	9e	NC		NC		1	
LEAD		7439-92-1	0.5	9	0.006	9	0.5	9	0.006	9	NC		NC		1	
NICKEL		7440-02-0	1	9e	0.2	9e	1	9e	0.2	9e	NC		NC		1	1
PETROLEUM HYDROCARBONS		NA														
ALIPHATICS	C5 to C8	NA	1	9e	0.2	9e	1	9e	0.2	9e	NC		NC		1	
ALIPHATICS	C9 to C12	NA	1	9e	0.2	9e	1	9e	0.2	9e	NC		NC		1	
ALIPHATICS	C9 to C18	NA	1	9e	0.2	9e	1	9e	0.2	9e	NC		NC		1	
AROMATICS	C9 to C10	NA	1	9e	0.2	9e	1	9e	0.2	9e	NC		NC		1	
AROMATICS	C11 to C22	NA	0.3	9d	0.1	9d	0.3	9d	0.1	9d	NC		NC		1	
SILVER		7440-22-4	1	9e	0.3	9e	1	9e	0.3	9e	NC		NC		1	
TETRACHLOROETHYLENE		127-18-4	1	9e	0.03	9e	1	9e	0.03	9e	1	9e	0.03	9e	1	1
TRICHLOROETHYLENE		79-01-6	1	9e	0.03	9e	1	9e	0.03	9e	1	9e	0.03	9e	1	1
VANADIUM		7440-62-2	1	9e	0.1	9e	1	9e	0.1	9e	NC		NC		1	

Reference # Description

RAFs

1 Default values. If there is no Reference Concentration, a non-cancer inhalation RAF was not implied. If there is no Inhalation Unit Risk, a cancer inhalation RAF was not implied.

9 MassDEP 2012 RAF Review. Unless specified otherwise, due to data limitations and consistent with the approach in Ontario Ministry of the Environment (2011 - for full reference see note 48e), a default RAF of 1 was chosen for all organic compounds for oral ingestion of contaminated soil and water.

9d MassDEP 2012 RAF Review - Based on Magee B, Andersen P and Burmaster. (1996). Absorption Adjustment Factor (AAF) Distributions for Polycyclic Aromatic Hydrocarbons (PAHs). Human and Ecological Risk Assessment 2:841-873.

9e MassDEP 2012 RAF Review - Based on Ontario Ministry of the Environment (2011). Rationale for the Development of Soil and Ground Water Standards for Use at Contaminated Sites in Ontario (April 15, 2011, Standards Development Branch, Ontario Ministry of the Environment (see Section 2.6, Development of Relative Absorption Factors, pp 61-67 and Table 2.35b Estimation of Dermal Relative Absorption Factors (RAFs) PP 120- 141) http://www.ene.gov.on.ca/environment/en/resources/STDPROD_081485.html; Accessed March 22, 2012.

Table 3
Exposure Assumptions and Equations for Construction Worker - Incidental Ingestion of and Dermal Contact with Soil, and Inhalation of Particulates

Construction Worker - Soil: Table CW-2
Equations to Calculate Cancer Risk for Construction Worker

Vlookup Version v0315

Cancer Risk from Ingestion

$$ELCR_{ing} = LADD_{ing} * CSF_{oral}$$

$$LADD_{ing} = \frac{EPC * IR * RAF_{c\text{-}ing} * EF * ED_{ing} * EP * C1}{BW * AP_{lifetime}}$$

Cancer Risk from Dermal Absorption

$$ELCR_{derm} = LADD_{derm} * CSF_{oral}$$

$$LADD_{derm} = \frac{EPC * SA * AF * RAF_{c\text{-}derm} * EF * ED_{derm} * EP * C1}{BW * AP_{lifetime}}$$

Cancer Risk from Particulate Inhalation - Gastrointestinal Absorption

$$ELCR_{inh\text{-}GI} = LADD_{inh\text{-}GI} * CSF_{oral}$$

$$LADD_{inh\text{-}GI} = \frac{EPC * RCAF_{inh\text{-}gi} * PM_{10} * VR_{work} * RAF_{c\text{-}ing} * EF * ED_{inh} * EP * C2 * C3 * C4}{BW * AP_{lifetime}}$$

Cancer Risk from Particulate Inhalation - Pulmonary Absorption

$$ELCR_{inh} = LADD_{inh} * CSF_{inhalation}$$

$$LADD = \frac{EPC * RCAF_{inh} * PM_{10} * VR_{work} * RAF_{c\text{-}inh} * EF * ED_{inh} * EP * C2 * C3 * C4}{BW * AP_{lifetime}}$$

Parameter	Value	Units
CSF	OHM-specific	$(mg/kg\text{-}day)^{-1}$
LADD	age/OHM-specific	mg/kg-day
EPC	OHM-specific	mg/kg
IR	100	mg/day
$RAF_{c\text{-}ing}$	OHM-specific	dimensionless
$RAF_{c\text{-}derm}$	OHM-specific	dimensionless
$RAF_{c\text{-}inh}$	OHM-specific	dimensionless
EF	0.714	event/day
$ED_{ing\ \&\ derm}$	1	day/event
ED_{inh}	0.333	day/event
EP	182	days
C1	1.0E-06	kg/mg
C2	1.0E-09	kg/µg
C3	1440	min/days
C4	1.0E-03	m^3/L
BW	58.0	kg
$AP_{(lifetime)}$	25,550	days
VR_{work}	60	L/min
AF	0.29	mg/cm^2
SA	3473	cm^2/day
$RCAF_{inh\text{-}gi}$	1.5	dimensionless
$RCAF_{inh}$	0.5	dimensionless
PM_{10}	60	$µg/m^3$

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Table 3 (cont'd.)
Exposure Assumptions and Equations for Construction Worker - Incidental Ingestion of and Dermal Contact with Soil, and Inhalation of Particulates

Construction Worker - Soil: Table CW-3
Equations to Calculate Noncancer Risk for Construction Worker

Vlookup Version v0315

Noncancer Risk from Ingestion

$$HQ_{ing} = \frac{ADD_{ing}}{RfD_{oral\text{-}subchronic}}$$

$$ADD_{ing} = \frac{EPC * IR * RAF_{nc\text{-}ing} * EF * ED_{ing} * EP * C1}{BW * AP_{noncancer}}$$

Noncancer Risk from Dermal Absorption

$$HQ_{derm} = \frac{ADD_{derm}}{RfD_{oral\text{-}subchronic}}$$

$$ADD_{dermal} = \frac{EPC * SA * AF * RAF_{nc\text{-}derm} * EF * ED_{dermal} * EP * C1}{BW * AP_{noncancer}}$$

Noncancer Risk from Particulate Inhalation - Gastrointestinal Absorption

$$HQ_{inh\text{-}GI} = \frac{ADD_{inh\text{-}GI}}{RfD_{oral\text{-}subchronic}}$$

$$ADD_{inh\text{-}GI} = \frac{EPC * RCAF_{inh\text{-}gi} * PM_{10} * VR_{work} * RAF_{nc\text{-}ing} * EF * ED_{inh} * EP * C2 * C3 * C4}{BW * AP_{noncancer}}$$

Noncancer Risk from Particulate Inhalation - Pulmonary Absorption

$$HQ_{inh} = \frac{ADD}{RfD_{inhalation\text{-}subchronic}}$$

$$ADD_{inh} = \frac{EPC_{soil} * RCAF_{inh} * PM_{10} * VR_{work} * RAF_{nc\text{-}inh} * EF * ED_{inh} * EP * C2 * C3 * C4}{BW * AP_{noncancer}}$$

Parameter	Value	Units
RfD	OHM-specific	mg/kg-day
ADD	OHM-specific	mg/kg-day
EPC	OHM-specific	mg/kg
IR	100	mg/day
$RAF_{nc\text{-}ing}$	OHM-specific	dimensionless
$RAF_{nc\text{-}derm}$	OHM-specific	dimensionless
$RAF_{nc\text{-}inh}$	OHM-specific	dimensionless
EF	0.714	event/day
$ED_{ing\ \&\ derm}$	1	day/event
ED_{inh}	0.333	day/event
EP	182	days
C1	1.0E-06	kg/mg
C2	1.0E-09	kg/µg
C3	1440	min/days
C4	1.0E-03	m^3/L
BW	58.0	kg
$AP_{noncancer}$	182	days
VR_{work}	60	L/min
AF	0.29	mg/cm^2
SA	3473	cm^2/day
$RCAF_{inh\text{-}gi}$	1.5	dimensionless
$RCAF_{inh}$	0.5	dimensionless
PM10	60	$µg/m^3$

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Table 3 (cont'd.)
Exposure Assumptions and Equations for Construction Worker - Incidental Ingestion of and Dermal Contact with Soil, and Inhalation of Particulates

Construction Worker - Soil: Table CW-4
Definitions and Exposure Factors

Vlookup Version v0315

Parameter	Value	Units	Notes
ELCR - Excess Lifetime Cancer Risk	chemical specific	dimensionless	Pathway specific (ing =ingestion, derm=dermal, inh=inhalation)
HI - Hazard Index	chemical specific	dimensionless	Pathway specific (ing =ingestion, derm=dermal, inh=inhalation)
CSF - Cancer Slope Factor	chemical specific	$(mg/kg\text{-}day)^{-1}$	see Table CW-5.
RfD - Reference Dose	chemical specific	mg/kg-day	see Table CW-5.
LADD - Lifetime Average Daily Dose	chemical specific	mg/kg-day	Pathway specific. See Table CW-2.
ADD - Average Daily Dose	chemical specific	mg/kg-day	Pathway specific. See Table CW-3.
EPC - Exposure Point Concentration	chemical specific	mg/kg	see Table CW-1.
IR - Soil Ingestion Rate	100	mg/day	MADEP. 2002. Technical Update: Calculation of an Enhanced Soil Ingestion Rate. (http://www.mass.gov/dep/ors/orspubs.htm).
RAF_c - Relative Absorption Factor for Cancer Effects	chemical specific	dimensionless	Pathway specific - see Table CW-5.
RAF_{nc} - Relative Absorption Factor for Noncancer Effects	chemical specific	dimensionless	Pathway specific - see Table CW-5.
EF - Exposure Frequency	0.714	event/day	5 events (days) / 7 events (days) in a week; MADEP 1995 Guidance for Disposal Site Risk Characterization pg B-38.
$ED_{ing,derm}$ - Exposure Duration for ingestion or dermal exposure	1	day/event	
ED_{inh} - Exposure Duration for inhalation exposure	0.333	day/event	Represents 8 hours / event.
EP - Exposure Period	182	days	6 months; MADEP 1995 Guidance for Disposal Site Risk Characterization.
BW - Body Weight	58.0	kg	U.S. EPA. 1997. Exposure Factors Handbook. Table 7-7, Females, ages 18 - 25.
$AP_{(lifetime)}$ - Averaging Period for lifetime	25,550	days	Represents 70 years
$AP_{(noncancer)}$ - Averaging Period for noncancer	182	days	6 months; MADEP 1995 Guidance for Disposal Site Risk Characterization.
AF - Adherence Factor	0.29	mg/cm^2	MA DEP. 2002 Technical Update: Weighted Skin-Soil Adherence Factors. (http://www.mass.gov/dep/ors/orspubs.htm)
VR_{work} - Ventilation Rate during work (heavy exertion)	60	L/min	Table B-4 MADEP 1995 Guidance for Disposal Site Risk Characterization.
SA - Surface Area	3473	cm^2/day	MADEP. 1995. Guidance for Disposal Site Risk Characterization. 50th percentile for females. Appendix Table B-2.
$IFAF_{inh\text{-}gi}$ - Ingestion Fraction Adjustment Factor, gastrointestinal	1.5	dimensionless	MADEP 2007. Characterization of Risks Due to Inhalation of Particulates by Construction Workers
$IFAF_{inh}$ - Inhalation Fraction Adjustment Factor, inhalation	0.5	dimensionless	MADEP 2002. Characterization of Risks Due to Inhalation of Particulates by Construction Workers
PM10 - Concentration of PM_{10}	60	$\mu g/m^3$	MADEP 1995 Guidance for Disposal Site Risk Characterization pg B-11

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Table 4
Exposure Assumptions and Equations for Resident - Incidental Ingestion of and Dermal Contact with Soil

Resident - Soil: Table RS-3
Equations to Calculate Cancer Risk for Resident (Age 1-31 years)

Cancer Risk from Ingestion

$$ELCR_{ing} = LADD_{ing(1\text{-}31)} * CSF$$

$$LADD_{ing\ (1\text{-}31)} = LADD_{ing\ (1\text{-}8)} + LADD_{ing\ (8\text{-}15)} + LADD_{ing\ (15\text{-}31)}$$

$$LADD_{ing\ (age\ group\ x)} = \frac{[OHM]_{soil} * IR_x * RAF_{c\text{-}ing} * EF_{ing} * ED * EP_x * C}{BW_x * AP_{lifetime}}$$

Cancer Risk from Dermal Absorption

$$ELCR_{derm} = LADD_{derm} * CSF$$

$$LADD_{derm\ (1\text{-}31)} = LADD_{derm\ (1\text{-}8)} + LADD_{derm\ (8\text{-}15)} + LADD_{derm\ (15\text{-}31)}$$

$$LADD_{derm(age\ group\ x)} = \frac{[OHM]_{soil} * SA_x * RAF_{c\text{-}derm} * SAF_x * EF_{derm} * ED * EP_x * C}{BW_x * AP_{lifetime}}$$

Cancer Risk from Homegrown Produce

$$ELCR_{produce} = LADD_{produce(1\text{-}31)} * CSF$$

$$LADD_{produce(1\text{-}31)} = LADD_{produce(1\text{-}8)} + LADD_{produce(8\text{-}15)} + LADD_{produce(15\text{-}31)}$$

$$LADD_{produce(age\ x)} = \frac{[OHM_{soil}] * PUF * PIR_x * RAF_{produce} * EF_{produce} * ED * EP_x * C}{BW_x * AP_{lifetime}}$$

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Parameter	Value	Units
CSF	OHM specific	$(mg/kg\text{-}day)^{-1}$
LADD	age/OHM specific	mg/kg-day
$[OHM]_{soil}$	OHM specific	mg/kg
$IR_{(1\text{-}8)}$	100	mg/day
$IR_{(8\text{-}15)}$	50	mg/day
$IR_{(15\text{-}31)}$	50	mg/day
$PIR_{(1\text{-}8)}$	12,099	mg/day
$PIR_{(8\text{-}15)}$	17,809	mg/day
$PIR_{(15\text{-}31)}$	24,420	mg/day
$RAF_{c\text{-}ing}$	OHM specific	dimensionless
$RAF_{c\text{-}derm}$	OHM specific	dimensionless
$RAF_{c\text{-}produce}$	OHM specific	dimensionless
$EF_{ing,derm}$	0.412	event/day
$EF_{produce}$	1.00	event/day
ED	1	day/event
$EP_{(1\text{-}8)}$	7	years
$EP_{(8\text{-}15)}$	7	years
$EP_{(15\text{-}31)}$	16	years
C	0.000001	kg/mg
$BW_{(1\text{-}8)}$	17.0	kg
$BW_{(8\text{-}15)}$	39.9	kg
$BW_{(15\text{-}31)}$	58.7	kg
$AP_{(lifetime)}$	70	years
$SA_{(1\text{-}8)}$	2431	cm^2 / day
$SA_{(8\text{-}15)}$	4427	cm^2 / day
$SA_{(15\text{-}31)}$	5653	cm^2 / day
$SAF_{(1\text{-}8)}$	0.35	mg/cm^2
$SAF_{(8\text{-}15)}$	0.14	mg/cm^2
$SAF_{(15\text{-}31)}$	0.13	mg/cm^2
PUF	OHM specific	$(mg/mg)(mg/mg)^{-1}$

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Table 4 (cont'd.)
Exposure Assumptions and Equations for Resident - Incidental Ingestion of and Dermal Contact with Soil

Resident - Soil: Table RS-4
Equations to Calculate Chronic Noncancer Risk for Resident Child (Age 1-8 years)

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Chronic Noncancer Risk from Ingestion

$$HQ_{ing} = \frac{ADD_{ing}}{RfD}$$

$$ADD_{ing} = \frac{[OHM]_{soil} * IR * RAF_{nc\text{-}ing} * EF_{ing} * ED * EP * C}{BW * AP}$$

Chronic Noncancer Risk from Dermal Absorption

$$HQ_{derm} = \frac{ADD_{ing,derm}}{RfD}$$

$$ADD_{derm} = \frac{[OHM]_{soil} * SA * RAF_{nc\text{-}derm} * SAF * EF_{derm} * ED * EP * C}{BW * AP}$$

Chronic Noncancer Risk from Homegrown Produce

$$HQ_{produce} = \frac{ADD_{produce}}{RfD}$$

$$ADD_{produce} = \frac{[OHM_{soil}] * PUF * PIR * RAF_{produce} * EF_{produce} * ED * EP * C}{BW * AP}$$

Parameter	Value	Units
RfD	OHM specific	mg/kg-day
ADD	OHM specific	mg/kg-day
$[OHM]_{soil}$	OHM specific	mg/kg
IR	100	mg/day
PIR	12,099	mg/day
$RAF_{nc\text{-}ing}$	OHM specific	dimensionless
$RAF_{nc\text{-}derm}$	OHM specific	dimensionless
$RAF_{nc\text{-}produce}$	OHM specific	dimensionless
$EF_{ing,derm}$	0.412	event/day
$EF_{produce}$	1.00	event/day
ED	1	day/event
EP	7	years
C	0.000001	kg/mg
BW	17.0	kg
AP	7	year
SA	2431	cm^2 / day
SAF	0.35	mg/cm^2
PUF	OHM specific	$(mg/mg)(mg/mg)^{-1}$

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Table 4 (cont'd.)
Exposure Assumptions and Equations for Resident - Incidental Ingestion of and Dermal Contact with Soil

Resident - Soil: Table RS-5
Equations to Calculate Subchronic Noncancer Risk for Resident Child (Age 1-2 years)

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Subchronic Noncancer Risk from Ingestion

$$HQ_{ing} = \frac{ADD_{ing}}{RfD_{subchronic}}$$

$$ADD_{ing} = \frac{[OHM]_{soil} * IR * RAF_{nc\text{-}ing} * EF_{ing} * ED * EP * C}{BW * AP}$$

Subchronic Noncancer Risk from Dermal Absorption

$$HQ_{derm} = \frac{ADD_{derm}}{RfD_{subchronic}}$$

$$ADD_{derm} = \frac{[OHM]_{soil} * SA * RAF_{nc\text{-}derm} * SAF * EF_{derm} * ED * EP * C}{BW * AP}$$

Subchronic Noncancer Risk from Homegrown Produce

$$HQ_{produce} = \frac{ADD_{produce}}{RfD_{subchronic}}$$

$$ADD_{produce} = \frac{[OHM_{soil}] * PUF * PIR * RAF_{produce} * EF_{produce} * ED * EP * C}{BW * AP}$$

Parameter	Value	Units
RfD	OHM specific	mg/kg-day
ADD	OHM specific	mg/kg-day
$[OHM]_{soil}$	OHM specific	mg/kg
IR	100	mg/day
PIR	10,900	mg/day
$RAF_{nc\text{-}ing}$	OHM specific	dimensionless
$RAF_{nc\text{-}derm}$	OHM specific	dimensionless
$RAF_{nc\text{-}produce}$	OHM specific	dimensionless
$EF_{ing,derm}$	0.714	event/day
$EF_{produce}$	1.00	event/day
ED	1	day/event
EP	0.577	years
C	0.000001	kg/mg
BW	10.7	kg
AP	0.577	year
SA	1670	cm^2 / day
SAF	0.35	mg/cm^2
PUF	OHM specific	$(mg/mg)(mg/mg)^{-1}$

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Table 4 (cont'd.)
Exposure Assumptions and Equations for Resident - Incidental Ingestion of and Dermal Contact with Soil

Resident - Soil: Table RS-6
Definitions and Exposure Factors

Vlookup Versionv0315

Parameter	Value	Units	Notes
ELCR - Excess Lifetime Cancer Risk	chemical specific	dimensionless	Pathway specific (ing =ingestion, derm=dermal, inh=inhalation)
CSF - Cancer Slope Factor	chemical specific	$(mg/kg\text{-}day)^{-1}$	see Table RS-7
LADD - Lifetime Average Daily Dose	chemical specific	mg/kg-day	Pathway specific
LADE - Lifetime Average Daily Exposure	chemical specific	$\mu g/m^3$	
HQ - Hazard Quotient	chemical specific	dimensionless	Pathway specific (ing =ingestion, derm=dermal, inh=inhalation)
RfD - Reference Dose	chemical specific	mg/kg-day	see Table RS-7
ADD - Average Daily Dose	chemical specific	mg/kg-day	Pathway specific
ADE - Average Daily Exposure	chemical specific	mg/m^3	
EPC - Exposure Point Concentration	chemical specific	mg/kg	
PUF - Plant Uptake Factor	chemical specific	$(mg/mg)(mg/mg)^{-1}$	See Table RS-7; $(mg_{OHM}/mg_{plant})/(mg_{OHM}/mg_{soil})^{-1}$
$IR_{(1-2)}$ - Soil Ingestion Rate for age group 1-2	100	mg/day	MADEP. 2002. Technical Update: Calculation of an Enhanced Soil Ingestion Rate. (http://www.mass.gov/dep/ors/orspubs.htm)
$IR_{(1-8)}$ - Soil Ingestion Rate for age group 1-8	100	mg/day	Ibid
$IR_{(8-15)}$ - Soil Ingestion Rate for age group 8-15	50	mg/day	Ibid
$IR_{(15-31)}$ - Soil Ingestion Rate for age group 15-31	50	mg/day	Ibid
$PIR_{(1-2)}$ = Produce Ingestion Rate for age group 1-2	10,900	mg/day	see Table RS-6
$PIR_{(1-8)}$ = Produce Ingestion Rate for age group 1-8	12,099	mg/day	see Table RS-6
$PIR_{(8-15)}$ = Produce Ingestion Rate for age group 8-15	17,809	mg/day	Ibid
$PIR_{(15-31)}$ = Produce Ingestion Rate for age group 15-31	24,420	mg/day	Ibid
RAF_c - Relative Absorption Factor for Cancer Effects	chemical specific	dimensionless	
$EF_{subchronic}$ - Exposure Frequency for subchronic ingestion or dermal exposure	0.714	event/day	5 days/week
$EF_{chronic}$ - Exposure Frequency for chronic ingestion or dermal exposure	0.412	event/day	5 days/week, 30 weeks/year
EF_{cancer} - Exposure Frequency for cancer, ingestion or dermal exposure	0.412	event/day	5 days/week, 30 weeks/year
$EF_{produce}$ - Exposure Frequency for produce ingestion, cancer and noncancer	1.00	event/day	
ED - Exposure Duration	1	day/event	
$EP_{(1-2)}$ - Exposure Period for age group 1-2	0.577	years	30 weeks
$EP_{(1-8)}$ - Exposure Period for age group 1-8	7	years	
$EP_{(8-15)}$ - Exposure Period for age group 8-15	7	years	
$EP_{(15-31)}$ - Exposure Period for age group 15-31	16	years	
$BW_{(1-2)}$ - Body Weight for age group 1-2	10.7	kg	U.S. EPA. 1997. Exposure Factors Handbook. Table 7-7, females.
$BW_{(1-8)}$ - Body Weight for age group 1-8	17.0	kg	Ibid
$BW_{(8-15)}$ - Body Weight for age group 8-15	39.9	kg	Ibid
$BW_{(15-31)}$ - Body Weight for age group 15-31	58.7	kg	Ibid
$AP_{subchronic}$ - Averaging Period for subchronic noncancer	0.577	years	30 weeks
$AP_{chronic}$ - Averaging Period for chronic noncancer	7	years	
AP_{cancer} - Averaging Period for lifetime	70	years	
$SA_{(1-2)}$ - Surface Area for age group 1-2	1670	cm^2 / day	50th percentile of face (1/3 head), forearms, hands, lower legs, and feet for females MADEP. 1995. Guidance for Disposal Site Risk Characterization. Appendix Table B-2.
$SA_{(1-8)}$ - Surface Area for age group 1-8	2431	cm^2 / day	Ibid
$SA_{(8-15)}$ - Surface Area for age group 8-15	4427	cm^2 / day	Ibid
$SA_{(15-31)}$ - Surface Area for age group 15-31	5653	cm^2 / day	Ibid
$SAF_{(1-2)}$ - Surface Adherence Factor for age group 1-2	0.35	mg/cm^2	All SAFs developed for ShortForm according to procedure outlined in MA DEP Technical
$SAF_{(1-8)}$ - Surface Adherence Factor for age group 1-8	0.35	mg/cm^2	Update:Weighted Skin-Soil Adherence Factors, April 2002
$SAF_{(8-15)}$ - Surface Adherence Factor for age group 8-15	0.14	mg/cm^2	
$SAF_{(15-31)}$ - Surface Adherence Factor for age group 15-31	0.13	mg/cm^2	

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Table 5
Exposure Assumptions and Equations for Indoor Worker - Inhalation of Vapors

Offices and Schools - Indoor Air: Table OSA-2
Equations to Calculate Cancer Risk

Cancer Risk from Inhalation

$$ELCR = LADE_{(18\text{-}45)} * URF$$

$$LADE = \frac{[OHM]_{air} * EF * ED * EP}{AP_{lifetime}}$$

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Exposure Factor	Value	Units
URF	OHM specific	$(\mu g/m^3)^{-1}$
LADE	OHM specific	$\mu g/m^3$
$[OHM]_{air}$	OHM specific	$\mu g/m^3$
EF	0.687	event/day
ED	0.333	day/event
EP	27	years
$AP_{lifetime}$	70	years

