GEC Project No. 911JR-3117

REVISED RELEASE ABATEMENT MEASURE (RAM) PLAN MODIFICATION REPORT AND APPLICATION FOR RISK-BASED CLEANUP OF PCBS EASTERN EXTERIOR COURTYARD

BOOTT MILLS
130 FOOT of JOHN STREET
LOWELL, MASSACHUSETTS
MADEP RTN: 3-26688

September 10, 2014

Prepared For:
Boott Mill Developer LLC
6 Faneuil Hall Marketplace
Boston, MA 02109

Submitted to:
Massachusetts Department of Environmental Protection
Northeast Regional Office
205 B Lowell Street
Wilmington, Massachusetts 01887

And

EPA New England, Region 1
5 Post Office Square - Suite 100
Boston, MA 02109-3912

Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781)356-9140 Fax: (781)356-9147
info@goldmanenvironmental.com

TABLE OF CONTENTS

SECTION **PAGE**

1.0 INTRODUCTION.....1

2.0 SITE CONDITIONS AND SURROUNDING RECEPTORS 4

3.0 PRIOR SITE ACTIVITIES.....6

4.0 RAM MODIFICATION OBJECTIVES 9

5.0 SIGNIFICANT NEW SITE INFORMATION OR DATA 17

6.0 MANAGEMENT OF REMEDIATION WASTE, REMEDIAL WASTEWATER AND/OR REMEDIAL ADDITIVES.....26

7.0 OTHER INFORMATION REQUIRED BY MADEP OR EPA REGION 1 27

8.0 LSP OPINION (310 CMR 40.0445(2)(e)) 28

9.0 PUBLIC INVOLVEMENT.....28

10.0 IMPLEMENTATION SCHEDULE AND FEE.....29

FIGURES

Figure 1: Site Locus

Figure 2: MADEP Site Scoring Map

Figure 3: Site Plan

Figure 3A: Site Plan (Eastern Courtyard)

Figure 3B: Site Plan (Eastern Courtyard with Grid Overlay)

Figure 3C: Site Plan (Eastern Courtyard showing Top 12-Inch Asphalt/Gravel Sub-base Sampling Locations

Figure 3D: Site Plan Showing Disposal Site Boundaries and Area Subject to AUL

Figure 4: Groundwater Contour Plan (Eastern Courtyard)

Figure 5A: Eastern Courtyard Plan, Soil PCB Concentrations – 2011 to 2013 Discrete Samples

Figure 5B: Eastern Courtyard Plan, Soil PCB Concentrations – 2013 Composite Samples

TABLE OF CONTENTS

FIGURES
(Continued)

Figure 5C: Eastern Courtyard Plan, Soil PCB Concentrations – 2014 Discrete Samples

Figure 5D: Eastern Courtyard Plan, Soil PCB Concentrations – 2014 Composite Samples

Figure 5E: Eastern Courtyard Plan, Combined Asphalt/Gravel Sub-base PCB Concentrations – 2014 Data

Figure 6A: Eastern Courtyard Plan, Soil Lead Concentrations- 0-3 Foot Interval

Figure 6B: Eastern Courtyard Plan, Soil Lead Concentrations- 3-7 Foot Interval

Figure 7A: Eastern Courtyard Plan, Excavation Areas to Achieve 50 mg/kg PCB Cleanup Standard

Figure 7B: Eastern Courtyard Plan, Excavation Areas to Achieve 10 mg/kg PCB Cleanup Standard

Figure 8A: Eastern Courtyard Plan, Hot Spot #1 Confirmatory Soil Sampling Locations

Figure 8B: Eastern Courtyard Plan, Hot Spot #2 Confirmatory Soil Sampling Locations

Figure 8C: Eastern Courtyard Plan, Hot Spot #3 Confirmatory Soil Sampling Locations

TABLES

Table 1.1: Summary of Groundwater Analytical Data: MADEP EPH & VPH

Table 1.2: Summary of Groundwater Analytical Data: PAHs

Table 1.3: Summary of Groundwater Analytical Data: Trace Metals

Table 1.4: Summary of Groundwater Analytical Data: PCBs

Table 1.5: Summary of Groundwater Analytical Data: VOCs

Table 2.1: Summary of Soil Analytical Data: MADEP EPH, TPH & PAHs

Table 2.2.1: Summary of Soil and Asphalt Analytical Data: PCBs

Table 2.2.2: Summary of Soil Analytical Data: PCB Congeners

Table 2.2.3: Calculation of TCDD Toxic Equivalence for Soil Analytical Data: PCB Congeners

TABLE OF CONTENTS

TABLES
(Continued)

Table 2.2.4: Comparison of Total Dioxin-like PCB Congeners to TCDD Toxic Equivalence and Total PCBs for Soil Analytical Data

Table 2.3: Summary of Soil Analytical Data: Total Trace Metals

Table 3: Summary of Soil Vapor Data: PCBs

Table 4: Groundwater Elevation Measurements

Table 5.1: Evaluation of Groundwater Analytical Data: EPH

Table 5.2: Evaluation of Groundwater Analytical Data: PAHs

Table 5.3: Evaluation of Groundwater Analytical Data: Trace Metals

Table 5.4: Evaluation of Groundwater Analytical Data: PCBs

Table 5.5: Evaluation of Groundwater Analytical Data: VOCs

Table 6.1.1: Evaluation of Soil Analytical Data to Identify COCs: EPH, TPH & PAHs

Table 6.1.2: Evaluation of Soil Analytical Data to Identify Method to Derive EPCs: EPH

Table 6.1.3: Derivation of Soil Exposure Point Concentrations: EPH

Table 6.2.1: Evaluation of Soil Analytical Data to Identify COCs: PCBs

Table 6.2.2: Evaluation of Soil Analytical Data to Identify Hot Spots and Exposure Points: PCBs

Table 6.2.3: Evaluation of Soil Analytical Data to Identify Representative Soil Samples: PCBs

Table 6.2.4: Evaluation of Soil Analytical Data to Identify Method to Derive EPCs: PCBs

Table 6.2.5: Derivation of Soil Exposure Point Concentrations: PCBs

Table 6.3.1: Evaluation of Soil Analytical Data to Identify COCs: Metals

Table 6.3.2: Evaluation of Soil Analytical Data to Identify Method to Derive EPCs: Metals

Table 6.3.3: Derivation of Soil Exposure Point Concentrations: Metals

Table 6.4: Summary of Soil Exposure Point Concentrations

Table 6.5: Exposure Point Concentrations for Dust

Table 7: Summary of Baseline Risk Estimates

Table 8: Summary of Derived PCB and Lead Cleanup Standards for Soils

Table 9: Comparison of Soil and Groundwater Exposure Point Concentrations to MCP Upper Concentration Limits

TABLE OF CONTENTS
(continued)
ATTACHMENTS

Attachment 1: Release Abatement Measure Status Report #1, Boott Mills, March 2014

Attachment 2: Conceptual Site Model, Baseline Method 3 Risk Characterization and Derivation of Clean-up Standards for PCBs and Lead, and Proposed Conditions for Notice of Activity and Use Limitation, Boott Mills – Exterior Courtyard PCB Release, dated July 1, 2014

Attachment 2A – Baseline Risk Assessment for Commercial Worker

Attachment 2B – Baseline Risk Assessment for Resident

Attachment 2C – Baseline Risk Assessment for Construction Worker

Attachment 2D – Baseline Risk Assessment for Utility Worker

Attachment 2E – Cleanup Standard Calculations for Resident

Attachment 2F – Cleanup Standard Calculations for Construction Worker

Attachment 3: QA/QC Plan & SOPs, dated July 16, 2014

Attachment 4: Laboratory Reports – March and June 2014

Attachment 5: Data Usability & Representativeness Evaluation

Attachment 6: Soil Management Plan, Boott Mills, Remediation of PCB Soils in Excavation #1, Excavation #2 and Excavation #3, dated July 6, 2014

Attachment 7: Soil Management Plan, Boott Mills, Post Class A-3 RAO Utility Repair Projects, dated July 6, 2014

Attachment 8: Feasibility Evaluation of PCB Remedial Alternatives

Attachment 9: Certification

Attachment 10: Public Notifications

Attachment 11: Boring Logs – March and June 2014

1.0 INTRODUCTION

Goldman Environmental Consultants, Inc. (GEC) on behalf of Boott Mill Developer, LLC, the property owner, submits the following Release Abatement Measure (RAM) Plan Modification Report and Application for Risk-Based Cleanup of Polychlorinated Biphenyls (PCBs) for the release of oil and hazardous materials (OHM) to soil located at 130 Foot of John Street in Lowell, Massachusetts. The disposal site is mostly located within two courtyards associated with 130 Foot of John Street. The eastern exterior courtyard is impacted by a release of PCBs and lead. The western interior courtyard is impacted by a release of lead. The PCB release is assigned release tracking numbers (RTN) 3-26688, which is the primary RTN for the property. RTN 3-30667 is a secondary RTN linked to RTN 3-26688, and is associated with the lead release.

Initially a RAM Plan for both the eastern exterior courtyard and western interior courtyard was electronically submitted to the Massachusetts Department of Environmental Protection (MADEP) on August 2, 2012 and was mailed to Region 1 of the United States Environmental Protection Agency (EPA Region I) on August 2, 2012. Following the submittal of the RAM Plan, subsurface investigations were conducted in both courtyards and these subsurface investigations were summarized in a RAM Status Report, dated November 30, 2012, which pertained to both courtyards (Attachment 1 of the *RAM Plan Modification and Application for Risk-Based Cleanup of PCBs*, dated August 27, 2013). Following the submittal of the November 30, 2012 RAM Status Report to MADEP, GEC submitted separate RAM Status Reports for the eastern exterior courtyard and for the western interior courtyards in the hopes of eliminating any possible confusion between the two. On June 7, 2013 separate RAM Status Reports, one for the eastern exterior courtyard (contained in Attachment 2 of the *RAM Plan Modification and Application for Risk-Based Cleanup of PCBs*, dated August 27, 2013) and one for the western interior courtyard, dated June 6, 2013, were submitted to the MADEP.

In August 2013, a *RAM Plan Modification Report and Application for Risk-Based Cleanup of PCBs* for the eastern exterior courtyard was submitted to MADEP and EPA Region I. This documented contained the plans for the excavation of PCB-contaminated soils from PCB Hot Spots for off-Site disposal, and included the following: (1) two RAM Status Reports; (2) a Conceptual Site Model / Baseline Risk Characterization / Derivation of Clean-up Standards for PCB and Lead; (3) a QA/QC Plan and Standard Operating Procedures; (4) Laboratory Reports; (5) Data Usability and Representativeness Evaluation; (6) Soil Management Plan for Remediation of PCB Hot Spot Soils; (7) Soil Management Plan for Post Class A-3 Response Action Outcome Utility Repair Projects; (8) Feasibility Evaluations; (9) Certifications; and (10)

Public Notifications. The intent of the *RAM Plan Modification Report and Application for Risk-Based Cleanup of PCBs* was to outline procedures to conduct a Site-specific risk-based cleanup of PCBs in accordance with applicable regulations and guidelines promulgated by both the MADEP and the EPA. It was prepared in accordance with the Massachusetts Contingency Plan (MCP) (310 CMR 40.0000), and the requirements of the "risk-based procedure" for the clean-up of PCB contamination as described by the EPA under the Toxic Substances Control Act (TSCA) and specifically in the PCB regulations at 40 CFR 761.61.

In a letter, dated October 22, 2013, EPA Region I provided their comments to the request for risk-based PCB cleanup under 40 CFR § 761.61(c). GEC on behalf of Boott Mill Developer LLC responded to EPA Region I's comments in a letter, dated December 20, 2013. GEC's response letter included a field investigation plan to address the following elements: (1) the collection of soil samples from the 0-0.5, 0.5-1, 1-2 and 2-3 foot intervals for analysis of PCBs to determine if any shallow thickness contained more than 10 mg/kg PCBs; (2) the collection of soil samples from the 0-1, 1-2, 2-3, 3-4 and 4-5 foot intervals near B-2 and B-16 to determine if any one-foot thickness of soils contained levels greater than 50 mg/kg PCBs; (3) Soxhlet extraction via EPA Method 3540; (4) analysis of soil samples for PCBs via EPA Method 8280A; and (5) analysis of select soil samples for PCB dioxin-like congeners via EPA Method 8270M. The soil sampling plan was provided as Table 2 in GEC's December 20, 2013 response letter to EPA Region I and in the March 2014 RAM Status Report, which is provided as Attachment 1. The field investigation was conducted in March 2014.

Following the completion of the field investigation and initial evaluation of the data, a determination was made that a small fraction of the PCB contamination contained the dioxin-like congeners of PCB. During subsequent discussions, EPA Region I suggested that the PCB cleanup standard could be set at 50 mg/kg, so long as justified based on a cost-benefit analysis as well as other factors. The cost-benefit analysis (feasibility evaluation) is provided as Attachment 8.

Based on this new potential cleanup standard, an additional investigation was conducted to determine the volume of soils containing more than 50 mg/kg PCBs. Additional analysis of dioxin-like congeners was not conducted because the dioxin-like congeners contribute to a very small portion of the risk estimates, as documented in Attachment 2 Section 3.0. This additional investigation was conducted during June 2014 and is documented in Section 5.2, below.

Upon consultation with EPA Region I, the cleanup standard will be set at 50 mg/kg PCB for <u>individual soil sampling locations</u> and a TSCA cap will be installed over the exterior

courtyard. The selection of a 50 mg/kg PCB cleanup standard is supported by a feasibility evaluation (cost-benefit analysis), which compares and contrasts the 10 and 50 mg/kg PCB cleanup standard options.

However, because utility lines and subsurface structures (storm drain system) will exist beneath the cap, a risk characterization compliant with the MCP was conducted to ensure that short-term exposure to the PCBs by utility workers and construction workers would be consistent with No Significant Risk of harm. In addition, exposures to residents and commercial workers were also considered. As a result of this risk characterization, a MCP cleanup standard of 10 mg/kg for the exposure point concentration was identified (Attachment 2).

This *Revised RAM Plan Modification and Application for Risk-Based Cleanup of PCB* proposes the following remediation: (1) the removal of 12-inches of asphalt and base material from the entire exterior courtyard so that a TSCA cap can be constructed; (2) the recycling of the asphalt / base material containing no more than 2 mg/kg PCB at an asphalt batching plant; (3) the off-site disposal of asphalt/gravel sub-base material containing more than 2 mg/kg but less than 50 mg/kg PCBs at a facility approved to accept PCB contaminated material less than 50 mg/kg; (4) the excavation of three hot spots of PCB-contaminated soils to the 50 mg/kg PCB cleanup standards and the transportation of the soil to a hazardous waste landfill approved to accept PCB remediation waste with concentrations greater than 50 mg/kg PCBs; (5) the construction of a TSCA cap over the soils of exterior courtyard; (6) recording / registering a Notice of Activity and Use Limitation (deed restriction) providing notification of the PCB contamination and requiring maintenance of the TSCA cap over the exterior courtyard and the foundation floor of Mill Building #5; (7) the preparation of a Soil Management Plan for future emergency utility repair projects; and (8) the preparation of a Best Management Plan to prohibit gardening of edible produce within the soils currently occupied by Mill Buildings #3 and #5 and the exterior courtyard. Please refer to Attachment 6 for the Soil Management Plan (SMP) which outlines the excavation sequence, handling and transportation and disposal/recycling of the excavate materials, dust monitoring and decontamination procedures.

This *Revised RAM Plan Modification and Application for Risk-Based Cleanup of PCB* contains the following Attachments: (1) RAM Status Report; (2) Conceptual Site Model, baseline Method 3 Risk Characterization, derivation of PCB cleanup standards, and identification of conditions of Notice of Activity and Use Limitation; (3) QA/QC Plan and Standard Operating Procedures for confirmatory soil sampling; (4) laboratory reports for supplemental investigations; (5) Data Validation and Representativeness Evaluation for the data used in the risk characterization; (6) Soil Management Plan for PCB Hot Spot remediation; (7)

Soil Management Plan for post-Permanent Solution utility worker; (8) Feasibility Evaluations required by MCP and TSCA; (9) certification required by TSCA; (10) copies of public notification letters; and (11) boring logs.

The person assuming responsibility for conducting this RAM is:

Boott Mill Developer, LLC (Property Owner)
c/o Gilbert Winn
6 Faneuil Hall Marketplace
Boston, MA 02109
Phone: (617) 742-4500

2.0 SITE CONDITIONS AND SURROUNDING RECEPTORS

A detailed description of the Site conditions and surrounding receptors can be found in the *Phase I Initial Site Investigation (ISI) Report* prepared by GEC and dated April 11, 2012 for RTNs 3-26688 & 3-30667. Pertinent information obtained from the report is provided below. Additional information pertaining to site conditions, including a Conceptual Site Model and a description of MCP regulatory history at the Site is included in Attachment 2, *Conceptual Site Model, Baseline Method 3 Risk Characterization and Derivation of Clean-up Standards for PCBs and Lead, and Proposed Conditions for Notice of Activity and Use Limitation, Boott Mills – Exterior Courtyard PCB Release*.

The property is located at 130 Foot of John Street and consists of a 1.7-acre parcel that is occupied by three adjoining mill buildings identified as Mill buildings 3, 4, and 5. The longitude and latitude of 130 Foot of John Street, Lowell, MA are 42°38’54” north and 71°18’29” east/west. The Universal Transverse Mercator (UTM) coordinates are 310807 meters east and 4724354 meters north Currently the property buildings contains 39 occupied residential condo units, 78 finished apartments, of which 74 are occupied, 4,000 square feet of occupied commercial space, and 39,000 square feet of unfinished commercial space. The current usage of the surrounding Mill buildings is mixed usage consisting of residential, office, commercial, museum and empty space

The Site Locus is provided as Figure 1. The MADEP Site Scoring Map, showing 500-foot and ½-mile radii, is provided as Figure 2. The Site Plan is provided as Figure 3. The eastern courtyard is depicted in Figures 3A to 3C. The Disposal Site Boundaries and Area to be subject to a Notice of Activity and Use Limitation (AUL) are depicted in Figure 3D.

No schools or day cares are known to be located within 500 feet of the property.

Institutions are defined at 310 CMR 40.0006 as any publicly or privately owned hospital, health care facility, orphanage, nursing home, convalescent home, educational facility or correctional facility, where such facility in whole or in part provides overnight housing. No institutions are known to be located within 500 feet of the property.

Natural resource areas include: (1) all surface waters, including wetlands, vernal pools, ponds, lakes, streams, rivers and reservoirs; (2) drinking water supplies consisting of Zone II areas, Interim Wellhead Protection Areas, Zone A areas, Potentially Productive Aquifers, and private wells; (3) Areas of Critical Environmental Concern (ACEC); (4) Sole Source Aquifers; (5) local, state and/or federal protected open space; (6) fish habitats; and (7) habitats of Species of Special Concern or Threatened or Endangered Species.

The Merrimack River abuts the property to the north and the Merrimack Canal abuts the property to the west. Other canals located within ½-mile of the disposal site include, the Northern Canal, the Hamilton Canal, and the Eastern Canal. The Concord River is located approximately ½-mile southeast of the disposal site.

The Merrimack River generally flows from northwest to southeast in the vicinity of the property. In the vicinity of the disposal site, the Merrimack River is a Class B (Warm Water, Treated Water Supply, CSO) water body according to the Massachusetts Surface Water Quality Standards [314 CMR 4.00] for unlisted waters. Class B water bodies are designated as a habitat for fish, other aquatic life and wildlife, and for primary and secondary contact recreation. Class B (Warm Water) water bodies are subject to dissolved oxygen and temperature criteria for warm water fisheries. Class B (Treated Water Supply) water bodies denotes those Class B waters that are used as a source of public water supply after appropriate treatment. Class B (CSO) water bodies occasionally are subject to short-term impairment of swimming or other recreational uses due to untreated combined sewer overflow discharges in a typical year, and the aquatic life community may suffer adverse impact yet is still generally viable.

Based on a review of the MADEP Site Scoring Map (Figure 2), the disposal site is located within a 100-year flood plain. Other 100-year flood plains are located within ½-mile of the disposal site along the Merrimack River, the Eastern Canal, the Hamilton Canal and the Concord River. A Natural Heritage and Endangered Species Program (NHESP) estimated rare wetland habitat is located in the portion of the Merrimack River that abuts the property. Protected Open Spaces are located approximately 500-feet southeast, 500-feet north, ¼-mile

southwest, ¼-mile southeast, ½-mile west, ½-mile southwest, ½-mile east and ½-mile north of the property.

The property and surrounding areas are serviced by the municipal potable water supply. Based on the MADEP Site scoring map, the property is not located within a potential or actual drinking water source area. No private water supply wells are located nearby.

3.0 PRIOR SITE ACTIVITIES

Based on the RAM Completion Report prepared by Environmental Compliance Services, Inc. (ECS), dated January 29, 2008, a release of PCBs was discovered in the eastern (exterior) courtyard by TRC Solutions, Inc. of Lowell, MA in November 2006. ECS, submitted a RAM Plan to the MADEP, on December 8, 2006, that provided details on the planned excavation of PCB-contaminated soils. The presence of PCBs in soils at a concentration (22.73 mg/kg) greater than the applicable Reportable Concentration RCS-1 (2 mg/kg) was reported to the MADEP as a 120-day reportable condition on March 20, 2007. The PCB release condition was assigned RTN 3-26688.