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Table 5 (cont'd.)
Exposure Assumptions and Equations for Indoor Worker - Inhalation of Vapors

Offices and Schools - Indoor Air: Table OSA-3
Equations to Calculate Noncancer Risk

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Noncancer Risk from Inhalation

$$HQ = \frac{ADE}{RfC}$$

$$ADE = \frac{[OHM]_{air} * EF * ED * EP * C}{AP}$$

Exposure Factor	Value	Units
RfC	OHM specific	mg/m^3
ADE	OHM specific	mg/m^3
$[OHM]_{air}$	OHM specific	$\mu g/m^3$
EF	0.687	event/day
ED	0.333	day/event
EP	7	years
C	0.001	mg/µg
AP	7	year

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Table 5 (cont'd.)
Exposure Assumptions and Equations for Indoor Worker - Inhalation of Vapors

Offices and Schools - Indoor Air: Table OSA-4
Definitions and Exposure Factors

Vlookup Version v0315

Parameter	Value	Units	Notes
ELCR - Excess Lifetime Cancer Risk	chemical specific	dimensionless	See Table OSA-2.
URF - Unit Risk Factor	chemical specific	$(\mu g/m^3)^{-1}$	Risk per concentration unit. See Table OSA-5.
LADE - Lifetime Average Daily Exposure	chemical specific	$\mu g/m^3$	See Table OSA-2.
HQ - Hazard Quotient	chemical specific	dimensionless	Ratio of ADE to reference concentration.
RfC - Reference Concentration	chemical specific	mg/m^3	See Table OSA-5.
ADE - Average Daily Exposure	chemical specific	mg/m^3	See Table OSA-3.
EPC - Exposure Point Concentration	chemical specific	$\mu g/m^3$	See Table OSA-1.
EF - Exposure Frequency	0.687	event/day	5 of 7 days in a week. 50 of 52 weeks in a year.
ED - Exposure Duration	0.333	day/event	8 of 24 hours in a day.
EP - Exposure Period for Noncancer	7	years	
EP - Exposure Period for Cancer	27	years	MCP Method 1 Standards.
$AP_{(noncancer)}$ - Averaging Period for noncancer	7	years	
$AP_{(lifetime)}$ - Averaging Period for lifetime	70	years	

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Table 6
Exposure Assumptions and Equations for Resident - Inhalation of Vapors

Resident - Indoor Air: Table RA-2

Equations to Calculate Cancer Risk for Resident (Age 1-31 years)

Cancer Risk from Inhalation

$$ELCR_{air} = LADE_{(1-31)} * URF$$

$$LADE = \frac{[OHM]_{air} * EF * ED * EP}{AP_{lifetime}}$$

Vlookup Versionv0315

Parameter	Value	Units
URF	OHM specific	$(\mu g/m^3)^{-1}$
LADE	age/OHM specific	$\mu g/m^3$
$[OHM]_{air}$	OHM specific	$\mu g/m^3$
EF	1.00	event/day
ED	1	day/event
EP	30	years
$AP_{lifetime}$	70	years

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Table 6 (cont'd.)
Exposure Assumptions and Equations for Resident - Inhalation of Vapors

Resident - Indoor Air: Table RA-3
Equations to Calculate Noncancer Risk for Resident Child (Age 1-8 years)

Vlookup Versionv0315

Noncancer Risk from Inhalation

$$HQ_{air} = \frac{ADE}{RfC}$$

$$ADE = \frac{[OHM]_{air} * EF * ED * EP * C}{AP}$$

Parameter	Value	Units
RfC	OHM specific	mg/m^3
ADE	OHM specific	mg/m^3
$[OHM]_{soil}$	OHM specific	$\mu g/m^3$
EF	1.00	event/day
ED	1	day/event
EP	7	years
C	0.001	mg/ug
AP	7	year

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Table 6 (cont'd.)
Exposure Assumptions and Equations - Inhalation of Vapors

Resident - Indoor Air: Table RA-4
Definitions and Exposure Factors

Vlookup Versionv0315

Parameter	Value	Units	Notes
ELCR - Excess Lifetime Cancer Risk	chemical specific	dimensionless	
URF - Unit Risk Factor	chemical specific	$(\mu g/m^3)^{-1}$	see Table RA-5
LADE - Lifetime Average Daily Exposure	chemical specific	$\mu g/m^3$	see Table RA-2
HQ - Hazard Quotient	chemical specific	dimensionless	
RfC - Reference Concentration	chemical specific	mg/m^3	see Table RA-5
ADE - Average Daily Exposure	chemical specific	mg/m^3	see Table RA-3
EPC - Exposure Point Concentration	chemical specific	$\mu g/m^3$	see Table RA-1
EF - Exposure Frequency	1.00	event/day	
ED - Exposure Duration	1	day/event	
$EP_{(1-8)}$ - Exposure Period age group 1-8 (noncancer)	7	years	
$EP_{(1-31)}$ - Exposure Period for age group 1-31 (cancer)	30	years	
$AP_{(noncancer)}$ - Averaging Period for noncancer	7	years	
$AP_{(lifetime)}$ - Averaging Period for lifetime	70	years	

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Table 7

Soil Exposure Point Concentrations (EPCs) - Select CVOCs and Metals

Site Wide Samples from top 0.5 feet by EPA, Manufacturing Area (2012) 0-2 feet, and Construction RAM (2017) 0-2 feet

		Sample	TCE (ug/kg)	PCE (ug/kg)	Pb (mg/kg)	As (mg/kg)	Ag (mg/kg)
Central	EPA 0-0.5'	SS-302	*20*	*10*	**320**	19	*
Manufacturing	EPA 0-0.5'	SS-305	*20*	*10*	97	*18*	*
Area of Site	EPA 0-0.5'	SS-311	230	16	**230**	*13*	*
	EPA 0-0.5'	SS-312	*20*	*10*	100	*8*	*
	EPA 0-0.5'	SS-313	27	*10*	180	*12*	*
	EPA 0-0.5'	SS-314	*20*	*10*	87	*9*	*
	EPA 0-0.5'	SS-315	*20*	*10*	200	*12*	*
	EPA 0-0.5'	SS-317	140	59	100	*8*	*
	EPA 0-0.5'	SS-318	6	*10*	150	12	*
	EPA 0-0.5'	SS-320	*20*	*10*	**490**	*17*	*
	EPA 0-0.5'	SS-321	*20*	*10*	140	11	*
	EPA 0-0.5'	SS-322	*20*	*10*	44	*7*	*
	EPA 0-0.5'	SS-323	*20*	*10*	150	*10*	*
	EPA 0-0.5'	SS-324	*20*	*10*	60	*7*	*
	EPA 0-0.5'	SS-07	*65*	*65*	24	*6*	60
	EPA 0-0.5'	SS-08	*75*	*75*	130	*6*	68
	EPA 0-0.5'	SS-10	*120*	*120*	140	*6*	50
	OTO (2012) 0-2'	LS-15**	*	*	50.7	6.0	**101**
	OTO (2017) 0-2'	HA-01	*	*	53	7.1	**120**
	OTO (2017) 0-2'	HA-1-N-13.5'	*	*	**350**	8.6	**110**
	OTO (2017) 0-2'	HA-02	*	*	94	6.3	37
	OTO (2017) 0-2'	HA-03	*	*	**200**	4.6	76
	OTO (2017) 0-2'	HA-3-N-12'	*	*	170	**26**	82
	OTO (2017) 0-2'	HA-04	*	*	23	4.3	19
	OTO (2017) 0-2'	HA-05	*	*	110	6.1	55
	OTO (2017) 0-2'	HA-06	*	*	96	5.8	84
	OTO (2017) 0-2'	HA-07	*	*	5.5	3.1	0.56
	OTO (2017) 0-2'	HA-08***	*	*	**710**	6.0	**140**
	OTO (2017) 0-2'	HA-8-S-12'	*	*	54	2.9	47
	OTO (2017) 0-2'	HA-8-W-23'	*	*	97	4.4	86
	OTO (2017) 0-2'	HA-09	*	*	120	4.4	62
		EPC=	230	120	154	8.9	70
			Maximum	Maximum	Average	Average	Average
North & West	EPA 0-0.5'	SS-02	*70*	*70*	25	*5*	26
Areas of Site	EPA 0-0.5'	SS-04	*75*	*75*	130	9	**130**
	OTO (2012) 0-2'	LS-14	*	*	25.8	3.2	36
	OTO (2012) 0-2'	LS-27	*	*	4.9	3.0	*1.6*
		EPC=	75	75	46	9.0	48
			Maximum	Maximum	Average	Maximum	Average
Southeastern	OTO (2017) 0-2'	SB-4	*	*	**950**	20	**170**
Area of Site	OTO (2017) 0-2'	SB-5	*	*	**1,700**	8.5	**160**
		EPC=	*	*	**1,325**	20	**165**
			Maximum	Maximum	Average	Maximum	Average
Southern	EPA 0-0.5'	SS-03	*84*	*84*	36	*5*	18
Area of Site	EPA 0-0.5'	SS-05	*83*	*83*	48	*5*	22
		EPC=	84	84	42	8.9	73
			Maximum	Maximum	Average	Average	Average
Sample results shown in *italics* indicates the result is the analytical detection limit (non-detect)							
S-1/GW-2			300	10,000	200	20	100
S-1/GW-3			300	10,000	200	20	100
S-2/GW-2			300	10,000	600	20	200
S-2/GW-3			60,000	200,000	600	20	200

Red = Mobile lab analyses

Black = North Chelmsford Laboratory Analyses

* Not Analyzed.

** Cadmium, nickel, and vanadium were detected in sample LS-15 at concentrations of 6.96, 53.2, and 165 mg/kg, respectively

*** Antimony was detected in sample HA-08 at a concentration of 33 mg/kg and above the S-2/GW-2/GW-3 standard of 20 mg/kg.

1. Soil samples collected by EPA between May and August 2015. Samples shown in red were analyzed GC/MS for VOCs and XRF for metals. in EPA's Office of Environmental Measurement and Evaluation (OEME) mobil laboratory. Samples shown in black were analyzed in EPA's OEME laboratory in North Chelmsford, MA. Analyses by

Table 7 (cont'd.)
Soil Exposure Point Concentrations (EPCs) - Below Former North Cyclone
Inorganic Analytes
Concentrations in mg/kg
298 Federal Street
Greenfield, MA

Sample No.:	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**S8**	**S9**	**EPCs**	**MassDEP**	**S-1 /**	**S-2 /**	**S-3 /**
Depth (feet):	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	**0-0.5**	**Natural Soil**	**GW-2,3**	**GW-2,3**	**GW-2,3**
Date Collected:	10/26/2015	10/26/2015	10/26/15	10/26/15	10/26/15	10/26/15	10/26/15	10/26/15	10/26/15	**Average**	**Background**	**Standard**	**Standard**	**Standard**
Antimony	4.7	4	3.1	5.2	3.4	4.9	4.8	4.4	4.3	4.3	1	20	30	30
Arsenic	10	6.4	7.3	6.2	4.7	5.4	5.3	*3*	3.7	5.8	20	20	20	50
Lead	110	110	14	200	24	**460**	110	**290**	120	160	100	200	600	600
Silver	**180**	**190**	**190**	**180**	**180**	**190**	**210**	**230**	**210**	**196**	0.6	100	200	200

NOTES:
1. Concentrations in milligrams per kilogram (mg/kg, or parts per million) on a dry weight basis.
2. Concentrations shown in "<" indicates not detected; value is sample-specific quantitation limit.
3. MCP Method 1 soil standards from 310 CMR 40.0975(6).
4. Values shown in **bold** exceed Method 1 standards.

Table 7 (cont'd.)
Soil Exposure Point Concentrations (EPCs)
West and South Grids Post-excavation
293 Federal Street
Greenfield, MA

West Grid After Excavation 2-3 feet						
	West Grid					
	Sample	**Depth(ft)**	**TCE (ug/kg)**	**PCE(ug/kg)**	**Pb (mg/kg)**	**As(mg/kg)**
	Grid-01	5	120	50	21	*5*
	Grid-02	5	**6,300**	2,200	15	*5*
	Grid-03	2	**4,600**	1,300	73	17
	Grid-04	2	**860**	380	110	*9*
	Grid-05	3	**870**	240	21	**34**
	Grid-06	3	**7,400**	1,900	26	*14*
	Grid-07	3	**6,300**	520	66	18
	Grid-08	2	*20*	10	62	12
Average 2-3			**4,006**	868	59	18
(doesn't include 5' and Grid-08)						

South Grid After Excavation EPCs 2-4 feet						
	South Grid					
	Grid-09	2(utility)	**14,000**	170	**330**	**21**
	Grid-10	4	**620**	*35*	20	6
	Grid-11	2(utility)	**26,000**	350	**2,600**	**100**
	Grid-12	2(utility)	**57,000**	350	**2,000**	**100**
	Grid-13	4	**3,600**	65	**3,070**	**110**
	Grid-14	4	**5,800**	93	**766**	**49**
	Grid-15	2	**7,300**	8	**1,160**	**65**
	Grid-16	4	130	*35*	50	**29**
	Grid-17	2	**310**	*35*	135	**35**
	Grid-18	2	19	*35*	**1,360**	**63**
	Grid-19	2	270	*35*	**924**	**54**
	Grid-19.5	2	**8,400**	*35*	**710**	***22***
	Grid-20-B	2	120	*35*	**815**	***23***
	Grid-20.5	2	150	*35*	**5,800**	**330**
	Grid-21	2	100	*35*	182	*11*
Average 2-4			**8,255**	90	**1,328**	**68**

Method 1 Standards						
S-1/GW-2			*300*	10,000	200	20
S-1/GW-3			300	10,000	200	20
S-2/GW-2			*300*	10,000	600	20
S-2/GW-3			60,000	200,000	600	20

Values in **bold** exceed Method 1 Standards.
Samples analyzed in EPA's Office of Environmental Measurement and Evaluation (OEME).

Table 7 (cont'd.)
Soil Exposure Point Concentrations (EPCs)
Chlorinated Volatile Organic Compounds (CVOCs)
Concentrations in mg/kg
298 Federal Street
Greenfield, MA

Sample No.:	LS-14	LS-17	LS-19	LS-24	MW-100	MW-104	MW-105	EPCs	Method 1 Standards						UCLs
Depth (feet):	6-8	6-8	7-9	6-8	7.5-10	10-12.5	5-7.5	5-12.5	S-1 / GW-2	S-1 / GW-3	S-2 / GW-2	S-2 GW-3	S-3 GW-2	S-3 GW-3	
Date Collected:	1/11/12	1/11/12	1/12/12	2/21/12	3/1/13	3/1/13	3/1/13	Maximum							
PID Reading (ppmv):	53	24	55	55	8.4	417	6.9		NS	NS	NS	NS	NS	NS	NS
cis-1,2-Dichloroethylene	< 0.007	**0.301**	**8.81**	< 0.092	<0.15	<0.11	**1.5**	**8.8**	0.1	100	0.1	500	0.4	500	5,000
trans-1,2-Dichloroethylene	< 0.007	< 0.009	0.052	< 0.092	<0.15	<0.11	<0.11	0.05	1	500	1	1,000	1	3,000	10,000
Tetrachloroethylene	0.278	0.203	3.57	2.02	<0.15	<0.11	<0.11	3.6	10	30	10	200	10	1,000	10,000
Trichloroethylene	**2.18**	**4.36**	**43.1**	**7.74**	**0.46**	**1.4**	**0.68**	**43.1**	0.3	30	0.3	60	0.3	60	600

NOTES:
1. Concentrations in milligrams per kilogram (mg/kg, or parts per million) on a dry weight basis.
2. "<" indicates not detected; value is sample-specific quantitation limit.
3. MCP Method 1 soil standards from 310 CMR 40.0975(6).
4. "NS" = No standard.
5. Values shown in **bold** exceed Method 1 standards.
6. "PID"=Photoionization detector soil headspace measurement in parts per million by volume.
7. Only analytes detected in at least one sample are shown; refer to laboratory reports for full analyte listing.
8. Bolded values indicated concentrations that exceed the Method 1 Standards.

Table 7 (cont'd.)
Soil Exposure Point Concentrations (EPCs)
Volatile and Extractable Petroleum Hydrocarbons (VPH/EPH)
Concentrations in mg/kg
298 Federal Street
Greenfield, MA

Sample No.:	LS-9	LS-17	LS-19	LS-24	LS-30	EPCs	Method 1 Standards						UCLs
Depth (feet):	5-6	6-8	7-9	6-8	6-8	5-9	S-1 / GW-2	S-1 / GW-3	S-2 / GW-2	S-2 GW-3	S-3 GW-2	S-3 GW-3	
Date Collected:	1/11/12	1/11/12	1/12/12	2/21/12	2/21/12	Maximum							
PID Reading (ppmv):	159	24	55	55	4.6		NA	NA	NA	NA	NA	NA	NA
VPH Fractions													
C5-C8 Aliphatics	21.6	2.41	16.4	---	4.87	21.6	100	100	500	500	500	500	5,000
C9-C12 Aliphatics	153	< 0.59	< 0.74	---	19.5	153	1,000	1,000	3,000	3,000	5,000	5,000	20,000
C9-C10 Aromatics	54	< 0.59	< 0.74	---	5.82	54	100	100	500	500	500	500	5,000
EPH Fractions													
C9-C18 Aliphatics	981	< 13	< 13	<12	< 11	981	1,000	1,000	3,000	3,000	5,000	5,000	20,000
C19-C36 Aliphatics	< 13	< 13	< 13	<12	< 11	<13	3,000	3,000	5,000	5,000	5,000	5,000	20,000
C11-C22 Aromatics	104	< 13	< 13	<12	< 11	104	1,000	1,000	3,000	3,000	5,000	5,000	10,000

NOTES:
1. Concentrations in mg/kg (parts per million) on a dry weight basis.
2. "<" indicates not detected; value is sample-specific quantitation limit.
3. MCP Method 1 soil standards from 310 CMR 40.0975(6).
4. "PID"=Photoionization detector soil headspace measurement in parts per million by volume.
5. "---" indicates not analyzed for this parameter.
6. Locations subsequently excavated are shown shaded.

Table 8
Groundwater Exposure Point Concentrations (EPCs)
Volatile Organic Compounds (VOCs)
Concentrations in ug/l
298 Federal Street
Greenfield, MA

Well No.:	**LS-19**	**~~LS-20~~**	**LS-22**	**MW-101**			**MW-102**	**MW-103**			**MW-104**			**GW-2**	**GW-3**
Sample Date:	10/24/19	8/9/18	9/26/19	9/26/19	12/26/19	Average	8/9/18	9/26/19	12/26/19	Average	8/9/18	9/26/19	Maximum	**Standard**	**Standard**
1,1-Dichloroethylene	<10	<1	<1	<10	<50	ND	<1	<4	<1	ND	2	<400	<400	80	30,000
cis-1,2-Dichloroethylene	**1,200**	**23**	<1	**68**	**130**	**99**	4.2	**460**	**56**	**258**	**180**	**5,500**	**5,500**	20	50,000
trans-1,2-Dichloroethylene	13	1.9	<1	<10	<50	ND	<1	**160**	20	**90**	4.6	<400	<400	80	50,000
Tetrachloroethylene	**400**	<1	<1	<10	<50	ND	<1	<4	<1	ND	15	<400	<400	50	30,000
Trichloroethylene	**2,700**	**180**	**5.4**	**1,000**	**3,400**	**2,200**	**15**	<4	<1	ND	**890**	**45,000**	**45,000**	5	5,000
Vinyl Chloride	<20	<2	<2	<20	<100	ND	<2	<8	<2	ND	**9.8**	<800	<800	2	50,000

NOTES:
1. Concentrations in micrograms per liter (ug/l, or parts per billion).
2. MCP Method 1 groundwater standards from 310 CMR 40.0974(2).
3. **Bold** indicates values exceeds applicable Method 1 Standard.
4. Destroyed Wells are shown as "~~Strike through~~"

Table 8 (cont'd.)
Basement Groundwater Exposure Point Concentrations (EPCs)
Volatile Organic Compounds (VOCs)
Concentrations in ug/l
Former Lunt Silversmiths
Greenfield, MA

Well No.:	LWP-101	LWP-102	LWP-103	LWP-104	LWP-105	LWP-106	LWP-107	LWP-108	GW-2	GW-3	
Sample Date:	9/15/16	9/15/16	9/15/16	9/15/16	9/15/16	9/15/16	9/15/16	9/15/16	Standard	Standard	UCLs
1,1-Dichloroethylene	<1,000	<1.0	<1.0	<1.0	1.2	<1.0	2	<1.0	80	30,000	100,000
cis-1,2-Dichloroethylene	<1,000	5.6	**20**	<1.0	**31**	16	5.8	2.4	20	50,000	100,000
trans-1,2-Dichloroethylene	<1,000	14	48	<1.0	1.4	<1.0	1.7	<1.0	80	50,000	100,000
Tetrachloroethylene	**3,200**	2	1.5	<1.0	7.6	<1.0	12	<1.0	50	30,000	100,000
Trichloroethylene	**250,000**	**28**	**22**	**18**	**510**	**24**	**2,200**	**15**	5	5,000	50,000

NOTES:
1. Concentrations in micrograms per liter (ug/l, or parts per billion).
2. "<" indicates not detected; value is quantitation limit.
3. MCP Method 1 groundwater standards from 310 CMR 40.0974(2).
4. UCLs = Upper Concentration Limits, from 310 CMR 40.0996(7).
5. Values shown in **bold** exceed Method 1 standards.
6. "--" = Not analyzed for this parameter.
7. "NS" = No standard available.

Table 9
Indoor Air Exposure Point Concentrations (EPCs) - Condominium Unit B1 1st and 2nd Floor Post SSDS Installation - 2/2018 through 2/2019 PEPMM in Operation
Concentrations in ug/m^3
298 Federal Street
Greenfield, Massachusetts

Sample ID	IA-5							IA-6									IA-7					Residential Indoor Air Threshold Values (TV_r)	Commercial/ Industrial Indoor Air Threshold Values ($TV_{c/i}$)
Sample Location	1st Floor Office Rm. 152							1st Floor Office Rm 108									1st Floor Jan. Closet Rm. 126						
Sample Date	7/21/16	1/19/18	2/16/18	6/8/18	10/30/18	2/28/19	EPC	7/21/16	8/19/16	3/2/17	1/19/18	2/16/18	6/8/18	10/30/18	2/28/19	EPC	7/21/16	6/8/18	10/30/18	N/A	EPC		
Volatile Organic Compounds			PEPMM Operational				Average					PEPMM Operational				Average	PEPMM Operational				Average		
1,1-Dichloroethylene	<0.14	<0.14	*0.14*	*0.14*	*0.14*	*0.14*	*0.14*	<0.14	<0.14	<0.14	<0.14	*0.14*	*0.14*	*0.14*	0.22	0.16	*0.14*	*0.14*	*0.14*	N/A	*0.14*	0.8	180
cis-1,2-Dichloroethylene	<0.14	<0.14	*0.14*	*0.14*	*0.14*	*0.14*	*0.14*	<0.14	<0.14	<0.14	<0.14	*0.14*	*0.14*	*0.14*	*0.14*	*0.14*	*0.14*	*0.14*	*0.14*	N/A	*0.14*	0.8	5.3
trans-1,2-Dichloroethylene	0.23	<0.14	*0.14*	*0.14*	*0.14*	0.16	0.15	**1.3**	**1.5**	**<0.14**	<0.14	0.16	0.47	0.14	0.23	0.25	*0.14*	*0.14*	*0.14*	N/A	*0.14*	0.8	53
Tetrachloroethylene	<0.24	<0.24	0.32	*0.24*	*0.24*	0.31	0.28	0.88	<0.24	0.33	0.27	0.46	0.25	0.29	0.43	0.36	0.29	*0.24*	*0.24*	N/A	0.26	1.4	4.1
Trichloroethylene	**0.85**	0.31	**0.54**	**0.63**	**0.53**	**0.59**	**0.57**	**8.7**	**2.8**	**4.5**	**1.5**	**2.2**	**1.5**	**2.9**	**1.9**	**2.13**	**2.0**	**0.64**	*0.19*	N/A	**0.94**	0.4	1.8
Vinyl Chloride	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	ND	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	ND	<0.09	<0.09	<0.09	N/A	ND	0.27	1.3

Sample ID	IA-8									IA-9							IA-10	IA-11			Residential Indoor Air Threshold Values (TV_r)	Commercial/ Industrial Indoor Air Threshold Values ($TV_{c/i}$)
Sample Location	1st Floor Nurse Sta. Rm. 156									2nd Floor IT Rm. 235							1st Floor Resd. Rm. 161	1st Fl. Resd. Rm.134				
Sample Date	7/21/16	8/19/16	3/2/17	1/19/18	2/16/18	6/8/18	10/30/18	2/28/19	EPC	7/21/16	1/19/18	2/16/18	6/8/18	10/30/18	2/28/19	EPC	9/7/16	6/8/18	10/30/18	2/28/19	EPC		
Volatile Organic Compounds					PEPMM Operational				Average			PEPMM Operational				Average	PEPMM Operational				Average		
1,1-Dichloroethylene	<0.14	<0.14	<0.14	<0.14	*0.14*	*0.14*	*0.14*	*0.14*	*0.14*	<0.14	<0.14	*0.14*	*0.14*	*0.14*	*0.14*	*0.14*	*0.14*	*0.14*	*0.14*	*0.14*	*0.14*	0.8	180
cis-1,2-Dichloroethylene	<0.14	<0.14	<0.14	<0.14	*0.14*	*0.14*	*0.14*	*0.14*	*0.14*	<0.14	<0.14	*0.14*	*0.14*	*0.14*	*0.14*	*0.14*	*0.14*	*0.14*	*0.14*	*0.14*	*0.14*	0.8	5.3
trans-1,2-Dichloroethylene	<0.14	<0.14	<0.14	*0.14*	*0.14*	*0.14*	*0.14*	0.16	0.15	0.29	<0.14	*0.14*	*0.14*	*0.14*	0.16	0.15	*0.14*	*0.14*	*0.14*	0.17	0.15	0.8	53
Tetrachloroethylene	0.29	0.63	<0.24	<0.24	0.35	*0.24*	*0.24*	0.34	0.29	0.26	<0.24	0.39	*0.24*	*0.24*	0.32	0.30	*0.24*	*0.24*	*0.24*	0.35	0.27	1.4	4.1
Trichloroethylene	**2.1**	**1.7**	**4.70**	**0.49**	**0.96**	**0.72**	**0.87**	**1.10**	**0.91**	**2.1**	**0.72**	**1.3**	**0.69**	**1.1**	**1.5**	**1.15**	**0.79**	**0.42**	**0.79**	**0.75**	**0.69**	0.4	1.8
Vinyl Chloride	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	ND	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	ND	<0.09	<0.09	<0.09	<0.09	ND	0.27	1.3

NOTES:
1. Only analytes detected are shown on the table for 1/26/12 samples. Refer to lab reports for full listing of analytical parameters. Samples collected 7/21/16 and after analyzed by TO-15 for only the 6 analytes shown.
2. Concentrations in micrograms per cubic meter (ug/m3).
3. "<" or "ND" = Not detected; value and value in italics is quantitation limit. "N/A" indicates no analysis was performed.
4. Indoor Air Threshold Values from MassDEP Vapor Intrusion Guidance, WSC#-16-435, October 2016.
5. "NA" indicates no threshold value available.
6. Bold indicates measured concentration exceeds the residential Threshold Value.
7. Janary 26, 2012 air samples collected prior to building renovations.
8. July 21, 2016 air samples collected after building renovations were completed, and basement windows had been sealed as part of the renovation.
9. August 19, 2016 air samples collected after two former basement windows in the western end of the basement had been reopened and two window fans had operated for one week.
10. September 7, 2016 air sample collected in an unoccupied 1st floor residential room with door closed for 24 hours after window fans in basement had operated since August 10, 2016.
11. March 2, 2017 Indoor air samples collected during "worst case" winter heating conditions, with the outside air temperatures in the 30's degrees °F during the day, droping to 20 degrees °F at night. The basement ventilation fans were continuing to operate during sample collection.
12. The January 18-19, 2018 indoor air samples were collected under 'worst case" winter heating conditions with the SSDS and the concrete cap in place, but the vent pipes were capped. Outdoor temperatures ranged from 12 to 29 degrees °F.
13. The February 15-16, 2018 indoor air samples were collected under winter heating conditions with the SSDS operating and the concrete cap in place. Outdoor temperatures ranged from 32 to 47 degrees °F.
14. The June 7-8, 2018 indoor air samples were collected under summer HVAC conditions with the SSDS operating and the concrete cap in place. Outdoor temperatures ranged from the upper 60's during the day, down into the 50's at night.
15. The October 29-30, 2018 indoor air samples were collected during Fall heating conditions with the SSDS operating and the concrete cap in place. The weather conditions on 10/29/18 were rainy with temperatures in the 40's, clearing overnight with temperatures into the 30's (no frost) with 10/30/18 conditions sunny and windy with temperatures in the 40's.
16. The February 27-28, 2019 indoor air samples were collected during Winter heating conditions with the SSDS operating and the concrete cap in place. The weather conditions on 2/27/19 were 13 degrees in the morning, rising to 22 degrees during the day, dropping to 17 degrees overnight, and rising to 32 degrees on 2/28/19.
17. The Exposure Point Concentration (EPC) Calculations are based on the four rounds of indoor air data (with the exception of the janitors closet where only three were collected) collected from February 2018 to February 2019 after the SSDS was installed and functional.
18. Two different residential rooms were used due to the inability to use the same room each time due to patient occupancy. Where the concentration is shown in italics, the detection limit was used for the analyte concentration.
19. EPCs were calculated as the average of the detected concentrations and value of the detection limit.

PEPMM in operation.
EPCs based on indoor air data with PEPMM in operation

	Highest EPCs C/I	Resd
1,1-Dichloroethylene	0.16	*0.14*
cis-1,2-Dichloroethylene	*0.14*	*0.14*
trans-1,2-Dichloroethylene	0.25	0.15
Tetrachloroethylene	0.36	0.27
Trichloroethylene	2.13	0.69
Vinyl Chloride	ND	ND

Table 9 (cont'd.)
Indoor Air Exposure Point Concentrations (EPCs) - Condominium Unit B1 Basement Post SSDS Installation - 2/2018 through 2/2019 PEPMM in Operation
Concentrations in ug/m^3
298 Federal Street
Greenfield, Massachusetts

Sample ID	IA-2			IA-3									IA-4					Residential Indoor Air Threshold Values (TV_r)	Commercial/ Industrial Indoor Air Threshold Values ($TV_{c/i}$)
Sample Location	Basement near settling tanks			Basement SW corner									Basement north central						
			PEPMM					PEPMM Operational				EPC					PEPMM		
Sample Date	1/26/12	7/21/16	2/28/19	1/26/12	7/21/16	8/19/16	1/19/18	2/16/18	6/8/18	10/30/18	2/28/19	Maximum	1/26/12	7/21/16	8/19/16	1/19/18	2/16/18		
Volatile Organic Compounds																			
1,1-Dichloroethylene	<1.48	<0.14	0.2	<1.48	<0.14	<0.14	<0.14	*0.14*	*0.14*	*0.14*	*0.14*	*0.14*	<1.48	<0.14	<0.14	<0.14	<0.14	0.8	170
cis-1,2-Dichloroethylene	< 0.65	<0.14	0.37	**2.6**	**0.73**	<0.14	**2.5**	*0.14*	*0.14*	*0.14*	*0.14*	*0.14*	< 0.65	<0.14	<0.14	0.6	<0.14	0.8	5.3
trans-1,2-Dichloroethylene	<0.84	0.4	0.19	<0.84	0.5	<0.14	<0.14	*0.14*	*0.14*	*0.14*	*0.14*	*0.14*	<0.84	<0.14	0.24	<0.14	<0.14	0.8	61
Tetrachloroethylene	**2.2**	**0.6**	0.34	**4.4**	**19**	**3**	**3.4**	0.6	0.24	0.57	0.37	0.60	< 1.4	1.3	0.5	0.26	0.45	1.4	4.1
Trichloroethylene	**5.6**	**7.1**	**1.1**	**2.3**	**140**	**35**	**60**	**2.5**	**1.6**	**3.1**	**0.84**	**3.1**	**8.1**	**15**	**14**	**5.2**	**1.4**	0.4	1.8
Vinyl Chloride	<1.01	<0.09	<0.09	<1.01	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	ND	<1.01	<0.09	<0.09	<0.09	<0.09	0.27	1.3

NOTES:
1. Only analytes detected are shown on the table for 1/26/12 samples. Refer to lab reports for full listing of analytical parameters. Samples collected 7/21/16 and after analyzed by TO-15 for only the 6 analytes shown.
2. Concentrations in micrograms per cubic meter (ug/m3).
3. "<" or "ND" = Not detected; value and value in italics is quantitation limit. "N/A" indicates no analysis was performed.
4. Indoor Air Threshold Values from MassDEP Vapor Intrusion Guidance, WSC#-16-435, October 2016.
5. "NA" indicates no threshold value available.
6. Bold indicates measured concentration exceeds the residential Threshold Value.
7. Janary 26, 2012 air samples collected prior to building renovations.
8. July 21, 2016 air samples collected after building renovations were completed, and basement windows had been sealed as part of the renovation.
9. August 19, 2016 air samples collected after two former basement windows in the western end of the basement had been reopened and two window fans had operated for one week.
10. September 7, 2016 air sample collected in an unoccupied 1st floor residential room with door closed for 24 hours after window fans in basement had operated since August 10, 2016.
11. March 2, 2017 Indoor air samples collected during "worst case" winter heating conditions, with the outside air temperatures in the 30's degrees °F during the day, droping to 20 degrees °F at night. The basement ventilation fans were continuing to operate during sample collection.
12. The January 18-19, 2018 indoor air samples were collected under 'worst case" winter heating conditions with the SSDS and the concrete cap in place, but the vent pipes were capped. Outdoor temperatures ranged from 12 to 29 degrees °F
13. The February 15-16, 2018 indoor air samples were collected under winter heating conditions with the SSDS operating and the concrete cap in place. Outdoor temperatures ranged from 32 to 47 degrees °F.
14. The June 7-8, 2018 indoor air samples were collected under summer HVAC conditions with the SSDS operating and the concrete cap in place. Outdoor temperatures ranged from the upper 60's during the day, down into the 50's at night.
15. The October 29-30, 2018 indoor air samples were collected during Fall heating conditions with the SSDS operating and the concrete cap in place. The weather conditions on 10/29/18 were rainy with temperatures in the 40's, clearing overnight with temperatures into the 30's (no frost) with 10/30/18 conditions sunny and windy with temperatures in the 40's.
16. The February 27-28, 2019 indoor air samples were collected during Winter heating conditions with the SSDS operating and the concrete cap in place. The weather conditions on 2/27/19 were 13 degrees in the morning, rising to 22 degrees during the day, dropping to 17 degrees overnight, and rising to 32 degrees on 2/28/19.

PEPMM in operation.
EPCs based on indoor air data with PEPMM in operation

Table 9 (cont'd.)
Indoor Air Exposure Point Concentrations (EPCs) - Building C - PEPMM in Operation
Concentrations in ug/m^3
Condominium Unit C Building at 298 Federal Street
Greenfield, Massachusetts

Sample ID	Grab Sample	IA-101				IA-102				IA-104			EPCs	IA-203				Residential Indoor Air Threshold Values (TV_r)	Commercial/ Industrial Indoor Air Threshold Values (TV_{ci})
Sample Location	Condominium Unit C Building 1st Floor													2nd Floor					
		PEPMM OPERATIONAL											**Maximum**	PEPMM OPERATIONAL					
Sample Date	10/27/16	3/21/19	6/20/19	9/27/19	12/13/19	3/21/19	6/20/19	9/27/19	12/13/19	6/20/19	9/27/19	12/13/19		3/21/19	6/20/19	9/27/19	12/13/19		
Volatile Organic Compounds																			
1,1-Dichloroethylene	0.6	<0.14	<0.14	<0.14	<0.14	<0.16	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	*0.16*	<0.14	<0.14	<0.14	<0.14	0.8	180
cis-1,2-Dichloroethylene	0.15	<0.14	<0.14	<0.14	<0.14	<0.16	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	*0.16*	<0.14	<0.14	<0.14	<0.14	0.8	5.3
trans-1,2-Dichloroethylene	<0.14	<0.14	<0.14	<0.14	<0.14	<0.16	0.2	<0.14	<0.14	<0.14	<0.14	<0.14	0.2	<0.14	<0.14	<0.14	<0.14	0.8	53
Tetrachloroethylene	<0.24	<0.24	<0.24	<0.24	<0.24	<0.27	<0.24	0.37	<0.24	<0.24	<0.24	<0.24	0.37	<0.24	<0.24	0.49	<0.24	1.4	4.1
Trichloroethylene	**4.8**	0.85	1.4	0.48	1.4	0.63	1.5	0.52	1.6	1.4	0.49	1.5	1.6	1.00	0.41	0.97	0.56	0.4	1.8
Vinyl Chloride	<0.09	<0.09	<0.09	<0.09	<0.09	<0.1	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	0.1	<0.09	<0.09	<0.09	<0.09	0.27	1.3

NOTES:
1. Only analytes shown were analyzed for the 3/21, 6/20, 9/27, and 12/13/2019 samples. The 10/27/16 included all TO-15 analytes prior to construction activities. Refer to lab report for full analyte listing.
2. Concentrations in micrograms per cubic meter (ug/m3).
3. "<" = Not detected; value is quantitation limit.
4. Indoor Air Threshold Values from MassDEP Vapor Intrusion Guidance, WSC#-16-435, October 2016.
5. **Bold** = measured concentration exceeds the commercial/industrial indoor air Threshold Value.
6. The 10/27/16 sample was collected over a four hour period prior to construction activities commencing.
7. The 3/21/19 samples were collected over a 24 hour period in the finished building prior to occupancy during winter heating conditions. The PEPMM had been operational since 3/11/2019. Overnight temperatures were below freezing with daytime temperatures rising into the 40's.
8. The 6/20/19 samples were collected over a 24 hour period in the finished building prior to occupancy with the air condition system operating. The second floor was ready for occupancy and the first floor was having minor finishing work performed. The weather was high 60's to low 70's with rain showers.
9. The 9/27/19 samples were collected over a 24 hour period. The second floor (sample IA-203) and west end of the first floor (IA-104) was finished and fully occupied and in use with the HVAC system operating. The rest of the first floor (samples IA-101 and IA-102) was finished with the HVAC system operating but unoccupied. The weather was 50 to 70 degrees during the day with rain showers, dropping into the 40's overnight.

Table 10
Calculation of Risk Estimates for Construction Worker - Incidental Ingestion of and Dermal Contact with Soil and Inhalation of Particulates - Central Manufacturing Area - 0 to 2 feet bgs

Construction Worker - Soil: Table CW-1
Exposure Point Concentration (EPC) and Risk
Based on Construction Worker 18-25 years of age

ShortForm Version 10-12
Vlookup Version v0315

ELCR (all chemicals) = 1.1E-07
HI (all chemicals) = 3.3E-01

****Do not insert or delete any rows****
Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material (OHM)	EPC (mg/kg)	ELCR ingestion	ELCR dermal	ELCR inhalation GI	ELCR inhalation pulmonary	$ELCR_{total}$	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Subchronic HQ_{inh-GI}	Subchronic HQ_{inh}	HQ_{total}
TRICHLOROETHYLENE	0.23	1.0E-10	3.0E-11	2.6E-12	3.1E-13	1.3E-10	5.7E-04	1.7E-04	1.5E-05	4.3E-06	7.6E-04
TETRACHLOROETHYLENE	0.12	2.1E-11	6.4E-12	5.5E-13	9.6E-14	2.8E-11	2.5E-05	7.4E-06	6.4E-07	1.1E-07	3.3E-05
ARSENIC	8.9	5.9E-08	3.5E-08	1.5E-09	7.1E-09	1.0E-07	1.8E-02	1.1E-02	4.7E-04	1.7E-02	4.6E-02
LEAD	154						1.3E-01	1.5E-02	3.3E-03	5.7E-03	1.5E-01
SILVER	70						1.7E-02	5.2E-02	4.5E-04	1.9E-02	8.8E-02
CADMIUM	6.96				3.3E-09	3.3E-09	8.6E-03	1.7E-03	2.2E-04	1.3E-02	2.3E-02
NICKEL	53.2				6.8E-09	6.8E-09	3.3E-03	6.6E-03	8.5E-05	2.0E-03	1.2E-02
VANADIUM	36						4.9E-03	5.0E-03	1.3E-04	1.3E-03	1.1E-02

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Table 10 (cont'd.)
Calculation of Risk Estimates for Construction Worker - Incidental Ingestion of and Dermal Contact with Soil and Inhalation of Particulates - Southeastern Area - 0 to 2 feet bgs

Construction Worker - Soil: Table CW-1
Exposure Point Concentration (EPC) and Risk
Based on Construction Worker 18-25 years of age

ShortForm Version 10-12
Vlookup Version v0315

ELCR (all chemicals) = 2.3E-07
HI (all chemicals) = 1.6E+00

****Do not insert or delete any rows****
Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material (OHM)	EPC (mg/kg)	ELCR ingestion	ELCR dermal	ELCR inhalation GI	ELCR inhalation pulmonary	$ELCR_{total}$	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Subchronic HQ_{inh-GI}	Subchronic HQ_{inh}	HQ_{total}
ARSENIC	20	1.3E-07	8.0E-08	3.4E-09	1.6E-08	2.3E-07	4.1E-02	2.5E-02	1.1E-03	3.7E-02	1.0E-01
LEAD	1325						1.1E+00	1.3E-01	2.8E-02	4.9E-02	1.3E+00
SILVER	165						4.1E-02	1.2E-01	1.1E-03	4.4E-02	2.1E-01

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Table 10 (cont'd.)
Calculation of Risk Estimates for Construction Worker - Incidental Ingestion of and Dermal Contact with Soil and Inhalation of Particulates - Below Former Cyclone Area - 0 to 0.5 feet bgs

Construction Worker - Soil: Table CW-1
Exposure Point Concentration (EPC) and Risk
Based on Construction Worker 18-25 years of age

ShortForm Version 10-12
Vlookup Version v0315

ELCR (all chemicals) = 6.7E-08
HI (all chemicals) = 4.6E-01

****Do not insert or delete any rows****
Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material (OHM)	EPC (mg/kg)	ELCR ingestion	ELCR dermal	ELCR inhalation GI	ELCR inhalation pulmonary	$ELCR_{total}$	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Subchronic HQ_{inh-GI}	Subchronic HQ_{inh}	HQ_{total}
ANTIMONY	4.3						1.3E-02	1.3E-02	3.4E-04	1.6E-05	2.7E-02
ARSENIC	5.8	3.8E-08	2.3E-08	9.9E-10	4.6E-09	6.7E-08	1.2E-02	7.2E-03	3.1E-04	1.1E-02	3.0E-02
LEAD	160						1.3E-01	1.6E-02	3.4E-03	6.0E-03	1.6E-01
SILVER	196						4.8E-02	1.5E-01	1.3E-03	5.2E-02	2.5E-01

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Table 10 (cont'd.)
Calculation of Risk Estimates for Construction Worker - Incidental Ingestion of and Dermal Contact with Soil and Inhalation of Particulates - Western Grid after Excavation - 2 to 3 feet bgs

Construction Worker - Soil: Table CW-1
Exposure Point Concentration (EPC) and Risk
Based on Construction Worker 18-25 years of age

ShortForm Version 10-12
Vlookup Version v0315

ELCR (all chemicals) = 2.5E-09
HI (all chemicals) = 9.4E-02

****Do not insert or delete any rows****
Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material (OHM)	EPC (mg/kg)	ELCR ingestion	ELCR dermal	ELCR inhalation GI	ELCR inhalation pulmonary	$ELCR_{total}$	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Subchronic HQ_{inh-GI}	Subchronic HQ_{inh}	HQ_{total}
TRICHLOROETHYLENE	4.006	1.8E-09	5.3E-10	4.6E-11	5.3E-12	2.3E-09	9.9E-03	3.0E-03	2.6E-04	7.5E-05	1.3E-02
TETRACHLOROETHYLENE	0.868	1.5E-10	4.6E-11	3.9E-12	6.9E-13	2.0E-10	1.8E-04	5.4E-05	4.6E-06	8.1E-07	2.4E-04
LEAD	59						4.8E-02	5.9E-03	1.3E-03	2.2E-03	5.8E-02
SILVER	18						4.4E-03	1.3E-02	1.1E-04	4.8E-03	2.3E-02

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Table 10 (cont'd.)
Calculation of Risk Estimates for Construction Worker - Incidental Ingestion of and Dermal Contact with Soil and Inhalation of Particulates - Southern Grid after Excavation - 2 to 4 feet bgs

Construction Worker - Soil: Table CW-1
Exposure Point Concentration (EPC) and Risk
Based on Construction Worker 18-25 years of age

ShortForm Version 10-12
Vlookup Version v0315

ELCR (all chemicals) = 4.8E-09
HI (all chemicals) = 1.4E+00

****Do not insert or delete any rows****
Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material (OHM)	EPC (mg/kg)	ELCR ingestion	ELCR dermal	ELCR inhalation GI	ELCR inhalation pulmonary	$ELCR_{total}$	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Subchronic HQ_{inh-GI}	Subchronic HQ_{inh}	HQ_{total}
TRICHLOROETHYLENE	8.255	3.6E-09	1.1E-09	9.4E-11	1.1E-11	4.8E-09	2.0E-02	6.1E-03	5.3E-04	1.5E-04	2.7E-02
TETRACHLOROETHYLENE	0.09	1.6E-11	4.8E-12	4.1E-13	7.2E-14	2.1E-11	1.8E-05	5.6E-06	4.8E-07	8.4E-08	2.5E-05
LEAD	1328						1.1E+00	1.3E-01	2.8E-02	4.9E-02	1.3E+00
SILVER	68						1.7E-02	5.1E-02	4.3E-04	1.8E-02	8.6E-02

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Table 10 (cont'd.)
Calculation of Risk Estimates for Construction Worker - Incidental Ingestion of and Dermal Contact with Soil and Inhalation of Particulates - CVOCs 5 to 12.5 feet bgs and VPH/EPH 5 to 9 feet bgs

Construction Worker - Soil: Table CW-1
Exposure Point Concentration (EPC) and Risk
Based on Construction Worker 18-25 years of age

ShortForm Version 10-12
Vlookup Version v0315

ELCR (all chemicals) = 2.6E-08
HI (all chemicals) = 1.5E-01

****Do not insert or delete any rows****
Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material (OHM)	EPC (mg/kg)	ELCR ingestion	ELCR dermal	ELCR inhalation GI	ELCR inhalation pulmonary	$ELCR_{total}$	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Subchronic HQ_{inh-GI}	Subchronic HQ_{inh}	HQ_{total}
DICHLOROETHYLENE, CIS-1,2-	8.8						5.4E-04	1.6E-04	1.4E-05	5.5E-06	7.3E-04
DICHLOROETHYLENE, TRANS-1,2-	0.05						3.1E-07	9.3E-08	8.0E-09	3.1E-08	4.4E-07
TETRACHLOROETHYLENE	3.6	6.3E-10	1.9E-10	1.6E-11	2.9E-12	8.4E-10	7.4E-04	2.2E-04	1.9E-05	3.4E-06	9.8E-04
TRICHLOROETHYLENE	43.1	1.9E-08	5.7E-09	4.9E-10	5.7E-11	2.5E-08	1.1E-01	3.2E-02	2.8E-03	8.0E-04	1.4E-01
ALIPHATICS C5 to C8	21.6						6.7E-05	1.3E-04	1.7E-06	4.0E-06	2.1E-04
ALIPHATICS C9 to C12	153						1.9E-04	3.8E-04	4.9E-06	9.5E-06	5.8E-04
AROMATICS C9 to C10	54						2.2E-04	4.5E-04	5.7E-06	4.0E-06	6.8E-04
ALIPHATICS C9 to C18	981						1.2E-03	2.4E-03	3.1E-05	6.1E-05	3.7E-03
AROMATICS C11 to C22	104						1.3E-04	4.3E-04	3.3E-06	7.7E-06	5.7E-04

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Table 11
Calculation of Risk Estimates for Resident - Incidental Ingestion of and Dermal Contact with Soil - Central Manufacturing Area - 0 to 2 feet bgs

Resident - Soil: Table RS-1
Exposure Point Concentration (EPC)
Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

ShortForm Version 10-12
Vlookup Versionv0315

ELCR (all chemicals) = 3.8E-06
Chronic HI (all chemicals) = 5.0E-01
Subchronic HI (all chemicals) = 1.3E+00

Do not insert or delete any rows
Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	Derm & Ing $ELCR_{total}$	Chronic HQ_{ing}	Chronic HQ_{derm}	Derm & Ing HQ_{total}	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Derm & Ing HQ_{total}	
TRICHLOROETHYLENE	0.23	4.3E-09	1.3E-09	5.6E-09	1.1E-03	2.8E-04	1.4E-03	3.1E-03	5.4E-04	3.6E-03	
TETRACHLOROETHYLENE	0.12	9.0E-10	2.8E-10	1.2E-09	4.8E-05	1.2E-05	6.1E-05	1.3E-04	2.3E-05	1.6E-04	
ARSENIC	8.3	2.3E-06	1.4E-06	3.8E-06	3.4E-02	1.7E-02	5.1E-02	9.2E-02	3.2E-02	1.2E-01	
LEAD	154				2.5E-01	2.5E-02	2.7E-01	6.9E-01	4.8E-02	7.3E-01	**Note! Lead IH HQ limit is 1, not 10.**
SILVER	70				3.4E-02	8.7E-02	1.2E-01	9.3E-02	1.6E-01	2.6E-01	
CADMIUM	6.96				1.7E-02	2.9E-03	2.0E-02	4.6E-02	5.4E-03	5.2E-02	
NICKEL	53.2				6.4E-03	1.1E-02	1.7E-02	1.8E-02	2.1E-02	3.8E-02	
VANADIUM	36				9.7E-03	8.2E-03	1.8E-02	2.7E-02	1.6E-02	4.2E-02	

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Table 11 (cont'd.)
Calculation of Risk Estimates for Resident - Ingestion of Home Grown Produce -
Central Manufacturing Area - 0 to 2 feet bgs

Resident - Soil: Table RS-2
Exposure Point Concentration (EPC)
Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Vlookup Versionv0315

ELCR (all chemicals) = 1.3E-04
Chronic HI (all chemicals) = 31
Subchronic HI (all chemicals) = 45

*Vegetable uptake is informational only and NOT included in totals on EPC tab.