Soil excavation was conducted on March 29 and 30, 2007 under the December 2006 RAM Plan. Excavated soils were directly loaded onto trucks and transported to Turnkey Landfill in Rochester, New Hampshire. A total of 209 tons of soil was transported off-site for disposal. On April 5, 2007, nine soil samples were collected from the sidewalls and bottom of the excavation for confirmatory analysis. PCB levels ranged from none detected to 6.15 mg/kg. Polycyclic aromatic hydrocarbons (PAHs) and lead were detected at levels above Method 1 S-1 standards. No separate release notification appears to have occurred for the PAHs and lead. On April 30, 2007, the excavation was backfilled with clean soils and gravel. ECS submitted a RAM Completion Report to the MADEP on January 29, 2008, on behalf of Boott Cotton Mill Development Corporation. A stormwater management system was installed in the excavated area subsequent to the RAM. Presumably no RAM Plan was needed because the work was done within the clean backfill.

The activities described above were conducted prior to GEC's involvement at the site, and under the direction of previous ownership. To the best of our knowledge EPA Region I was not notified of the PCB release, provided a copy of the RAM Plan prior to conducting RAM activities, or provided a copy of the RAM Completion Report (presumably because all concentrations of PCBs were detected below 50 mg/kg).

In February 2010 GEC was contracted by an entity interested in purchasing the property to conduct a due diligence Phase I Environmental Site Assessment (ESA) for the property. Subsequently, in June and September 2011, due diligence subsurface investigations were conducted by GEC to evaluate the extent and magnitude of contamination across the Site. Subsurface investigations included: the advancement of thirteen test borings within both the exterior and enclosed courtyards, with seven completed as groundwater monitoring wells; the collection of soil samples from all thirteen borings; the collection of groundwater samples from the recently installed monitoring wells; the installation of two permanent soil vapor points (SVPs); and the collection of soil vapor samples from both SVPs. Soil and groundwater samples were submitted under chain of custody to Groundwater Analytical, Inc. (GWA) of Buzzards Bay, Massachusetts, Con-Test Analytical Laboratory (Con-Test) of East Longmeadow, Massachusetts, or Alpha Analytical, Inc. (Alpha) of Westborough, Massachusetts for laboratory analysis. GWA was a state-certified laboratory at the time of the June 2011 sampling, but ceased operations shortly thereafter. As a result, the September 2011 samples were sent to Con-Test or Alpha; both labs are state-certified laboratories. Refer to Figures 3 and 3A for Site Plans depicting test boring and monitoring well locations. Groundwater analytical data are summarized in Tables 1.1 to 1.5; soil analytical data in Tables 2.1 to 2.3; and soil vapor analytical data in Table 3. Groundwater elevation measurements are provided in Table 4.

GEC's 2011 subsurface investigation within the eastern exterior courtyard found evidence of residual PCB contamination in soil above the applicable MADEP Method 1 S-1 Standard (2 mg/kg), with one soil sample containing PCB (124 mg/kg) at a level exceeding its MCP Upper Concentration Limit (UCL) (100 mg/kg) for soil and TSCA limit (50 mg/kg). The full extent of PCB contamination in soils, including whether the contamination extends beneath mill Buildings 3 or 5, was not known at the time GEC's RAM Plan was submitted.

PCBs were only detected in two groundwater samples collected via bailer (not low flow technique) from recently installed monitoring wells (GEC-1 and GEC-2). Subsequent filtered and non-filtered samples collected from GEC-1 and GEC-2 via low flow technique contained no detectable levels of PCBs. In addition, little or no volatile petroleum hydrocarbons (VPH) or volatile organic compounds (VOCs) were detected in the groundwater samples. Based on these results, PCBs, VOCs and VPH in groundwater is not a significant issue. Insufficient VOCs and VPH are present in groundwater to result in the co-solution of PCBs in groundwater.

No PCBs were detected in the soil vapor samples. The sample detection limit for individual Aroclors ranged from 0.040 to 0.049 ug/m^3. A Residential Soil Vapor Screening Value was calculated using the PCB "ambient air cancer risk concentration" (0.01 μg/m^3) for a

cancer risk of 1E-06, obtained from EPA's Integrated Risk Information System (IRIS), and a soil vapor to indoor air attenuation factor of 70, consistent with MADEP's Interim Final Vapor Intrusion Guidance document. The EPA derived the ambient air cancer risk concentration from the upper-bound cancer unit risk for inhalation of 1E-04 per $\mu g/m^3$, which is also provided in IRIS. The resulting Residential Soil Vapor Screening Value is 0.70 $\mu g/m^3$, which is far above the highest Aroclor detection limit for the soil vapor samples. Therefore, vapor intrusion of PCBs from the subsurface into indoor air of the mill buildings is unlikely to occur. This comparison is documented in Table 3.

For the eastern exterior courtyard, concentrations of lead in shallow soils (0-3 feet) collected from borings B-10, B-11, and B-12 exceed the MADEP's background concentrations for soils associated with fill containing coal ash or wood ash. The levels of lead also exceed the Method 1 S-1 soil standards.

For monitoring well GEC-1, located in the eastern exterior courtyard, total lead was detected (71 ug/l) above its Method 1 GW-3 standard (10 ug/l) in the groundwater sample collected on September 7, 2011. Yet, no dissolved lead was detected in the filtered sample collected at the same time from GEC-1, thereby suggesting that lead is adsorbed to soil particles and is not mobilized within the water column.

GEC's investigation in the eastern exterior courtyard also found levels of the following PAHs above their MADEP-published background concentrations and Method 1 S-1 soil standards: benzo[a]anthracene, benzo[b]fluoranthene, benzo[a]pyrene and dibenzo[a,h]anthracene. These exceedences were detected in samples obtained from soil recoveries that contained fly ash, coal, gasified coal and / or coal ash. The presence of PAHs is due at least in part to the presence of coal ash in the soils, which is a background condition.

Chromium was detected in one soil sample and nickel in two soil samples at levels greater than their Method 1 S-1 standards and slightly greater than background concentrations. The presence of chromium and nickel may be attributable to the observed presence of coal ash, fly ash and coal in the fill, and/or to historic industrial operations at the subject property.

The Phase I ISI Report was submitted to the MADEP in April 2012. All work not described in the Phase I ISI Report was conducted as a RAM and has been summarized in the RAM Plan, dated August 2, 2012, and RAM Status Reports, dated November 30, 2012, June 6, 2013 and March 7, 2014. The standard operating procedures (SOPs) utilized during characterization of the Site are included as Attachment 3. Laboratory Reports for all of the

samples collected since August 2013 are included as Attachment 4. All laboratory reports have undergone a representativeness evaluation and data usability assessment, in accordance with 310 CMR 40.1056(2)(k) and consistent with MADEP guidance, *MCP Representativeness Evaluations and Data Usability Assessments*, Policy WSC-07-350, dated September 19, 2007, provided as Attachment 5. Refer to Figures 5A to 5D for a depiction of PCB concentrations detected in soils in the eastern courtyard, in discrete samples and composite samples, and in Figure 5E for asphalt/gravel sub-base PCB concentrations. Refer to Figures 6A and 6B for a depiction of lead concentrations detected in soils in the eastern courtyard, in the 0-3 foot interval and in the 3-7 foot interval, respectively. Refer to Figure 7A for the locations of the three identified PCB Hot Spots and for the extents of proposed soil excavations to achieve a 50 mg/kg PCB cleanup for all individual soil samples (and 10 mg/kg exposure point concentration limit PCB cleanup). Figure 7B provides the excavation area and depths that would be required to achieve 10 mg/kg PCB cleanup for all soil samples.

4.0 RAM MODIFICATION OBJECTIVES

The RAM Plan, dated August 2, 2012, had three general objectives: (1) conduct additional subsurface investigations within the eastern courtyard of the Site to address data gaps and more accurately determine the horizontal and vertical extent of PCB contamination; (2) conduct soil removal activities, if appropriate, to reduce the concentration of PCB in soils to applicable MCP and TSCA standards; and (3) properly dispose of contaminated soils in accordance with applicable state and federal requirements.

Objective 1 has been conducted; horizontal and vertical extents of PCB contamination have been delineated. Activities related to Objective 1 were discussed in previous RAM submittals and in Section 5.2 below. Based on the subsurface investigations conducted under Objective 1, a determination was made that soil removal activities are warranted to reduce PCB concentrations in soil. Hot spots of PCB-contaminated soil have been identified and a *Method 3 Risk Characterization and Derivation of Clean-up Standards for PCBs and Lead* has been conducted (Attachment 2). Based on the findings of the *Method 3 Risk Characterization and Derivation of Clean-up Standards for PCBs and Lead*, three PCB Hot Spots of soil contamination, warranting excavation, have been identified. The horizontal and vertical extents of each planned excavation area (i.e., extents of PCB Hot Spots) have been established based on the existing soil data. Off-Site locations for disposition of excavated PCB-contaminated soils have been tentatively identified, pending EPA Region I and disposal facility approval. Details/modifications pertaining to Objectives 2 and 3 are described below.

4.1 PCB Clean-up Standards

GEC derived Site-specific PCB clean-up standards in the initial RAM Plan Modification and Application for Risk-Based Cleanup of PCBs. Based on additional investigations conducted in response to EPA Region I's comments on the Application, a larger portion of the exterior courtyard was determined to have one or more soil samples with levels of PCB exceeding 10 mg/kg. EPA Region I suggested trying to justify a 50 mg/kg PCB clean-up standard presuming the installation of a TSCA cap and including a feasibility evaluation justifying the remediation of PCB-contaminated soils to 50 mg/kg rather than to 10 mg/kg (Attachment 8). Based on this recommendation, new Site-specific clean-up standards for PCB were derived, as documented below.

The remediation of PCB Hot Spot soils will involve the excavation of soils with PCB levels above the derived Site-specific clean-up standards for PCBs. A description of how the Site-specific clean-up standards were derived is provided in Section 4.0 of Attachment 2. A site-specific risk-based clean-up standard of 10 mg/kg PCB was derived. The 10 mg/kg PCB clean-up standard is also consistent with the TSCA >1 to 10 mg/kg PCB clean-up standard for High Occupancy limit assuming the presence of a cap over the soils. This standard is compared to the exterior courtyard exposure point concentrations, which include confirmatory soil data following remediation of all three PCB Hot Spots. The exposure point concentration for PCB is the 95th percentile upper confidence limit on the mean. A PCB clean-up standard for individual confirmatory samples was also identified. The clean-up standard for individual confirmatory samples is 50 mg/kg, which is the TSCA Low Occupancy limit assuming the presence of a cap over the soils.

The Site-specific clean-up standards and the planned application of the clean-up standards are provided in Table 8. The risk-based PCB cleanup standard (10 mg/kg), which is compared to the PCB exposure point concentration for soils across the Site (i.e., 95th percentile upper confidence limit on the mean) satisfies the requirements of the MCP (presuming the installation of a protective barrier). The EPA cleanup standard for PCBs in soils is 50 mg/kg, where all individual soil samples must contain no more than 50 mg/kg PCB.

4.2 Soil Removal Activities and Cap Construction

In addition to the removal of the soil within the three PCB Hot Spots, the asphalt and gravel sub-base will be removed from across the courtyard to allow for the installation of a TSCA-compliant protective barrier or cap. In order to keep the disturbance to a minimum, the

Hot Spots will be excavated one at a time first, followed by the remaining asphalt throughout the courtyard. After the completion of PCB Hot Spot excavation the remaining asphalt pavement and underlying gravel sub-base will be removed to an approximate depth of 12 inches, and live-loaded and transported off-Site for either recycling or disposal.

The current asphalt alone is approximately 4 to 5 inches thick followed by several inches of processed gravel sub-base. To prepare for the asphalt/gravel sub-base removal, six composited samples (identified as ACS-1 to ACS-6) of asphalt/gravel sub-base were submitted for analysis of PCBs via EPA Method 8082A. The locations of the individual asphalt/gravel sub-base samples and composited zones are depicted in Figure 3C. The distribution of PCBs in ACS-1 to ACS-6 is depicted in Figure 5E.

The levels of PCBs in the asphalt/gravel sub-base of ACS-1 to ACS-4 ranged between <0.17 and 1.73 mg/kg. These levels are less than the 2 mg/kg PCB limit for recycling via asphalt batching. The top 12inches of asphalt/gravel sub-base from ACS-1 to ACS-4 will be transported to Aggregate Industries of Plainville, Massachusetts for recycling under a Bill of Lading or Material Shipping Record for asphalt batching (PCB concentrations <2 mg/kg). The area of ACS-1 to ACS-4 is estimated to be 3,518 square feet. Presuming the top 12 inches of asphalt/gravel sub-bases are removed, the volume of asphalt/gravel sub-bases to be transported for asphalt batching is estimated to be approximately 130 cubic yards.

For ACS-5 and ACS-6, the levels of PCB are 7.68 and 4.41 mg/kg, respectively. The levels of PCB detected in ACS-5 and ACS-6 are too high for recycling via asphalt batching and will therefore, be transported off-site for disposal. The top 12 inches of asphalt/gravel sub-base from ACS-5 and ACS-6 will be transported to Waste Management, Turnkey in Rochester, New Hampshire for disposal under a Uniform Hazardous Waste Manifest, permitted to accept PCB concentration less than 50 mg/kg. The area of ACS-5 and ACS-6 is estimated to be 1,936 square feet. Presuming the top 12 inches of asphalt/gravel sub-bases are removed, the volume of asphalt/gravel sub-base to be transported and disposed at Waste Management, Turnkey is estimated to be approximately 72 cubic yards. No hot spots of lead-contaminated soils were identified. The representative levels of lead (exposure point concentrations between 287 and 419 mg/kg) in soils of the exterior courtyard are less than the Site-specific cleanup standard for lead of 450 mg/kg for the eastern courtyard exposure point concentration. The lead cleanup standard is intended to ensure that the total cumulative non-cancer risk limit is less than the MCP's non-cancer risk limit of 1, because both lead and PCBs are significant contributors to non-cancer risk at this Site. No confirmatory soil samples are planned to be collected and analyzed for lead

following the completion of PCB hot spot excavation, because soil excavation is planned to lower PCB levels in soils not lead levels in soils.

Three areas within the eastern, exterior courtyard have been identified for soil removal and are depicted on Figure 7A as PCB Hot Spot #1, PCB Hot Spot #2 and PCB Hot Spot #3. Soils in these areas require removal for No Significant Risk of harm to be achieved (Attachment 2).

PCB Hot Spot #1 will be excavated to the east up to the fire hydrant and its supply line, to the southern wall of the Mill #5 building, to near boring B-17 on the west where PCB concentrations are known to be non-detect in soil samples collected from the 0-3, 3-5 and 5-7 foot intervals, and to near boring B-57B where PCB concentrations are known to be no more than 5.2 mg/kg based on soil samples collected from the 1-2, 2-3 and 3-5 foot intervals. Hot Spot #1 will be excavated to a depth of 4 feet below grade below where PCB concentrations are known to be less than 50 mg/kg based on previously collected soil sample (B-10 3-6' = 1.1 mg/kg PCB). Soil will be excavated from Hot Spot #1 from a depth of ground surface to 4 feet below grade and live loaded for transport and disposal to Waste Management Model City, Model City, New York (for PCB concentrations > 50 mg/kg). The area to be excavated is approximately 68 square feet, and the volume of soil to be excavated and transported off-Site for disposal is approximately 10 cubic yards.

PCB Hot Spot #2 will be excavated to the western edge of the stormwater system, to the northern wall of the Mill #3 building, to borings B-38, B-38A and B-71 to the north where PCB concentrations are known to be less than 50 mg/kg based on previously collected soil samples, and to near boring B-8 on the west where PCB concentrations are known to be less than 50 mg/kg based on previously collected soil samples. Hot Spot #2 will be excavated to a depth of 7 feet below grade where PCB concentrations are known to be less than 10 mg/kg based on previously collected soil samples (B-26 7-9' = 3.1 mg/kg PCB; B-26 9-12' = no PCB detected). Soil will be excavated from Hot Spot #2 from a depth of ground surface to 7 feet below grade and live loaded for transport and disposal to Waste Management Model City, Model City, New York (for PCB concentrations > 50 mg/kg). The area to be excavated is approximately 124 square feet, and the volume of soil to be excavated and transported off-Site for disposal is approximately 32 cubic yards.

PCB Hot Spot #3 will be excavated to the southern wall of the Mill #5 building, to the stormwater system to the south, to borings B-9 and B-16 to the east where PCB concentrations are known to be less than 50 mg/kg, and to near borings B-48 and B-48A to the west where PCB

concentrations are known to be less than 50 mg/kg based on previously collected soil samples. Hot Spot #3 will be excavated to a depth of 5 feet below grade where PCB concentrations are known to be less than 50 mg/kg based on previously collected soil samples (B-16 5-7', 7-9' and 9-12'). Soil will be excavated from Hot Spot #3 from a depth of ground surface to 5 feet below grade and live loaded for transport and disposal to Waste Management Model City, Model City, New York (for PCB concentrations > 50 mg/kg). The area to be excavated is approximately 230 square feet, and the volume of soil to be excavated and transported off-Site for disposal is approximately 43 cubic yards.

All excavation activities will be conducted in accordance with the Soil Management Plan (SMP) for the Remediation of the three PCB Hot Spots (Attachment 6). Contaminated soil will be live loaded and transported off-Site under a Uniform Hazardous Waste Manifest, to be properly disposed of at an appropriate disposal facility in accordance with the TSCA and MCP. Tentatively, all soils excavated from PCB Hot Spots #1 to #3 will be transported to Waste Management Model City, Model City, New York (for PCB concentrations > 50 mg/kg). The total estimated volume of remediation waste to be shipped for disposal at Waste Management Model City is 85 cubic yards.

Upon EPA Region I's approval to conduct the excavations, GEC will seek final approval from the disposal/recycling facilities identified. During soil excavation activities, utilities will be supported and not removed. Soils will be excavated from along building walls and the storm drain system in small sections, polyethylene sheeting will be placed in the excavation to note the extents of excavation and then the excavation backfilled with clean fill brought on from off-site before proceeding to excavate the next section to avoid undermining the Site buildings and the storm drain system.

Prior to the placement of any backfill, and upon completion of the excavation, confirmatory samples will be collected from the sidewalls and bottoms of the excavation and the excavation lined with polyethylene sheeting to note the extents of the excavation in case confirmatory samples indicate further excavation is needed. If necessary, additional excavation work followed again by confirmatory sampling, will be conducted. The confirmatory soil monitoring plan for PCB is provided in Section 4.3.

Following completion of the PCB Hot Spot remediation program, a cap or protective barrier that is compliant with 40 CFR 264.310(a) and 40 CFR 761.75(b)(1)(ii) through (b)(1)(v) will be installed over the soils of the exterior courtyard. The cap will consist of six inches of bituminous asphalt underlain by six inches of processed gravel. This exceeds the minimum

thicknesses of a 10 inch compacted soil cap and/or the 6 inch asphalt cap required under 40 CFR 264.310(a). The cap will be of sufficient strength to maintain its effectiveness and integrity during the use of the cap surface. The principal purpose of this cap is to mitigate direct contact of the remaining PCB-contaminated soils in the exterior courtyard.

4.3 Monitoring Plan

Numerous subsurface investigations have been conducted within the eastern, exterior courtyard including grid sampling, Soxhlet extraction of soil samples prior to PCB analysis, and dioxin-like PCB congener analysis conducted in accordance with EPA's Subpart N of 40 CFR 761 and EPA Region I's guidance. Refer to Attachment 3 for the SOPs.

Based on the results of concurrent Aroclor PCB and dioxin-like PCB congener analyses, a small proportion of the total Aroclor PCBs is attributable to dioxin-like PCBs (in TCDD toxicity equivalence). If the 95th percentile upper confidence limit on the mean for the eastern courtyard is no more than 10 mg/kg PCB, the dioxin-like PCBs (in TCDD toxicity equivalence) will not significantly impact Site risk (see Attachment 2). Therefore, confirmatory sampling will be conducted for Aroclor PCBs via EPA Method 8082A with Soxhlet extraction.

Confirmatory soil samples will be collected in accordance with Subpart O of 40 CFR § 761. A square-based grid system will be overlaid on Hot Spot #1, Hot Spot #2 and Hot Spot #3 with the grid axes oriented on a magnetic north-south line centered in each Hot Spot and an east-west axis perpendicular to the magnetic north-south axis also centered in the area. A series of sampling points will be marked out within each Hot Spot at points 1.5 meters (4.5 feet) apart oriented to the grid axes. Refer to Figures 8A to 8C for proposed confirmatory soil sampling locations within the three hot spots. Samples will be collected at depth intervals comparable to depth intervals sampled during the March and June 2014 sampling events. Six duplicate confirmatory samples, one trip blank and one field blank sample will be collected during the confirmatory sampling event. Samples collected from within the excavations will be collected utilizing a spade in accordance with SOPs included in Attachment 3. Sample location from the middle of the excavation will be bottom samples, and those of the side will be sidewall samples. Refer to the table below for a summary of proposed confirmatory soil sampling depths. For comparison risk-based PCB cleanup standard, an exposure point concentration will be calculated consistent with the MCP. The total PCB concentration for each individual soil sample will be compared to the TSCA cleanup standard of 50 mg/kg. These results together will be used to determine when the remedial goal for soil excavation is reached. Should the first round of confirmatory soil samples indicate additional soil excavation is needed, soil will be further

excavated from specific locations based on soil confirmatory results. Following additional soil excavation activities, additional confirmatory soil samples will be collected following the confirmatory sampling grid pattern initially conducted at similar depths; however, the grid location will be shifted 1 meter north and 1 meter east. Please refer to Figures 8A, 8B and 8C for sample locations for Hot Spot 1, 2, and 3 respectively.