Do not insert or delete any rows

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Chronic		Subchronic
		$ELCR_{vegetable*}$	$HQ_{vegetable*}$	$HQ_{vegetable*}$
TRICHLOROETHYLENE	0.23			
TETRACHLOROETHYLENE	0.12			
ARSENIC	8.3	1.3E-04	9.8E-01	1.4E+00
LEAD	154		1.1E+01	1.6E+01
SILVER	70			

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Table 11 (cont'd.)
Calculation of Risk Estimates for Resident - Incidental Ingestion of and Dermal Contact with Soil - Southeastern Area - 0 to 2 feet bgs

Resident - Soil: Table RS-1
Exposure Point Concentration (EPC)
Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

ShortForm Version 10-12
Vlookup Versionv0315

ELCR (all chemicals) = 9.1E-06
Chronic HI (all chemicals) = 2.8E+00
Subchronic HI (all chemicals) = 7.2E+00

Do not insert or delete any rows
Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	Derm & Ing $ELCR_{total}$	Chronic HQ_{ing}	Chronic HQ_{derm}	Derm & Ing HQ_{total}	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Derm & Ing HQ_{total}	
ARSENIC	20	5.6E-06	3.5E-06	9.1E-06	8.1E-02	4.1E-02	1.2E-01	2.2E-01	7.8E-02	3.0E-01	
LEAD	1325				2.1E+00	2.2E-01	2.4E+00	5.9E+00	4.1E-01	6.3E+00	**Note! Lead IH HQ limit is 1, not 10.**
SILVER	165				8.0E-02	2.0E-01	2.8E-01	2.2E-01	3.9E-01	6.1E-01	

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Table 11 (cont'd.)
Calculation of Risk Estimates for Resident - Ingestion of Home Grown Produce - Southeastern Area - 0 to 2 feet bgs

Resident - Soil: Table RS-2
Exposure Point Concentration (EPC)
Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Vlookup Versionv0315

ELCR (all chemicals) = 3.2E-04
Chronic HI (all chemicals) = 97
Subchronic HI (all chemicals) = 138

*Vegetable uptake is informational only and NOT included in totals on EPC tab.

Do not insert or delete any rows

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Chronic		Subchronic
		$ELCR_{vegetable*}$	$HQ_{vegetable*}$	$HQ_{vegetable*}$
ARSENIC	20	3.2E-04	2.4E+00	3.4E+00
LEAD	1325		9.4E+01	1.3E+02
SILVER	165			

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Table 11 (cont'd.)
Calculation of Risk Estimates for Resident - Incidental Ingestion of and Dermal Contact with Soil - Below Former North Cyclone - 0 to 0.5 feet bgs

Resident - Soil: Table RS-1
Exposure Point Concentration (EPC)
Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

ShortForm Version 10-12
Vlookup Versionv0315

ELCR (all chemicals) = 2.6E-06
Chronic HI (all chemicals) = 7.1E-01
Subchronic HI (all chemicals) = 1.7E+00

Do not insert or delete any rows
Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	Derm & Ing $ELCR_{total}$	Chronic HQ_{ing}	Chronic HQ_{derm}	Derm & Ing HQ_{total}	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Derm & Ing HQ_{total}	
ANTIMONY	4.3				2.6E-02	2.2E-02	4.8E-02	7.2E-02	4.2E-02	1.1E-01	
ARSENIC	5.8	1.6E-06	1.0E-06	2.6E-06	2.3E-02	1.2E-02	3.5E-02	6.5E-02	2.3E-02	8.7E-02	
LEAD	160				2.6E-01	2.6E-02	2.8E-01	7.1E-01	5.0E-02	7.6E-01	**Note! Lead IH HQ limit is 1, not 10.**
SILVER	196				9.5E-02	2.4E-01	3.4E-01	2.6E-01	4.6E-01	7.2E-01	

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Table 11 (cont'd.)
Calculation of Risk Estimates for Resident - Ingestion of Home Grown Produce -
Below Former North Cyclone - 0 to 0.5 feet bgs

Resident - Soil: Table RS-2
Exposure Point Concentration (EPC)
Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Vlookup Versionv0315

ELCR (all chemicals) = 9E-05
Chronic HI (all chemicals) = 12
Subchronic HI (all chemicals) = 17

*Vegetable uptake is informational only and NOT included in totals on EPC tab.

Do not insert or delete any rows

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Chronic		Subchronic
		$ELCR_{vegetable*}$	$HQ_{vegetable*}$	$HQ_{vegetable*}$
ANTIMONY	4.3			
ARSENIC	5.8	9.2E-05	6.9E-01	9.8E-01
LEAD	160		1.1E+01	1.6E+01
SILVER	196			

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Table 11 (cont'd.)
Calculation of Risk Estimates for Resident - Incidental Ingestion of and Dermal Contact with Soil - Western Grid after Excavation - 2 to 3 feet bgs

Resident - Soil: Table RS-1
Exposure Point Concentration (EPC)
Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

ShortForm Version 10-12
Vlookup Versionv0315

ELCR (all chemicals) = 1.1E-07
Chronic HI (all chemicals) = 1.6E-01
Subchronic HI (all chemicals) = 4.1E-01

Do not insert or delete any rows
Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	Derm & Ing $ELCR_{total}$	Chronic HQ_{ing}	Chronic HQ_{derm}	Derm & Ing HQ_{total}	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Derm & Ing HQ_{total}	
TRICHLOROETHYLENE	4.006	7.5E-08	2.3E-08	9.8E-08	1.9E-02	5.0E-03	2.4E-02	5.3E-02	9.4E-03	6.3E-02	
TETRACHLOROETHYLENE	0.868	6.5E-09	2.0E-09	8.5E-09	3.5E-04	8.9E-05	4.4E-04	9.7E-04	1.7E-04	1.1E-03	
LEAD	59				9.5E-02	9.7E-03	1.1E-01	2.6E-01	1.8E-02	2.8E-01	**Note! Lead IH HQ limit is 1, not 10.**
SILVER	18				8.7E-03	2.2E-02	3.1E-02	2.4E-02	4.2E-02	6.6E-02	

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Table 11 (cont'd.)
Calculation of Risk Estimates for Resident - Ingestion of Home Grown Produce -
Western Grid after Excavation - 2 to 3 feet bgs

Resident - Soil: Table RS-2
Exposure Point Concentration (EPC)
Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Vlookup Versionv0315

ELCR (all chemicals) =
Chronic HI (all chemicals) = 4.2
Subchronic HI (all chemicals) = 6.0

*Vegetable uptake is informational only and NOT included in totals on EPC tab.

Do not insert or delete any rows

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Chronic		Subchronic
		$ELCR_{vegetable*}$	$HQ_{vegetable*}$	$HQ_{vegetable*}$
TRICHLOROETHYLENE	4.006			
TETRACHLOROETHYLENE	0.868			
LEAD	59		4.2E+00	6.0E+00
SILVER	18			

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Table 11 (cont'd.)
Calculation of Risk Estimates for Resident - Incidental Ingestion of and Dermal Contact with Soil - Southern Grid after Excavation - 2 to 4 feet bgs

Resident - Soil: Table RS-1
Exposure Point Concentration (EPC)
Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

ShortForm Version 10-12
Vlookup Versionv0315

ELCR (all chemicals) = 2.0E-07
Chronic HI (all chemicals) = 2.5E+00
Subchronic HI (all chemicals) = 6.7E+00

Do not insert or delete any rows
Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	Derm & Ing $ELCR_{total}$	Chronic HQ_{ing}	Chronic HQ_{derm}	Derm & Ing HQ_{total}	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Derm & Ing HQ_{total}	
TRICHLOROETHYLENE	8.255	1.5E-07	4.8E-08	2.0E-07	4.0E-02	1.0E-02	5.0E-02	1.1E-01	1.9E-02	1.3E-01	
TETRACHLOROETHYLENE	0.09	6.7E-10	2.1E-10	8.8E-10	3.6E-05	9.3E-06	4.6E-05	1.0E-04	1.8E-05	1.2E-04	
LEAD	1328				2.1E+00	2.2E-01	2.4E+00	5.9E+00	4.1E-01	6.3E+00	**Note! Lead IH HQ limit is 1, not 10.**
SILVER	68				3.3E-02	8.4E-02	1.2E-01	9.1E-02	1.6E-01	2.5E-01	

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Table 11 (cont'd.)
Calculation of Risk Estimates for Resident - Ingestion of Home Grown Produce -
Southern Grid after Excavation - 2 to 4 feet bgs

Resident - Soil: Table RS-2
Exposure Point Concentration (EPC)
Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Vlookup Versionv0315

ELCR (all chemicals) =
Chronic HI (all chemicals) = 95
Subchronic HI (all chemicals) = 135

*Vegetable uptake is informational only and NOT included in totals on EPC tab.

Do not insert or delete any rows

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Chronic		Subchronic
		$ELCR_{vegetable*}$	$HQ_{vegetable*}$	$HQ_{vegetable*}$
TRICHLOROETHYLENE	8.255			
TETRACHLOROETHYLENE	0.09			
LEAD	1328		9.5E+01	1.4E+02
SILVER	68			

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Table 11 (cont'd.)
Calculation of Risk Estimates for Resident - Incidental Ingestion of and Dermal Contact with Soil - CVOCs 5 to 12.5 feet bgs and VPH/EPH 5 to 9 feet bgs

Resident - Soil: Table RS-1
Exposure Point Concentration (EPC)
Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

ShortForm Version 10-12
Vlookup Versionv0315

ELCR (all chemicals) = 1.1E-06
Chronic HI (all chemicals) = 3.8E-01
Subchronic HI (all chemicals) = 7.1E-01

Do not insert or delete any rows
Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	Derm & Ing $ELCR_{total}$	Chronic HQ_{ing}	Chronic HQ_{derm}	Derm & Ing HQ_{total}	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Derm & Ing HQ_{total}
DICHLOROETHYLENE, CIS-1,2-	8.8				1.1E-02	2.7E-03	1.3E-02	2.9E-03	5.1E-04	3.5E-03
DICHLOROETHYLENE, TRANS-1,2-	0.05				6.1E-06	1.5E-06	7.6E-06	1.7E-06	2.9E-07	2.0E-06
TETRACHLOROETHYLENE	3.6	2.7E-08	8.4E-09	3.5E-08	1.5E-03	3.7E-04	1.8E-03	4.0E-03	7.0E-04	4.7E-03
TRICHLOROETHYLENE	43.1	8.1E-07	2.5E-07	1.1E-06	2.1E-01	5.3E-02	2.6E-01	5.8E-01	1.0E-01	6.8E-01
ALIPHATICS C5 to C8	21.6				1.3E-03	2.2E-03	3.5E-03	3.6E-04	4.2E-04	7.8E-04
ALIPHATICS C9 to C12	153				3.7E-03	6.3E-03	1.0E-02	1.0E-03	1.2E-03	2.2E-03
AROMATICS C9 to C10	54				4.4E-03	7.4E-03	1.2E-02	1.2E-03	1.4E-03	2.6E-03
ALIPHATICS C9 to C18	981				2.4E-02	4.0E-02	6.4E-02	6.5E-03	7.7E-03	1.4E-02
AROMATICS C11 to C22	104				2.5E-03	7.1E-03	9.7E-03	6.9E-04	1.4E-03	2.0E-03

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Table 12
Calculation of Risk Estimates for Indoor Worker - Inhalation of Vapors - Condo Unit B1 1st Floor Office

Offices and Schools - Indoor Air: Table OSA-1
Exposure Point Concentration (EPC)
Based on an Office Worker or Teacher Exposed for 27 Years. Applicable to students*.

ShortForm Version 10-12
Vlookup Version v0315

*Risk-based concentrations are protective of students; cancer risks are over-estimated for students.

ELCR (all chemicals) = 1.0E-06
HI (all chemicals) = 2.5E-01

****Do not insert or delete any rows****
Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC ($\mu g/m^3$)	$ELCR_{air}$	HQ_{air}
DICHLOROETHYLENE, 1,1-	0.16		1.8E-04
DICHLOROETHYLENE, CIS-1,2-	*0.14*		5.3E-03
DICHLOROETHYLENE, TRANS-1,2-	0.25		9.5E-04
TETRACHLOROETHYLENE	0.36	9.5E-08	2.1E-03
TRICHLOROETHYLENE	2.13	9.4E-07	2.4E-01

See http://www.mass.gov/eea/docs/dep/cleanup/laws/tcestat.pdf

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Table 12 (cont'd.)
Calculation of Risk Estimates for Indoor Worker - Inhalation of Vapors - Condo Unit B1 Basement

Offices and Schools - Indoor Air: Table OSA-1
Exposure Point Concentration (EPC)
Based on an Office Worker or Teacher Exposed for 27 Years. Applicable to students*.

ShortForm Version 10-12
Vlookup Version v0315

*Risk-based concentrations are protective of students; cancer risks are over-estimated for students.

ELCR (all chemicals) = 1.5E-06

HI (all chemicals) = 3.6E-01

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC ($\mu g/m^3$)	$ELCR_{air}$	HQ_{air}
DICHLOROETHYLENE, 1,1-	*0.14*		1.6E-04
DICHLOROETHYLENE, CIS-1,2-	*0.14*		5.3E-03
DICHLOROETHYLENE, TRANS-1,2-	*0.14*		5.3E-04
TETRACHLOROETHYLENE	0.6	1.6E-07	3.4E-03
TRICHLOROETHYLENE	3.1	1.4E-06	3.5E-01

See http://www.mass.gov/eea/docs/dep/cleanup/laws/tcestat.pdf

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Table 12 (cont'd.)
Calculation of Risk Estimates for Indoor Worker - Inhalation of Vapors - Condo Unit C 1st Floor

Offices and Schools - Indoor Air: Table OSA-1
Exposure Point Concentration (EPC)
Based on an Office Worker or Teacher Exposed for 27 Years. Applicable to students*.

ShortForm Version 10-12
Vlookup Version v0315

*Risk-based concentrations are protective of students; cancer risks are over-estimated for students.

ELCR (all chemicals) = 8.0E-07

****Do not insert or delete any rows****

HI (all chemicals) = 1.9E-01

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC ($\mu g/m^3$)	$ELCR_{air}$	HQ_{air}
DICHLOROETHYLENE, 1,1-	*0.16*		1.8E-04
DICHLOROETHYLENE, CIS-1,2-	*0.16*		6.1E-03
DICHLOROETHYLENE, TRANS-1,2-	0.2		7.6E-04
TETRACHLOROETHYLENE	0.37	9.8E-08	2.1E-03
TRICHLOROETHYLENE	1.6	7.1E-07	1.8E-01

See http://www.mass.gov/eea/docs/dep/cleanup/laws/tcestat.pdf

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Table 13
Calculation of Risk Estimates for Resident - Inhalation of Vapors - Condo Unit B1 1st Floor Residential Room

Resident - Indoor Air: Table RA-1
Exposure Point Concentration (EPC)
Based on Resident Ages 1-31 (Cancer) and 1-8 (Noncancer)

ShortForm Version 10-12
Vlookup Versionv0315

ELCR (all chemicals) = 1.83E-06
HI (all chemicals) = 3.78E-01

****Do not insert or delete any rows****
Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC ($\mu g/m^3$)	$ELCR_{air}$	HQ_{air}	
DICHLOROETHYLENE, 1,1-	*0.14*		7.0E-04	
DICHLOROETHYLENE, CIS-1,2-	*0.14*		2.3E-02	
DICHLOROETHYLENE, TRANS-1,2-	0.15		2.5E-03	
TETRACHLOROETHYLENE	0.27	3.5E-07	6.8E-03	
TRICHLOROETHYLENE	0.69	1.5E-06	3.5E-01	**See http://www.mass.gov/eea/docs/dep/cleanup/laws/tcestat.pdf**

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Table 13 (cont'd.)
Calculation of Risk Estimates for Resident - Inhalation of Vapors - Condo Unit B1 1st Floor Office

Resident - Indoor Air: Table RA-1
Exposure Point Concentration (EPC)
Based on Resident Ages 1-31 (Cancer) and 1-8 (Noncancer)

ShortForm Version 10-12
Vlookup Versionv0315

ELCR (all chemicals) = 5.03E-06
HI (all chemicals) = 1.10E+00

****Do not insert or delete any rows****
Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC ($\mu g/m^3$)	$ELCR_{air}$	HQ_{air}
DICHLOROETHYLENE, 1,1-	0.16		8.0E-04
DICHLOROETHYLENE, CIS-1,2-	*0.14*		2.3E-02
DICHLOROETHYLENE, TRANS-1,2-	0.25		4.2E-03
TETRACHLOROETHYLENE	0.36	4.6E-07	9.0E-03
TRICHLOROETHYLENE	2.13	4.6E-06	1.1E+00

See http://www.mass.gov/eea/docs/dep/cleanup/laws/tcestat.pdf

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Table 13 (cont'd.)
Calculation of Risk Estimates for Resident - Inhalation of Vapors - Condo Unit C 1st Floor

Resident - Indoor Air: Table RA-1
Exposure Point Concentration (EPC)
Based on Resident Ages 1-31 (Cancer) and 1-8 (Noncancer)

ShortForm Version 10-12
Vlookup Versionv0315

ELCR (all chemicals) = 3.90E-06
HI (all chemicals) = 8.40E-01

****Do not insert or delete any rows****
Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC ($\mu g/m^3$)	$ELCR_{air}$	HQ_{air}	
DICHLOROETHYLENE, 1,1-	0.16		8.0E-04	
DICHLOROETHYLENE, CIS-1,2-	*0.16*		2.7E-02	
DICHLOROETHYLENE, TRANS-1,2-	0.2		3.3E-03	
TETRACHLOROETHYLENE	0.37	4.8E-07	9.3E-03	
TRICHLOROETHYLENE	1.6	3.4E-06	8.0E-01	**See http://www.mass.gov/eea/docs/dep/cleanup/laws/tcestat.pdf**

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TABLE 14
SUMMARY OF HAZARD INDICES AND RISK ESTIMATES
298 Federal Street
Greenfield, Massachusetts
MassDEP RTN 1-18869

RECEPTOR Media Site Area (Soil depth feet bgs)	Exposure Pathway	Hazard Index (HI) Subchronic	 Chronic	Excess Lifetime Cancer Risk (ELCR)
CURRENT/FUTURE CONDITIONS				
CONSTRUCTION WORKER	Incidental Ingestion, Dermal Contact, and			
Soil	Inhalation of Airborne Particulates			
CVOCs and Metals Central Manufacturing (0 to 2)		0.3	--	1E-07
CVOCs and Metals Southeastern (0 to 2)		**1.6**	--	2E-07
Metals Below Former Cyclone Area (0 to 0.5)		0.5	--	7E-08
CVOCs and Metals Western Grid after Excavation (2-3)		0.09	--	3E-09
CVOCs and Metals Southern Grid after Excavation (2-4)		**1.4**	--	5E-09
CVOCs and VPH/EPH (5 to 12.5 feet)		0.15	--	3E-08
INDOOR WORKER				
Indoor Air	Inhalation of Vapors			
Condo Unit B1 First Floor Offices		--	0.3	1E-06
Condo Unit B1 Basement		--	0.4	2E-06
Condo Unit C First Floor		--	0.2	8E-07
RESIDENTIAL PATIENT				
Indoor Air	Inhalation of Vapors			
Condo Unit B1 First Floor Residental Rooms		--	0.4	2E-06
Condo Unit C First Floor		--	0.8	4E-06
FUTURE CONDITIONS				
RESIDENTS				
Soil	Incidental Ingestion and Dermal Contact			
CVOCs and Metals Central Manufacturing (0 to 2)		**1.3**	0.5	4E-06
CVOCs and Metals Southeastern (0 to 2)		**7.2**	**2.8**	9E-06
Metals Below Former Cyclone Area (0 to 0.5)		**1.7**	0.7	3E-06
CVOCs and Metals Western Grid after Excavation (2-3)		0.4	0.2	1E-07
CVOCs and Metals Southern Grid after Excavation (2-4)		**6.7**	**2.5**	2E-07
CVOCs and VPH/EPH (5 to 12.5 feet)		0.7	0.4	1E-06
Soil	Ingestion of Homegrown Produce			
CVOCs and Metals Central Manufacturing (0 to 2)		**31**	**45**	**1E-04**
CVOCs and Metals Southeastern (0 to 2)		**138**	**97**	**3E-04**
Metals Former Cyclone Area (0 to 0.5)		**17**	**12**	**9E-05**
CVOCs and Metals Western Grid after Excavation (2-3)		**6.0**	**4.2**	NC
CVOCs and Metals Southern Grid after Excavation (2-4)		**135**	**95**	NC
CVOCs and VPH/EPH (5 to 12.5 feet)		--	--	--
Total Future Residential (maximum ingestion, dermal & produce) =		**145**	**100**	**3E-04**
MassDEP Risk Limits:		1	1	1E-05

Notes:
NC indicates no carcinogens detected.
Bolded values exceed MassDEP risk limits for total hazard index for noncarcinogens and excess lifetime cancer risk for carcinogens.
Therefore, a Condition of No Significant Risk does not exist for these receptors, media, and exposure pathways.

ATTACHMENT A
TOXICITY PROFILES

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

ANTIMONY
CAS # 7440-36-0

This fact sheet answers the most frequently asked health questions (FAQs) about antimony. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

SUMMARY: Exposure to antimony occurs in the workplace or from skin contact with soil at hazardous waste sites. Breathing high levels of antimony for a long time can irritate the eyes and lungs, and can cause problems with the lungs, heart, and stomach. This chemical has been found in at least 403 of 1,416 National Priorities List sites identified by the Environmental Protection Agency.

What is antimony?

(Pronounced ăn′tə-mō′nē)

Antimony is a silvery-white metal that is found in the earth's crust. Antimony ores are mined and then mixed with other metals to form antimony alloys or combined with oxygen to form antimony oxide.

Little antimony is currently mined in the United States. It is brought into this country from other countries for processing. However, there are companies in the United States that produce antimony as a by-product of smelting lead and other metals.

Antimony isn't used alone because it breaks easily, but when mixed into alloys, it is used in lead storage batteries, solder, sheet and pipe metal, bearings, castings, and pewter. Antimony oxide is added to textiles and plastics to prevent them from catching fire. It is also used in paints, ceramics, and fireworks, and as enamels for plastics, metal, and glass.

What happens to antimony when it enters the environment?

- Antimony is released to the environment from natural sources and from industry.
- In the air, antimony is attached to very small particles that may stay in the air for many days.
- Most antimony ends up in soil, where it attaches strongly to particles that contain iron, manganese, or aluminum.
- Antimony is found at low levels in some rivers, lakes, and streams.

How might I be exposed to antimony?

- Because antimony is found naturally in the environment, the general population is exposed to low levels of it every day, primarily in food, drinking water, and air.
- It may be found in air near industries that process or release it, such as smelters, coal-fired plants, and refuse incinerators.
- In polluted areas containing high levels of antimony, it may be found in the air, water, and soil.
- Workers in industries that process it or use antimony ore may be exposed to higher levels.

How can antimony affect my health?

Exposure to antimony at high levels can result in a variety of adverse health effects.

Breathing high levels for a long time can irritate your eyes and lungs and can cause heart and lung problems, stomach pain, diarrhea, vomiting, and stomach ulcers.

In short-term studies, animals that breathed very high levels of antimony died. Animals that breathed high levels

had lung, heart, liver, and kidney damage. In long-term studies, animals that breathed very low levels of antimony had eye irritation, hair loss, lung damage, and heart problems. Problems with fertility were also noted. In animal studies, problems with fertility have been seen when rats breathed very high levels of antimony for a few months.

Ingesting large doses of antimony can cause vomiting. We don't know what other effects may be caused by ingesting it. Long-term animal studies have reported liver damage and blood changes when animals ingested antimony. Antimony can irritate the skin if it is left on it.

Antimony can have beneficial effects when used for medical reasons. It has been used as a medicine to treat people infected with parasites.

How likely is antimony to cause cancer?

The Department of Health and Human Services, the International Agency for Research on Cancer, and the Environmental Protection Agency (EPA) have not classified antimony as to its human carcinogenicity.

Lung cancer has been observed in some studies of rats that breathed high levels of antimony. No human studies are available. We don't know whether antimony will cause cancer in people.

Is there a medical test to show whether I've been exposed to antimony?

Tests are available to measure antimony levels in the body. Antimony can be measured in the urine, feces, and blood for several days after exposure. However, these tests cannot tell you how much antimony you have been exposed to or whether you will experience any health effects. Some tests are not usually performed in most doctors' offices and may require special equipment to conduct them.

Has the federal government made recommendations to protect human health?

The EPA allows 0.006 parts of antimony per million parts of drinking water (0.006 ppm). The EPA requires that discharges or spills into the environment of 5,000 pounds or more of antimony be reported.

The Occupational Safety and Health Administration **(**OSHA**)** has set an occupational exposure limit of 0.5 milligrams of antimony per cubic meter of air (0.5 mg/m^3) for an 8-hour workday, 40-hour workweek.

The American Conference of Governmental Industrial Hygienists (ACGIH) and the National Institute for Occupational Safety and Health (NIOSH) currently recommend the same guidelines for the workplace as OSHA.

Glossary

Carcinogenicity: Ability to cause cancer.
CAS: Chemical Abstracts Service.
Ingestion: Taking food or drink into your body.
Long-term: Lasting one year or more.
Milligram (mg): One thousandth of a gram.
Parasite: An organism living in or on another organism.
ppm: Parts per million.
Short-term: Lasting 14 days or less.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1992. Toxicological profile for antimony. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

Arsenic - ToxFAQs™

CAS # 7440-38-2

This fact sheet answers the most frequently asked health questions (FAQs) about arsenic. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to higher than average levels of arsenic occur mostly in the workplace, near hazardous waste sites, or in areas with high natural levels. At high levels, inorganic arsenic can cause death. Exposure to lower levels for a long time can cause a discoloration of the skin and the appearance of small corns or warts. Arsenic has been found in at least 1,149 of the 1,684 National Priority List (NPL) sites identified by the Environmental Protection Agency (EPA).

What is arsenic?

Arsenic is a naturally occurring element widely distributed in the earth's crust. In the environment, arsenic is combined with oxygen, chlorine, and sulfur to form inorganic arsenic compounds. Arsenic in animals and plants combines with carbon and hydrogen to form organic arsenic compounds.

Inorganic arsenic compounds are mainly used to preserve wood. Copper chromated arsenate (CCA) is used to make "pressure-treated" lumber. CCA is no longer used in the U.S. for residential uses; it is still used in industrial applications. Organic arsenic compounds are used as pesticides, primarily on cotton fields and orchards.

What happens to arsenic when it enters the environment?

- Arsenic occurs naturally in soil and minerals and may enter the air, water, and land from wind-blown dust and may get into water from runoff and leaching.
- Arsenic cannot be destroyed in the environment. It can only change its form.
- Rain and snow remove arsenic dust particles from the air.
- Many common arsenic compounds can dissolve in water. Most of the arsenic in water will ultimately end up in soil or sediment.
- Fish and shellfish can accumulate arsenic; most of this arsenic is in an organic form called arsenobetaine that is much less harmful.

How might I be exposed to arsenic?

- Ingesting small amounts present in your food and water or breathing air containing arsenic.
- Breathing sawdust or burning smoke from wood treated with arsenic.
- Living in areas with unusually high natural levels of arsenic in rock.
- Working in a job that involves arsenic production or use, such as copper or lead smelting, wood treating, or pesticide application.

How can arsenic affect my health?

Breathing high levels of inorganic arsenic can give you a sore throat or irritated lungs.

Ingesting very high levels of arsenic can result in death. Exposure to lower levels can cause nausea and vomiting, decreased production of red and white blood cells, abnormal heart rhythm, damage to blood vessels, and a sensation of "pins and needles" in hands and feet.

Ingesting or breathing low levels of inorganic arsenic for a long time can cause a darkening of the skin and the appearance of small "corns" or "warts" on the palms, soles, and torso.

Skin contact with inorganic arsenic may cause redness and swelling.

Almost nothing is known regarding health effects of organic arsenic compounds in humans. Studies in animals show that some simple organic arsenic

Arsenic

CAS # 7440-38-2

compounds are less toxic than inorganic forms. Ingestion of methyl and dimethyl compounds can cause diarrhea and damage to the kidneys.

How likely is arsenic to cause cancer?

Several studies have shown that ingestion of inorganic arsenic can increase the risk of skin cancer and cancer in the liver, bladder, and lungs. Inhalation of inorganic arsenic can cause increased risk of lung cancer. The Department of Health and Human Services (DHHS) and the EPA have determined that inorganic arsenic is a known human carcinogen. The International Agency for Research on Cancer (IARC) has determined that inorganic arsenic is carcinogenic to humans.

How can arsenic affect children?

There is some evidence that long-term exposure to arsenic in children may result in lower IQ scores. There is also some evidence that exposure to arsenic in the womb and early childhood may increase mortality in young adults.

There is some evidence that inhaled or ingested arsenic can injure pregnant women or their unborn babies, although the studies are not definitive. Studies in animals show that large doses of arsenic that cause illness in pregnant females, can also cause low birth weight, fetal malformations, and even fetal death. Arsenic can cross the placenta and has been found in fetal tissues. Arsenic is found at low levels in breast milk.

How can families reduce the risks of exposure to arsenic?

- If you use arsenic-treated wood in home projects, you should wear dust masks, gloves, and protective clothing to decrease exposure to sawdust.
- If you live in an area with high levels of arsenic in water or soil, you should use cleaner sources of water and limit contact with soil.
- If you work in a job that may expose you to arsenic, be aware that you may carry arsenic home on your clothing, skin, hair, or tools. Be sure to shower and change clothes before going home.

Is there a medical test to determine whether I've been exposed to arsenic?

There are tests available to measure arsenic in your blood, urine, hair, and fingernails. The urine test is the most reliable test for arsenic exposure within the last few days. Tests on hair and fingernails can measure exposure to high levels of arsenic over the past 6-12 months. These tests can determine if you have been exposed to above-average levels of arsenic. They cannot predict whether the arsenic levels in your body will affect your health.

Has the federal government made recommendations to protect human health?

The EPA has set limits on the amount of arsenic that industrial sources can release to the environment and has restricted or cancelled many of the uses of arsenic in pesticides. EPA has set a limit of 0.01 parts per million (ppm) for arsenic in drinking water.

The Occupational Safety and Health Administration (OSHA) has set a permissible exposure limit (PEL) of 10 micrograms of arsenic per cubic meter of workplace air (10 $\mu g/m^3$) for 8 hour shifts and 40 hour work weeks.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological Profile for Arsenic (Update). Atlanta, GA: U.S. Department of Health and Human Services. Public Health Service.

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636

ToxFAQs™ Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

Cadmium- ToxFAQs™

CAS # 7440-43-9

This fact sheet answers the most frequently asked health questions (FAQs) about cadmium. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to cadmium happens mostly in the workplace where cadmium products are made. The general population is exposed from breathing cigarette smoke or eating cadmium contaminated foods. Cadmium damages the kidneys, lungs, and bones. Cadmium has been found in at least 1,014 of the 1,669 National Priorities List (NPL) sites identified by the Environmental Protection Agency (EPA).

What is cadmium?

Cadmium is a natural element in the earth's crust. It is usually found as a mineral combined with other elements such as oxygen (cadmium oxide), chlorine (cadmium chloride), or sulfur (cadmium sulfate, cadmium sulfide).

All soils and rocks, including coal and mineral fertilizers, contain some cadmium. Most cadmium used in the United States is extracted during the production of other metals like zinc, lead, and copper. Cadmium does not corrode easily and has many uses, including batteries, pigments, metal coatings, and plastics.

What happens to cadmium when it enters the environment?

- Cadmium enters soil, water, and air from mining, industry, and burning coal and household wastes.
- Cadmium does not break down in the environment, but can change forms.
- Cadmium particles in air can travel long distances before falling to the ground or water.
- Some forms of cadmium dissolve in water.
- Cadmium binds strongly to soil particles.
- Fish, plants, and animals take up cadmium from the environment.

How might I be exposed to cadmium?

- Eating foods containing cadmium; low levels are found in all foods (highest levels are found in leafy vegetables, grains, legumes, and kidney meat).
- Smoking cigarettes or breathing cigarette smoke.
- Breathing contaminated workplace air.
- Drinking contaminated water.
- Living near industrial facilities which release cadmium into the air.

How can cadmium affect my health?

Breathing high levels of cadmium can severely damage the lungs. Eating food or drinking water with very high levels severely irritates the stomach, leading to vomiting and diarrhea.

Long-term exposure to lower levels of cadmium in air, food, or water leads to a buildup of cadmium in the kidneys and possible kidney disease. Other long-term effects are lung damage and fragile bones.

How likely is cadmium to cause cancer?

The Department of Health and Human Services (DHHS) and the International Agency for Research on Cancer (IARC) have determined that cadmium and cadmium compounds are human carcinogens. The EPA determined that cadmium is a probable human carcinogen (group B1).

Cadmium

CAS # 7440-43-9

How can cadmium affect children?

The health effects in children are expected to be similar to the effects seen in adults (kidney and lung damage depending on the route of exposure).

A few studies in animals indicate that younger animals absorb more cadmium than adults. Animal studies also indicate that the young are more susceptible than adults to a loss of bone and decreased bone strength from exposure to cadmium.

We don't know if cadmium causes birth defects in people. Studies in animals exposed to high levels of cadmium during pregnancy have resulted in harmful effects to the young. Young animals exposed to cadmium before birth have shown effects on behavior and learning. There is also some information from animal studies that high enough exposures to cadmium before birth can reduce body weights and affect the skeleton in the developing young.

How can families reduce the risk of exposure to cadmium?

- Do not allow children to play with batteries. Dispose of nickel-cadmium batteries properly.
- Cadmium is a component of tobacco smoke. Avoid smoking and smoking in enclosed spaces like inside the home or car in order to limit exposure to children and other family members.
- If you work with cadmium, use all safety precautions to avoid carrying cadmium-containing dust home from work on your clothing, skin, hair, or tools.
- A balanced diet can reduce the amount of cadmium taken into the body from food and drink.

Is there a medical test to determine whether I've been exposed to cadmium?

Cadmium can be measured in blood, urine, hair, or nails. Urinary cadmium has been shown to accurately reflect the amount of cadmium in the body.

The amount of cadmium in your blood shows your recent exposure to cadmium. The amount of cadmium in your urine shows both your recent and your past exposure.

Has the federal government made recommendations to protect human health?

The EPA has determined that exposure to cadmium in drinking water at concentrations of 0.04 milligrams per liter (0.04 mg/L) for up to 10 days is not expected to cause any adverse effects in a child.

The EPA has determined that lifetime exposure to 0.005 mg/L cadmium is not expected to cause any adverse effects.

The Food and Drug Administration (FDA) has determined that the cadmium concentration in bottled drinking water should not exceed 0.005 mg/L.

The Occupational Health and Safety Administration (OSHA) has limited workers' exposure to an average of 5 $\mu g/m^3$ for an 8-hour workday, 40-hour workweek.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2012. Toxicological Profile for Cadmium. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30333.

Phone: 1-800-232-4636

ToxFAQs™ Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

1,2-DICHLOROETHENE
CAS # 540-59-0, 156-59-2, and 156-60-5

This fact sheet answers the most frequently asked health questions (FAQs) about 1,2-dichloroethene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to 1,2-dichloroethene occurs mainly in workplaces where it is made or used. Breathing high levels of 1,2-dichloroethene can make you feel nauseous, drowsy, and tired. *cis*-1,2-Dichloroethene has been found in at least 146 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA). *trans*-1,2-Dichloroethene was found in at least 563 NPL sites. 1,2-Dichloroethene was found at 336 sites, but the isomer (*cis*- or *trans*-) was not specified.

What is 1,2-dichloroethene?

(Pronounced 1,2-dī-klôrʹ ō-ĕthʹēn)

1,2-Dichloroethene, also called 1,2-dichloroethylene, is a highly flammable, colorless liquid with a sharp, harsh odor. It is used to produce solvents and in chemical mixtures. You can smell very small amounts of 1,2-dichloroethene in air (about 17 parts of 1,2-dichloroethene per million parts of air [17 ppm]).

There are two forms of 1,2-dichloroethene; one is called *cis*-1,2-dichloroethene and the other is called *trans*-1,2-dichloroethene. Sometimes both forms are present as a mixture.

What happens to 1,2-dichloroethene when it enters the environment?

- 1,2-Dichloroethene evaporates rapidly into air.
- In the air, it takes about 5-12 days for half of it to break down.
- Most 1,2-dichloroethene in the soil surface or bodies of water will evaporate into air.
- 1,2-Dichloroethene can travel through soil or dissolve in water in the soil. It is possible that it can contaminate groundwater.
- In groundwater, it takes about 13-48 weeks to break down.
- There is a slight chance that 1,2-dichloroethene will break down into vinyl chloride, a different chemical which is believed to be more toxic than 1,2-dichloroethene.

How might I be exposed to 1,2-dichloroethene?

- Breathing 1,2-dichloroethene that has leaked from hazardous waste sites and landfills.
- Drinking contaminated tap water or breathing vapors from contaminated water while cooking, bathing, or washing dishes.
- Breathing 1,2-dichloroethene, touching it, or touching contaminated materials in the workplace.

How can 1,2-dichloroethene affect my health?

Breathing high levels of 1,2-dichloroethene can make you feel nauseous, drowsy, and tired; breathing very high levels can kill you.

When animals breathed high levels of *trans*-1,2-dichloroethene for short or longer periods of time, their livers and lungs were damaged and the effects were more severe with longer exposure times. Animals that breathed very high

levels of *trans*-1,2-dichloroethene had damaged hearts.

Animals that ingested extremely high doses of *cis*- or *trans*-1,2-dichloroethene died.

Lower doses of *cis*-1,2-dichloroethene caused effects on the blood, such as decreased numbers of red blood cells, and also effects on the liver.

The long-term (365 days or longer) human health effects after exposure to low concentrations of 1,2-dichloroethene aren't known. One animal study suggested that an exposed fetus may not grow as quickly as one that hasn't been exposed.

Exposure to 1,2-dichloroethene hasn't been shown to affect fertility in people or animals.

How likely is 1,2-dichloroethene to cause cancer?

The EPA has determined that *cis*-1,2-dichloroethene is not classifiable as to its human carcinogenicity.

No EPA cancer classification is available for *trans*-1,2-dichloroethene.

Is there a medical test to show whether I've been exposed to 1,2-dichloroethene?

Tests are available to measure concentrations of the breakdown products of 1,2-dichloroethene in blood, urine, and tissues. However, these tests aren't used routinely to determine whether a person has been exposed to this compound. This is because after you are exposed to 1,2-dichloroethene, the breakdown products in your body that are detected with these tests may be the same as those that come from exposure to other chemicals. These tests aren't available in most doctors' offices, but can be done at special laboratories that have the right equipment.

Has the federal government made recommendations to protect human health?

The EPA has set the maximum allowable level of *cis*-1,2-dichloroethene in drinking water at 0.07 milligrams per liter of water (0.07 mg/L) and *trans*-1,2-dichloroethene at 0.1 mg/L.

The EPA requires that any spills or accidental release of 1,000 pounds or more of 1,2-dichloroethene must be reported to the EPA.

The Occupational Health Safety and Health Administration (OSHA) has set the maximum allowable amount of 1,2-dichloroethene in workroom air during an 8-hour workday in a 40-hour workweek at 200 parts of 1,2-dichloroethene per million parts of air (200 ppm).

Glossary

Carcinogenicity: Ability of a substance to cause cancer.

CAS: Chemical Abstracts Service.

Fertility: Ability to reproduce.

Ingest: To eat or drink something.

Milligram (mg): One thousandth of a gram.

ppm: Parts per million.

Solvent: A chemical that can dissolve other substances.

References

This ToxFAQs information is taken from the 1996 Toxicological Profile for 1,2-Dichloroethene produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

Lead – ToxFAQs™

CAS # 7439-92-1

This fact sheet answers the most frequently asked health questions (FAQs) about lead. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to lead can happen from breathing workplace air or dust, eating contaminated foods, or drinking contaminated water. Children can be exposed from eating lead-based paint chips or playing in contaminated soil. Lead can damage the nervous system, kidneys, and reproductive system. Lead has been found in at least 1,272 of the 1,684 National Priority List (NPL) sites identified by the Environmental Protection Agency (EPA).

What is lead?

Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust. Lead can be found in all parts of our environment. Much of it comes from human activities including burning fossil fuels, mining, and manufacturing.

Lead has many different uses. It is used in the production of batteries, ammunition, metal products (solder and pipes), and devices to shield X-rays. Because of health concerns, lead from paints and ceramic products, caulking, and pipe solder has been dramatically reduced in recent years. The use of lead as an additive to gasoline was banned in 1996 in the United States.

What happens to lead when it enters the environment?

- Lead itself does not break down, but lead compounds are changed by sunlight, air, and water.
- When lead is released to the air, it may travel long distances before settling to the ground.
- Once lead falls onto soil, it usually sticks to soil particles.
- Movement of lead from soil into groundwater will depend on the type of lead compound and the characteristics of the soil.

How might I be exposed to lead?

- Eating food or drinking water that contains lead. Water pipes in some older homes may contain lead solder. Lead can leach out into the water.
- Spending time in areas where lead-based paints have been used and are deteriorating. Deteriorating lead paint can contribute to lead dust.
- Working in a job where lead is used or engaging in certain hobbies in which lead is used, such as making stained glass.
- Using health-care products or folk remedies that contain lead.

How can lead affect my health?

The effects of lead are the same whether it enters the body through breathing or swallowing. Lead can affect almost every organ and system in your body. The main target for lead toxicity is the nervous system, both in adults and children. Long-term exposure of adults can result in decreased performance in some tests that measure functions of the nervous system. It may also cause weakness in fingers, wrists, or ankles. Lead exposure also causes small increases in blood pressure, particularly in middle-aged and older people and can cause anemia. Exposure to high lead levels can severely damage the brain and kidneys in adults or children and ultimately cause death. In pregnant women, high-levels of exposure to lead may cause miscarriage. High-level exposure in men can damage the organs responsible for sperm production.

How likely is lead to cause cancer?

We have no conclusive proof that lead causes cancer in humans. Kidney tumors have developed in rats and mice that had been given large doses of some kind of lead compounds. The Department of Health and Human Services (DHHS) has determined that lead and lead compounds are reasonably anticipated to be human carcinogens and the EPA has determined that lead is a probable human carcinogen. The International Agency for Research on Cancer (IARC) has determined that inorganic lead is probably carcinogenic to humans and that there is insufficient information to determine whether organic lead compounds will cause cancer in humans.

Lead

CAS # 7439-92-1

How can lead affect children?

Small children can be exposed by eating lead-based paint chips, chewing on objects painted with lead-based paint, or swallowing house dust or soil that contains lead.

Children are more vulnerable to lead poisoning than adults. A child who swallows large amounts of lead may develop blood anemia, severe stomachache, muscle weakness, and brain damage. If a child swallows smaller amounts of lead, much less severe effects on blood and brain function may occur. Even at much lower levels of exposure, lead can affect a child's mental and physical growth.

Exposure to lead is more dangerous for young and unborn children. Unborn children can be exposed to lead through their mothers. Harmful effects include premature births, smaller babies, decreased mental ability in the infant, learning difficulties, and reduced growth in young children. These effects are more common if the mother or baby was exposed to high levels of lead. Some of these effects may persist beyond childhood.

How can families reduce the risks of exposure to lead?

- Avoid exposure to sources of lead.
- Do not allow children to chew or mouth surfaces that may have been painted with lead-based paint.
- If you have a water lead problem, run or flush water that has been standing overnight before drinking or cooking with it.
- Some types of paints and pigments that are used as make-up or hair coloring contain lead. Keep these kinds of products away from children.
- If your home contains lead-based paint or you live in an area contaminated with lead, wash children's hands and faces often to remove lead dusts and soil, and regularly clean the house of dust and tracked in soil.

Is there a medical test to determine whether I've been exposed to lead?

A blood test is available to measure the amount of lead in your blood and to estimate the amount of your recent exposure to lead. Blood tests are commonly used to screen children for lead poisoning. Lead in teeth or bones can be measured by X-ray techniques, but these methods are not widely available. Exposure to lead also can be evaluated by measuring erythrocyte protoporphyrin (EP) in blood samples. EP is a part of red blood cells known to increase when the amount of lead in the blood is high. However, the EP level is not sensitive enough to identify children with elevated blood lead levels below about 25 micrograms per deciliter (µg/dL). These tests usually require special analytical equipment that is not available in a doctor's office. However, your doctor can draw blood samples and send them to appropriate laboratories for analysis.

Has the federal government made recommendations to protect human health?

The Centers for Disease Control and Prevention (CDC) recommends that states test children at ages 1 and 2 years. Children should be tested at ages 3–6 years if they have never been tested for lead, if they receive services from public assistance programs for the poor such as Medicaid or the Supplemental Food Program for Women, Infants, and Children, if they live in a building or frequently visit a house built before 1950; if they visit a home (house or apartment) built before 1978 that has been recently remodeled; and/or if they have a brother, sister, or playmate who has had lead poisoning. CDC has updated its recommendations on children's blood lead levels. Experts now use an upper reference level value of 97.5% of the population distribution for children's blood lead. In 2012-2015, the value to identify children with blood lead levels that are much higher than most children have, is 5 micrograms per deciliter (µg/dL). EPA limits lead in drinking water to 15 µg per liter.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological Profile for lead (Update). Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service.

Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30333.

Phone: 1-800-232-4636.

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NICKEL

CAS # 7440-02-0

Division of Toxicology ToxFAQs™ **August 2005**

This fact sheet answers the most frequently asked health questions (FAQs) about nickel. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Nickel is a naturally occurring element. Pure nickel is a hard, silvery-white metal used to make stainless steel and other metal alloys. Skin effects are the most common effects in people who are sensitive to nickel. Workers who breathed very large amounts of nickel compounds developed chronic bronchitis and lung and nasal sinus cancers. Nickel has been found in at least 882 of the 1,662 National Priority List sites identified by the Environmental Protection Agency (EPA).

What is nickel?

Nickel is a very abundant natural element. Pure nickel is a hard, silvery-white metal. Nickel can be combined with other metals, such as iron, copper, chromium, and zinc, to form alloys. These alloys are used to make coins, jewelry, and items such as valves and heat exchangers. Most nickel is used to make stainless steel.

Nickel can combine with other elements such as chlorine, sulfur, and oxygen to form nickel compounds. Many nickel compounds dissolve fairly easy in water and have a green color. Nickel compounds are used for nickel plating, to color ceramics, to make some batteries, and as substances known as catalysts that increase the rate of chemical reactions. Nickel is found in all soil and is emitted from volcanoes. Nickel is also found in meteorites and on the ocean floor. Nickel and its compounds have no characteristic odor or taste.

What happens to nickel when it enters the environment?

❏ Nickel is released into the atmosphere by industries that make or use nickel, nickel alloys, or nickel compounds. It is also released into the atmosphere by oil-burning power plants, coal-burning power plants, and trash incinerators.

❏ In the air, it attaches to small particles of dust that settle to the ground or are taken out of the air in rain or snow; this usually takes many days.

❏ Nickel released in industrial waste water ends up in soil or sediment where it strongly attaches to particles containing iron or manganese.

❏ Nickel does not appear to accumulate in fish or in other animals used as food.

How might I be exposed to nickel?

❏ By eating food containing nickel, which is the major source of exposure for most people.

❏ By skin contact with soil, bath or shower water, or metals containing nickel, as well as by handling coins or touching jewelry containing nickel.

❏ By drinking water that contains small amounts of nickel.

❏ By breathing air or smoking tobacco containing nickel.

❏ Higher exposure may occur if you work in industries that process or use nickel.

How can nickel affect my health?

The most common harmful health effect of nickel in humans is an allergic reaction. Approximately 10-20% of the population is sensitive to nickel. People can become sensitive to nickel when jewelry or other things containing it are in direct contact with the skin for a long time. Once a person is sensitized to nickel, further contact with the metal may produce a reaction. The most common reaction is a skin rash at the site of contact. The skin rash may also

occur at a site away from the site of contact. Less frequently, some people who are sensitive to nickel have asthma attacks following exposure to nickel. Some sensitized people react when they consume food or water containing nickel or breathe dust containing it.

People working in nickel refineries or nickel-processing plants have experienced chronic bronchitis and reduced lung function. These persons breathed amounts of nickel much higher than levels found normally in the environment.

Workers who drank water containing high amounts of nickel had stomach ache and suffered adverse effects to their blood and kidneys.

Damage to the lung and nasal cavity has been observed in rats and mice breathing nickel compounds. Eating or drinking large amounts of nickel has caused lung disease in dogs and rats and has affected the stomach, blood, liver, kidneys, and immune system in rats and mice, as well as their reproduction and development.

How likely is nickel to cause cancer?

Cancers of the lung and nasal sinus have resulted when workers breathed dust containing high levels of nickel compounds while working in nickel refineries or nickel processing plants. The Department of Health and Human Services (DHHS) has determined that nickel metal may reasonably be anticipated to be a carcinogen and that nickel compounds are known human carcinogens. The International Agency for Research on Cancer (IARC) has determined that some nickel compounds are carcinogenic to humans and that metallic nickel may possibly be carcinogenic to humans. The EPA has determined that nickel refinery dust and nickel subsulfide are human carcinogens.

How can nickel affect children?

It is likely that the health effects seen in children exposed to nickel will be similar to those seen in adults. We do not know whether children differ from adults in their susceptibility to nickel. Human studies that examined whether nickel can harm the fetus are inconclusive. Animal studies have found increases in newborn deaths and decreased newborn weight after ingesting very high amounts of nickel. Nickel can be transferred from the mother to an infant in breast milk and can cross the placenta.

How can families reduce the risks of exposure to nickel?

❑ Avoiding jewelry containing nickel will eliminate risks of exposure to this source of the metal.

❑ Exposures of the general population from other sources, such as foods and drinking water, are almost always too low to be of concern.

Is there a medical test to determine whether I've been exposed to nickel?

There are tests available to measure nickel in your blood, feces, and urine. More nickel was measured in the urine of workers who were exposed to nickel compounds that dissolve easily in water than in the urine of workers exposed to nickel compounds that are hard to dissolve. This means that it is easier to tell if you have been exposed to soluble nickel compounds than less-soluble compounds. The nickel measurements do not accurately predict potential health effects from exposure to nickel.

Has the federal government made recommendations to protect human health?

The EPA recommends that drinking water should contain no more than 0.1 milligrams of nickel per liter of water (0.1 mg/L). To protect workers, the Occupational Safety and Health Administration (OSHA) has set a limit of 1 mg of nickel per cubic meter of air (1 mg/m^3) for metallic nickel and nickel compounds in workplace air during an 8-hour workday, 40-hour workweek.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2005. Toxicological Profile for Nickel (Update). Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

SILVER
CAS # 7440-22-4

This fact sheet answers the most frequently asked health questions (FAQs) about silver. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Silver is an element found naturally in the environment. At very high levels, it may cause argyria, a blue-gray discoloration of the skin and other organs. This chemical has been found in at least 27 of the 1,177 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is silver?