Sample Location	Sample ID	Sample Depth	Aroclor PCBs via EPA Method 8082A with Soxhlet extraction
Hot Spot #1	HS1-C1	2-3’	X
		3-4’	X
	HS1-C2	2-3’	X
		3-4’	X
	HS1-C3	4-5’	X
	HS1-C4	2-3’	X
		3-4’	X
	HS1-C5	2-3’	X
		3-4’	X
Hot Spot #2	HS2-C1	2-3’	X
		3-5’	X
		5-7’	X
	HS2-C2	7-8’	X
	HS2-C3	2-3’	X
		3-5’	X
		5-7’	X
	HS2-C4	2-3’	X
		3-5’	X
		5-7’	X
	HS2-C5	7-8’	X
	HS2-C6	7-8’	X
	HS2-C7	2-3’	X
		3-5’	X
		5-7’	X
	HS2-C8	2-3’	X
		3-5’	X
		5-7’	X

Hot Spot #3	HS3-C1	2-3’	X
		3-5’	X
	HS3-C2	2-3’	X
		3-5’	X
	HS3-C3	5-6’	X
	HS3-C4	5-6’	X
	HS3-C5	2-3’	X
		3-5’	X
	HS3-C6	5-6’	X
	HS3-C7	5-6’	X
	HS3-C8	5-6’	X
	HS3-C9	2-3’	X
		3-5’	X
	HS3-C10	2-3’	X
		3-5’	X
	HS3-C11	5-6’	X
	HS3-C12	5-6’	X
	HS3-C13	2-3’	X
		3-5’	X
	HS3-C14	2-3’	X
		3-5’	X

4.4 Post-Remedial Activities

Following excavation activities, backfilling of excavation holes and construction of a protective barrier / cap, a Notice of Activity and Use Limitation (deed restriction) will be prepared requiring the periodic inspection and maintenance of the cap and providing the PCB notifications required by TSCA. The Notice of Activity and Use Limitation will be prepared consistent with the requirements of the MCP and TSCA. The Notice of Activity and Use Limitation will apply to the exterior courtyard and Mill Building #5. Please refer to Attachment 2 for the proposed conditions of the Notice of Activity and Use Limitation. Figure 3D provides the proposed area subject to the Notice of Activity and Use Limitation relative to disposal site boundaries and property boundaries.

The Notice of Activity and Use Limitation will not apply to Mill Building #3, because each soil sample collected from this area contained less than 1 mg/kg PCB. However, gardening

of edible produce is presumed not to occur throughout the disposal site via implementation of Best Management Practices. Following recording / registering the Notice of Activity and Use Limitation at the Registry of Deeds / Land Court, a Permanent Solution with Conditions will be submitted to MADEP with a copy sent to EPA Region I. The Conditions of the Permanent Solution are the following: (1) a Notice of Activity and Use Limitation; (2) control of gardening of edible produce via Best Management Practices; and (3) the exclusion from the risk characterization of contaminants of concern in soils that are attributable to fill containing coal ash or wood ash.

Utility lines, storm water catch basins and a storm water system will exist beneath the protective barrier / cap. Therefore, the Notice of Activity and Use Limitation allows occasional access to these lines and structures for maintenance purposes, so long as conducted under a Soil Management Plan suitable for utility work, and protective barrier is restored upon completion of the work. A copy of the Utility Work Soil Management Plan is provided in Attachment 7.

5.0 SIGNIFICANT NEW SITE INFORMATION OR DATA

5.1 New Property Ownership

The ownership of the property was transferred from Boott Properties LLC to Boott Mill Developer LLC on September 27, 2012. Responsibility for the RAM and further response actions under the MCP and TSCA were transferred to the new owner through a Tier II Transfer Submittal that became effective on January 17, 2013, 45 days after it was submitted to MADEP. The contact information for the new owner is provided below:

Boott Mill Developer LLC
Attn: Gilbert Winn, Exec. VP, Boott II Winn LLC, Manager, Boott Mill Developer, LLC
Six Faneuil Hall Marketplace
Boston, MA 02109
Tel 617-742-4500

5.2 Additional Investigations in March and June 2014

Two rounds of additional investigations were conducted in response to EPA Region I's comments to the original *RAM Plan Modification and Application for Risk-Based TSCA Cleanup of PCBs*, dated August 27, 2013, and subsequent discussions with EPA Region I. These investigations were conducted during March and June 2014, and are described below.

The sampling plan for the March 2014 investigation was provided in the RAM Status Report, submitted in early March 2014 (Attachment 1). The QA/QC Plan and SOP are provided in Attachment 3. The laboratory reports for the March and June 2014 investigations are provided in Attachment 4. The laboratory reports for the earlier investigations were provided in the RAM Plan, dated August 2, 2012 and the two RAM Status Reports, dated November 30, 2012 and June 6, 2013. These three reports were previously provided to both MADEP and EPA Region I.

Groundwater analytical data are summarized in Tables 1.1 to 1.5, soil analytical data are summarized in Tables 2.1 to 2.3, and soil vapor analytical data are summarized in Table 3. Depth to groundwater and groundwater elevation measurements are provided in Table 4. The Data Usability and Representativeness Evaluation is presented in Attachment 5. Sampling locations for the Site are depicted on Figures 3 and 3A to 3C. Figure 3A is a Site Plan of the exterior courtyard. Figure 3B is a Site Plan of the exterior courtyard with the sample locations and the sampling grid overlay. It's clear that each grid has been sampled. Figure 3C is a Site Plan of the exterior courtyard with the sampling grid for the asphalt/gravel sub-base composite sample locations. Figure 5A shows the 2011 – 2013 discrete PCB sample results for each boring, including the sample depth interval. Figure 5B show the 2013 composite sample results for a series of contiguous grids, and their depth intervals. Figure 5C shows the 2014 discrete PCB sample results and their depth intervals. Figure 5D shows the 2014 composite PCB sample results, depth intervals, and corresponding sample locations. Finally, Figure 5E shows the asphalt/gravel sub-base sample results and grid layout. The 2014 boring logs are provided in Attachment 11.

March 2014

The soil boring program was conducted on March 4 and 5, 2014, by New England Geotech (NE Geotech), LLC of Jamestown, Rhode Island, with the oversight of GEC. The purpose of the investigation was to fill in data gaps to satisfy TSCA pre-excavation sampling requirements for delineating the vertical and horizontal extents of PCB contamination under 40 CFR 761 Subpart N. All borings installed were completed adjacent to locations previously sampled; however, shorter soil interval lengths were sampled. In accordance with TSCA regulations, some samples were collected and analyzed from individual borings and some samples were collected from borings located in contiguous grids and then composited into one sample. During this period, twenty-two borings were advanced to depths ranging from zero to nine feet below ground surface in continuous intervals, with dedicated acetate sleeves. The borings were identified as B-2A, B-10A, B-11A, B-16A, B-20A, B-21A, B-41A, B-42A, B-44A, B-47A thru B-52A and B-55A thru B-61A. All borings were located in the eastern exterior

courtyard and were intended to determine the extent of PCB contamination (at previously sampled borings, for example B-2, sampled again and identified as B-2A). Soil descriptions and soil boring depths are provided on boring logs in Attachment 11, and the results are shown on Figure 5C.

Test borings were advanced using a track-mounted GeoProbe drill rig. No borings were completed as monitoring wells. During boring activities, a Mini-Rae 2000 photoionization detector (PID) equipped with a 10.6 eV lamp was used for jar headspace screening. Soil headspace readings ranged from 0.4 per million as volume (ppmv) to 161 ppmv. The headspace readings are provided on the boring logs in Attachment 11.

The locations of the borings are depicted on Figures 5C and 5D. Soil samples were collected from the soil borings and submitted to ConTest for analysis of PCBs via EPA Method 8082A with Soxhlet Extraction and/or PCB Dioxin-Like Congeners via EPA Method 8270M. The following table summarizes sample depths and parameters analyzed.

Boring	Soil Interval (feet)	PCBs via EPA 8082A with Soxhlet Extraction	PCB Congeners via EPA 8270M
B-49A	0-1	X	X
	1-2	X	
	2-3	X	
B-50A	0-1	X	X
	1-2	X	
	2-3	XX*	
	5-7	X	
	7-9	X	
B-2A	0-1	X	X
	1-2	X	
	2-3	X	
	3-4	X	
	4-5	XX*	
B-16A	0-1	X	X
	1-2	X	
	2-3	X	
	3-4	X	
	4-5	X	
B-10A	0-0.5	X	
	0.5-1	X	
	1-2	X	
	2-3	XX*	

Boring	Soil Interval (feet)	PCBs via EPA 8082A with Soxhlet Extraction	PCB Congeners via EPA 8270M
B-11A	0-0.5	XX*	XX*
	0.5-1	X	
	1-2	X	
	2-3	X	
B-20A	0-0.5	X	
	0.5-1	X	
	1-2	XX*	
	2-3	X	
B-21A	0-0.5	X	X
	0.5-1	X	
	1-2	X	
	2-3	X	
B-48A	0-0.5	XX*	
	0.5-1	X	
	1-2	X	
	2-3	X	
Composite 1A	0-0.5	X	
	0.5-1	X	
	1-2	X	
	2-3	X	
	3-4	X	
	4-5	X	
Composite 2A	0-0.5	X	
	0.5-1	X	
Composite 5A	0-0.5	X	
	0.5-1	X	
	1-2	X	
	2-3	X	
Composite 6A	0-0.5	X	X
	0.5-1	X	
	1-2	X	
	2-3	X	

Notes:
*Indicates duplicate sample
Composite 1A comprised of samples from borings B-41A and B-42A
Composite 2A comprised of samples from borings G-44A and B-47A
Composite 5A comprised of samples from borings B-58A, B-59A, B-60A and B-61A
Composite 6A comprised of samples from borings B-51A, B-52A, B-55A, B-56A and B-57A

The PCB levels detected during the March 2014 sampling event, which included Soxhlet extraction, were comparable to PCB levels detected during previous investigations that did not use Soxhlet extraction. However, more samples covering a wider area were found to contain

PCB concentrations greater than 10 mg/kg. Analytical results indicated that most PCB soil contamination is present below the two foot interval, and not in the 0-0.5, 0.5-1 or 1-2 foot intervals.

As documented in Attachment 2, low levels of TCDD toxicity equivalent dioxin-like PCBs were detected during the March 2014 sampling event. The dioxin-like PCBs account for a small proportion of the total PCB cancer and non-cancer risk estimates.

June 2014

Soil Sampling

An additional soil boring program was conducted on June 3, 2014, by NE Geotech, with the oversight of GEC. The purpose of the investigation was to further fill in data gaps to satisfy TSCA pre-excavation sampling requirements for delineating the vertical and horizontal extents of PCB contamination under 40 CFR 761 Subpart N, specifically to identify the horizontal and vertical extents of soil volumes containing more than 50 mg/kg PCBs. Some borings were installed adjacent to locations previously sampled; however, shorter soil interval lengths and/or different soil interval lengths were sampled. During this period, ten soil borings were advanced to depths ranging from one to seven feet below ground surface in continuous intervals, with dedicated acetate sleeves. The borings were identified as B-51B, B-52B, B-55B thru B-57B, and B-69 thru B-73. All borings were located in the eastern exterior courtyard and were intended to determine the extent of PCB contamination. Soil descriptions and soil boring depths are provided on boring logs in Attachment 11.

Test borings were drilled on June 3, 2014 with a track-mounted GeoProbe drill rig. No borings were completed as monitoring wells. During boring activities, an Ion Science Tiger PID equipped with a 10.6 eV lamp was used for jar headspace screening. Soil headspace readings ranged from 0.1 to 150 ppmv. The headspace readings are provided on the boring logs in Attachment 11.

The locations of the borings were added to Figures 5C. Soil samples were collected from the soil borings and submitted to ConTest for analysis of PCBs via EPA Method 8082A with Soxhlet Extraction. The following table summarizes sample depths and parameters analyzed.

Boring	Soil Interval (feet)	PCBs via EPA 8082A with Soxhlet Extraction
B-51B	1-2	X
	2-3	X
	3-5	X
B-52B	1-2	X
	2-3	X
	3-5	X
B-55B	1-2	X
	2-3	X
	3-5	X
B-56B	1-2	X
	2-3	X
	3-4	X
B-57B	1-2	X
	2-3	X
	3-5	X
B-69	0-0.5	X
	0.5-1	X
	1-2	X
	2-5	X
	5-7	X
B-70	0-0.5	X
	0.5-1	X
	1-2	X
	2-5	X
	5-7	X
B-71	0-0.5	X
	0.5-1	X
	1-2	X
B-72	0-0.5	X
	0.5-1	X
	1-2	X
B-73	0-0.5	X
	0.5-1	X
	1-2	X

Data collected during the June 2014 sampling event from Hot Spot #1 and #2 were analyzed to determine if the hot spot areas could be reduced in size based on the new data. The analysis of the June 2014 analytical sampling results revealed that the vertical and/or horizontal extents of Hot Spots #1 and #2 requiring remediation could be reduced, presuming a 50 mg/kg

PCB cleanup standard. Based on these findings, Hot Spots #1 and #2 were reduced in size. Refer to Figure 7A for the extents of Hot Spots #1 thru #3.

Asphalt Sampling

As part of the redevelopment of the Site, the current asphalt and asphalt base will be removed and in its place, a TSCA cap or protective barrier will be placed across the entire eastern exterior courtyard. To determine the appropriate disposal option for the top one foot of asphalt/gravel sub-base, twenty-four asphalt/gravel sub-base samples were collected from the ground surface to one foot below ground surface. The asphalt sampling was conducted on June 3, 2014, by NE Geotech, with the oversight of GEC. To ensure representative samples were collected from throughout the courtyard, the courtyard was divided into twenty-four grids and one sample collected from each grid. In accordance with TSCA regulations, samples were collected from each grid and samples located in contiguous grids were composited into a sample for submittal of PCB laboratory analyses. A total of six composite asphalt/asphalt sub-base samples were submitted for laboratory analysis. The borings advanced and the individual samples collected were identified as AS-1 through AS-25. Samples composited and submitted to ConTest for PCB analysis via EPA Method 8082A with Soxhlet Extraction were identified as ACS-1 to ACS-6.

All samples were collected on June 3, 2014 with a track-mounted GeoProbe drill rig. During boring activities, an Ion Science Tiger PID equipped with a 10.6 eV lamp was used for jar headspace screening. Asphalt/gravel sub-base headspace readings ranged from 0.4 ppmv to 55.8 ppmv. The PID readings are likely attributable to off-gassing of the hot asphalt.

The locations of the asphalt/gravel sub-base samples and the grid pattern used to determine sample locations are depicted on Figure 3C. Asphalt/gravel sub-base samples were collected from the borings and submitted to ConTest for analysis of PCBs via EPA Method 8082A with Soxhlet Extraction. The following table summarizes which samples were composited, sample depths and parameters analyzed.

Sample ID	Borings Composited	Asphalt/Gravel Sub-Base Interval (feet)	PCBs via EPA 8082A with Soxhlet Extraction
ASC-1			X
	AS-1	0-1	
	AS-2	0-1	
	AS-3	0-1	
	AS-4	0-1	
ASC-2			X
	AS-5	0-1	
	AS-6	0-1	
	AS-7	0-1	
	AS-8	0-1	
ASC-3			X
	AS-9	0-1	
	AS-10	0-1	
	AS-11	0-1	
	AS-12	0-1	
ASC-4			X
	AS-13	0-1	
	AS-14	0-1	
	AS-15	0-1	
	AS-16	0-1	
ASC-5			X
	AS-17	0-1	
	AS-18	0-1	
	AS-19	0-1	
	AS-20	0-1	
ASC-6			X
	AS-21	0-1	
	AS-22	0-1	
	AS-23	0-1	
	AS-24	0-1	
	AS-25	0-1	

The levels of PCBs in the asphalt/gravel sub-bases of ACS-1 to ACS-4 ranged between <0.17 and 1.73 mg/kg. These levels are less than the 2 mg/kg PCB limit for recycling via asphalt batching. The asphalt/gravel sub-bases from ACS-1 to ACS-4 will be transported to Aggregate Industries of Plainville, Massachusetts for recycling. For ACS-5 and ACS-6, the levels of PCB are 7.68 and 4.41 mg/kg, respectively. The levels of PCB detected in ACS-5 and ACS-6 are too high for recycling via asphalt batching, and will therefore, be transported and disposed at Waste

Management, Turnkey in Rochester, New Hampshire for disposal under a Uniform Hazardous Waste Manifest, permitted to accept PCB concentration less than 50 mg/kg.

5.3 TSCA Issues

For the eastern courtyard, within the RAM Plan, the planned method of cleanup under TSCA was identified as self-implementing [40 CFR 761.61(a)]. Due to the presence of numerous subsurface utilities in the eastern exterior courtyard, in place of the self-implementing method the TSCA risk-based cleanup method [40 CFR 761.61(c)] has been chosen. For the original RAM Plan Modification and Application for Risk-Based Cleanup of PCB, a PCB cleanup standard of 10 mg/kg was identified. This cleanup standard would apply to each soil sample where more than 10 mg/kg PCB was detected, and would require the installation of a protective barrier / cap to mitigate contact to soils.

As a result of additional investigations during March and June 2014, a larger area of the exterior courtyard was found to have soil samples containing more than 10 mg/kg, which would substantially increase the volume of soils requiring remediation to achieve a 10 mg/kg PCB cleanup standard. Therefore, EPA Region I suggested a PCB cleanup standard of 50 mg/kg followed by the installation of a cap, if justified by a feasibility evaluation (cost-benefit evaluation) that demonstrates that it is not cost effective to conduct additional remediation to achieve the 10 mg/kg PCB cleanup standard. The feasibility evaluation, provided in Attachment 8, indicates that it will cost approximately $165,000 to remediate approximately 85 cubic yards (127 tons) of soil to the 50 mg/kg PCB cleanup standard and approximately $230,000 to remediate approximately 235 cubic yards (353 tons) of soil to the 10 mg/kg PCB cleanup standard. This difference in cost (an additional $65,000) indicates that the benefit of remediating to the stricter standard (10 mg/kg) is not justified. In both cases, PCB contaminated soil will remain and will require a TSCA cap and an AUL. In either case, there is still no impact to groundwater and no direct contact to contaminated soil. To remove the additional approximately 150 cubic yards of soil contaminated with PCBs between 10 and 50 mg/kg, would not appreciably reduce the level of risk and therefore is not justified by the additional cost. In addition, the contaminated soil would need to be transported to a facility where it would take up landfill space. On-site management of this material can be considered a more green remedial option.

These costs do not include the costs install the TSCA cap or to implement the Notice of AUL because they are common costs to both PCB cleanup standards. The areas subject to the 50

and 10 mg/kg PCB cleanup standards for individual soil samples are depicted in Figures 7A and 7B, respectively.

Because utility lines and other subsurface structures are located in the exterior courtyard, future short-term exposures to utility/construction workers and other receptors may occur. To be compliant with the MCP, a baseline risk assessment was conducted to demonstrate that No Significant Risk of harm would exist during short-term utility or construction work. In addition, risk assessments were used to develop a cleanup standard for PCB based on exposure point concentrations and not individual samples. The PCB cleanup standard for comparison to exposure point concentrations (95th percentile upper confidence limit on the mean for the exterior courtyard exposure point) was determined to be 10 mg/kg. The risk assessment conducted and the cleanup goals developed also meet the requirements of the MCP [310 CMR 40.0000]. The risk assessment is provided as Attachment 2.

This combination *Revised RAM Plan Modification and Application for TSCA Risk-Based Cleanup of PCBs* is being submitted to MADEP and the PCB Coordinator of EPA Region 1. This document contains the required elements of the application identified in the EPA Region 1's Risk-Based Cleanup and Disposal Approval Checklist. It includes (1) Site background and history; (2) a description of the nature of the contamination; (3) summary tables of analytical data, Site Maps showing the distribution of contamination and proposed soil volumes to remediate; (4) the planned excavation of the three PCB Hot Spots and installation of a TSCA cap over the entire exterior courtyard, and the post-excavation confirmatory sampling plan (Section 4.3); (5) an evaluation of PCB cleanup alternatives (feasibility evaluation) (Attachment 8); (6) design features of any cap or protective barrier planned for the Site (Section 4.2); (6) certifications required by TSCA (Attachment 9); (7) SOPs and QA/QC plan for sampling and analysis (Attachment 3); (8) human health risk assessment and ecological risk assessment (Attachment 2); and (9) planned language for the deed restriction / Notice of Activity and Use Limitation (Attachment 2).

6.0 MANAGEMENT OF REMEDIATION WASTE, REMEDIAL WASTEWATER AND / OR REMEDIAL ADDITIVES

To date, under this RAM, no soil excavation has been conducted in the exterior courtyard, which would result in remediation waste. The location and depth of planned soil excavation have been identified and are discussed in Section 4.1. Based on known excavation extents and calculations, a conservative estimate of the total volume of material that will be removed is as follows: (1) 85 cubic yards of material to be removed from Hot Spots #1 to 3#, (to

be disposed at Waste Management Model City); (2) 72 cubic yards of asphalt/gravel sub-base material containing >2 mg/kg PCBs from ACS-5 and ACS-6 (to be disposed at Waste Management Turnkey); and (3) 117 cubic yards of asphalt/gravel sub-bases containing <2 mg/kg PCBs from ACS-1 to ACS-4 (to be recycled off-site at Aggregate Industries). Ultimately, the amount of soil removed will depend on Site conditions encountered at the time of remediation (i.e., the available space to safely remove soil without compromising subsurface utilities, the structural integrity of building footings and the stormwater system located in the middle of the courtyard; and the extent of soil excavation required for PCB levels in soils to meet the Site-specific clean-up standards.

Tentatively, soils targeted for off-site disposal excavated from Hot Spots # 1 to #3 will be live loaded and transported to Waste Management Model City, Model City, New York (PCB concentrations >50 mg/kg) under a Uniform Hazardous Waste Manifest for disposal. Tentatively, asphalt/gravel sub-bases removed from the exterior courtyard in areas ACS-1 to ACS-4 will be live loaded and transported to Aggregate Industries, Plainville, Massachusetts for asphalt batching under a bill of lading or Material Shipping Record. Asphalt/gravel sub-base material removed from exterior courtyard areas ACS-5 and ACS-6 will be live loaded and transported to Waste Management, Turnkey in Rochester, New Hampshire under a Hazardous Waste Manifest for disposal. Upon EPA's approval to conduct the excavations, GEC will seek final approval from the disposal facilities identified above for soil and asphalt/gravel sub-base disposal and asphalt/gravel sub-base recycling. To err on the side of caution, GEC is estimating that up to 130 cubic yards of material will be transported to Waste Management Model City, up to 175 cubic yards of material will be transported to Aggregate Industries, and up to 105 cubic yards of material will be shipped to Waste Management, Turnkey in Rochester, New Hampshire.

The depth to groundwater is approximately eleven feet or more below grade (Table 4) in the eastern courtyard. Soil excavation will not extend to this depth. Therefore, dewatering of the excavation is unlikely to be needed and remedial wastewater is unlikely to be generated. The use of remedial additives is not planned for this RAM.

7.0 OTHER INFORMATION REQUIRED BY MADEP OR EPA REGION 1

In accordance with 761.61(a)(3)(i)(E) a written certification signed by the owner of the property where the cleanup Site is located and signed by the party conducting the cleanup is provided as Attachment 9.

8.0 LISCENSED SITE PROFESSIONAL OPINION (310 CMR 40.0445(2)(e))

This RAM Plan Modification has been prepared in accordance with 310 CMR 40.0444 and under the oversight of Brian T. Butler, LSP 5736, of Goldman Environmental Consultants, Inc. To date, the RAM has been conducted in accordance with the original RAM Plan, dated August 2, 2012, and the *RAM Plan Modification and Application for Risk-Based Cleanup of PCBs*, dated August 27, 2013. Neither MADEP nor EPA Region 1 provided any conditions of approval for this RAM.

310 CMR 40.0442(5) requires that in instances of excavation of greater than 1,500 cubic yards of remediation waste, a Licensed Site Professional provide certification of sufficient financial resources of the person conducting the response action. The RAM Plan does not anticipate the excavation of soil at that volume; therefore, the certification requirement does not apply.

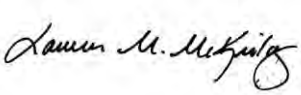
9.0 PUBLIC INVOLVEMENT

Pursuant to 310 CMR 40.0447 and in accordance with 310 CMR 40.1403(3)(d), GEC will or has notified the City of Lowell Mayor's Office and the City of Lowell Health Department of Boott Mill Developer LLC's intent to initiate the RAM Modification Plan. The notification will have identified the purpose, nature and expected duration of the RAM Modification Plan. Refer to Attachment 10 for copies of the Public Notification letters.

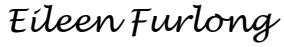
10.0 IMPLEMENTATION SCHEDULE AND FEE

This RAM Modification Plan and Application for Risk-Based Cleanup of PCBs will be initiated upon EPA approval, and is expected to be completed within 60 days following the initiation of activities described in the Plan. The Site has undergone Tier Classification; therefore, no fee is required pursuant to 310 CMR 40.0444(2)(a). The RAM Plan is being electronically submitted to MADEP attached to a BWSC106 Release Abatement Measure Transmittal Form. The RAM Plan will also be submitted to EPA attached to a letter describing the planned implementation of remedial actions to address a release of PCBs under the TSCA PCB Risk-Based Cleanup Application.

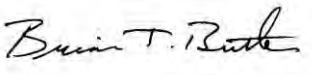
Respectfully submitted,
Goldman Environmental Consultants, Inc.



Lauren M. McKinlay
Project Manager/Geologist



Eileen A. Furlong
Principal, Sr. Risk Assessor



Brian T. Butler, LSP
Senior V. P., Operations

P:\Projects\911-Winn Management\911-3117 Boott Mills\EPA Submittal 7-2014\Revised RAM Plan Modification Exterior Courtyard July 12 2014 LMM BB EAF edits.docx

FIGURES

USGS 7.5 Minute Topographic

Lowell
Massachusetts Quadrangle

Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781)356-9140 Fax: (781)356-9147
www.goldmanenvironmental.com

SITE LOCUS

Boott Mills
130 Foot of John Street,
Lowell, Massachusetts

GEC Project #: 1717-2030

Figure 1

Scale
1 : 25,000

N

MassDEP - Bureau of Waste Site Cleanup

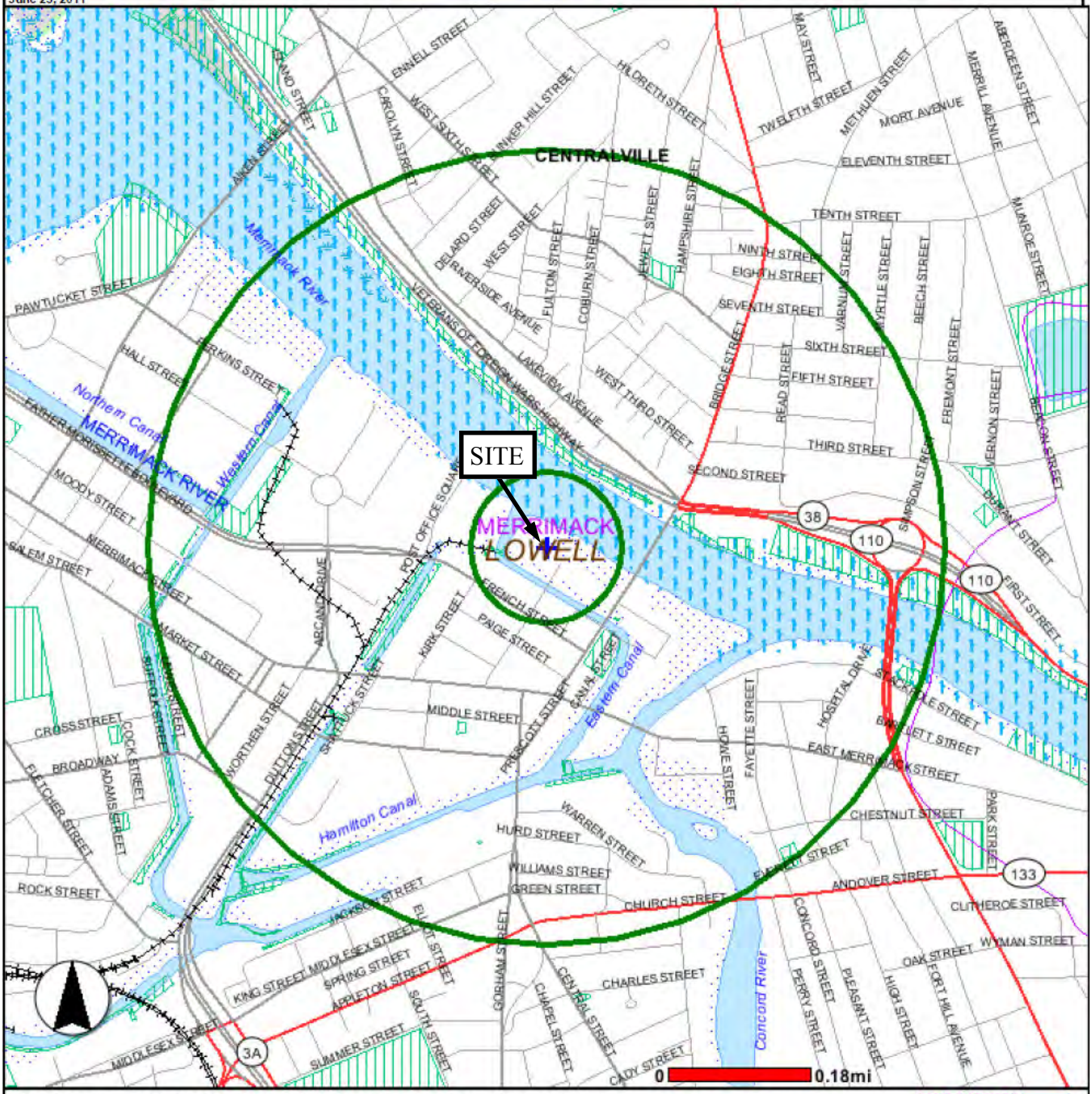
MCP Numerical Ranking System Map: 500 feet & 0.5 Mile Radii

Site Name:
Boott Mills Development
130 Foot of John Street
Lowell, MA
RTN:
NAD83 MA Coordinates:
215766mE, 933083mN

June 23, 2011

The information shown on this map is the best available at the date of printing. For more information please refer to www.mass.gov/mgis/massgis.htm

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, Sub; 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
NHESP: Est Rare Weland Habitat, Certified Vernal Pool
DEP Permitted Solid Waste Landfill

GEC
Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781)356-9140 Fax: (781)356-9147
www.goldmanenvironmental.com

Boott Mills
130 Foot of John Street
Lowell, MA

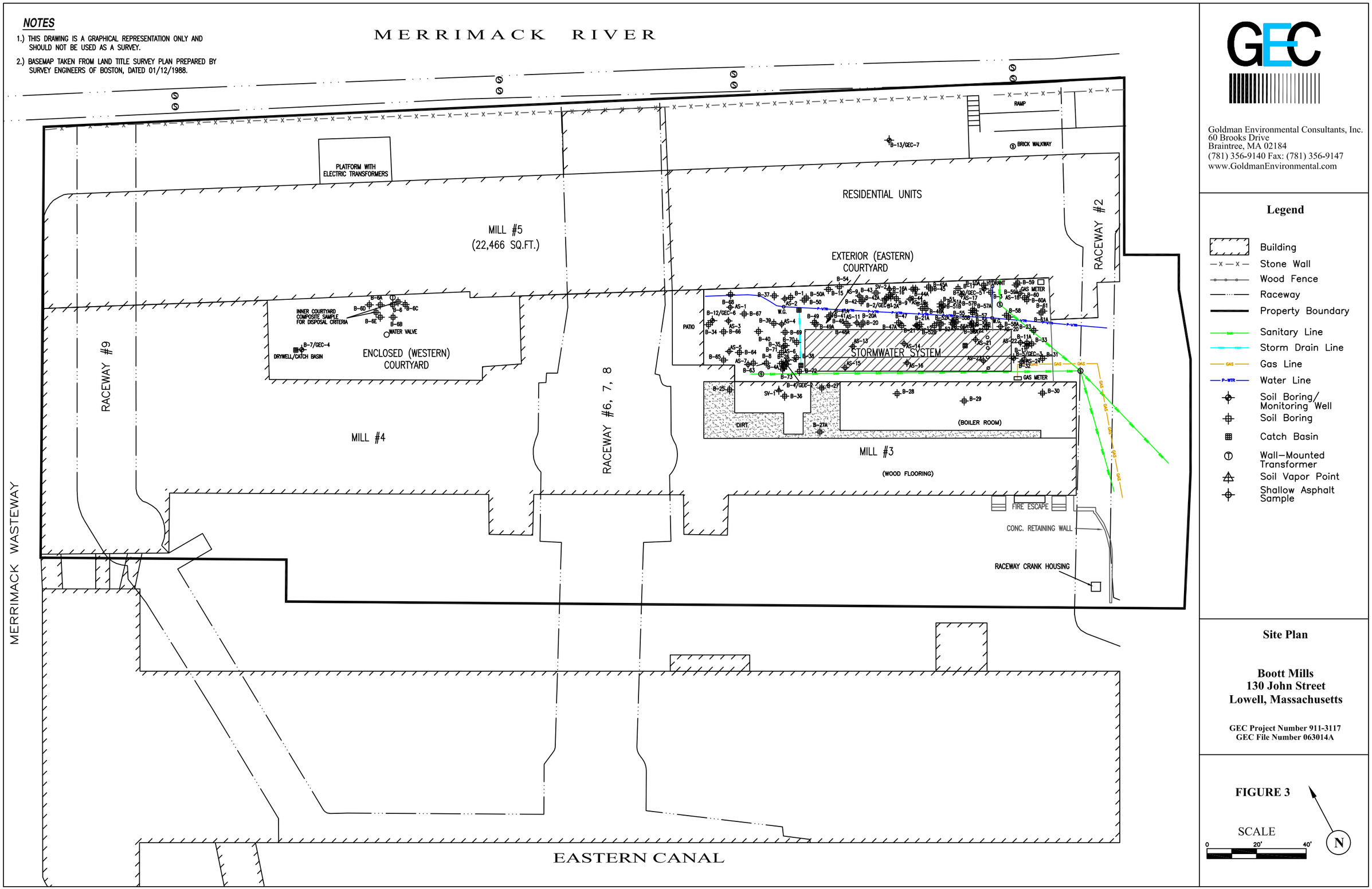
GEC Project #: 1717-2030

Figure 2

NOTES

1.) THIS DRAWING IS A GRAPHICAL REPRESENTATION ONLY AND SHOULD NOT BE USED AS A SURVEY.

2.) BASEMAP TAKEN FROM LAND TITLE SURVEY PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON, DATED 01/12/1988.



Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Soil Boring/ Monitoring Well
- Soil Boring
- Catch Basin
- Wall-Mounted Transformer
- Soil Vapor Point
- Shallow Asphalt Sample

Site Plan

Boott Mills
130 John Street
Lowell, Massachusetts

GEC Project Number 911-3117
GEC File Number 063014A

FIGURE 3

SCALE
0 20' 40'

N

NOTES

1.) THIS DRAWING IS A GRAPHICAL REPRESENTATION ONLY AND SHOULD NOT BE USED AS A SURVEY.

2.) BASEMAP TAKEN FROM LAND TITLE SURVEY PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON, DATED 01/12/1988.

RESIDENTIAL UNITS

EXTERIOR (EASTERN) COURTYARD

RACEWAY #2

RACEWAY #6, 7, 8

PATIO

STORMWATER SYSTEM

DIRT

(BOILER ROOM)

MILL #3

(WOOD FLOORING)

FIRE ESCAPE

CONC. RETAINING WALL

RACEWAY CRANK HOUSING

GAS METER

HYDRANT

W.G.

B-1, B-2/GEC-1, B-2A, B-3, B-4/GEC-2, B-4A, B-5/GEC-3, B-6, B-7, B-8, B-9, B-10/GEC-5, B-10A, B-11, B-11A, B-12/GEC-6, B-13, B-14, B-15, B-16, B-16A, B-17, B-18, B-19, B-20, B-20A, B-21, B-21A, B-22, B-23, B-25, B-26, B-27, B-27A, B-28, B-29, B-30, B-31, B-32, B-33, B-34, B-35, B-36, B-37, B-38, B-39, B-40, B-41, B-41A, B-42, B-42A, B-43, B-44, B-44A, B-45, B-45A, B-46, B-46A, B-47, B-47A, B-48, B-48A, B-49, B-49A, B-50, B-50A, B-51, B-51A, B-51B, B-52, B-52A, B-52B, B-54, B-55, B-55A, B-55B, B-56, B-56A, B-56B, B-57, B-57A, B-57B, B-58, B-58A, B-59, B-59A, B-60, B-60A, B-61, B-61A, B-63, B-64, B-65, B-66, B-67, B-68, B-69, B-70, B-71, B-72, B-73

AS-1, AS-2, AS-3, AS-4, AS-5, AS-6, AS-7, AS-8, AS-9, AS-10, AS-11, AS-12, AS-13, AS-14, AS-15, AS-16, AS-17, AS-18, AS-19, AS-20, AS-21, AS-22, AS-23, AS-24

SV-1, SV-2

S

Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Soil Boring/ Monitoring Well
- Soil Boring
- Catch Basin
- Wall-Mounted Transformer
- Soil Vapor Point
- Shallow Asphalt Sample

Site Plan
(Eastern Courtyard)

Boott Mills
130 John Street
Lowell, Massachusetts

GEC Project Number 911JR-3114
GEC File Number 071414A

FIGURE 3A

SCALE
0 10' 20'

N

NOTES

1.) THIS DRAWING IS A GRAPHICAL REPRESENTATION ONLY AND SHOULD NOT BE USED AS A SURVEY.

2.) BASEMAP TAKEN FROM LAND TITLE SURVEY PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON, DATED 01/12/1988.

RESIDENTIAL UNITS

EXTERIOR (EASTERN) COURTYARD

RACEWAY #2

RACEWAY #6, 7, 8

PATIO

STORMWATER SYSTEM

DIRT

(BOILER ROOM)

MILL #3

(WOOD FLOORING)

FIRE ESCAPE

CONC. RETAINING WALL

RACEWAY CRANK HOUSING

HYDRANT

GAS METER

W.G.

B-1, B-1A, B-2/GEC-1, B-2A, B-3, B-4/GEC-2, B-4A, B-5/GEC-3, B-5A, B-6/GEC-4, B-7, B-8, B-9, B-10, B-10A, B-10/GEC-5, B-11, B-11A, B-12/GEC-6, B-13, B-14, B-15, B-16, B-16A, B-17, B-18, B-19, B-20, B-20A, B-21, B-21A, B-22, B-23, B-24, B-25, B-26, B-27, B-27A, B-28, B-29, B-30, B-31, B-32, B-33, B-34, B-35, B-36, B-37, B-38, B-39, B-40, B-41, B-41A, B-42, B-42A, B-43, B-44, B-44A, B-45, B-45A, B-46, B-46A, B-47, B-47A, B-48, B-48A, B-49, B-49A, B-50, B-50A, B-51, B-51A, B-51B, B-52, B-52A, B-52B, B-53, B-54, B-55, B-55A, B-55B, B-56, B-56A, B-56B, B-57, B-57A, B-57B, B-58, B-58A, B-59, B-59A, B-60, B-60A, B-61, B-61A, B-63, B-64, B-65, B-66, B-67, B-68, B-69, B-70, B-71, B-72, B-73

AS-1, AS-2, AS-3, AS-4, AS-5, AS-6, AS-7, AS-8, AS-9, AS-10, AS-11, AS-12, AS-13, AS-14, AS-15, AS-16, AS-17, AS-18, AS-19, AS-20, AS-21, AS-22, AS-23, AS-24

SV-1, SV-2

Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Soil Boring/ Monitoring Well
- Soil Boring
- Catch Basin
- Wall-Mounted Transformer
- Soil Vapor Point
- Shallow Asphalt Sample

Site Plan
(Eastern Courtyard with Grid Overlay)

Boott Mills
130 John Street
Lowell, Massachusetts

GEC Project Number 911-3117
GEC File Number 071414A

FIGURE 3B

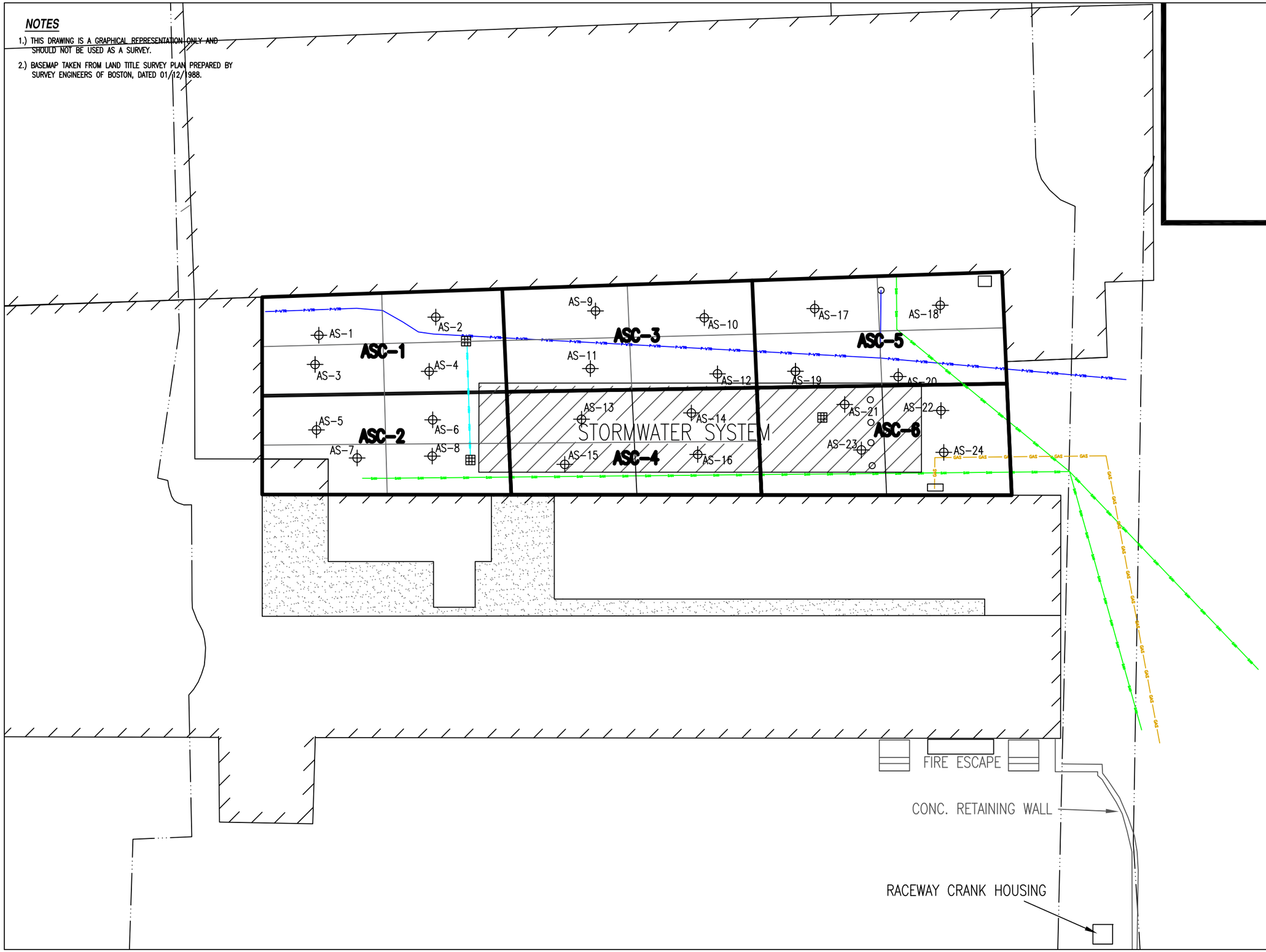
SCALE
0 10' 20'

N

NOTES

1.) THIS DRAWING IS A GRAPHICAL REPRESENTATION ONLY AND SHOULD NOT BE USED AS A SURVEY.