(Pronounced sĭl′vər)

Silver is a naturally occurring element. It is found in the environment combined with other elements such as sulfide, chloride, and nitrate. Pure silver is "silver" colored, but silver nitrate and silver chloride are powdery white and silver sulfide and silver oxide are dark-gray to black. Silver is often found as a by-product during the retrieval of copper, lead, zinc, and gold ores.

Silver is used to make jewelry, silverware, electronic equipment, and dental fillings. It is also used to make photographs, in brazing alloys and solders, to disinfect drinking water and water in swimming pools, and as an antibacterial agent. Silver has also been used in lozenges and chewing gum to help people stop smoking.

What happens to silver when is enters the environment?

- Silver may be released into the air and water through natural processes such as the weathering of rocks.
- Human activities such as the processing of ores, cement manufacture, and the burning of fossil fuel may release silver into the air.
- It may be released into water from photographic processing.
- Rain may wash silver out of soil into the groundwater.
- Silver does not appear to concentrate to a significant extent in aquatic animals.

How might I be exposed to silver?

- Breathing low levels in air.
- Swallowing it in food or drinking water.
- Carrying out activities such as jewelry-making, soldering, and photography.
- Using anti-smoking lozenges or other medicines containing it.

How can silver affect my health?

Exposure to high levels of silver for a long period of time may result in a condition called arygria, a blue-gray discoloration of the skin and other body tissues. Lower-level exposures to silver may also cause silver to be deposited in the skin and other parts of the body; however, this is not known to be harmful. Argyria is a permanent effect, but it appears to be a cosmetic problem that may not be otherwise harmful to health.

Exposure to high levels of silver in the air has resulted in breathing problems, lung and throat irritation, and stomach pains. Skin contact with silver can cause mild allergic reactions such as rash, swelling, and inflammation in some people.

Animal studies have shown that swallowing silver results in the deposit of silver in the skin. One study in mice found that the animals exposed to silver in drinking water were less active than unexposed animals.

No studies are available on whether silver affects reproduction or causes developmental problems in people.

How likely is silver to cause cancer?

No studies are available on whether silver may cause cancer in people. The only available animal studies showed both positive and negative results when silver was implanted under the skin.

The EPA has determined that silver is not classifiable as to human carcinogenicity.

Is there a medical test to show whether I've been exposed to silver?

Silver can be measured in the blood, urine, feces, and body tissues of exposed people. Silver builds up in the body, and the best way to learn if past exposure has occurred is to look for silver in samples of skin. Tests for silver are not commonly done at a doctor's office because they require special equipment. Although doctors can find out if a person has been exposed to silver by doing these tests, they cannot tell whether any health effects will occur.

Has the federal government made recommendations to protect human health?

The EPA recommends that the concentration of silver in drinking water not exceed 0.10 milligrams per liter of water (0.10 mg/L) because of the skin discoloration that may occur.

The EPA requires that spills or accidental releases of 1,000 pounds or more of silver be reported to the EPA.

The Occupational Safety and Health Administration (OSHA) limits silver in workplace air to 0.01 milligrams per cubic meter (0.01 mg/m^3) for an 8-hour workday, 40-hour workweek. The National Institute of Occupational Safety and Health (NIOSH) also recommends that workplace air contain no more that 0.01 mg/m^3 silver.

The American Conference of Governmental Industrial Hygienists (ACGIH) recommends that workplace air contain no more than 0.1 mg/m^3 silver metal and 0.01 mg/m^3 soluble silver compounds.

The federal recommendations have been updated as of July 1999.

Glossary

Carcinogenicity: Ability to cause cancer.

CAS: Chemcial Abstracts Service.

Milligram (mg): One thousandth of a gram.

National Priorities List: A list of the nation's worst hazardous waste sites.

Soluble: Capable of being dissolved in water.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1990. Toxicological profile for silver. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone:1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

Tetrachloroethylene - ToxFAQs™

CAS # 127-18-4

This fact sheet answers the most frequently asked health questions (FAQs) about tetrachloroethylene. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Tetrachloroethylene is a manufactured chemical used for dry cleaning and metal degreasing. Exposure to very high concentrations of tetrachloroethylene can cause dizziness headaches, sleepiness, incoordination confusion, nausea, unconsciousness, and even death. Tetrachloroethylene has been found in at least 945 of the 1,699 National Priorities List sites identified by U.S. Environmental Protection Agency (EPA).

What is tetrachloroethylene?

Tetrachloroethylene is a nonflammable colorless liquid. Other names for tetrachloroethylene include perchloroethylene, PCE, perc, tetrachloroethene, and perchlor. Most people can smell tetrachloroethylene when it is present in the air at a level of 1 part in 1 million parts of air (1 ppm) or more.

Tetrachloroethylene is used as a dry cleaning agent and metal degreasing solvent. It is also used as a starting material (building block) for making other chemicals and is used in some consumer products.

What happens to tetrachloroethylene when it enters the environment?

- Tetrachloroethylene can be released into air, water, and soil at places where it is produced or used.
- Tetrachloroethylene breaks down very slowly in the air and so it can be transported long distances in the air. Half of the amount in the air will degrade in approximately 100 days.
- Tetrachloroethylene evaporates quickly from water into air. It is generally slow to break down in water.
- Tetrachloroethylene may evaporate quickly from shallow soils or may filter through the soil and into the groundwater below. It is generally slow to break down in soil.

How might I be exposed to tetrachloroethylene?

- When you bring clothes from the dry cleaners, they will release small amounts of tetrachloroethylene into the air.
- When you drink water containing tetrachloroethylene, you are exposed to it. You might also be exposed to tetrachloroethylene that is released into the air during showering and bathing.
- People residing near contaminated sites or dry cleaning locations may be exposed to higher levels than the general population.
- People working in the dry cleaning industries or using metal degreasing products may be exposed to elevated levels of tetrachloroethylene.

How can tetrachloroethylene affect my health?

Breathing high levels of tetrachloroethylene for a brief period may cause dizziness or drowsiness, headache, and incoordination; higher levels may cause unconsciousness and even death.

Exposure for longer periods to low levels of tetrachloroethylene may cause changes in mood, memory, attention, reaction time, and vision.

Studies in animals exposed to tetrachloroethylene have shown liver and kidney effects, and changes in brain chemistry, but we do not know what these findings mean for humans.

How likely is tetrachloroethylene to cause cancer?

Studies in humans suggest that exposure to tetrachloroethylene might lead to a higher risk of getting bladder cancer, multiple myeloma, or non-Hodgkin's lymphoma, but the evidence is not very strong.

Agency for Toxic Substances and Disease Registry
Division of Toxicology and Human Health Sciences

ATSDR

CS265956-A

Tetrachloroethylene

CAS # 127-18-4

In animals, tetrachloroethylene has been shown to cause cancers of the liver, kidney, and blood system.

EPA considers tetrachloroethylene likely to be carcinogenic to humans by all routes of exposure. The International Agency for Research on Cancer (IARC) considers tetrachloroethylene probably carcinogenic to humans. The Department of Health and Human Services (DHHS) considers tetrachloroethylene to be reasonable anticipated to be a human carcinogen.

How can tetrachloroethylene affect children?

It is not known whether children are more susceptible than adults to the effects of tetrachloroethylene.

A few studies in humans have suggested that exposure to tetrachloroethylene increased the numbers of babies with birth defects, but these studies were not large enough to clearly answer the question. Studies in animals exposed by inhalation or stomach tube have not shown clear evidence of specific birth defects.

How can families reduce the risks of exposure to tetrachloroethylene?

- Tetrachloroethylene has been found in low levels in some food. You can minimize the risk of your family's exposure by peeling and thoroughly washing fruits and vegetables before cooking.
- Use bottled water if you have concerns about the presence of tetrachloroethylene in your tap water. You may also contact local drinking water authorities and follow their advice.
- Prevent children from playing in dirt or eating dirt if you live near a waste site that has tetrachloroethylene.
- Tetrachloroethylene is widely used as a scouring solvent that removes oils from fabrics, as a carrier solvent, as a fabric finish or water repellant, and as a metal degreaser/cleaner. Follow instructions on product labels to minimize exposure to tetrachloroethylene.

Is there a medical test to show whether I've been exposed to tetrachloroethylene?

Tetrachloroethylene and its breakdown products (metabolites) can be measured in blood and urine. However, the detection of tetrachloroethylene or its metabolites cannot predict the kind of health effects that might develop from that exposure. Because tetrachloroethylene and its metabolites leave the body fairly rapidly, the tests need to be conducted within days after exposure.

Has the federal government made recommendations to protect human health?

The Occupational Safety and Health Administration (OSHA) has set an 8-hour time weighted average permissible exposure limit of 100 ppm, an acceptable ceiling exposure limit of 200 ppm, and a maximum peak of 300 ppm (not to be exceeded for more than 5 minutes of any 3-hour period).

The National Institute for Occupational Safety and Health (NIOSH) recommends that workplace exposure to tetrachloroethylene be minimized due to concerns about its carcinogenicity.

References

This ToxFAQs™ information is taken from the 2014 Toxicological Profile for Tetrachloroethylene (Draft for Public Comment) produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services in Atlanta, GA

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636, FAX: 770-488-4178.

ToxFAQs™ Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

Trichloroethylene - ToxFAQs™

CAS # 79-01-6

This fact sheet answers the most frequently asked health questions (FAQs) about trichloroethylene. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Trichloroethylene is used as a solvent for cleaning metal parts. Exposure to very high concentrations of trichloroethylene can cause dizziness, headaches, sleepiness, incoordination, confusion, nausea, unconsciousness, and even death. The Environmental Protection Agency (EPA) and the International Agency for Research on Cancer (IARC) classify trichloroethylene as a human carcinogen. Trichloroethylene has been found in at least 1,045 of the 1,699 National Priorities List sites identified by the EPA.

What is trichloroethylene?

Trichloroethylene is a colorless, volatile liquid. Liquid trichloroethylene evaporates quickly into the air. It is nonflammable and has a sweet odor.

The two major uses of trichloroethylene are as a solvent to remove grease from metal parts and as a chemical that is used to make other chemicals, especially the refrigerant, HFC-134a. Trichloroethylene was once used as an anesthetic for surgery.

What happens to trichloroethylene when it enters the environment?

- Trichloroethylene can be released to air, water, and soil at places where it is produced or used.
- Trichloroethylene is broken down quickly in air.
- Trichloroethylene breaks down very slowly in soil and water and is removed mostly through evaporation to air.
- It is expected to remain in groundwater for long time since it is not able to evaporate.
- Trichloroethylene does not build up significantly in plants or animals.

How might I be exposed to trichloroethylene?

- Breathing trichloroethylene in contaminated air.
- Drinking contaminated water.
- Workers at facilities using this substance for metal degreasing are exposed to higher levels of trichloroethylene.
- If you live near such a facility or near a hazardous waste site containing trichloroethylene, you may also have higher exposure to this substance.

How can trichloroethylene affect my health?

Exposure to moderate amounts of trichloroethylene may cause headaches, dizziness, and sleepiness; large amounts may cause coma and even death. Eating or breathing high levels of trichloroethylene may damage some of the nerves in the face. Exposure to high levels can also result in changes in the rhythm of the heartbeat, liver damage, and evidence of kidney damage. Skin contact with concentrated solutions of trichloroethylene can cause skin rashes.

There is some evidence exposure to trichloroethylene in the work place may cause scleroderma (a systemic autoimmune disease) in some people. Some men occupationally-exposed to trichloroethylene and other chemicals showed decreases in sex drive, sperm quality, and reproductive hormone levels.

How likely is trichloroethylene to cause cancer?

There is strong evidence that trichloroethylene can cause kidney cancer in people and some evidence for trichloroethylene-induced liver cancer and malignant lymphoma. Lifetime exposure to trichloroethylene resulted in increased liver cancer in mice and increased kidney cancer and testicular cancer in rats.

The National Toxicology Program (NTP) has determined that trichloroethylene is a "known human carcinogen". The EPA and the International Agency for Research on Cancer (IARC) have determined that trichloroethylene is "carcinogenic to humans."

Agency for Toxic Substances and Disease Registry
Division of Toxicology and Health Human Sciences

ATSDR

CS256651A

Trichloroethylene

CAS # 79-01-6

How can trichloroethylene affect children?

It is not known whether children are more susceptible than adults to the effects of trichloroethylene.

Some human studies indicate that trichloroethylene may cause developmental effects such as spontaneous abortion, congenital heart defects, central nervous system defects, and small birth weight. However, these people were exposed to other chemicals as well.

In some animal studies, exposure to trichloroethylene during development caused decreases in body weight, increases in heart defects, changes to the developing nervous system, and effects on the immune system.

How can families reduce the risk of exposure to trichloroethylene?

- Avoid drinking water from sources that are known to be contaminated with trichloroethylene. Use bottled water if you have concerns about the presence of chemicals in your tap water. You may also contact local drinking water authorities and follow their advice.
- Discourage your children from putting objects in their mouths. Make sure that they wash their hands frequently and before eating.
- Prevent children from playing in dirt or eating dirt if you live near a waste site that has trichloroethylene.
- Trichloroethylene is used in many industrial products. Follow instructions on product labels to minimize exposure to trichloroethylene.

Is there a medical test to show whether I've been exposed to trichloroethylene?

Trichloroethylene and its breakdown products (metabolites) can be measured in blood and urine. However, the detection of trichloroethylene or its metabolites cannot predict the kind of health effects that might develop from that exposure. Because trichloroethylene and its metabolites leave the body fairly rapidly, the tests need to be conducted within days after exposure.

Has the federal government made recommendations to protect human health?

The EPA set a maximum contaminant goal (MCL) of 0.005 milligrams per liter (mg/L; 5 ppb) as a national primary drinking standard for trichloroethylene.

The Occupational Safety and Health Administration (OSHA) set a permissible exposure limit (PEL) of 100 ppm for trichloroethylene in air averaged over an 8-hour work day, an acceptable ceiling concentration of 200 ppm provided the 8 hour PEL is not exceeded, and an acceptable maximum peak of 300 ppm for a maximum duration of 5 minutes in any 2 hours.

The National Institute for Occupational Safety and Health (NIOSH) considers trichloroethylene to be a potential occupational carcinogen and established a recommended exposure limit (REL) of 2 ppm (as a 60-minute ceiling) during its use as an anesthetic agent and 25 ppm (as a 10-hour TWA) during all other exposures.

References

This ToxFAQs™ information is taken from the 2014 Toxicological Profile for Trichloroethylene (Draft for Public Comment) produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services.

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636.

ToxFAQs™ Ion the web: www.atsdr.cdc.gov/toxFAQs.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

Vanadium - ToxFAQs™

CAS # 7440-62-2

This fact sheet answers the most frequently asked health questions (FAQs) about vanadium. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Everyone is exposed to low levels of vanadium in air, water, and food; however, most people are exposed mainly from food. Breathing high levels of vanadium pentoxide may cause lung damage. Ingesting vanadium can cause nausea and vomiting. In animals, ingesting vanadium can cause decreased red blood cells and increased blood pressure. Vanadium has been found in at least 319 of 1,699 National Priorities List (NPL) sites identified by the Environmental Protection Agency (EPA).

What is vanadium?

Vanadium is an element that occurs in nature as a white-to-gray metal compounds, and is often found as crystals. Pure vanadium has no smell. It usually combines with other elements such as oxygen, sodium, sulfur, or chloride. Vanadium and vanadium compounds can be found in the earth's crust and in rocks, some iron ores, and crude petroleum deposits.

Vanadium is used in producing rust-resistant, spring, and high-speed tool steels.

Vanadium pentoxide is used in ceramics, as a catalyst, and in the production of superconductive magnets.

Vanadyl sulfate and sodium metavanadate have been used as dietary supplements.

What happens to vanadium when it enters the environment?

- Vanadium mainly enters the environment from natural sources and from the burning of fuel oils.
- It does not dissolve well in water.
- It combines with other elements and particles.
- Vanadium binds strongly to soil and sediments.
- Low levels have been found in plants, but it is not likely to build up in the tissues of animals.

How might I be exposed to vanadium?

- Eating foods containing vanadium, higher levels are found in seafoods. Vanadium is found in some nutritional supplements.
- Breathing air near an industry that burns fuel oil or coal; these industries release vanadium oxide into the air.
- Working in industries that process vanadium or make products containing vanadium.
- Breathing contaminated air or drinking contaminated water near waste sites or landfills containing vanadium.
- Breathing cigarette smoke.
- Vanadium is not readily absorbed by the body from the stomach, gut, or contact with the skin.

How can vanadium affect my health?

Exposure to high levels of vanadium pentoxide in air can result in lung damage.

Nausea, mild diarrhea, and stomach cramps have been reported in people some vanadium compounds. A number of effects have been found in animals ingesting vanadium compounds including decreases in the number of red blood cells, increased blood pressure, and mild neurological effects. The amounts of vanadium given in these animal studies that resulted in harmful effects are much higher than those likely to occur in the environment.

Vanadium

CAS # 7440-62-2

How likely is vanadium to cause cancer?

The International Agency for Research on Cancer (IARC) has classified vanadium pentoxide as possibly carcinogenic to humans based on evidence of lung cancer in exposed mice.

The Department of Health and Human Services (DHHS) and EPA have not classified vanadium as to its human carcinogenicity.

How can vanadium affect children?

The health effects in children are expected to be similar to the effects seen in adults.

Studies in animals exposed during pregnancy have shown that vanadium can cause decreases in growth and increases in the occurrence of birth defects. These effects are usually observed at levels which cause effects in the mother. Effects have also been observed at vanadium doses which did not cause effects in the mother.

How can families reduce the risk of exposure to vanadium?

- Vanadium is present in some supplements. Consult with your doctor before taking supplements containing vanadium to determine if they are appropriate for you. Supplements should be kept out of reach of children.
- Vanadium is a component of tobacco smoke. Avoid smoking in enclosed spaces like inside the home or car in order to limit exposure to children and other family members.

Is there a medical test to determine whether I've been exposed to vanadium?

Vanadium can be measured in blood and urine. These tests cannot determine if harmful health effects will occur from the exposure to vanadium.

Has the federal government made recommendations to protect human health?

The Occupational Safety and Health Administration (OSHA) has set a legal limit of 0.5 milligrams per cubic meter (0.5 mg/m^3) for vanadium pentoxide dust as a ceiling limit not to be exceeded during the workday. A ceiling limit of 0.1 mg/m^3 for vanadium pentoxide fumes has also been established.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2012. Toxicological Profile for Vanadium. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636.

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VOLATILE/EXTRACTABLE PETROLEUM HYDROCARBON FRACTIONS - VPH/EPH

The following toxicity profile was compiled using information taken directly from MA DEP documents (MA DEP, 1994, 2002, and 2003). Secondary references are cited to the MA DEP document where the information was presented.

GENERAL BACKGROUND INFORMATION

Petroleum products are a complex and highly variable mixture of hundreds of individual hydrocarbon compounds. Industry specifications for refined products, such as gasoline and diesel fuel, are based upon physical and performance-based criteria rather than on a specific chemical formulation. The compositions of petroleum products released to the environment are therefore complex and variable, and are a function of the origin and chemistry of the parent crude oil, the refining and blending processes, and the use of performance-enhancing additives. Once released to the environment, the chemistry of a petroleum product is further altered by contaminant fate and transport processes, such as leaching, volatilization, and biodegradation (MA DEP, 2002).

Although little toxicological data are available for the vast majority of petroleum constituents, it is possible to make some broad observations and conclusions:

- Petroleum products are comprised mainly of aliphatic and aromatic hydrocarbon compounds
- Aromatic hydrocarbons appear to be more toxic than aliphatic compounds; and
- The toxicity of aliphatic compounds appears to be related to their carbon number/molecular weights.

These three precepts are the foundation of the VPH/EPH approach. Under this approach, the non-cancer toxicity of petroleum-contaminated media is established by determining the collective concentrations of specified ranges of aliphatic and aromatic hydrocarbons and assigning a toxicity value (e.g., reference dose) to each range. Well-characterized compounds within specified ranges are selected as "surrogate" indicators to define the toxicity of the entire range (e.g., every aliphatic compound having between 5 and 8 carbon atoms (C_5-C_8 aliphatic hydrocarbons) are assumed to be as toxic as n-hexane). Cancer effects are evaluated separately by the identification and quantitation of those specific hydrocarbons, such as benzene and certain polycyclic aromatic hydrocarbons (PAHs), which are designated carcinogens. (MA DEP, 2002).

HUMAN TOXICOLOGICAL PROFILE - General

Inhaled or ingested volatile hydrocarbons have both general and specific effects. Many organic solvents, including petroleum hydrocarbons, have the potential on acute high-level vapor exposure to cause central nervous system (CNS) disturbances like disorientation, euphoria, giddiness, and confusion; progressing to unconsciousness, paralysis, convulsion, and death from respiratory or cardiac arrest (Browning, 1965 in MA DEP, 2003). These effects have been observed with aliphatic and aromatic compounds found within the C_5 - C_9 (aliphatics) and C_6 - C_{10} (aromatics) carbon ranges.

The acute narcotic effects of the volatile hydrocarbons result from direct chemical action. The similarity of CNS disruption produced by hydrocarbons of diverse structures suggests that these effects result from a common process, which is physical interaction of the solvents with the cells of the CNS (Andrews and Snyder, 1991 in MA DEP, 2003). For example, interaction of the lipid-soluble hydrocarbons with the synaptosomal membranes causes CNS toxicities. The potency of the CNS effects depends on the structure of the individual hydrocarbon molecule.

Other non-specific effects of hydrocarbons are exhibited after prolonged exposure to these agents. The nonspecific effects observed in animals and humans are neurobehavioral toxicities. The neurobehavioral effects are manifested as sensory, cognitive, affective, and motor abnormalities. There is some evidence suggesting that the mechanism of the behavioral effects is alterations in the utilization and turnover of biogenic amines in the brain. These effects occur at lower hydrocarbon concentrations than those producing morphological changes.

Recent animal studies indicate that both aromatic (Korsak and Rydzynski, 1996; Gralewicz et al., 1997 in MA DEP, 2003) and aliphatic (Lund et al., 1995 in MA DEP, 2003) volatile hydrocarbons may cause nonspecific neurobehavioral toxicities with differing intensities depending on the structure of the hydrocarbon.

Distinct from the general CNS effects of hydrocarbons are their associated specific organ toxicities. Examples of such effects include the hematopoietic toxicity of benzene and the neurodegenerative toxicity of n-hexane. The specific toxicities of hydrocarbons may be directly related to their metabolites, as is the case with benzene and n-hexane (Andrews and Snyder, 1991 in MA DEP, 2003).

HUMAN TOXICOLOGICAL PROFILE – Volatile/Extractable Petroleum Hydrocarbon Fractions

Aliphatic Fractions

C_5-C_8 Aliphatics

n-Hexane was originally selected by MA DEP as the indicator for this range because its toxicity has been well investigated and also because of some evidence demonstrating that the other alkanes in the group may have similar neurotoxic capacities. The peripheral neurotoxicity of n-hexane is of particular human health concern, although respiratory and irritation effects have also been observed. Several epidemiological studies have demonstrated that human inhalation exposure to n-hexane resulted in polyneuropathy. In the epidemiological studies, exposure was to n-hexane, commercial grade hexane, or other mixtures within the specified carbon ranges for this fraction. The mixtures contained n-hexane at levels ranging from 12.3 to 60%. The data do not allow comparison of the severity of the neuropathy induced by pure n-hexane or the aliphatic mixtures in the series (MA DEP, 2003).

C_9-C_{18} Aliphatics

Inhalation exposure of painters to white spirit resulted in early disability work status due to neuropsychological disorders. In most of the studies, workers were exposed to mixtures of organic solvents, with the principal component being white spirit. The effects were mainly functional disturbances in the CNS including memory and learning impairments (Lund et al. (1995) and references therein in MA DEP, 2003).

C_{19}-C_{32} Aliphatics

No human toxicological data are available. However, emerging studies suggest that exposures to petroleum distillates appear to increase the risk of autoimmune diseases (e.g., undifferentiated connective tissue diseases (Lacey et al., 1999 in MA DEP, 2003)).

Aromatic Fractions

C_6-C_8 Aromatics

In the MA DEP fractions approach (MA DEP, 1994), aromatic hydrocarbons with fewer than nine carbon atoms (e.g., benzene, toluene) are evaluated on a compound-specific basis. No toxicity data were identified on mixtures in this carbon range. However, the MA DEP has selected a representative oral reference dose for the carbon range considering the availability of good toxicity data for styrene, ethylbenzene, and xylenes and compositional information for this fraction. The human health concerns for these compounds include CNS effects, mucous membrane irritations, and developmental and reproductive effects.

C_9-C_{32} Aromatics

The MA DEP grouped the entire range of C_9-C_{32} aromatic hydrocarbon compounds as a single fraction for the purposes of deriving the oral RfD. For the purposes of evaluating inhalation toxicity, MA DEP evaluated the C_9-C_{18} and C_{19}-C_{32} carbon ranges.

The C_9-C_{18} fraction includes two and three ring PAHs, such as naphthalene, 2-methylnaphthalene, and fluorene; and alkylated benzenes, such as 1,2,4-trimethylbenzene and isopropylbenzene. The critical effects for these compounds from inhalation exposure are pulmonary, hepatic, renal, CNS, and developmental/reproductive effects.

C_{19}-C_{32} Aromatics

No appropriate data were identified to support development of inhalation RfCs for the individual components or mixtures in this carbon range. The compounds in this carbon range are not very volatile and inhalation of gaseous compounds is not a likely route of exposure.