2.) BASEMAP TAKEN FROM LAND TITLE SURVEY PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON, DATED 01/12/1988.



Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Shallow Asphalt Sample

Site Plan
(Eastern Courtyard showing Top 12" Asphalt/Soil Sampling Locations)

Boott Mills
130 John Street
Lowell, Massachusetts

GEC Project Number 911-3117
GEC File Number 071414A

FIGURE 3C

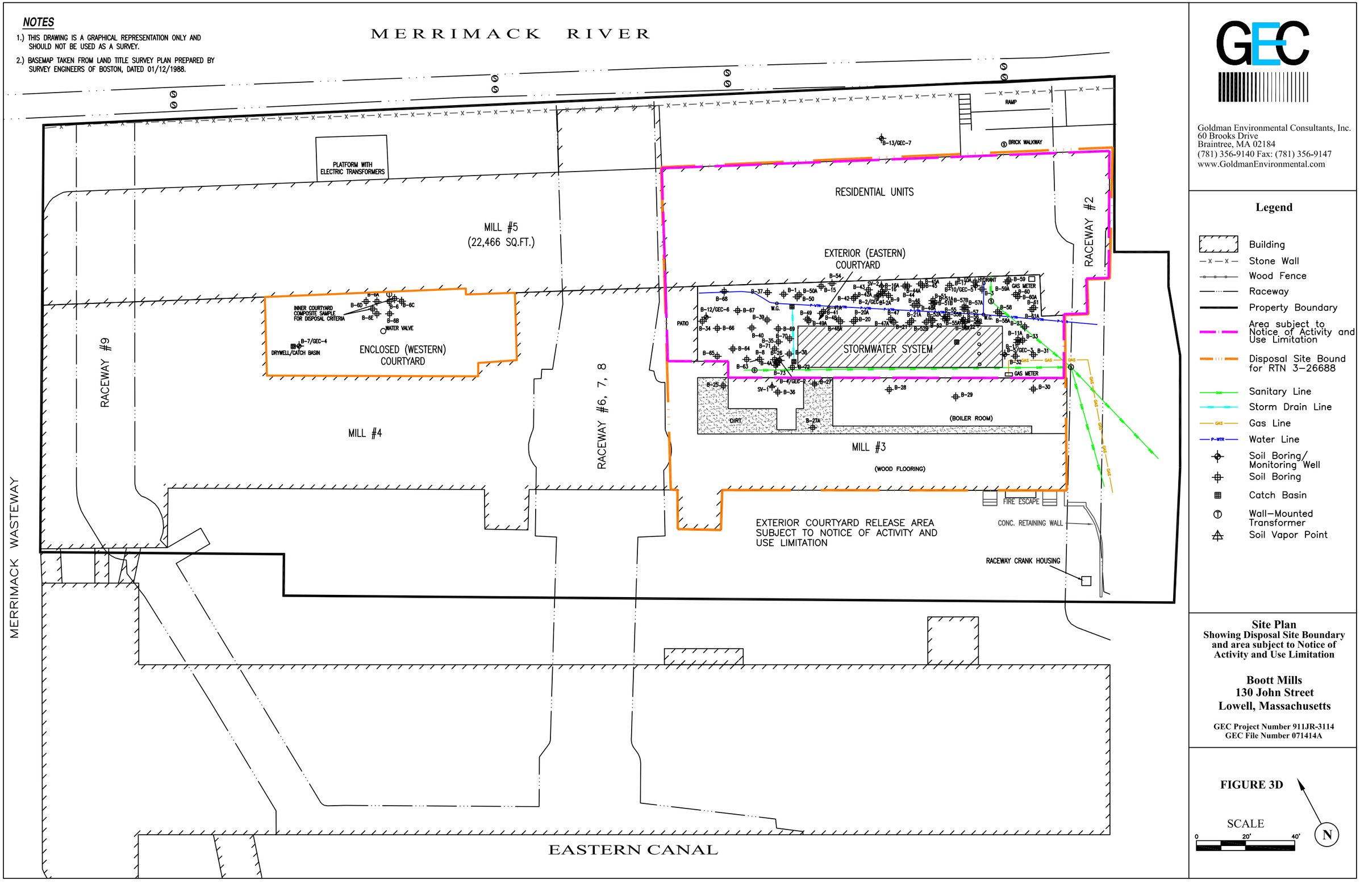
SCALE
0 10' 20'

N

NOTES

1.) THIS DRAWING IS A GRAPHICAL REPRESENTATION ONLY AND SHOULD NOT BE USED AS A SURVEY.

2.) BASEMAP TAKEN FROM LAND TITLE SURVEY PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON, DATED 01/12/1988.



Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Area subject to Notice of Activity and Use Limitation
- Disposal Site Bound for RTN 3-26688
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Soil Boring/ Monitoring Well
- Soil Boring
- Catch Basin
- Wall-Mounted Transformer
- Soil Vapor Point

Site Plan
Showing Disposal Site Boundary and area subject to Notice of Activity and Use Limitation

Boott Mills
130 John Street
Lowell, Massachusetts

GEC Project Number 911JR-3114
GEC File Number 071414A

FIGURE 3D

SCALE
0 20' 40'

N

NOTES

1.) THIS DRAWING IS A GRAPHICAL REPRESENTATION ONLY AND SHOULD NOT BE USED AS A SURVEY.

2.) BASEMAP TAKEN FROM LAND TITLE SURVEY PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON, DATED 01/12/1988.

RAMP

BRICK WALKWAY

(88.58)
B-13/GEC-7

88.65

88.65

RESIDENTIAL UNITS

88.75

88.75

EXTERIOR (EASTERN)
COURTYARD

RACEWAY #2

88.85

HYDRANT

GAS METER

B-10/GEC-5
(88.86)

B-2/GEC-1
(88.86)

88.85

B-12/GEC-6
(88.87)

W.G.

W.G.

PATIO

88.95

STORMWATER SYSTEM

B-5/GEC-3
(88.96)

GAS METER

B-4/GEC-2
(88.89)

88.95

DIRT

(BOILER ROOM)

RACEWAY #6, 7, 8

MILL #3

(WOOD FLOORING)

FIRE ESCAPE

CONC. RETAINING WALL

Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Groundwater Contour
- Groundwater Flow
- (88.96) Groundwater Elevation
- Soil Boring/ Monitoring Well
- Catch Basin

Groundwater Contour Plan
(Eastern Courtyard)

Boott Mills
John Street
Lowell, Massachusetts

GEC Project Number 911-3117
GEC File Number 071414A

FIGURE 4

SCALE
0 10' 20'

N

NOTES

1.) THIS DRAWING IS A GRAPHICAL REPRESENTATION ONLY AND SHOULD NOT BE USED AS A SURVEY.

2.) BASEMAP TAKEN FROM LAND TITLE SURVEY PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON, DATED 01/12/1988.

3.) TOTAL PCB CALCULATED AS THE SUM OF ALL DETECTS ONLY.

4.) SEE FIGURE 5B FOR 2013 COMPOSITE SAMPLES.

RESIDENTIAL UNITS

EXTERIOR (EASTERN) COURTYARD

RACEWAY #2

RACEWAY #6, 7, 8

STORMWATER SYSTEM

MILL #3

(WOOD FLOORING)

(BOILER ROOM)

DIRT

PATIO

3-5' ND

FIRE ESCAPE

CONC. RETAINING WALL

RACEWAY CRANK HOUSING

HYDRANT

GAS METER

W.G.

B-1 0-3' 1.1 3-5' ND
B-50 1-5' 1.1 10-15' ND
B-37 0-3' 36 3-9' 5.6
B-15 1-5' 31 10-15' 4.1
B-16 1-5' 15 5-7' 7.6 7-9' 4.2 9-12' 2.7
B-9 0-1' ND 1-3' 8.21
B-17 0-3' ND 3-5' ND 5-7' ND
B-10/GEC-5 0-3' 3.32 3-6' 0.70
B-3 5-10' ND
B-2/GEC-1 0-3' 9.8 3-5' 11.4 5-7' ND
B-12/GEC-6 0-3' 0.25 3-6' ND
B-34
B-39 0-3' 3.0 3-5' 17.3 5-7' 45.0 7-9' 13.5
B-49 0-3' 0.42 3-9' 0.25
B-48 0-3' 18.7 3-9' ND
B-20 0-3' 1.84 3-9' ND
B-21 0-3' 2.3 3-5' 0.85 5-7' 1.66
B-22 0-3' 6.2 3-5' 1.13
B-23 3-5' 2.8 5-7' ND
0-3' ND 3-5' ND
B-35
B-8
B-26
B-38 0-9' 37 9-12' ND
B-4/GEC-2 2-5' 124 12-15' ND
2-5' 32 5-7' 26 7-9' 3.0 9-12' ND
B-11 0-3' 11.19 3-6' ND
10-15' ND
B-5/GEC-3
B-31
B-32
0-3' 0.27 3-5' ND
0-3' ND 3-5' ND
GAS METER
B-25 0-3' ND 3-5' 0.13 5-7' ND
0-1' 0.268 1-3' ND 0-3' 0.0699 5-10' ND
B-36 0-3' 0.12 3-5' ND
B-27 0-3' ND 3-5' 0.40
B-28 0-3' 0.45
B-29 0-3' ND 3-5' ND 5-6' ND
B-30 0-3' 0.37 3-4.5' 0.11
B-27A 0-3' ND 3-5' 0.38 5-7' 0.39

Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Site Boundary
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Soil Boring/ Monitoring Well
- Soil Boring
- Catch Basin
- Wall-Mounted Transformer
- Soil Vapor Point
- 0-3' Sample Depth (in ft)
- 3.32 PCB Concentration (mg/kg)
- 11 Concentration above 10 mg/kg
- ND Non-Detect

Eastern Courtyard Plan
Soil PCB Concentrations
2011 - 2013 Discrete Samples

Boott Mills
130 John Street
Lowell, Massachusetts

GEC Project Number 911-3117
GEC File Number 071514A

FIGURE 5A

SCALE
0 10' 20'

N

NOTES

1.) THIS DRAWING IS A GRAPHICAL REPRESENTATION ONLY AND SHOULD NOT BE USED AS A SURVEY.

2.) BASEMAP TAKEN FROM LAND TITLE SURVEY PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON, DATED 01/12/1988.

3.) TOTAL PCB CALCULATED AS THE SUM OF ALL DETECTS ONLY.

RESIDENTIAL UNITS

RACEWAY #2

COMPOSITE 1
0–5' 7.7

EXTERIOR (EASTERN)
COURTYARD

COMPOSITE 3
0–3' 0.40
3–9' ND

COMPOSITE 4
0–3' 16.7
3–9' 1.31

COMPOSITE 2
0–5' 0.89

COMPOSITE 6
0–3' 3.9
3–9' ND

COMPOSITE 5
0–3' 2.01
3–9' ND

B-54 B-43 B-42 B-45 B-44 B-46 B-51 B-59 B-60 B-61 B-58 B-50 B-49 B-41 B-47 B-55 B-57 B-56 B-52 B-68 B-67 B-39 B-66 B-40 B-65 B-64 B-63

HYDRANT

GAS METER

W.G.

PATIO

STORMWATER SYSTEM

GAS METER

RACEWAY #6, 7, 8

DIRT

(BOILER ROOM)

MILL #3

(WOOD FLOORING)

FIRE ESCAPE

CONC. RETAINING WALL

RACEWAY CRANK HOUSING

Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Soil Boring/ Monitoring Well
- Soil Boring
- Catch Basin
- Wall–Mounted Transformer
- Soil Vapor Point
- 3–5' Sample Depth (in ft)
- 0.40 PCB Concentration (mg/kg)
- 31 Concentration above 10 mg/kg
- ND Non–Detect

Eastern Courtyard Plan
Soil PCB Concentrations
2013 Composite Samples

Boott Mills
130 John Street
Lowell, Massachusetts

GEC Project Number 911-3117
GEC File Number 071514A

FIGURE 5B

SCALE
0 10' 20'

N

NOTES

1.) THIS DRAWING IS A GRAPHICAL REPRESENTATION ONLY AND SHOULD NOT BE USED AS A SURVEY.

2.) BASEMAP TAKEN FROM LAND TITLE SURVEY PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON, DATED 01/12/1988.

3.) TOTAL PCB CALCULATED AS THE SUM OF ALL DETECTS ONLY.

RESIDENTIAL UNITS

EXTERIOR (EASTERN) COURTYARD

STORMWATER SYSTEM

PATIO

RACEWAY #2

RACEWAY #6,

MILL #3

(WOOD FLOORING)

(BOILER ROOM)

FIRE ESCAPE

CONC. RETAINING WALL

RACEWAY CRANK HOUSING

GAS METER

HYDRANT

W.G.

HOT SPOT #1 (2-4 FEET)

HOT SPOT #2 (2-7 FEET)

HOT SPOT #3 (2-5 FEET)

B-2A	
0-1'	ND
1-2'	ND
2-3'	ND
3-4'	1.34
4-5'	61

B-10A	
0-0.5'	ND
0.5-1'	0.47
1-2'	3.5
2-3'	110

B-16A	
0-1'	ND
1-2'	ND
2-3'	1.54
3-4'	17.1
4-5'	1.56

B-50A	
0-1'	ND
1-2'	1.36
2-3'	36
5-7'	ND
7-9'	ND

B-49A	
0-1'	ND
1-2'	1.4
2-3'	6.5

B-51B	
1-2'	16.2
2-3'	2.08
3-5'	ND

B-55B	
1-2'	0.14
2-3'	0.92
3-5'	1.97

B-57B	
1-2'	0.75
2-3'	4.90
3-5'	2.16

B-69	
0-0.5'	ND
0.5-1'	ND
1-2'	4.7
2-5'	41
5-7'	ND

B-11A	
0-0.5'	1.35
0.5-1'	3.6
1-2'	0.14
2-3'	ND

B-52B	
1-2'	3.0
2-3'	9.3
3-5'	ND

B-70	
0-0.5'	ND
0.5-1'	1.09
1-2'	ND
2-5'	2.08
5-7'	ND

B-71	
0-0.5'	ND
0.5-1'	ND
1-2'	9.40

B-56B	
1-2'	1.98
2-3'	1.74
3-4'	ND

B-21A	
0-0.5'	ND
0.5-1'	ND
1-2'	0.65
2-3'	11.5

B-73	
0-0.5'	ND
0.5-1'	0.20
1-2'	1.50

B-72	
0-0.5'	ND
0.5-1'	ND
1-2'	1.96

B-48A	
0-0.5'	ND
0.5-1'	ND
1-2'	5.1
2-3'	2.7

B-20A	
0-0.5'	ND
0.5-1'	ND
1-2'	0.48
2-3'	60

Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Soil Boring/ Monitoring Well
- Soil Boring
- Catch Basin
- Wall-Mounted Transformer
- Soil Vapor Point
- 0-0.5' Sample Depth (ft)
- 2.04 PCB Concentration (mg/kg)
- ND Non-Detect
- 51 Red indicates concentrations above 50 mg/kg

Eastern Courtyard Plan
Soil PCB Concentration - 2014 Discrete Samples

Boott Mills
130 John Street
Lowell, Massachusetts

GEC Project Number 911JR-3114
GEC File Number 071414A

FIGURE 5C

SCALE 0 10' 20'

N

NOTES

1.) THIS DRAWING IS A GRAPHICAL REPRESENTATION ONLY AND SHOULD NOT BE USED AS A SURVEY.

2.) BASEMAP TAKEN FROM LAND TITLE SURVEY PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON, DATED 01/12/1988.

3.) TOTAL PCB CALCULATED AS TEH SUM OF ALL DETECTS ONLY.

RESIDENTIAL UNITS

RACEWAY #2

RACEWAY #6, 7, 8

EXTERIOR (EASTERN) COURTYARD

COMPOSITE 1A	
0-0.5'	ND
0.5-1'	ND
1-2'	1.44
2-3'	14.9
3-4'	16.5
4-5'	6.9

COMPOSITE 6A	
0-0.5'	0.98
0.5-1'	0.39
1-2'	4.4
2-3'	87

B-42A, B-41A, B-44A, B-45A, B-46A, B-51A, B-52A, B-47A, B-55A, B-56A, B-57A, B-59A, B-60A, B-61A, B-58A

HYDRANT

GAS METER

W.G.

PATIO

STORMWATER SYSTEM

DIRT

(BOILER ROOM)

COMPOSITE 2A	
0-0.5'	1.21
0.5-1'	6.8

MILL #3

(WOOD FLOORING)

COMPOSITE 5A	
0-0.5'	0.24
0.5-1'	1.19
1-2'	ND
2-3'	ND

FIRE ESCAPE

CONC. RETAINING WALL

RACEWAY CRANK HOUSING

Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Soil Boring/ Monitoring Well
- Soil Boring
- Catch Basin
- Wall-Mounted Transformer
- Soil Vapor Point
- 0-0.5' Sample Depth (ft)
- 1.42 PCB Concentration (mg/kg)
- ND Non-Detect

Eastern Courtyard Plan
Soil PCB Concentration - 2014 Composite Samples

Boott Mills
130 John Street
Lowell, Massachusetts

GEC Project Number 911JR-3114
GEC File Number 071414A

FIGURE 5D

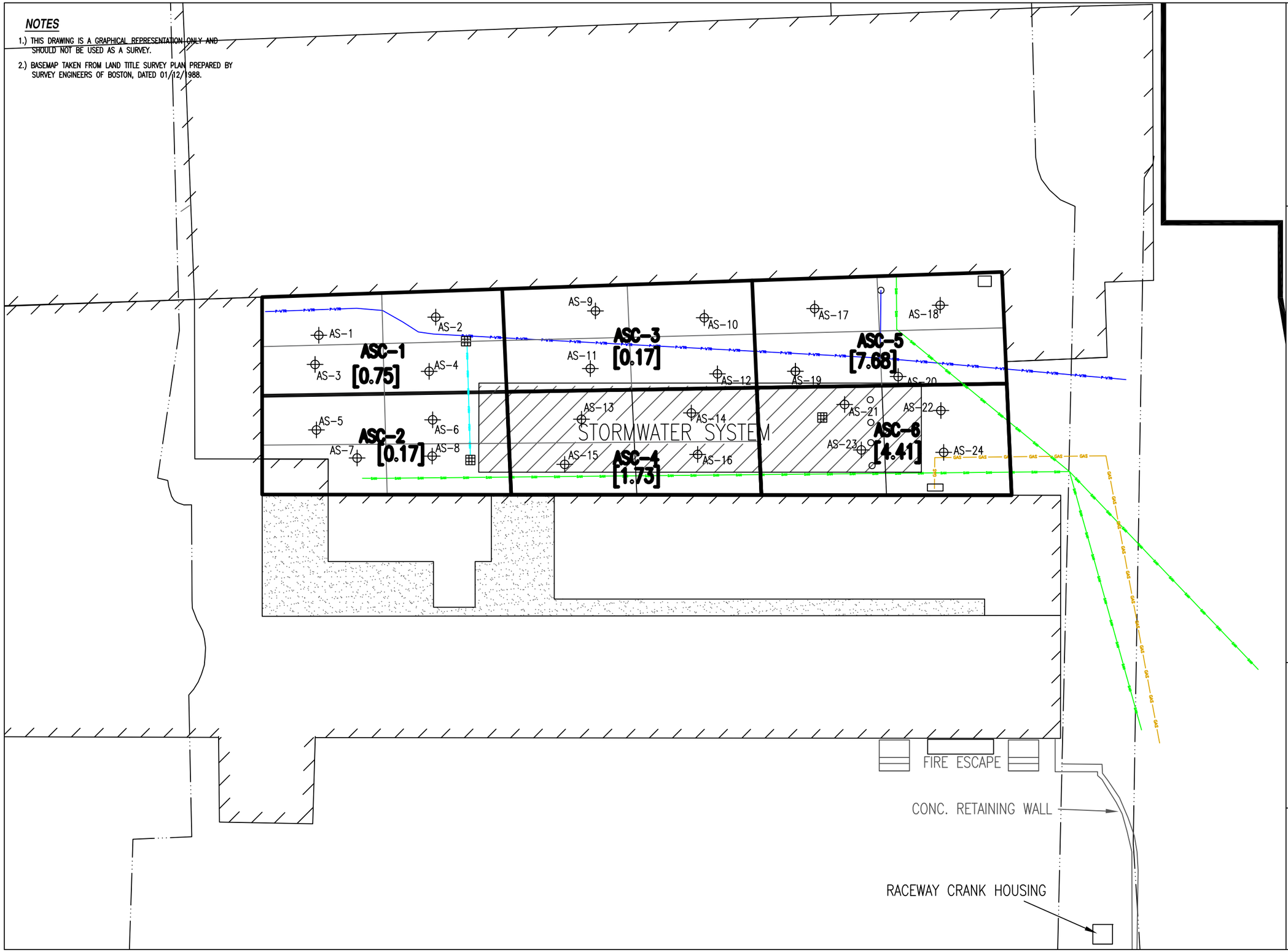
SCALE 0 10' 20'

N

NOTES

1.) THIS DRAWING IS A GRAPHICAL REPRESENTATION ONLY AND SHOULD NOT BE USED AS A SURVEY.

2.) BASEMAP TAKEN FROM LAND TITLE SURVEY PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON, DATED 01/12/1988.



Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Shallow Asphalt Sample
- [0.75] Combined PCB Concentration (mg/kg)

Site Plan
(Eastern Courtyard showing Combined Asphalt/Soil PCB Concentrations - 2014 Data)

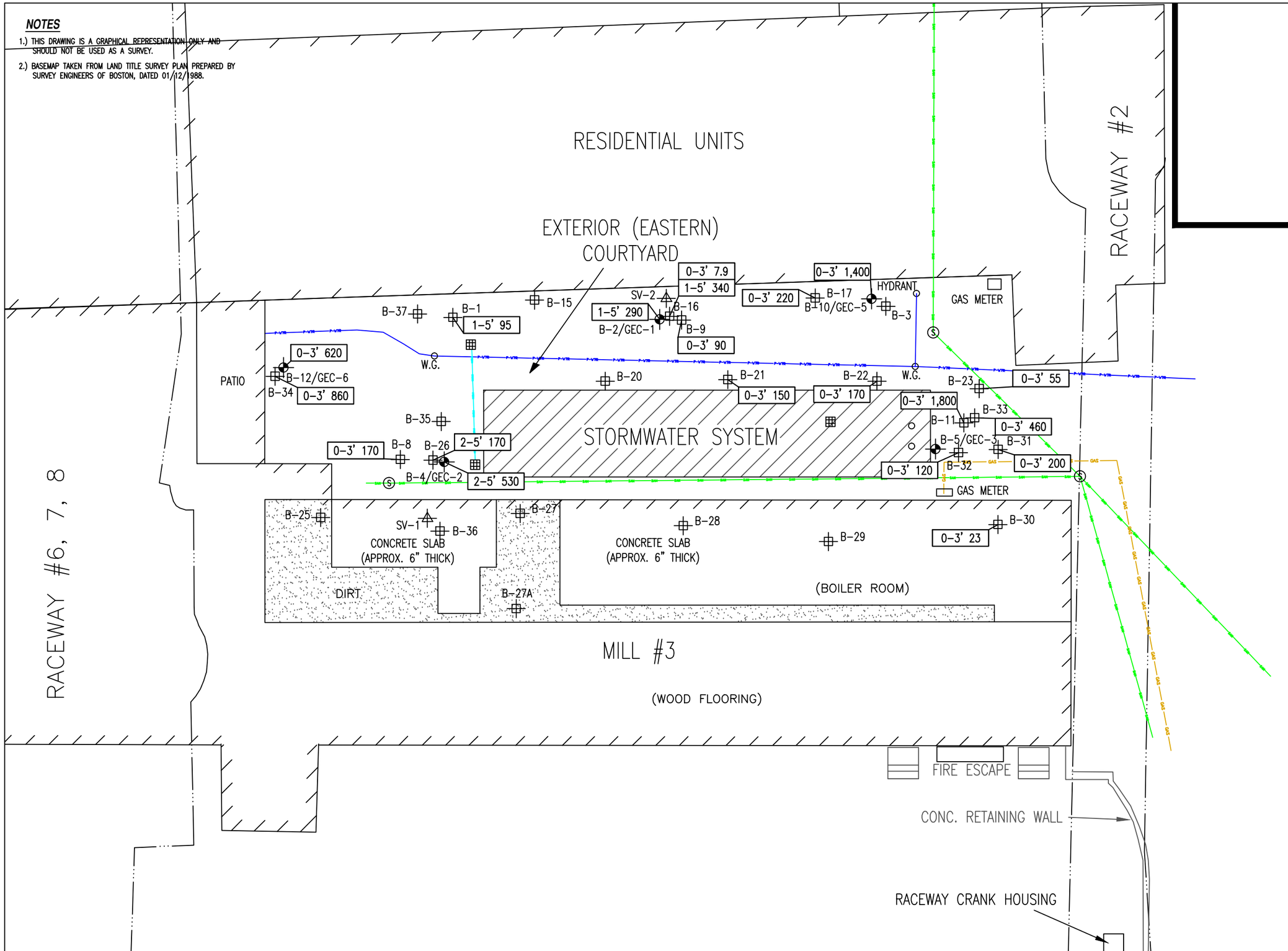
Boott Mills
130 John Street
Lowell, Massachusetts

GEC Project Number 911-3117
GEC File Number 071414A

FIGURE 5E

SCALE
0 10' 20'

N



Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Site Boundary
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Soil Boring/ Monitoring Well
- Soil Boring
- Catch Basin
- Wall-Mounted Transformer
- Soil Vapor Point
- 0-3' Sample Depth (in ft)
- 120 Lead Concentration (mg/kg)
- ND Non Detect

Eastern Courtyard Plan
Soil Lead Concentrations
0-3 Foot Interval

Boott Mills
130 John Street
Lowell, Massachusetts

GEC Project Number 1717-2040
GEC File Number 112012B

FIGURE 6A

SCALE
0 10' 20'
N

NOTES

1.) THIS DRAWING IS A GRAPHICAL REPRESENTATION ONLY AND SHOULD NOT BE USED AS A SURVEY.

2.) BASEMAP TAKEN FROM LAND TITLE SURVEY PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON, DATED 01/12/1988.

RESIDENTIAL UNITS

EXTERIOR (EASTERN) COURTYARD

RACEWAY #2

RACEWAY #6, 7, 8

PATIO

STORMWATER SYSTEM

CONCRETE SLAB (APPROX. 6" THICK)

DIRT

CONCRETE SLAB (APPROX. 6" THICK)

(BOILER ROOM)

MILL #3

(WOOD FLOORING)

FIRE ESCAPE

CONC. RETAINING WALL

RACEWAY CRANK HOUSING

GAS METER

HYDRANT

W.G.

B-1 B-2/GEC-1 B-3 B-4/GEC-2 B-5/GEC-3 B-6 B-7 B-8 B-9 B-10/GEC-5 B-11 B-12/GEC-6 B-15 B-16 B-17 B-20 B-21 B-22 B-23 B-25 B-26 B-27 B-27A B-28 B-29 B-30 B-31 B-32 B-33 B-34 B-35 B-36 B-37

SV-1 SV-2

3-5' 19
5-7' 110
3-5' 800
3-5' 130
3-5' 200
3-5' 17
3-5' 21
2-5' 170
3-5' 4.6
3-5' 16
3-4.5' 24

Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Site Boundary
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Soil Boring/ Monitoring Well
- Soil Boring
- Catch Basin
- Wall–Mounted Transformer
- Soil Vapor Point
- 3–5' Sample Depth (in ft)
- 16 Lead Concentration (mg/kg)
- ND Non Detect

Eastern Courtyard Plan
Soil Lead Concentrations
3-7 Foot Interval

Boott Mills
130 John Street
Lowell, Massachusetts

GEC Project Number 1717-2040
GEC File Number 112012B

FIGURE 6B

SCALE 0 10' 20'

N

NOTES

1.) THIS DRAWING IS A GRAPHICAL REPRESENTATION ONLY AND SHOULD NOT BE USED AS A SURVEY.

2.) BASEMAP TAKEN FROM LAND TITLE SURVEY PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON, DATED 01/12/1988.

RESIDENTIAL UNITS

EXTERIOR (EASTERN) COURTYARD

RACEWAY #2

RACEWAY #6, 7, 8

HOT SPOT #3 (2-5 FEET)

HOT SPOT #1 (2-4 FEET)

HOT SPOT #2 (2-7 FEET)

STORMWATER SYSTEM

PATIO

DIRT

(BOILER ROOM)

(WOOD FLOORING)

MILL #3

FIRE ESCAPE

CONC. RETAINING WALL

RACEWAY CRANK HOUSING

GAS METER

HYDRANT

W.G.

B-1, B-2/GEC-1, B-2A, B-3, B-4/GEC-2, B-5/GEC-3, B-6, B-7, B-8, B-9, B-10/GEC-5, B-11, B-11A, B-12/GEC-6, B-13, B-14, B-15, B-16, B-16A, B-17, B-18, B-19, B-20, B-20A, B-21, B-21A, B-22, B-23, B-25, B-26, B-27, B-27A, B-28, B-29, B-30, B-31, B-32, B-33, B-34, B-35, B-36, B-37, B-38, B-39, B-40, B-41, B-41A, B-42, B-42A, B-43, B-44, B-44A, B-45, B-45A, B-46, B-46A, B-47, B-47A, B-48, B-48A, B-49, B-49A, B-50, B-50A, B-51, B-51A, B-51B, B-52, B-52A, B-52B, B-53, B-54, B-55, B-55A, B-55B, B-56, B-56A, B-56B, B-57, B-57A, B-57B, B-58, B-58A, B-59, B-59A, B-60, B-60A, B-61, B-61A, B-63, B-64, B-65, B-66, B-67, B-68, B-69, B-70, B-71, B-72, B-73, SV-1, SV-2

Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Soil Boring/ Monitoring Well
- Soil Boring
- Catch Basin
- Wall-Mounted Transformer
- Soil Vapor Point
- Hot Spot Area > 50 ppm PCBs

Eastern Courtyard Plan
Excavation Areas to Achieve 50 mg/kg PCB Cleanup Standard

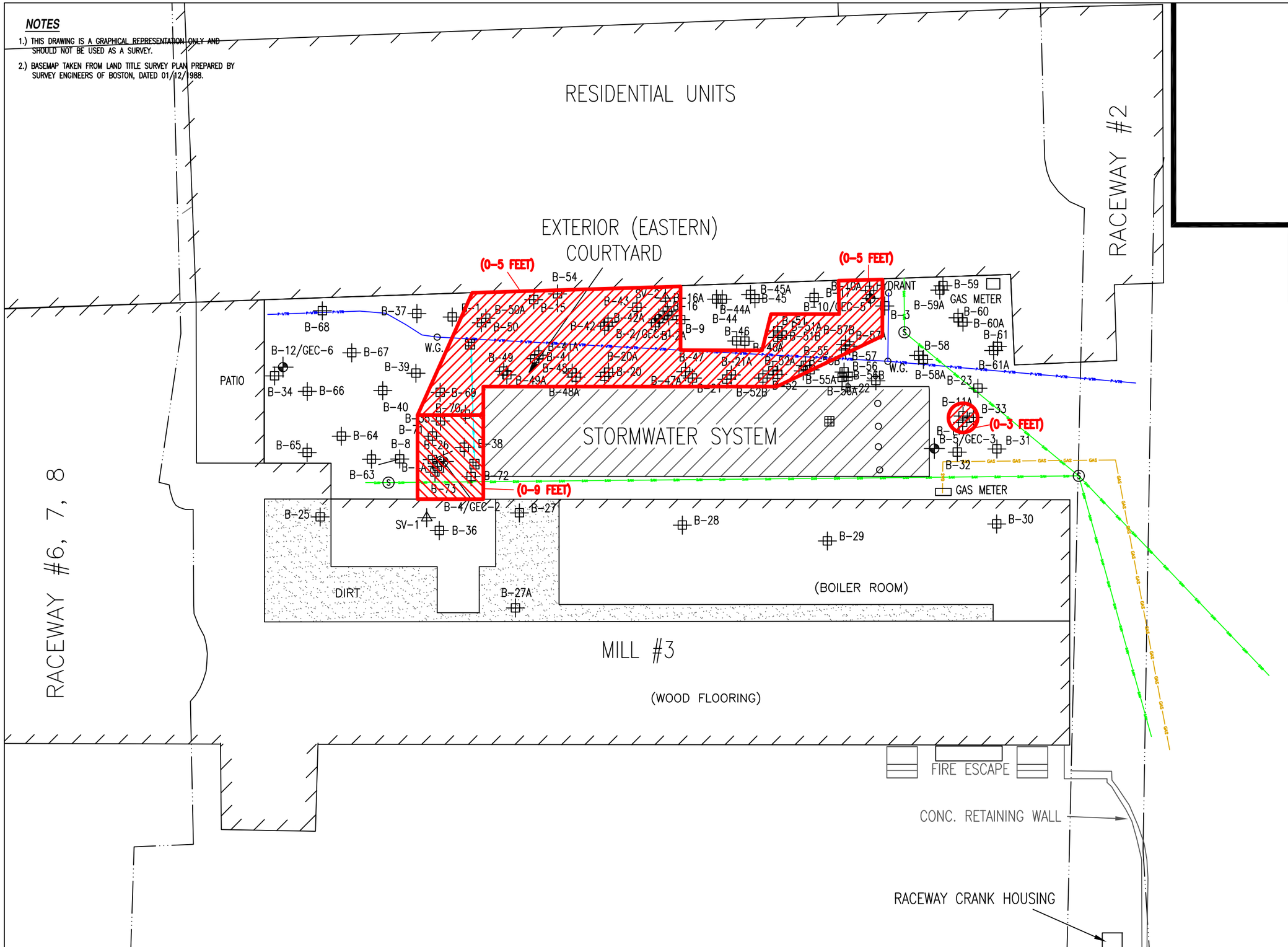
Boott Mills
130 John Street
Lowell, Massachusetts

GEC Project Number 911-3117
GEC File Number 071414A

FIGURE 7A

SCALE 0 10' 20'

N



GEC
Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Soil Boring/ Monitoring Well
- Soil Boring
- Catch Basin
- Wall-Mounted Transformer
- Soil Vapor Point
- Hot Spot Area > 10 ppm PCBs

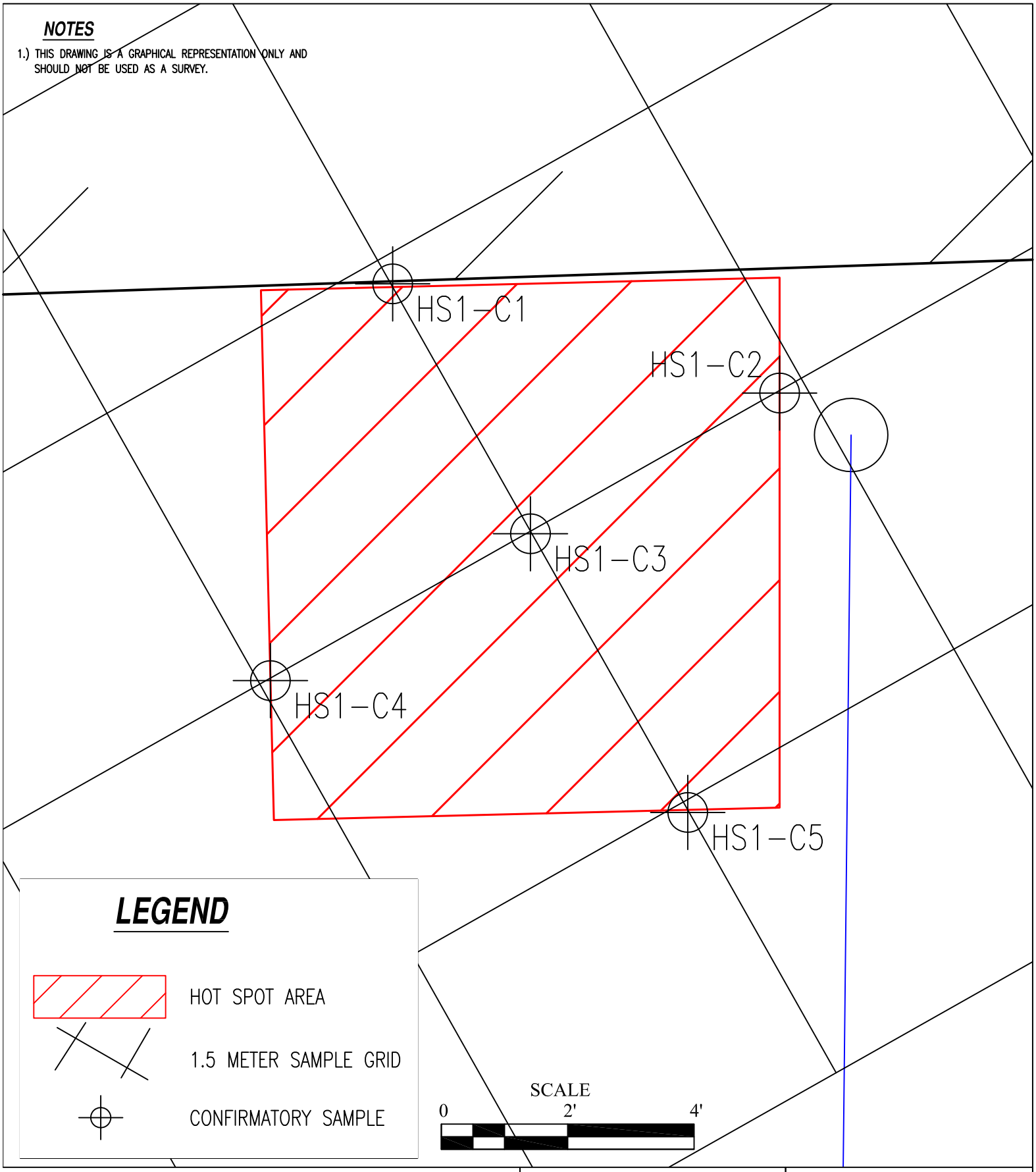
Eastern Courtyard Plan
Excavation Areas to Achieve 10 mg/kg PCB Cleanup Standard

Boott Mills
130 John Street
Lowell, Massachusetts

GEC Project Number 911-3117
GEC File Number 071414A

FIGURE 7B

SCALE
0 10' 20'
N



GEC
Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

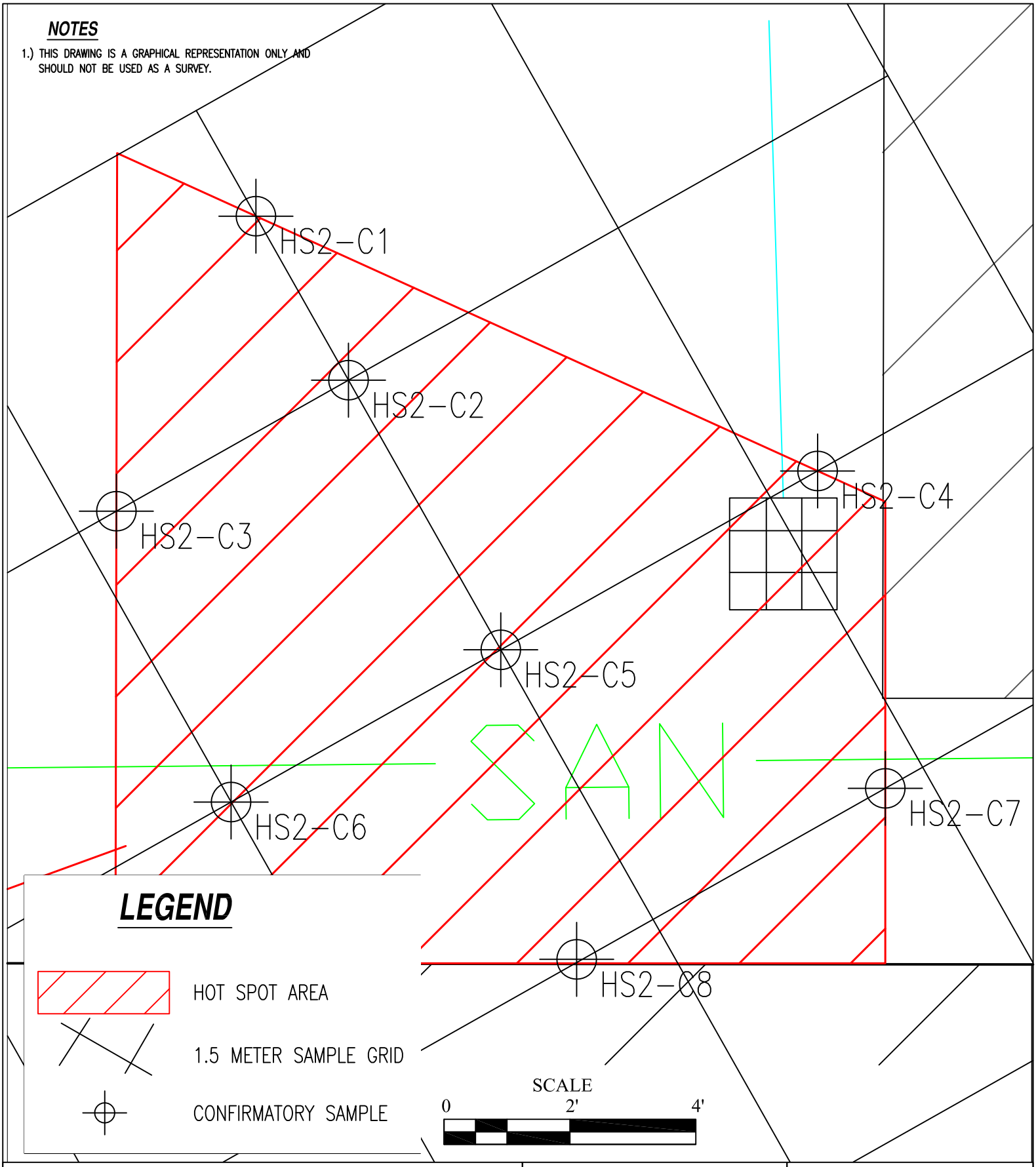
Hot Spot #1 - Confirmatory Soil Sampling Locations