ANIMAL TOXICOLOGICAL PROFILE – Volatile/Extractable Petroleum Hydrocarbon Fractions

Aliphatic Fractions

C_5-C_8 Aliphatics

Overall, the chronic commercial hexane studies used by the Total Petroleum Hydrocarbon Criteria Working Group (TPHCWG) demonstrated that an inhalation exposure to a hexane mixture containing 53% n-hexane produced no toxicity in rodents. However, and most importantly, other chronic human and animal studies showed that commercial hexane causes peripheral neuropathy. In addition, many potential diketone metabolites of n-alkanes produce peripheral neurotoxicity.

C_9-C_{18} Aliphatics

New oral gavage studies on various petroleum streams covering C_9 - C_{17} carbon ranges observed adverse effects in the treated animals such as body weight, organ weight, and blood chemistry changes. A recent neurotoxicity study revealed that exposure of rats to dearomatized white spirit for six months induced long-lasting and possibly irreversible effects in the nervous system.

In acute animal studies, white spirit with low aromatic content produced significant reductions in animal response to learned performances. Increased levels in brain noradrenaline, dopamine, and 5-hydroxytryptamine were observed in rats exposed to various levels of white spirit. Changes in indices of oxidative stress in the synaptosomes were also reported in animals exposed to white spirit for 3 weeks.

C_{19}-C_{32} Aliphatics

Based on a rat subchronic feeding study of several different highly refined white mineral oil samples representing various mineral hydrocarbon (MHC) sizes, the low molecular weight (average molecular weight 320-420) MHC caused mesenteric lymph node histiocytosis and liver granulomas, while the high molecular weight MHC demonstrated minimal effect (Smith et al., 1996 in MA DEP, 2003). No inhalation toxicity data are available.

Aromatic Fractions

C_6-C_8 Aromatics

See discussion under human toxicological profile.

C_9-C_{32} Aromatics

The C_9-C_{18} fraction includes low molecular weight PAHs and alkylated benzenes. Naphthalene is a hematopoietic and pulmonary toxicant. Inhalation exposure to naphthalene produced severe pulmonary damage and lesions in mice (NTP, 1992 in MA DEP, 2003). A recent oral study of a structurally related compound, 1-methylnaphthalene, suggested that the target site might be the pulmonary tissues. Chronic oral administration of 1-methylnaphthalene was associated with significantly increased nodular alveolar proteinosis in mice. A significant increase in pulmonary adenoma was observed in males (Murata et al., 1993 in MA DEP, 2003). In some short-term, high dose experiments, animals exposed to isopropylbenzene exhibited damage to the spleen and fatty changes to the liver. The critical treatment-related effects were to the kidney (Sandmeyer, 1981 in MA DEP, 2003). Rats exposed to trimethylbenzene demonstrated significant changes in CNS function by the behavioral tests in the higher dose groups (Gralewicz et al., 1997 in MA DEP, 2003). Systemic, reproductive, and developmental toxicities have also been demonstrated in animals exposed to C_9 aromatic mixtures (MA DEP, 2003).

For C_{19}-C_{32} aromatics, see discussion under human toxicological profile.

GENOTOXICITY

There are no studies relating TPH-VPH/EPH exposure in humans to genotoxicity. An inhalation oncogenicity study of commercial hexane in rats and mice (API, 1995, Part II in MA DEP, 2003) demonstrated liver tumors in female mice in the highest dose group.

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APPENDIX K



Northwest side of Site – Condominium Unit B1



Southwest side of Site – Condominium Unit B1



South Side of Site – Condominium Unit C – “Mowry Building”



South Side of Site – Condominium Unit C – “Mowry Building”



Southeast Side of Site – East end of Condominium Unit C – “Mowry Building”



New parking lot on east side of Site

APPENDIX L

Cost Summary

August 1, 2019

Project:
298 Federal Street Remediation `
298 Federal Street
Greenfield, MA 01301

Owner:
401 Liberty Street, LLC
265 State Street
Springfield, MA 01103
(413) 746 4400

General Contractor:
VAAS Builders, LLC
265 State Street
Springfield, MA 01103
(413) 746 4400

Environmental Consultant
O'Reilly Talbot & Okun Associates
293 Bridge St #500
Springfield, MA 01103
(413) 788-6222

Project:

298 Federal Street Remediation

298 Federal Street

Greenfield, MA 01301

DESCRIPTION		TOTAL
01-GENERAL CONDITIONS/ENV. DESIGN & MONITORING		$293,000
02-EXISTING CONDITIONS/REMEDIATION		$246,000
03-CONCRETE		$203,000
04-MASONRY		$165,000
	Total	**$907,000**

Project:

298 Federal Street Remediation

298 Federal Street

Greenfield, MA 01301

ELEMENT	COST
01-GENERAL CONDITIONS/ENV. DESIGN & MONITORING	
General Conditions & Requirements	$48,000
OSHA Haz Mat/Env Oversite	$32,000
Environmental Design & Monitoring	$187,000
Environmental Design & Monitoring (Projected to Completion)	$26,000
01-General Conditions Total	**$293,000**
02-EXISTING CONDITIONS/REMEDIATION	
Sawcuting/Trenching at Existing Floor Slabs Materials	$6,000
Sawcutting/Trenching at Existing Floor Slabs Labor	$15,000
Excavation & Export Materials to Landfill	$30,000
Excavation & Export Labor to Approved Landfill	$15,000
Excavation & Export Materials to Springfield	$18,000
Excavation & Export Labor to Springfield	$8,000
SSDS Infill/Trench/Riser/Fabric/Liner/Piping Roof Materials	$67,000
SSDS Infill/Trench/Riser/Fabric/Liner/Piping Labor	$87,000
02-Existing Conditions/Remediation Total	**$246,000**
03-CONCRETE	
Floor Sub Slab Trench Infill Materials	$52,000
Floor Sub Slab Trench Infill Labor	$36,000
Floor Slab Cap Materials	$87,000
Floor Slab Cap Labor	$28,000
03-Concrete Total	**$203,000**
04-MASONRY	
Masonry Patch/Infill/Repair South Wall B1	$65,000
Masonry Patch/Infill/Repair West Wall B1	$39,000
Masonry Patch/Infill/Repair North Wall B1	$16,000
Masonry Patch/Infill/Repair South Wall B2	$18,000
Masonry Patch/Infill/Repair North Wall B2	$27,000
04-Masonry Total	**$165,000**
TOTAL	**$907,000**

Remedial Cost Proposal

To: O'Reilly, Talbot & Okun - Bruce Nickelsen 3/4/2020
nickelsen@oto-env.com
From: Alana Miller
amiller@regenesis.com 929-466-0300

Subject: ***Preliminary Design and Cost Estimate***

Site: *298 Federal Street*
Greenfield, MA

Location: Treatment Unit

Applicable Product(s)	**Link(s) to View/Download Product Information**
3-D Microemulsion® Factory Emulsified	3-D Microemulsion
Bio-Dechlor INOCULUM® Plus	BDI Plus
Sulfidated MicroZVI™	S-MZVI

REGENESIS is pleased to present you with this design and cost estimate for the proposed treatment at your site utilizing the remediation technologies presented above. Included within this document you will find the following attachments supporting the proposed approach:

- Map Depicting Possible Treatment Areas
- Remedial Design and Cost Estimates
- Product Technical Sheets
- Standard Assumptions
- Terms and Conditions
- Design Verification - Summary of Proposed Testing

Remedial Approach

This approach combines both biological enhanced reductive dechlorination (ERD) and abiotic in situ chemical reduction (ISCR) degradation pathways for rapid reduction of chlorinated solvents. The self-distributing features of 3-D Microemulsion® combined with its longevity (several years) allow for sufficient coverage with minimal pore volume displacement thereby minimizing application costs. Our colloidal zero-valent iron (ZVI) product, Sulfidated-MicroZVI (S-MZVI®), will provide a source of iron, creating conditions for abiotic reduction via the formation of iron sulfides, oxides and hydroxides, while also maintaining strongly reducing conditions in the treatment area for an extended timeframe. This will foster rapid abiotic reduction of chlorinated solvents while reducing the potential for daughter product formation compared to a standard in situ bioremediation approach.

REGENESIS

Design Verification Testing

To best ensure a successful treatment, we recommend design verification testing (DVT) be completed prior to application of the proposed remedy. A tabulated summary of DVT items specifically recommended for this project is attached. The table contains explanations of these items, their purpose and designates responsibility for their completion. Please note that our cost estimate is inclusive of any DVT items to be completed by REGENESIS.

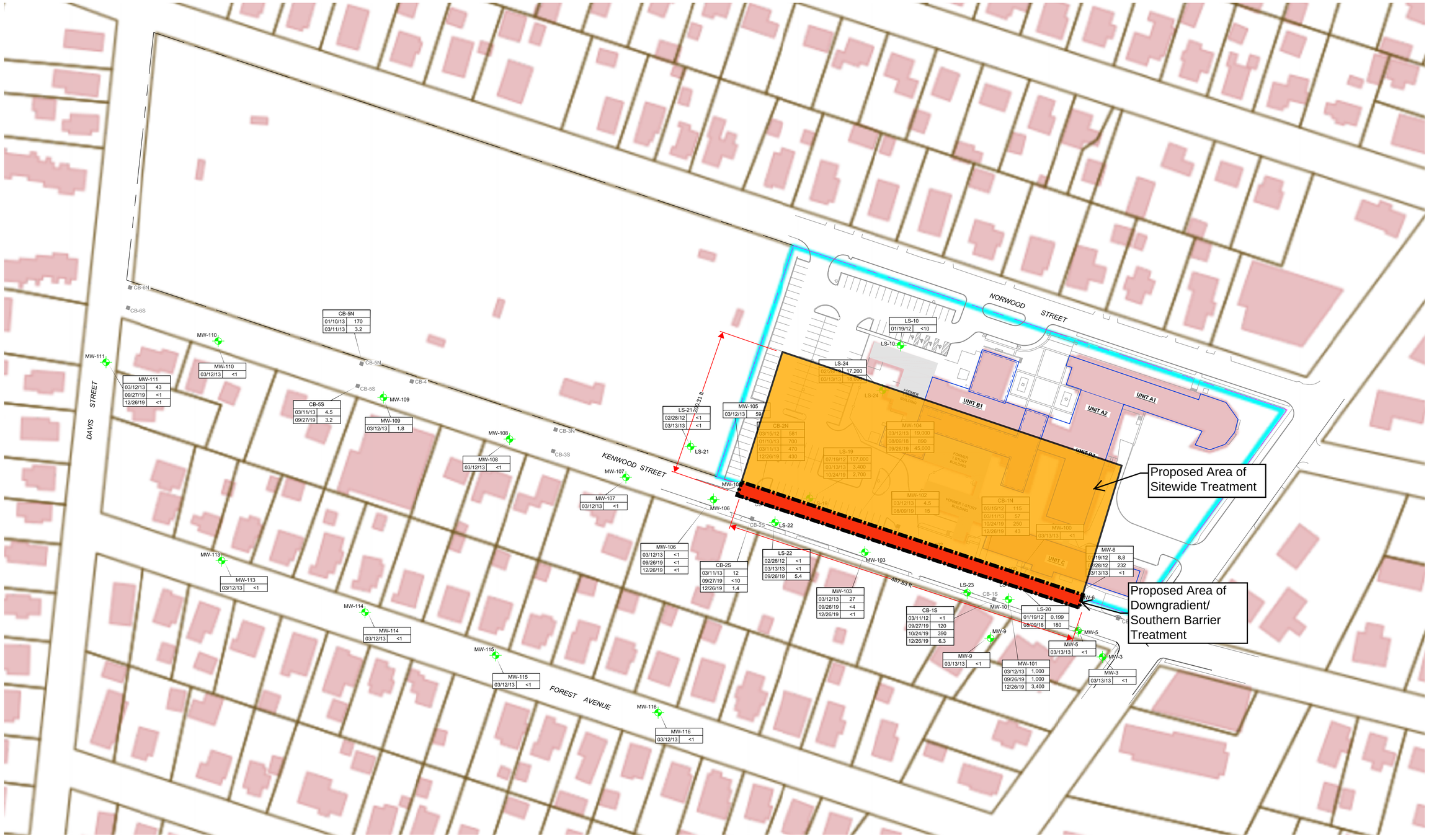
Assumptions

In generating this design proposal REGENESIS relied upon professional judgment and site specific information provided by others. Using this information as input, we performed calculations based upon known chemical and geologic relationships to generate an estimate of the mass of product and subsurface placement required to affect remediation of the site. The attached design summary tables specify the assumptions used in preparation of this technical design. We request that these modeling input assumptions be verified by your firm.

REGENESIS developed this Scope of Work in reliance upon the data and professional judgments provided by those whom completed the earlier environmental site assessment(s). The fees and charges associated with the Scope of Work were generated through REGENESIS' proprietary formulas and thus may not conform to billing guidelines, constraints or other limits on fees. REGENESIS does not seek reimbursement directly from any government agency or any governmental reimbursement fund (the "Government"). In any circumstance where REGENESIS may serve as a supplier or subcontractor to an entity which seeks reimbursement from the Government for all or part of the services performed or products provided by REGENESIS, it is the sole responsibility of the entity seeking reimbursement to ensure the Scope of Work and associated charges are in compliance with and acceptable to the Government prior to submission. When serving as a supplier or subcontractor to an entity which seeks reimbursement from the Government, REGENESIS does not knowingly present or cause to be presented any claim for payment to the Government.

Closing

Please feel free to contact me if you need additional information or have any questions regarding our evaluation and/or this correspondence (contact info listed above). Thank you for considering REGENESIS as part or your remedial solution for this project.



NOTES:

1. BASE MAP PROVIDED TO OTO IN ELECTRONIC FORMAT; ORIGINAL PLAN ENTITLED "EXISTING CONDITIONS" BY THE BERKSHIRE DESIGN GROUP, INC. (DATED SEPTEMBER, 2015).
2. SAMPLE LOCATIONS ARE SHOW ACCORDING TO TAPED MEASUREMENTS TAKEN FROM EXISTING SITE FEATURES.
3. ALL DATA IS TO BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD(S) USED IN THE DEVELOPMENT OF THIS PLAN.

LEGEND:

CB-0 ■ CATCH BASIN LOCATION WITH DESIGNATION

MW-3 MONITORING WELL LOCATION WITH DESIGNATION

MW-3
03/13/13 <1

SAMPLE LOCATION, WITH DATE AND TCE CONCENTRATION (MICROGRAMS PER LITER, OR PARTS PER BILLION)

SCALE
1" = 60'
0 30' 60' 120'

O'Reilly, Talbot & Okun
ENGINEERING ASSOCIATES
293 Bridge Street, Suite 500 Springfield, MA 01103 413.788.6222 www.OTO-ENV.com

- ENVIRONMENTAL (MCP) CONSULTING
- GEOTECHNICAL ENGINEERING
- ASBESTOS CONSULTING & MANAGEMENT
- RISK ASSESSMENT
- INDUSTRIAL HYGIENE

PROJECT TITLE:
298 FEDERAL STREET

GREENFIELD, MASSACHUSETTS

SCALE: 1" = 60'
PROJ. NO: J2693-01-02
DRAWN: CDA
CHECKED: BHN
DATE: 02/06/2020
REV:

DRAWING TITLE:
TCE CONCENTRATIONS

DRAWING NO.: 5

Project Information		
298 Federal Street		
Greenfield, MA		
Barrier at Southern Site Boundary		
Prepared For:		
O'Reilly, Talbot & Okun - Bruce Nickelsen		
Target Treatment Zone (TTZ) Info	**Unit**	**Value**
Barrier Length	ft	488
Top Treat Depth	ft	5.0
Bot Treat Depth	ft	25.0
Vertical Treatment Interval	ft	20.0
Treatment Zone Volume	ft^3	195,200
Treatment Zone Volume	cy	7,230
Soil Type	---	silty sand
Porosity	cm^3/cm^3	0.40
Effective Porosity	cm^3/cm^3	0.20
Treatment Zone Pore Volume	gals	584,079
Treatment Zone Effective Pore Volume	gals	292,040
Fraction Organic Carbon (foc)	g/g	0.003
Soil Density	g/cm^3	1.6
Soil Density	lb/ft^3	100
Soil Weight	lbs	1.9E+07
Hydraulic Conductivity	ft/day	17.0
Hydraulic Conductivity	cm/sec	6.00E-03
Hydraulic Gradient	ft/ft	0.005
GW Velocity	ft/day	0.43
GW Velocity	ft/yr	155
Contaminant Mass	**Unit**	**Value**
Dissolved Phase Contaminant Mass	lbs	257
Sorbed Phase Contaminant Mass	lbs	397
Competing Electron Acceptor Mass	lbs	439
Total Mass Contributing to H2 Demand	**lbs**	**1,093**
Mass Flux and 3DME Demand	**Unit**	**Value**
Groundwater Flux	L/day	23,492
Stoichiometric 3DME Demand	lbs	3,725
Total Mass Flux 3DME Demand	lbs	16,156
Toral 3DME Demand	**lbs**	**19,880**
Application Dosing		
3-D Microemulsion to be Applied	**lbs**	**20,000**
S-MZVI to be Applied	**lbs**	**15,000**
BDI Plus to be Applied	**liters**	**111**

3-D Microemulsion®, S-MZVI®, CRS®, BDI® Plus Application Design Summary

Barrier at Southern Site Boundary		
Treatment Type	**Barrier**	Input special application instructions here as needed.
Distance Perpendicular to Flow (ft)	488	
Spacing Within Rows (ft)	7	
Number of Rows	2	
DPT Injection Points	139	
Top Application Depth (ft bgs)	5	**Field Mixing Ratios**
Bottom Application Depth (ft bgs)	25	3DME Concentrate per Pt (gals)
3DME to be Applied (lbs)	**20,000**	17
3DME to be Applied (gals)	2,397	Mix Water per Pt (gals)
3DME Mix %	6%	296
Volume Water (gals)	**41,179**	3DME Mix Volume per Pt (gals)
3DME Mix Volume (gals)	43,575	313
S-MZVI to be Applied (lbs)	**15,000**	S-MZVI Volume per Pt (gals)
S-MZVI Volume (gals)	993	7
BDI Plus to be Applied (L)	**111**	BDI Volume per Pt (L)
BDI Plus Mix Water Volume (gals)	1,110	0.8
Total Application Volume (gals)	**45,708**	Volume per pt (gals)
Estimated Radius of Injection (ft)	2.6	329
Prepared by: Alana Miller		Volume per vertical ft (gals)
Date: 3/3/2020		16

Technical Notes/Discussion

Assumptions/Qualifications

In generating this preliminary estimate, Regenesis relied upon professional judgment and site specific information provided by others. Using this information as input, we performed calculations based upon known chemical and geologic relationships to generate an estimate of the mass of product and subsurface placement required to affect remediation of the site.

REGENESIS developed this Scope of Work in reliance upon the data and professional judgments provided by those whom completed the earlier environmental site assessment(s). The fees and charges associated with the Scope of Work were generated through REGENESIS' proprietary formulas and thus may not conform to billing guidelines, constraints or other limits on fees. REGENESIS does not seek reimbursement directly from any government agency or any governmental reimbursement fund (the "Government"). In any circumstance where REGENESIS may serve as a supplier or subcontractor to an entity which seeks reimbursement from the Government for all or part of the services performed or products provided by REGENESIS, it is the sole responsibility of the entity seeking reimbursement to ensure the Scope of Work and associated charges are in compliance with and acceptable to the Government prior to submission. When serving as a supplier or subcontractor to an entity which seeks reimbursement from the Government, REGENESIS does not knowingly present or cause to be presented any claim for payment to the Government.

Purchasing Information

298 Federal Street	--	Barrier at Southern Site Boundary
3-D Microemulsion to be Applied	**lbs**	**20,000**
S-MZVI to be Applied	**lbs**	**15,000**
BDI Plus to be Applied	**liters**	**111**
3-D Microemulsion Cost	$	$76,400
S-MZVI Cost	$	$109,500
BDI Plus Cost	$	$17,316
Subtotal Product Cost	**$**	**$203,216**
Estimated Tax and Freight %	%	15%
Estimated Tax and Freight Cost*	$	$30,482
Estimated Total Product Cost	**$**	**$233,698**
Estimated RRS Application Cost (Optio	**$**	**$211,247**
Total Estimated Project Cost**	**$**	**$444,945**
Estimated RRS Days to Apply	**---**	**29**

***Note that the combined tax and freight costs are preliminary estimates only. Please contact your local sales manager or Customer Service at 949-366-8000 to obtain a shipping quote. You will be asked to provide a ship-to address and estimated time of delivery.**

Currently Available Packaging Options

Package Type**	# of packages	lbs required
3DME-400 lb poly drums	50	20,000
3DME-2,000 lb reinforced plastic totes	10	20,000
S-MZVI-3,000 lb reinforced plastic totes	5	15,000
S-MZVI-500 lb poly drums	30	15,000
BDI-18 Liter kegs	7	--

****Total Project cost is only an estimate; actual project cost may change as the final scope and/or RRS proposal are developed.**

*****Available Package Types are subject to change.**

Project Information		
298 Federal Street		
Greenfield, MA		
Sitewide Treatment		
Prepared For:		
O'Reilly, Talbot & Okun - Bruce Nickelsen		
Target Treatment Zone (TTZ) Info	**Unit**	**Value**
Areal Extent	sq ft	97,600
Top Treat Depth	ft	5.0
Bot Treat Depth	ft	25.0
Vertical Treatment Interval	ft	20.0
Treatment Zone Volume	ft^3	1,952,000
Treatment Zone Volume	cy	72,296
Soil Type	---	silty sand
Porosity	cm^3/cm^3	0.40
Effective Porosity	cm^3/cm^3	0.20
Treatment Zone Pore Volume	gals	5,840,790
Treatment Zone Effective Pore Volume	gals	2,920,395
Fraction Organic Carbon (foc)	g/g	0.003
Soil Density	g/cm^3	1.6
Soil Density	lb/ft^3	100
Soil Weight	lbs	1.9E+08
Hydraulic Conductivity	ft/day	17.0
Hydraulic Conductivity	cm/sec	6.00E-03
Hydraulic Gradient	ft/ft	0.005
GW Velocity	ft/day	0.43
GW Velocity	ft/yr	155
Contaminant Mass	**Unit**	**Value**
Dissolved Phase Contaminant Mass	lbs	1,355
Sorbed Phase Contaminant Mass	lbs	2,184
Competing Electron Acceptor Mass	lbs	4,388
Total Mass Contributing to H2 Demand	**lbs**	**7,927**
Mass Flux and 3DME Demand	**Unit**	**Value**
Groundwater Flux	L/day	23,492
Stoichiometric 3DME Demand	lbs	28,471
Total Mass Flux 3DME Demand	lbs	10,593
Toral 3DME Demand	**lbs**	**39,065**
Application Dosing		
3-D Microemulsion to be Applied	**lbs**	**135,600**
S-MZVI to be Applied	**lbs**	**101,700**
BDI Plus to be Applied	**liters**	**1106**

3-D Microemulsion®, S-MZVI®, CRS®, BDI® Plus Application Design Summary

Sitewide Treatment		
Treatment Type	**Grid**	Input special application instructions here as needed.
Treatment Areal Extent (sq ft)	97,600	
Spacing Within Rows (ft)	10	
Spacing Between Rows (ft)	10	
DPT Injection Points	976	
Top Application Depth (ft bgs)	5	**Field Mixing Ratios**
Bottom Application Depth (ft bgs)	25	3DME Concentrate per Pt (gals)
3DME to be Applied (lbs)	**135,600**	17
3DME to be Applied (gals)	16,249	Mix Water per Pt (gals)
3DME Mix %	6%	286
Volume Water (gals)	**279,192**	3DME Mix Volume per Pt (gals)
3DME Mix Volume (gals)	295,441	303
S-MZVI to be Applied (lbs)	**101,700**	S-MZVI Volume per Pt (gals)
S-MZVI Volume (gals)	6,735	7
BDI Plus to be Applied (L)	**1,106**	BDI Volume per Pt (L)
BDI Plus Mix Water Volume (gals)	11,060	1.1
Total Application Volume (gals)	**313,529**	Volume per pt (gals)
Estimated Radius of Injection (ft)	2.5	321
Prepared by: Alana Miller		Volume per vertical ft (gals)
Date: 3/3/2020		16

Technical Notes/Discussion

Assumptions/Qualifications

In generating this preliminary estimate, Regenesis relied upon professional judgment and site specific information provided by others. Using this information as input, we performed calculations based upon known chemical and geologic relationships to generate an estimate of the mass of product and subsurface placement required to affect remediation of the site.

REGENESIS developed this Scope of Work in reliance upon the data and professional judgments provided by those whom completed the earlier environmental site assessment(s). The fees and charges associated with the Scope of Work were generated through REGENESIS' proprietary formulas and thus may not conform to billing guidelines, constraints or other limits on fees. REGENESIS does not seek reimbursement directly from any government agency or any governmental reimbursement fund (the "Government"). In any circumstance where REGENESIS may serve as a supplier or subcontractor to an entity which seeks reimbursement from the Government for all or part of the services performed or products provided by REGENESIS, it is the sole responsibility of the entity seeking reimbursement to ensure the Scope of Work and associated charges are in compliance with and acceptable to the Government prior to submission. When serving as a supplier or subcontractor to an entity which seeks reimbursement from the Government, REGENESIS does not knowingly present or cause to be presented any claim for payment to the Government.