Boott Mills
130 Foot of John Street
Lowell, Massachusetts

GEC Project Number 911JR-3114
GEC File Number 063014A

FIGURE 8A

N



Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

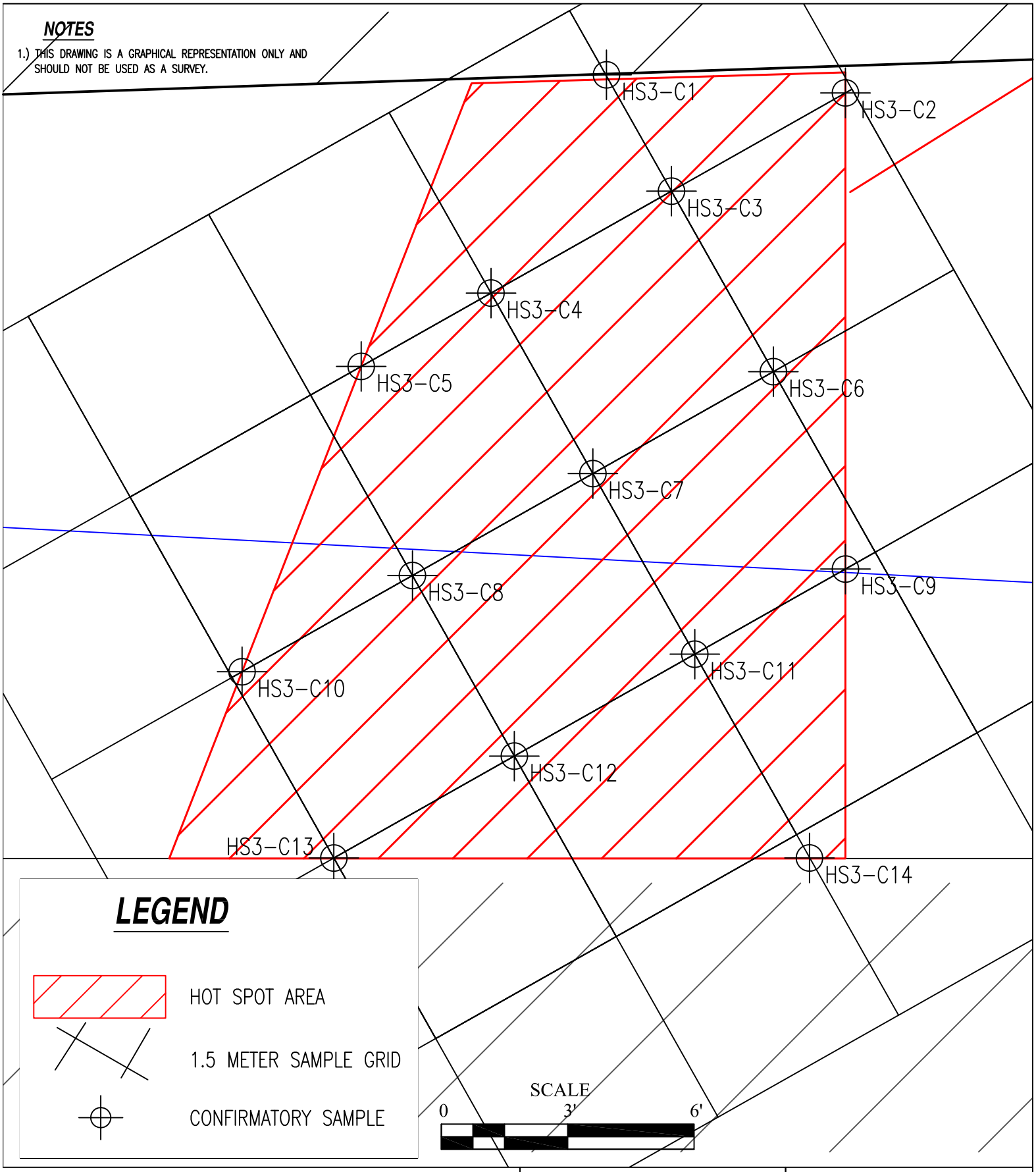
Hot Spot #2 - Confirmatory Soil Sampling Locations

Boott Mills
130 Foot of John Street
Lowell, Massachusetts

GEC Project Number 911JR-3114
GEC File Number 063014A

FIGURE 8B

N



Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Hot Spot #3 - Confirmatory Soil Sampling Locations

Boott Mills
130 Foot of John Street
Lowell, Massachusetts

GEC Project Number 911JR-3114
GEC File Number 063014A

FIGURE 8C

N

TABLES

TABLE 1.1
SUMMARY OF GROUNDWATER ANALYTICAL DATA:
MADEP EPH AND VPH
BOOTT MILLS
130 Foot of John Street, Lowell, MA

(unit, parts per billion [ppb], ug/L)

Sample Identification	Sample Date	Analytical Method	n-C19 to n-C36 Aliphatic Hydrocarbons	RDL	n-C11 to n-C22 Aromatic Hydrocarbons	RDL
GEC-1	06/15/2011	MA DEP EPH	190	110	160	110
	10/22/2012	MA DEP EPH	BRL	100	BRL	100
	10/22/2012 *	MA DEP EPH	BRL	110	BRL	110
GEC-2	06/15/2011	MA DEP EPH	150	110	130	110
	10/22/2012	MA DEP EPH	BRL	100	BRL	100
	10/22/2012 **	MA DEP EPH	BRL	130	BRL	130
GEC-3	06/15/2011	MA DEP EPH	BRL	110	BRL	110
GEC-4	06/15/2011	MA DEP EPH	BRL	120	BRL	120
Selected Groundwater Standards						
		MA GW-2	NA		50,000	
		MA GW-3	50,000		5,000	
		Surface Water Benchmark	2,100		5	

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

Bold = Exceeds One or More Selected Standards

- On 9/12/2011, groundwater samples were collected from GEC-2 and GEC-6 for analysis of VPH via MADEP's Method. No VPH constituents were detected in either sample.
- On 9/7/2011, a groundwater sample was collected from GEC-1 for analysis of VPH via MADEP's Method; however due to the closure of the original receiving laboratory the sample was lost during the transfer of samples to Alpha Analytical. No VPH data from GEC-1 is available.

* Sample was field filtered prior to laboratory analysis.

** Sample was laboratory filtered prior to laboratory analysis.

Prepared By: MDW
Reviewed By: EAF
Revision Date: 11/13/2012

TABLE 1.2
SUMMARY OF GROUNDWATER ANALYTICAL DATA:
PAHs
BOOTT MILLS
130 Foot of John Street, Lowell, MA

(unit, parts per billion [ppb], ug/L)

Sample Identification	Sample Date	Analytical Method	Phenanthrene	RDL	Fluoranthene	RDL	Pyrene	RDL	Benzo[a]anthracene	RDL	Chrysene	RDL
GEC-1	06/15/2011	EPA 8270C Mod	1.1	0.60	2.1	0.60	2.0	0.60	1.0	0.10	0.90	0.10
	9/7/2011	EPA 8270C Mod	BRL	0.20	0.25	0.20	0.24	0.20	BRL	0.20	BRL	0.20
	9/7/2011 *	EPA 8270C Mod	BRL	0.20	BRL	0.20	BRL	0.20	BRL	0.20	BRL	0.20
	10/22/2012	EPA 8270D	NA		NA		NA		0.18	0.050	BRL	0.20
	10/22/2012	MADEP-EPH-04-1.1	BRL	2.0	BRL	2.0	BRL	2.0	BRL	2.0	BRL	2.0
	10/22/2012 *	EPA 8270D	NA		NA		NA		0.079	0.056	BRL	0.22
	10/22/2012 *	MADEP-EPH-04-1.1	BRL	2.2	BRL	2.2	BRL	2.2	BRL	2.2	BRL	2.2
GEC-2	06/15/2011	EPA 8270C Mod	BRL	0.60	1.3	0.60	1.2	0.60	0.70	0.10	0.60	0.10
	09/12/2011	EPA 8270C Mod	BRL	5	BRL	5	BRL	5	BRL	5	BRL	5
	9/12/2011 *	EPA 8270C Mod	BRL	5	BRL	5	BRL	5	BRL	5	BRL	5
	10/22/2012	EPA 8270D	NA		NA		NA		0.27	0.050	0.29	0.20
	10/22/2012	MADEP-EPH-04-1.1	BRL	2.0	BRL	2.0	BRL	2.0	BRL	2.0	BRL	2.0
	10/22/2012 **	EPA 8270D	NA		NA		NA		BRL	0.063	BRL	0.25
	10/22/2012 **	MADEP-EPH-04-1.1	BRL	2.5	BRL	2.5	BRL	2.5	BRL	2.5	BRL	2.5
GEC-3	06/15/2011	EPA 8270C Mod	BRL	0.60	BRL	0.60	BRL	0.60	0.20	0.10	0.20	0.10
GEC-4	06/15/2011	EPA 8270C Mod	BRL	0.60	BRL	0.60	BRL	0.60	BRL	0.10	BRL	0.10
Selected Groundwater Standards and Guidance												
		MA GW-2	NA		NA		NA		NA		NA	
		MA GW-3	10,000		200		20		1,000		70	
		Surface Water Benchmark	38		0.9		0.089		1		0.07	

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

Bold = Exceeds One or More Selected Standards

* = Groundwater samples were field filtered prior to analysis.

** = Groundwater sample was laboratory filtered prior to analysis.

- Surface Water Benchmark values were from MADEP's spreadworks used to derive Method 1 GW-3 Standards

Prepared By: MDW
Reviewed By: EAF
Revision Date: 11/13/2012

TABLE 1.2
SUMMARY OF GROUNDWATER ANALYTICAL DATA:
PAHs
BOOTT MILLS
130 Foot of John Street, Lowell, MA

(unit, parts per billion [ppb], ug/L)

Sample Identification	Sample Date	Analytical Method	Benzo[b]fluoranthene	RDL	Benzo[k]fluoranthene	RDL	Benzo[a]pyrene	RDL	Indeno[1,2,3-c,d]pyrene	RDL
GEC-1	06/15/2011	EPA 8270C Mod	1.3	0.10	0.50	0.10	1.1	0.10	0.90	0.10
	9/7/2011	EPA 8270C Mod	0.27	0.20	BRL	0.20	0.28	0.20	0.37	0.20
	9/7/2011 *	EPA 8270C Mod	BRL	0.20	BRL	0.20	BRL	0.20	BRL	0.20
	10/22/2012	EPA 8270D	0.29	0.050	BRL	0.20	0.23	0.10	BRL	0.20
	10/22/2012	MADEP-EPH-04-1.1	BRL	2.0	BRL	2.0	BRL	2.0	BRL	2.0
	10/22/2012 *	EPA 8270D	0.11	0.056	BRL	0.22	BRL	0.11	BRL	0.22
	10/22/2012 *	MADEP-EPH-04-1.1	BRL	2.2	BRL	2.2	BRL	2.2	BRL	2.2
GEC-2	06/15/2011	EPA 8270C Mod	0.90	0.10	0.40	0.10	0.80	0.10	0.60	0.10
	09/12/2011	EPA 8270C Mod	BRL	5	BRL	5	BRL	5	BRL	5
	9/12/2011 *	EPA 8270C Mod	BRL	5	BRL	5	BRL	5	BRL	5
	10/22/2012	EPA 8270D	0.39	0.050	BRL	0.20	0.31	0.10	0.24	0.20
	10/22/2012	MADEP-EPH-04-1.1	BRL	2.0	BRL	2.0	BRL	2.0	BRL	2.0
	10/22/2012 **	EPA 8270D	BRL	0.063	BRL	0.25	BRL	0.13	BRL	0.25
	10/22/2012 **	MADEP-EPH-04-1.1	BRL	2.5	BRL	2.5	BRL	2.5	BRL	2.5
GEC-3	06/15/2011	EPA 8270C Mod	0.30	0.10	0.20	0.10	0.30	0.10	0.20	0.10
GEC-4	06/15/2011	EPA 8270C Mod	BRL	0.10	BRL	0.10	BRL	0.10	BRL	0.10
Selected Groundwater Standards and Guidance										
		MA GW-2	NA		NA		NA		NA	
		MA GW-3	400		100		500		100	
		Surface Water Benchmark	0.42		0.14		0.5		0.14	

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

Bold = Exceeds One or More Selected Standards

Prepared By: MDW
Reviewed By: EAF
Revision Date: 11/13/2012

TABLE 1.2
SUMMARY OF GROUNDWATER ANALYTICAL DATA:
PAHs
BOOTT MILLS
130 Foot of John Street, Lowell, MA

(unit, parts per billion [ppb], ug/L)

Sample Identification	Sample Date	Analytical Method	Dibenzo[a,h]anthracene	RDL	Benzo[g,h,i]perylene	RDL
GEC-1	06/15/2011	EPA 8270C Mod	0.20	0.10	0.70	0.10
	9/7/2011	EPA 8270C Mod	BRL	0.20	0.36	0.20
	9/7/2011 *	EPA 8270C Mod	BRL	0.20	BRL	0.20
	10/22/2012	EPA 8270D	BRL	0.20	BRL	0.20
	10/22/2012	MADEP-EPH-04-1.1	BRL	2.0	BRL	2.0
	10/22/2012 *	EPA 8270D	BRL	0.22	BRL	0.56
	10/22/2012 *	MADEP-EPH-04-1.1	BRL	2.2	BRL	2.2
GEC-2	06/15/2011	EPA 8270C Mod	0.10	0.10	0.50	0.10
	09/12/2011	EPA 8270C Mod	BRL	5	BRL	5
	9/12/2011 *	EPA 8270C Mod	BRL	5	BRL	5
	10/22/2012	EPA 8270D	BRL	0.20	BRL	0.20
	10/22/2012	MADEP-EPH-04-1.1	BRL	2.0	BRL	2.0
	10/22/2012 **	EPA 8270D	BRL	0.25	BRL	0.25
	10/22/2012 **	MADEP-EPH-04-1.1	BRL	2.5	BRL	2.5
GEC-3	06/15/2011	EPA 8270C Mod	BRL	0.10	0.20	0.10
GEC-4	06/15/2011	EPA 8270C Mod	BRL	0.10	BRL	0.10
Selected Groundwater Standards and Guidance						
		MA GW-2	NA		NA	
		MA GW-3	40		20	
		Surface Water Benchmark	0.04		0.02	

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

Bold = Exceeds One or More Selected Standards

Prepared By: MDW
Reviewed By: EAF
Revision Date: 11/13/2012

TABLE 1.3
SUMMARY OF GROUNDWATER ANALYTICAL DATA:
TRACE METALS
BOOT MILLS
130 Foot of John Street, Lowell, MA

(unit, parts per billion [ppb], ug/L)

Sample Identification	Sample Date	Analytical Method	Barium, Dissolved	RDL	Lead, Dissolved	RDL	Lead, Total	RDL	Hardness (mg/l)	RDL
GEC-1	6/15/2011	EPA 6010B	100	50	**12**	5.0	NA		NA	
	9/7/2011	EPA 6010B / SM18-20 2340B	NA		BRL	10	71	10	120	0.66
GEC-2	06/15/2011	EPA 6010B	BRL	50	BRL	5.0	NA		NA	
GEC-3	06/15/2011	EPA 6010B	BRL	50	BRL	5.0	NA		NA	
GEC-4	06/15/2011	EPA 6010B	BRL	50	BRL	5.0	NA		NA	
GEC-6	09/12/2011	EPA 6010B / SM18-20 2340B	NA		BRL	10	BRL	10	230	3.0
Selected Groundwater Standards										
		MA GW-2	NS		NS		NS			
		MA GW-3	50,000		10		10			
		Surface Water Benchmark	41,000		0.5		0.5			

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

NS = No applicable Standard

Bold = Exceeds One or More Selected Standards

- On 6/15/2011 GEC-1 and GEC-2 were sampled using bailers and could not be filtered in the field. Samples were filtered by the laboratory prior to preservation. GEC-3 and GEC-4 were field filtered prior to preservation.

- The Sept. 2011 samples from GEC-1 and GEC-6 were field filtered prior to preservation.

Prepared By: MDW
Reviewed By:
Revision Date: 11/12/2012

TABLE 1.4
SUMMARY OF GROUNDWATER ANALYTICAL DATA:
POLYCHORINATED BIPHENYLS
BOOTT MILLS
130 Foot of John Street, Lowell, MA

(unit, parts per billion [ppb], ug/L)

Sample Identification	Sample Date	Analytical Method	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	RDL
GEC-1	06/15/2011	EPA 8082	3.5	0.20	1.6	0.20	**5.1**	0.20
	9/7/2011	EPA 8082	BRL	0.25	0.43	0.25	BRL	0.25
	9/7/2011 *	EPA 8082	BRL	0.25	BRL	0.25	BRL	0.25
GEC-2	06/15/2011	EPA 8082	4.5	0.20	3.3	0.20	**7.8**	0.20
	09/12/2011	EPA 8082	BRL	0.20	BRL	0.20	BRL	0.20
	9/12/2011 *	EPA 8082	BRL	0.20	BRL	0.20	BRL	0.20
GEC-3	06/15/2011	EPA 8082	BRL	0.20	BRL	0.20	BRL	0.20
GEC-4	06/15/2011	EPA 8082	BRL	0.20	BRL	0.20	BRL	0.20
GEC-6	09/12/2011	EPA 8082	BRL	0.20	BRL	0.20	BRL	0.20
GEC-7	09/12/2011	EPA 8082	BRL	0.20	BRL	0.20	BRL	0.20
Selected Groundwater Standards								
		MA GW-2	5		5		5	
		MA GW-3	10		10		10	
		Surface Water Benchmark					0.014	

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

Bold = Exceeds One or More Selected Standards

1 = Total PCBs is a combination of separte aroclor compounds

* A sample of groundwater from GEC-1 and GEC-2 was filtered prior to analysis via EPA 8082.

Prepared By: MDW
Reviewed By:
Revision Date: 11/13/2012

TABLE 1.5
SUMMARY OF GROUNDWATER ANALYTICAL DATA:
VOLATILE ORGANIC COMPOUNDS
BOOT MILLS
130 Foot of John Street, Lowell, MA

(unit, parts per billion [ppb], ug/L)

Sample Identification	Sample Date	Analytical Method	Acetone	RDL
GEC-1	9/7/2011	EPA 8260B	BRL	5
GEC-2	09/12/2011	EPA 8260B	BRL	10
GEC-4	06/15/2011	EPA 8260B	BRL	10
GEC-6	09/12/2011	EPA 8260B	BRL	10
GEC-7	09/12/2011	EPA 8260B	11	10
Selected Groundwater Standards				
MA GW-2			50,000	
MA GW-3			50,000	
Surface Water Benchmark			3,400	

Notes:

ˌ = Reported Detection Limit

.L = Below Reporting Limit

NA = Not Analyzed

ɛeds One or More Selected Standards

TABLE 2.1
SUMMARY OF SOIL ANALYTICAL DATA:
MADEP EPH, TPH AND PAHs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	n-C19 to n-C36 Aliphatic Hydrocarbons	RDL	n-C11 to n-C22 Aromatic Hydrocarbons	RDL	Total Petroleum Hydrocarbons	RDL	Phenanthrene	RDL	Acenaphthene	RDL	Fluorene	RDL	Anthracene	RDL
Exterior Courtyard Samples																
B-1 1-5'	06/06/2011	MA DEP EPH	210	20	150	20	NA		1.9	0.5	BRL	0.5	BRL	0.5	0.6	0.5
B-1 10-15'	06/06/2011	MA DEP EPH	29	25	BRL	25	NA		BRL	0.62	BRL	0.62	BRL	0.62	BRL	0.62
B-2 1-5'	06/06/2011	MA DEP EPH	160	22	200	22	NA		8.4	0.54	0.7	0.54	0.85	0.54	2.3	0.54
B-2 10-15'	06/06/2011	MA DEP EPH	69	22	38	22	NA		BRL	0.56	BRL	0.56	BRL	0.56	BRL	0.56
B-3 5-10'	06/06/2011	MA DEP EPH	30	24	BRL	24	NA		BRL	0.6	BRL	0.6	BRL	0.6	BRL	0.6
B-4 12-15'	06/06/2011	MA DEP EPH	BRL	23	BRL	23	NA		BRL	0.58	BRL	0.58	BRL	0.58	BRL	0.58
B-4 2-5'	06/06/2011	MA DEP EPH	610	23	560	110	NA		17	2.8	BRL	2.8	BRL	2.8	**4.5**	2.8
B-5 10-15'	06/06/2011	MA DEP EPH	BRL	25	BRL	25	NA		BRL	0.63	BRL	0.63	BRL	0.63	BRL	0.63
B-8 0-3'	09/01/2011	EPA 8270C	NA		NA		NA		BRL	0.22	BRL	0.30	BRL	0.38	BRL	0.22
B-8 5-10'	09/01/2011	EPA 8270C	NA		NA		NA		6.0	0.25	BRL	0.34	BRL	0.42	1.5	0.25
B-9 0-3'	09/01/2011	EPA 8270C	NA		NA		NA		3.5	0.21	BRL	0.29	BRL	0.36	0.99	0.21
B-10 0-3'	09/01/2011	EPA 8270C	NA		NA		NA		8.2	0.23	0.45	0.30	0.56	0.38	2.1	0.23
B-11 0-3'	09/01/2011	EPA 8270C	NA		NA		NA		0.43	0.21	BRL	0.28	BRL	0.35	BRL	0.21
B-12 0-3'	09/01/2011	EPA 8270C	NA		NA		NA		0.66	0.23	BRL	0.31	BRL	0.39	BRL	0.23
WC-1 (B-16 1-5')	10/05/2012	EPA 8270D / 8100M	NA		NA		1,400	190	2.0	0.38	BRL	0.38	BRL	0.38	BRL	0.38
WC-1 (B-16 1-5')	10/05/2012	EPA 8260C	NA		NA		NA		NA		NA		NA		NA	
WC-2 (B-26 2-5')	10/09/2012	EPA 8270D / 8100M	NA		NA		740	190	3.9	0.38	BRL	0.38	BRL	0.38	1.0	0.38
WC-2 (B-26 2-5')	10/09/2012	EPA 8260C	NA		NA		NA		NA		NA		NA		NA	
Selected Soil Standards																
		MA S-1/GW-2	3,000		1,000		1,000		500		1,000		1,000		1,000	
		MA S-1/GW-3	3,000		1,000		1,000		500		1,000		1,000		1,000	
		MA S-2/GW-2	5,000		3,000		3,000		1,000		3,000		3,000		3,000	
		MA S-2/GW-3	5,000		3,000		3,000		1,000		3,000		3,000		3,000	
		MA S-3/GW-2	5,000		5,000		5,000		3,000		5,000		5,000		5,000	
		MA S-3/GW-3	5,000		5,000		5,000		3,000		5,000		5,000		5,000	
		MADEP Background - Urban Fill							20		2		2		**4**	
Enclosed Courtyard Samples																
B-6 0-4'	06/06/2011	MA DEP EPH	65	21	140	21	140	21	10	0.52	1.1	0.52	1	0.52	2.2	0.52
B-7 8-10'	06/06/2011	MA DEP EPH	BRL	24	BRL	24	BRL	24	BRL	0.61	BRL	0.61	BRL	0.61	BRL	0.61
Between Building and Merrimack River																
B-13 0-3'	09/01/2011	EPA 8270C	NA		NA		NA		9.2	0.22	0.64	0.30	0.60	0.37	1.6	0.22
Selected Soil Standards																
		MA RCS-1	3,000		1,000		1,000		10		4		1,000		1,000	
		MADEP Background - Urban Fill							20		2		2		4	