Purchasing Information		
298 Federal Street	**--**	**Sitewide Treatment**
3-D Microemulsion to be Applied	**lbs**	**135,600**
S-MZVI to be Applied	**lbs**	**101,700**
BDI Plus to be Applied	**liters**	**1,106**
3-D Microemulsion Cost	$	$489,516
S-MZVI Cost	$	$577,656
BDI Plus Cost	$	$172,536
Subtotal Product Cost	**$**	**$1,239,708**
Estimated Tax and Freight %	%	15%
Estimated Tax and Freight Cost*	$	$185,956
Estimated Total Product Cost	**$**	**$1,425,664**
Estimated RRS Application Cost (Optio	**$**	**$923,156**
Total Estimated Project Cost**	**$**	**$2,348,820**
Estimated RRS Days to Apply	**---**	**131**

***Note that the combined tax and freight costs are preliminary estimates only. Please contact your local sales manager or Customer Service at 949-366-8000 to obtain a shipping quote. You will be asked to provide a ship-to address and estimated time of delivery.**

Currently Available Packaging Options		
Package Type**	**# of packages**	**lbs required**
3DME-400 lb poly drums	339	135,600
3DME-2,000 lb reinforced plastic totes	68	136,000
S-MZVI-3,000 lb reinforced plastic totes	34	102,000
S-MZVI-500 lb poly drums	204	102,000
BDI-18 Liter kegs	62	--

****Total Project cost is only an estimate; actual project cost may change as the final scope and/or RRS proposal are developed.**

*****Available Package Types are subject to change.**

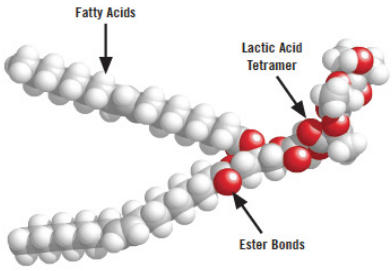
3-D Microemulsion® Factory Emulsified Technical Description

3-D Microemulsion (3DME®) is comprised of a patented molecular structure containing oleic acids (i.e., oil component) and lactates/polylactates, which are molecularly bound to one another (figure 1). The 3DME molecule contains both a soluble (hydrophilic) and insoluble (lipophilic) region. These two regions of the molecule are designed to be balanced in size and relative strength. The balanced hydrophilic/lipophilic regions of 3DME result in an electron donor with physical properties allowing it to initially adsorb to the aquifer material in the area of application, then slowly redistribute via very small 3DME "bundles" called micelles. These 3DME micelles spontaneously form within sections of the aquifer where concentrations of 3DME reach several hundred parts per million. The micelles' small size and mobility allow it to move with groundwater flow through the aquifer matrix, passing easily through the pore throats in between soil grains resulting in the further redistribution of 3DME within the aquifer. This allows for advective distribution of the oleic acids which are otherwise insoluble and unable to distribute in this manner, allowing for increased persistence of the lactate/polylactates component due to their initial attachment to the oleic acids.



Example of 3-D Microemulsion

FIGURE 1: THE 3-D MICROEMULSION MOLECULAR STRUCTURE



Due to its patented molecular structure, 3DME offers far greater transport when compared to blended emulsified vegetable oil (EVO) products, which fail to distribute beyond the limits of pumping. 3DME also provides greater persistence when compared to soluble substrates such as lactates or simple sugars. The 3DME molecular structures capitalize on the best features of the two electron-donor types while at the same time, minimize their limitations. 3DME is delivered to the site as a ready-to-apply emulsion that is simply diluted with water to generate a large volume of a 3DME colloidal suspension.

Suspension of 3DME generated by this mixing range from micelles on the order of .02 microns to .05 microns in diameter, to "swollen" micelles, (termed "microemulsions") which are on the order of .05 to 5 microns in diameter. Once injected into the subsurface in high volumes, the colloidal suspension mixes and dilutes in existing pore waters. The micelles/microemulsions on the injection front will then begin to sorb onto the surfaces of soils as a result of zeta potential attraction and organic matter within the soils themselves. As the sorption continues, the 3DME will "coat" pore surfaces developing a layer of molecules and in some cases a bilayer. This sorption process continues as the micelles/microemulsion moves outward and disassociates into their hydrophilic/hydrophobic components. The specialized chemistry of 3DME results in a staged release of electron donors: free lactate (immediate); polylactate esters (mid-range) and free fatty acids & fatty acid esters (long-term). Material longevity of three years or greater has been seen at most sites as determined from biogeochemical analyses.

For a list of treatable contaminants with the use of 3DME, view the Range of Treatable Contaminants Guide.

3-D Microemulsion® Factory Emulsified Technical Description

Chemical Composition

- Fatty acid esters
- Water
- Lactate oligomers
- Sodium lactate
- Proprietary surfactants

Properties

- Density – Approximately 1.0 grams per cubic centimeter (relative to water)
- pH – Neutral (approximately 6.5 to 7.5 standard units)
- Solubility – Soluble in Water
- Appearance – White emulsion
- Odor – Not detectable
- Vapor Pressure – None
- Non-hazardous

Storage and Handling Guidelines

Storage
Store in original tightly closed container
Store in a cool, dry, well-ventilated place
Store away from incompatible materials
Recommended storage containers: plastic-lined steel, plastic, glass, aluminum, stainless steel, or reinforced fiberglass

Handling
Avoid contact with eyes, skin, and clothing
Provide adequate ventilation
Wear appropriate personal protective equipment
Observe good industrial hygiene practices

Applications

- 3DME is diluted with water prior to application. Resulting emulsion has viscosity similar to water.
- Easily injects into formation through direct push injection points, injection wells or other injection delivery systems.

Application instructions for this product are contained in the 3DME FE Application Instructions.

Health and Safety

Material is food grade and relatively safe to handle. We recommend avoiding contact with eyes and prolonged contact with skin. OSHA Level D personal protection equipment including vinyl or rubber gloves, and eye protection are recommended when handling this product. Please review the 3DME FE Material Safety Data Sheet for additional storage, usage, and handling requirements.

REGENESIS®

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949.366.8000

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S-MicroZVI Specification Sheet

S-MicroZVI Technical Description

S-MicroZVI™ is an *In Situ* Chemical Reduction (ISCR) reagent that promotes the destruction of many organic pollutants and is most commonly used with chlorinated hydrocarbons. It is engineered to provide an optimal source of micro-scale zero valent iron (ZVI) that is both easy to use and delivers enhanced reactivity with the target contaminants via multiple pathways. S-MicroZVI can destroy many chlorinated contaminants through a direct chemical reaction (**see Figure 1**). S-MicroZVI will also stimulate anaerobic biological degradation by rapidly creating a reducing environment that is favorable for reductive dechlorination.



Sulfidated ZVI

S-MicroZVI is composed of colloidal, sulfidated zero-valent iron particles suspended in glycerol using proprietary environmentally acceptable dispersants. The passivation technique of sulfidation, completed using proprietary processing methods, provides unparalleled reactivity with chlorinated hydrocarbons like PCE and TCE and increases its stability and longevity by minimizing undesirable side reactions.

S-MicroZVI is Best in Class For

- ☑ Longevity
- ☑ Reactivity
- ☑ Transport

In addition to superior reactivity, S-MicroZVI is designed for easy handling that is unmatched by any ZVI product on the market. Shipped as a liquid suspension, S-MicroZVI requires no powder feeders, no thickening with guar, and pneumatic or hydraulic fracturing is not mandatory. When diluted with water prior to application, the resulting suspension is easy to inject using either direct push or permanent injection wells.

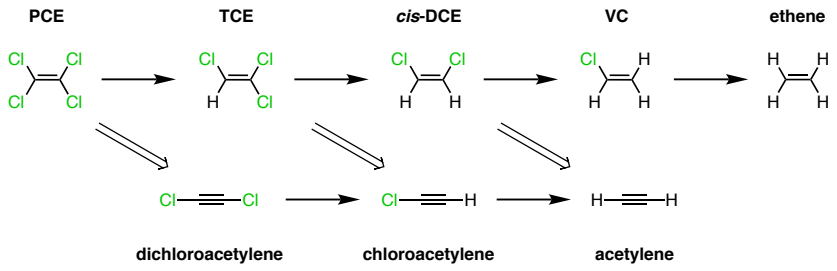


Figure 1: *Chlorinated ethene degradation pathways and products. The top pathway with single line arrows represent the reductive dechlorination (hydrogenolysis) pathway. The lower pathway with downward facing double line arrows represent the beta-elimination pathway.*

To see a list of treatable contaminants, view the S-MicroZVI treatable contaminants guide.

S-MicroZVI Specification Sheet

Chemical Composition

Iron, powders CAS 7439-89-6

Iron (II) sulfide CAS 1317-37-9

Glycerol CAS 56-81-8

Properties

Physical State: Liquid

Form: Viscous metallic suspension

Color: Dark gray

Odor: Slight

pH: Typically 7-9 as applied

Density: 15 lb/gal

Storage and Handling Guidelines

Storage:

- Use within four weeks of delivery
- Store in original containers
- Store at temperatures below 95F°
- Store away from incompatible materials

Handling:

- Never mix with oxidants or acids
- Wear appropriate personal protective equipment
- Do not taste or swallow
- Observe good industrial hygiene practices

Applications

S-MicroZVI is diluted with water on site and easily applied into the subsurface through low-pressure injections. S-MicroZVI can also be mixed with products like 3-D Microemulsion® or PlumeStop® prior to injection.

Health and Safety

The material is relatively safe to handle; however, avoid contact with eyes, skin and clothing. OSHA Level D personal protection equipment including: vinyl or rubber gloves and eye protection are recommended when handling this product. Please review the Safety Data Sheet for additional storage, and handling requirements here: S-MicroZVI SDS.

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BDI PLUS® Technical Description

Bio-Dechlor INOCULUM Plus (BDI PLUS®) is an enriched natural consortium containing species of Dehalococcoides sp. (DHC). BDI PLUS has been shown to simulate the rapid and complete dechlorination of chlorinated solvents such as tetrachloroethene (PCE), trichloroethene (TCE), dichloroethene (DCE) and vinyl chloride (VC) to non-toxic end products, ethene, carbon dioxide and water.

The culture also contains microbes capable of dehalogenating halomethanes (e.g., carbon tetrachloride and chloroform) and haloethanes (e.g., 1,1,1-TCA and 1,1-DCA) as well as mixtures of these contaminants.



Species of Dehalococcoides sp. (DHC)

For a list of treatable contaminants with the use of BDI PLUS, view the Range of Treatable Contaminants Guide

Chemical Composition

- Non-hazardous, naturally-occurring, non-altered anaerobic microbes and enzymes in a water-based medium.

Properties

- Appearance – Murky, yellow to grey water
- Odor – Musty
- pH 6.0 to 8.0
- Density – Approximately 1.0 grams per cubic centimeter (0.9 to 1.1 g/cc)
- Solubility – Soluble in Water
- Vapor Pressure – None
- Non-hazardous

Storage and Handling Guidelines

Storage
Store in original tightly closed container
Store away from incompatible materials
Recommended storage containers: plastic lined steel, plastic, glass, aluminum, stainless steel, or reinforced fiberglass
Store in a cool, dry area at 4-5°C (39 - 41°F)
Material may be stored for up to 3 weeks at 2-4°C without aeration

Handling
Avoid prolonged exposure
Observe good industrial hygiene practices
Wear appropriate personal protective equipment

BDI PLUS® Technical Description

Applications

- BDI PLUS is delivered to the site in liquid form and is designed to be injected directly into the saturated zone requiring treatment.
- Most often diluted with de-oxygenated water prior to injection into either hydraulic push injection points or properly constructed injection wells.
- The typical dilution rate of the injected culture is 10 gallons of deoxygenated water to 1 liter of standard BDI PLUS culture.

Application instructions for this product are contained here BDI PLUS Application Instructions.

Health and Safety

Material is non-hazardous and relatively safe to handle; however avoid contact with eyes and prolonged contact with skin. OSHA Level D personal protection equipment including: vinyl or rubber gloves and safety goggles or a splash shield are recommended when handling this product. An eyewash station is recommended. Please review the Material Safety Data Sheet for additional storage, usage, and handling requirements here: BDI PLUS SDS.

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949.366.8000

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Remedial Design Assumptions and Qualifications

Cost Estimate Disclaimer: The cost listed assumes conditions set forth within the proposed scope of work and assumptions and qualifications. Changes to either could impact the final cost of the project. This may include final shipping arrangements, sales tax or application related tasks such as product storage and handling, access to water, etc. If items listed need to be modified, please contact Regenesis for further evaluation.

Shipping Estimates: Shipping estimates are valid for 30 days. All shipping charges are estimates and actual freight charges are calculated at the time of invoice. Additional freight charges may be assessed for any accessorial requested at the time of delivery. The estimate included within assumes standard shipping.

Standard delivery is between 8am -5pm Monday –Friday. *accessorial – can include, but not limited to lift gate and pallet jack at delivery, inside delivery, time definite deliveries, and delivery appointments.

Please communicate any requirements for delivery with the customer service department at the time the order is placed.

Return Policy: To initiate a return please contact your local sales manager for an RMA. A 15% re-stocking fee will be charged for all returned goods. Return freight must be prepaid. All requests to return product must be in original condition and no product will be accepted for return after 90 days from date of delivery.

Professional Judgement: In generating this estimate, REGENESIS relied upon professional judgment and site specific information provided by others. Using this information as input, we performed calculations based upon known chemical and geologic relationships to generate an estimate of the mass of product and subsurface placement required to affect remediation of the site.

REGENESIS developed this Scope of Work in reliance upon the data and professional judgments provided by those whom completed the earlier environmental site assessment(s), and in reliance upon REGENESIS' prior experience on similar project sites. The fees and charges associated with the Scope of Work were generated through REGENESIS' proprietary formulas and thus may not conform to billing guidelines, constraints or other limits on fees. REGENESIS does not seek reimbursement directly from any government agency or any governmental reimbursement fund (the "Government"). In any circumstance where REGENESIS may serve as a supplier or subcontractor to an entity which seeks reimbursement from the Government for all or part of the services performed or products provided by REGENESIS, *it is the sole responsibility of the entity seeking reimbursement to ensure the Scope of Work and associated charges are in compliance with and acceptable to the Government prior to submission*. When serving as a supplier or subcontractor to an entity which seeks reimbursement from Government, REGENESIS does not knowingly present or cause to be presented any claim for payment to the government.

REGENESIS
1011 Calle Sombra
San Clemente, CA 92673-6244
Tel: 949.366.8000 • Fax: 949.366.8090

Terms and Conditions
Products and Services

1. PAYMENT TERMS. Net 30 Days. Accounts outstanding after 30 days will be assessed 1.5% monthly interest. Volume discount pricing will be rescinded on all accounts outstanding over 90 days. An early payment discount of 1.5% Net 10 is available for cash or check payments only. We accept Master Card, Visa and American Express.

2. **RETURN POLICY.** A 15% re-stocking fee will be charged for all returned goods. All requests to return product must be pre-approved by seller. Returned product must be in original condition and no product will be accepted for return after a period of 90 days.

3 FORCE MAJEURE. Seller shall not be liable for delays in delivery or services or failure to manufacture or deliver due to causes beyond its reasonable control, including but not limited to acts of God, acts of buyer, acts of military or civil authorities, fires, strikes, flood, epidemic, war, riot, delays in transportation or car shortages, or inability to obtain necessary labor, materials, components or services through seller's usual and regular sources at usual and regular prices. In any such event Seller may, without notice to buyer, at any time and from time to time, postpone the delivery or service dates under this contract or make partial delivery or performance or cancel all or any portion of this and any other contract with buyer without further liability to buyer. Cancellation of any part of this order shall not affect Seller's right to payment for any product delivered or service performed hereunder.

4. LIMITED WARRANTY. Seller warrants the product(s) sold and services provided as specified on face of invoice, solely to buyer. Seller makes no other warranty of any kind respecting the product and services, and expressly DISCLAIMS ALL OTHER WARRANTIES OF WHATEVER KIND RESPECTING THE PRODUCT AND SERVICES, INCLUDING ALL WARRANTIES OF MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE AND NON-INFRINGEMENT.

5. DISCLAIMER. Where warranties to a person other than buyer may not be disclaimed under law, seller extends to such a person the same warranty seller makes to buyer as set forth herein, subject to all disclaimers, exclusions and limitations of warranties, all limitations of liability and all other provisions set forth in the Terms and Conditions herein. Buyer agrees to transmit a copy of the Terms and Conditions set forth herein to any and all persons to whom buyer sells, or otherwise furnishes the products and/or services provided buyer by seller and buyer agrees to indemnify seller for any liability, loss, costs and attorneys' fees which seller may incur by reason, in whole or in part, of failure by buyer to transmit the Terms and Conditions as provided herein.

6. LIMITATION OF SELLER'S LIABILITY AND LIMITATION OF BUYER'S REMEDY. Seller's liability on any claim of any kind, including negligence, for any loss or damage arising out of, connected with, or resulting from the manufacture, sale, delivery, resale, repair or use of any goods or performance of any services covered by or furnished hereunder, shall in no case exceed the lesser of (1) the cost of repairing or replacing goods and repeating the services failing to conform to the forgoing warranty or the price of the goods and/or services or part thereof which gives rise to the claim. IN NO EVENT SHALL SELLER BE LIABLE FOR SPECIAL INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING LOST PROFITS, OR FOR DAMAGES IN THE NATURE OF PENALTIES.

7. INDEMNIFICATION. Buyer agrees to defend and indemnify seller of and from any and all claims or liabilities asserted against seller in connection with the manufacture, sale, delivery, resale or repair or use of any goods, and performance of any services, covered by or furnished hereunder arising in whole or in part out of or by reason of the failure of buyer, its agents, servants, employees or customers to follow instructions, warnings or recommendations furnished by seller in connection with such goods and services, by reason of the failure of buyer, its agents, servants, employees or customers to comply with all federal, state and local laws applicable to such goods and services, or the use thereof, including the Occupational Safety and Health Act of 1970, or by reason of the negligence or misconduct of buyer, its agents, servants, employees or customers.

8. EXPENSES OF ENFORCEMENT. In the event seller undertakes any action to collect amounts due from buyer, or otherwise enforce its rights hereunder, Buyer agrees to pay and reimburse Seller for all such expenses, including, without limitation, all attorneys and collection fees.

9. TAXES. Liability for all taxes and import or export duties, imposed by any city, state, federal or other governmental authority, shall be assumed and paid by buyer. Buyer further agrees to defend and indemnify seller against any and all liabilities for such taxes or duties and legal fees or costs incurred by seller in connection therewith.

10. ASSISTANCE AND ADVICE. Upon request, seller in its discretion will furnish as an accommodation to buyer such technical advice or assistance as is available in reference to the goods and services. Seller assumes no obligation or liability for the advice or assistance given or results obtained, all such advice or assistance being given and accepted at buyer's risk.

11. SITE SAFETY. Buyer shall provide a safe working environment at the site of services and shall comply with all applicable provisions of federal, state, provincial and municipal safety laws, building codes, and safety regulations to prevent accidents or injuries to persons on, about or adjacent to the site.

12. INDEPENDENT CONTRACTOR. Seller and Buyer are independent contractors and nothing shall be construed to place them in the relationship of partners, principal and agent, employer/employee or joint ventures. Neither party will have the power or right to bind or obligate the other party except as may be expressly agreed and delegated by other party, nor will it hold itself out as having such authority.

13. REIMBURSEMENT. Seller shall provide the products and services in reliance upon the data and professional judgments provided by or on behalf of buyer. The fees and charges associated with the products and services thus may not conform to billing guidelines, constraints or other limits on fees. Seller does not seek reimbursement directly from any government agency or any governmental reimbursement fund (the "Government"). In any circumstance where seller may serve as a supplier or subcontractor to an entity which seeks reimbursement from the Government for all or part of the services performed or products provided by seller, it is the sole responsibility of the buyer or other entity seeking reimbursement to ensure the products and services and associated charges are in compliance with and acceptable to the Government prior to submission. When serving as a supplier or subcontractor to an entity which seeks reimbursement from the Government, seller does not knowingly present or cause to be presented any claim for payment to the Government.

14. APPLICABLE LAW/JURISDICTION AND VENUE. The rights and duties of the parties shall be governed by, construed, and enforced in accordance with the laws of the State of California (excluding its conflict of laws rules which would refer to and apply the substantive laws of another jurisdiction). Any suit or proceeding hereunder shall be brought exclusively in state or federal courts located in Orange County, California. Each party consents to the personal jurisdiction of said state and federal courts and waives any objection that such courts are an inconvenient forum.

15. ENTIRE AGREEMENT. This agreement constitutes the entire contract between buyer and seller relating to the goods or services identified herein. No modifications hereof shall be binding upon the seller unless in writing and signed by seller's duly authorized representative, and no modification shall be effected by seller's acknowledgment or acceptance of buyer's purchase order forms containing different provisions. Trade usage shall neither be applicable nor relevant to this agreement, nor be used in any manner whatsoever to explain, qualify or supplement any of the provisions hereof. No waiver by either party of default shall be deemed a waiver of any subsequent default.

DESIGN VERIFICATION - SUMMARY OF PROPOSED TESTING

298 Federal Street, Greenfield, MA
3/3/2020

	Design Verification Tests/Tasks	Proposed	Description	To Be Completed By: REGENESIS or Consultant
Soil Physical Properties	Soil Borings-Physical Soil Description	x	Identification of physical soil properties and geology types. Physical identification of transport zones and back diffusion zones.	REGENESIS
	Soil Settling Tube Test	x	Field test to determine sand, silt and clay content.	REGENESIS
	Grain Size Analysis		Lab analysis of soil sample particle sizes. Can be used to accurately determine soil type.	
	Geophysical Borehole Logging		The use of Gamma-Ray, Conductivity, Resistivity and other logs for identifying the bedrock type	
	CPT		Uses a DPT rig for cone penetrometer testing for identifying soil properties and soil type.	
Soil & Groundwater Chemistry	Soil Sampling for COCs (e.g., VOCs)	x	Samples to determine residual contaminant sorbed mass.	Consultant
	Fraction Organic Carbon (foc)-Soil		Natural organic carbon level.	
	Groundwater Baseline Chemistry*	x	Lab tests for dissolved metals and other parameters that can affect PlumeStop distribution and performance.	Consultant
	Installation of Additional Monitoring Wells	x	Wells to target specific intervals of gw plume.	Consultant
Injection Rates & Distribution Testing	Grain Size Analysis		Lab analysis of soil sample particle sizes.	
	Hydrualic Conductivity/Pump Test		Field test conducted by the consultant. Significant factor in contaminant migration rates.	
	Clear Water Injection Test		Field test conducted by RRS or Tech Services to verify injection rates, pressures and disribution	
	Tracer Injection		Field test conducted by Tech Services to verify disribution	
	Field Calibration Test		Injection testing immediately prior to full scale injection	
	Pilot Test		An injection test with Regenesis products weeks or months before the full scale application.	
Transport Zone & Contaminant Flux	Injection Effect/Desorption Test		Coupled with a clear water injection test, can determine if injection process will desorb mass from the soil.	
	Passive Diffusion Bags		Devices inserted into wells to identify transport zones contaminant concentrations.	
	Passive Flux Meters		Devices inserted into wells to sample contaminant concentrations over time to determine rate of flux. When multiple are used per well they can identify transport zones.	
	Membrane Interface Probe/Hydraulic Profiling Tool (MiHPT)		Uses a DPT with interface probe to obtain high volume qualitative measurements of contaminants. When paired with HPT - Hydraulic Profiling Tool - provides vertical hydraulic conductivity profile to identify zones of mass flux and storage.	

APPENDIX M

O'Reilly, Talbot & Okun
ENGINEERING ASSOCIATES

File No. J2693-01-02
April 6, 2020

Ms. Valerie Bird, Director
Greenfield Board of Health
14 Court Square
Greenfield MA 01301

Re: Phase II Comprehensive Site Assessment
298 Federal Street
Greenfield, Massachusetts
RTN 1-18869

Dear Ms. Bird:

This letter is submitted to you on behalf of the Town of Greenfield, to notify you that a Phase II Comprehensive Site Assessment for the above referenced property has been submitted to the Massachusetts Department of Environmental Protection (MassDEP). Copies of the referenced report and accompanying data can be viewed on-line under the above referenced RTN number at the Massachusetts DEP website (http://db.state.ma.us/dep/cleanup/sites/search.asp). Copies of the Summary and Conclusions from the report are attached to this letter. If you have any questions on this matter, please feel free to give me a call.

If you have any questions regarding this matter, please contact me at 413-788-6222.

Very truly yours,
O'Reilly, Talbot & Okun Associates, Inc.

Bruce H. Nickelsen, LSP
Associate

ec: MassDEP

Attachments: Phase II Report Summary and Conclusions

O'Reilly, Talbot & Okun
ENGINEERING ASSOCIATES

File No. J2693-01-02
April 6, 2020

The Honorable Roxann Wedegartner, Mayor
Town of Greenfield
14 Court Square
Greenfield, MA 01301

Re: Phase II Comprehensive Site Assessment
298 Federal Street
Greenfield, Massachusetts
RTN 1-18869

Dear Mayor Wedegartner:

This letter is submitted to you on behalf of the Town of Greenfield, to notify you that a Phase II Comprehensive Site Assessment for the above referenced property has been submitted to the Massachusetts Department of Environmental Protection (MassDEP). Copies of the referenced report and accompanying data can be viewed on-line under the above referenced RTN number at the Massachusetts DEP website (http://db.state.ma.us/dep/cleanup/sites/search.asp). Copies of the Summary and Conclusions from the report are attached to this letter. If you have any questions on this matter, please feel free to give me a call.

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Very truly yours,
O'Reilly, Talbot & Okun Associates, Inc.



Bruce H. Nickelsen, LSP
Associate

ec: MassDEP

Attachments: Phase II Report Summary and Conclusions