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

Bold = Exceeds background concentration and S-1/GW-2 or S-1/GW-3 standard

Prepared By: MDW / EAF
Reviewed By: EAF
Revision Date: 11/01/2012

TABLE 2.1
SUMMARY OF SOIL ANALYTICAL DATA:
MADEP EPH, TPH AND PAHs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Acenaph-thylene	RDL	Naphthalene	RDL	2-Methyl-naphthalene	RDL	Fluoranthene	RDL	Pyrene	RDL	Benzo[a] anthracene	RDL	Chrysene	RDL
Exterior Courtyard Samples																
B-1 1-5'	06/06/2011	MA DEP EPH	BRL	0.5	BRL	0.5	BRL	0.5	3.2	0.5	3	0.5	1.7	0.5	2	0.5
B-1 10-15'	06/06/2011	MA DEP EPH	BRL	0.62	BRL	0.62	BRL	0.62	BRL	0.62	BRL	0.62	BRL	0.62	BRL	0.62
B-2 1-5'	06/06/2011	MA DEP EPH	BRL	0.54	BRL	0.54	BRL	0.54	**12**	0.54	11	0.54	5.9	0.54	6.6	0.54
B-2 10-15'	06/06/2011	MA DEP EPH	BRL	0.56	BRL	0.56	BRL	0.56	1	0.56	0.95	0.56	BRL	0.56	0.68	0.56
B-3 5-10'	06/06/2011	MA DEP EPH	BRL	0.6	BRL	0.6	BRL	0.6	BRL	0.6	BRL	0.6	BRL	0.6	BRL	0.6
B-4 12-15'	06/06/2011	MA DEP EPH	BRL	0.58	BRL	0.58	BRL	0.58	BRL	0.58	BRL	0.58	BRL	0.58	BRL	0.58
B-4 2-5'	06/06/2011	MA DEP EPH	BRL	2.8	BRL	2.8	BRL	2.8	**24**	2.8	19	2.8	**9.8**	2.8	**11**	2.8
B-5 10-15'	06/06/2011	MA DEP EPH	BRL	0.63	BRL	0.63	BRL	0.63	BRL	0.63	BRL	0.63	BRL	0.63	BRL	0.63
B-8 0-3'	09/01/2011	EPA 8270C	BRL	0.30	BRL	0.38	BRL	0.45	BRL	0.22	BRL	0.22	BRL	0.22	BRL	0.22
B-8 5-10'	09/01/2011	EPA 8270C	**1.1**	0.34	0.47	0.42	BRL	0.50	**14**	0.25	12	0.25	7.1	0.25	6.4	0.25
B-9 0-3'	09/01/2011	EPA 8270C	0.46	0.29	BRL	0.36	BRL	0.43	8.2	0.21	7.0	0.21	3.7	0.21	3.6	0.21
B-10 0-3'	09/01/2011	EPA 8270C	0.74	0.30	BRL	0.38	BRL	0.46	**14**	0.23	12	0.23	5.8	0.23	5.3	0.23
B-11 0-3'	09/01/2011	EPA 8270C	BRL	0.28	BRL	0.35	BRL	0.42	1.1	0.21	1.0	0.21	0.61	0.21	0.62	0.21
B-12 0-3'	09/01/2011	EPA 8270C	BRL	0.31	BRL	0.39	BRL	0.47	1.3	0.23	1.3	0.23	0.75	0.23	0.74	0.23
WC-1 (B-16 1-5')	10/05/2012	EPA 8270D / 8100M	BRL	0.38	BRL	0.38	BRL	0.38	1.9	0.38	2.0	0.38	0.97	0.38	1.1	0.38
WC-1 (B-16 1-5')	10/05/2012	EPA 8260C	NA		0.0074	0.0036	NA		NA		NA		NA		NA	
WC-2 (B-26 2-5')	10/09/2012	EPA 8270D / 8100M	BRL	0.38	BRL	0.38	BRL	0.38	6.7	0.38	7.9	0.38	4.5	0.38	4.1	0.38
WC-2 (B-26 2-5')	10/09/2012	EPA 8260C	NA		BRL	0.12	NA		NA		NA		NA		NA	
Selected Soil Standards																
		MA S-1/GW-2	600		40		80		1,000		1,000		7		70	
		MA S-1/GW-3	10		500		300		1,000		1,000		7		70	
		MA S-2/GW-2	600		40		80		3,000		3,000		40		400	
		MA S-2/GW-3	10		1,000		500		3,000		3,000		40		400	
		MA S-3/GW-2	600		40		80		5,000		5,000		300		3,000	
		MA S-3/GW-3	10		3,000		500		5,000		5,000		300		3,000	
		MADEP Background - Urban Fill	**1**		1		1		10		20		9		7	
Enclosed Courtyard Samples																
B-6 0-4'	06/06/2011	MA DEP EPH	BRL	0.52	BRL	0.52	BRL	0.52	11	0.52	9.4	0.52	4.7	0.52	5.4	0.52
B-7 8-10'	06/06/2011	MA DEP EPH	BRL	0.61	BRL	0.61	BRL	0.61	BRL	0.61	BRL	0.61	BRL	0.61	BRL	0.61
Between Building and Merrimack River																
B-13 0-3'	09/01/2011	EPA 8270C	0.33	0.30	BRL	0.37	BRL	0.45	13	0.22	11	0.22	5.6	0.22	5.9	0.22
Selected Soil Standards																
		MA RCS-1	1		4		0.7		1,000		1,000		7		70	
		MADEP Background - Urban Fill	1		1		1		10		20		9		7	

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

Prepared By: MDW / EAF
Reviewed By: EAF
Revision Date: 11/01/2012

TABLE 2.1
SUMMARY OF SOIL ANALYTICAL DATA:
MADEP EPH, TPH AND PAHs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Benzo[b] fluoranthene	RDL	Benzo[k] fluoranthene	RDL	Benzo[a] pyrene	RDL	Indeno[1,2,3-c,d] pyrene	RDL	Dibenzo[a,h] anthracene	RDL	Benzo[g,h,i] perylene	RDL
Exterior Courtyard Samples														
B-1 1-5'	06/06/2011	MA DEP EPH	1.5	0.5	1.4	0.5	1.9	0.5	1.2	0.5	BRL	0.5	1.2	0.5
B-1 10-15'	06/06/2011	MA DEP EPH	BRL	0.62	BRL	0.62	BRL	0.62	BRL	0.62	BRL	0.62	BRL	0.62
B-2 1-5'	06/06/2011	MA DEP EPH	6.1	0.54	**4.1**	0.54	6.1	0.54	**3.9**	0.54	1.0	0.54	**3.5**	0.54
B-2 10-15'	06/06/2011	MA DEP EPH	0.59	0.56	BRL	0.56	0.64	0.56	BRL	0.56	BRL	0.56	BRL	0.56
B-3 5-10'	06/06/2011	MA DEP EPH	BRL	0.6	BRL	0.6	BRL	0.6	BRL	0.6	BRL	0.6	BRL	0.6
B-4 12-15'	06/06/2011	MA DEP EPH	BRL	0.58	BRL	0.58	BRL	0.58	BRL	0.58	BRL	0.58	BRL	0.58
B-4 2-5'	06/06/2011	MA DEP EPH	**8.7**	2.8	**8.1**	2.8	**9.8**	2.8	**6.0**	2.8	**BRL**	2.8	**5.8**	2.8
B-5 10-15'	06/06/2011	MA DEP EPH	BRL	0.63	BRL	0.63	BRL	0.63	BRL	0.63	BRL	0.63	BRL	0.63
B-8 0-3'	09/01/2011	EPA 8270C	BRL	0.22	BRL	0.22	BRL	0.30	BRL	0.30	BRL	0.22	BRL	0.30
B-8 5-10'	09/01/2011	EPA 8270C	7.8	0.25	3.3	0.25	6.5	0.34	**4.9**	0.34	**1.2**	0.25	**4.2**	0.34
B-9 0-3'	09/01/2011	EPA 8270C	4.4	0.21	1.7	0.21	3.5	0.29	2.9	0.29	0.58	0.21	2.5	0.29
B-10 0-3'	09/01/2011	EPA 8270C	6.4	0.23	2.5	0.23	5.0	0.30	4.1	0.30	1.0	0.23	**3.6**	0.30
B-11 0-3'	09/01/2011	EPA 8270C	0.74	0.21	0.30	0.21	0.63	0.28	0.51	0.28	BRL	0.21	0.43	0.28
B-12 0-3'	09/01/2011	EPA 8270C	0.84	0.23	0.32	0.23	0.65	0.31	0.53	0.31	BRL	0.23	0.46	0.31
WC-1 (B-16 1-5')	10/05/2012	EPA 8270D / 8100M	0.98	0.38	BRL	0.38	0.76	0.38	0.57	0.38	BRL	0.38	0.49	0.38
WC-1 (B-16 1-5')	10/05/2012	EPA 8260C	NA		NA		NA		NA		NA		NA	
WC-2 (B-26 2-5')	10/09/2012	EPA 8270D / 8100M	4.4	0.38	1.7	0.38	4.3	0.38	2.8	0.38	0.65	0.38	2.2	0.38
WC-2 (B-26 2-5')	10/09/2012	EPA 8260C	NA		NA		NA		NA		NA		NA	
Selected Soil Standards														
		MA S-1/GW-2	7		70		2		7		0.7		1,000	
		MA S-1/GW-3	7		70		2		7		0.7		1,000	
		MA S-2/GW-2	40		400		4		40		4		3,000	
		MA S-2/GW-3	40		400		4		40		4		3,000	
		MA S-3/GW-2	300		3,000		30		300		30		5,000	
		MA S-3/GW-3	300		3,000		30		300		30		5,000	
		MADEP Background - Urban Fill	8		4		7		3		1		3	
Enclosed Courtyard Samples														
B-6 0-4'	06/06/2011	MA DEP EPH	4.5	0.52	3.2	0.52	4.3	0.52	2.8	0.52	0.76	0.52	2.3	0.52
B-7 8-10'	06/06/2011	MA DEP EPH	BRL	0.61	BRL	0.61	BRL	0.61	BRL	0.61	BRL	0.61	BRL	0.61
Between Building and Merrimack River														
B-13 0-3'	09/01/2011	EPA 8270C	6.5	0.22	2.6	0.22	5.0	0.30	3.7	0.30	0.90	0.22	3.2	0.30
Selected Soil Standards														
		MA RCS-1	7		70		2		7		0.7		1,000	
		MADEP Background - Urban Fill	8		4		7		3		1		3	

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

Prepared By: MDW / EAF
Reviewed By: EAF
Revision Date: 11/01/2012

TABLE 2.2.1
SUMMARY OF SOIL AND ASPHALT ANALYTICAL DATA:
POLYCHLORINATED BIPHENYLS (PCBs)
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]
Exterior Courtyard Samples									
B-1 1-5'	06/06/2011	EPA 8082	BRL	0.084	0.57	0.084	0.53	0.084	**1.142**
B-1 10-15'	06/06/2011	EPA 8082	BRL	0.1	BRL	0.1	BRL	0.1	0.15
B-2 1-5'	06/06/2011	EPA 8082	BRL	4.3	20	4.3	11	4.3	***33.15***
B-2 10-15'	06/06/2011	EPA 8082	BRL	0.091	1.8	0.091	2.3	0.46	***4.1455***
B-3 5-10'	06/06/2011	EPA 8082	BRL	0.097	BRL	0.097	BRL	0.097	0.1455
B-4 2-5'	06/06/2011	EPA 8082	BRL	9	60	9	64	9	***128.5***
B-4 12-15'	06/06/2011	EPA 8082	BRL	0.095	BRL	0.095	BRL	0.095	0.1425
B-5 10-15'	06/06/2011	EPA 8082	BRL	0.1	BRL	0.1	BRL	0.1	0.15
B-8 0-1'	09/01/2011	EPA 8082	BRL	0.0342	0.119	0.0342	0.149	0.0342	0.2851
B-8 1-3'	09/01/2011	EPA 8082	BRL	0.0381	BRL	0.0381	BRL	0.0381	0.05715
B-8 0-3'	09/01/2011	EPA 8082	BRL	0.04	BRL	0.04	0.0699	0.04	0.1099
B-8 5-10'	09/01/2011	EPA 8082	BRL	0.0455	BRL	0.0455	BRL	0.0455	0.06825
B-9 0-1'	09/01/2011	EPA 8082	BRL	0.0364	BRL	0.0364	BRL	0.0364	0.0546
B-9 1-3'	09/01/2011	EPA 8082	BRL	0.719	4.86	0.719	3.35	0.719	***8.5695***
B-10 0-3'	09/01/2011	EPA 8082	BRL	0.382	1.05	0.382	2.27	0.382	**3.511**
B-10 3-6'	09/01/2011	EPA 8082	BRL	0.426	BRL	0.426	0.691	0.426	**1.117**
B-11 0-3'	09/01/2011	EPA 8082	BRL	0.731	6.14	0.731	5.05	0.731	***11.5555***
B-11 3-6'	09/01/2011	EPA 8082	BRL	0.036	BRL	0.036	BRL	0.036	0.054
B-12 0-3'	09/01/2011	EPA 8082	BRL	0.0371	0.0649	0.0371	0.184	0.0371	0.26745
B-12 3-6'	09/01/2011	EPA 8082	BRL	0.0368	BRL	0.0368	BRL	0.0368	0.0552
B-15 0-3'	10/05/2012	EPA 8082A	BRL	1.1	5.8	1.1	4.0	1.1	***10.35***
B-15 3-5'	10/05/2012	EPA 8082A	BRL	1.1	6.3	1.1	5.1	1.1	***11.95***
B-15 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
WC-1 (B-16 1-5')	10/05/2012	EPA 8082A	BRL	1.1	7.4	1.1	7.6	1.1	***15.55***
B-16 5-7'	10/05/2012	EPA 8082A	BRL	0.54	4.6	0.54	3.0	0.54	***7.87***
B-16 7-9'	10/05/2012	EPA 8082A	BRL	0.52	2.5	0.52	1.7	0.52	***4.46***
B-16 9-12'	10/05/2012	EPA 8082A	BRL	0.22	1.7	0.22	1.0	0.22	**2.81**
B-17 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-17 3-5'	10/05/2012	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18
B-17 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-20 '0-3	10/05/2012	EPA 8082A	BRL	0.11	1.2	0.11	1.1	0.11	**2.355**
B-20 3-5'	10/05/2012	EPA 8082A	BRL	0.11	0.46	0.11	0.39	0.11	0.905
B-20 5-7'	10/05/2012	EPA 8082A	BRL	0.11	0.95	0.11	0.71	0.11	**1.715**
B-21 0-3'	10/05/2012	EPA 8082A	BRL	0.55	3.1	0.55	3.1	0.55	***6.475***
B-21 3-5'	10/05/2012	EPA 8082A	BRL	0.11	0.63	0.11	0.50	0.11	**1.185**
B-22 3-5'	10/05/2012	EPA 8082A	BRL	0.22	0.90	0.22	1.9	0.22	**2.91**
B-22 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-23 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-23 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
WC-2 (B-26 2-5')	10/09/2012	EPA 8082A	BRL	2.3	15	2.3	17	2.3	***33.15***
B-26 5-7'	10/09/2012	EPA 8082A	BRL	2.2	14	2.2	12	2.2	***27.1***
B-26 7-9'	10/09/2012	EPA 8082A	BRL	0.23	1.8	0.23	1.2	0.23	**3.115**
B-26 9-12'	10/09/2012	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18
B-31 0-3'	10/09/2012	EPA 8082A	BRL	0.11	0.12	0.11	0.15	0.11	0.325
B-31 3-5'	10/09/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15
B-32 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-32 3-5'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-34 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-35 0-3'	10/05/2012	EPA 8082A	BRL	0.21	1.6	0.21	1.4	0.21	**3.105**
B-35 3-5'	10/05/2012	EPA 8082A	BRL	1.1	9.3	1.1	8.0	1.1	***17.85***
B-35 5-7'	10/05/2012	EPA 8082A	BRL	5.7	18	5.7	27	5.7	***47.85***
B-35 7-9'	10/05/2012	EPA 8082A	BRL	1.1	5.8	1.1	7.7	1.1	***14.05***
B-37 0-3'	10/05/2012	EPA 8082A	BRL	0.11	0.66	0.11	0.44	0.11	**1.155**
B-37 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-38 0-9'	05/08/2013	EPA 8082A	BRL	5.4	BRL	5.4	37	5.4	***42.4***
B-38 9-12'	05/08/2013	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18
B-48 0-3'	05/09/2013	EPA 8082A	BRL	0.1	0.93	0.1	0.91	0.1	**1.89**
B-48 3-9'	05/09/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
Composite 1 0-5'	05/08/2013	EPA 8082A	BRL	1.1	4.8	1.1	2.9	1.1	***8.25***
Composite 2 0-5'	05/08/2013	EPA 8082A	BRL	0.11	0.44	0.11	0.45	0.11	0.945
Composite 3 0-3'	05/08/2013	EPA 8082A	BRL	0.11	0.14	0.11	0.26	0.11	0.455
Composite 3 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165

TABLE 2.2.1
SUMMARY OF SOIL AND ASPHALT ANALYTICAL DATA:
POLYCHLORINATED BIPHENYLS (PCBs)
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]
Composite 4 0-3'	05/08/2013	EPA 8082A	BRL	2.1	9.2	2.1	7.5	2.1	***17.75***
Composite 4 3-9'	05/08/2013	EPA 8082A	BRL	0.11	0.72	0.11	0.59	0.11	**1.365**
Composite 5 0-3'	05/09/2013	EPA 8082A	BRL	0.11	0.81	0.11	1.2	0.11	**2.065**
Composite 5 3-9'	05/09/2013	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18
Composite 6 0-3'	05/09/2013	EPA 8082A	BRL	0.55	2	0.55	1.9	0.55	***4.175***
Composite 6 3-9'	05/09/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-39 0-3'	05/08/2013	EPA 8082A	BRL	0.10	BRL	0.10	0.42	0.10	0.52
B-39 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	0.25	0.11	0.36
B-49 0-3'	05/08/2013	EPA 8082A	BRL	1.1	8.9	1.1	9.8	1.1	***19.25***
B-49 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-50 0-3'	05/08/2013	EPA 8082A	BRL	2.2	14	2.2	22	2.2	***37.1***
B-50 3-9'	05/08/2013	EPA 8082A	BRL	0.43	3.4	0.43	2.2	0.43	***5.815***
B-2A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-2A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15
B-2A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15
B-2A 3-4'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.67	0.10	0.67	0.10	**1.39**
B-2A 4-5'	03/04/2014	EPA 8082A / EPA 3540	BRL	1.1	6.1	1.1	3.5	1.1	***10.15***
B-2A 4-5' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	5.4	37	5.4	24	5.4	***63.7***
B-10A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15
B-10A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.15	0.11	0.32	0.11	0.525
B-10A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	2.0	0.43	1.50	0.43	**3.715**
B-10A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	11	BRL	11	110	11	***121***
B-10A 2-3' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	11	BRL	11	91	11	***102***
B-11A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.69	0.10	0.56	0.10	**1.3**
B-11A 0-0.5' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.68	0.10	0.67	0.10	**1.4**
B-11A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	2.10	0.43	1.50	0.43	**3.815**
B-11A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.14	0.12	BRL	0.12	0.26
B-11A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-16A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-16A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-16A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	0.59	0.41	0.95	0.41	**1.745**
B-16A 3-4'	03/04/2014	EPA 8082A / EPA 3540	BRL	2.2	10	2.2	7.1	2.2	***18.2***
B-16A 4-5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.91	0.11	0.65	0.11	**1.615**
B-20A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-20A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-20A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.26	0.11	0.20	0.11	0.515
B-20A 1-2' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.27	0.10	0.21	0.10	0.53
B-20A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	5.40	40	5.40	20	5.40	***62.7***
B-21A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615
B-21A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615
B-21A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.38	0.11	0.27	0.11	0.705
B-21A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	1.1	4.0	1.1	7.5	1.1	***12.05***
B-48A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	BRL	0.43	BRL	0.43	0.645
B-48A 0-0.5' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615
B-48A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615
B-48A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.45	2.5	0.45	2.6	0.45	***5.325***
B-48A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.44	1.5	0.44	1.2	0.44	**2.92**
B-49A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-49A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.82	0.10	0.58	0.10	**1.45**
B-49A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.53	3.8	0.53	2.7	0.53	***6.765***
B-50A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615
B-50A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.82	0.11	0.54	0.11	**1.415**
B-50A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	2.2	16	2.2	20	2.2	***37.1***
B-50A 2-3' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	2.2	20	2.2	16	2.2	***37.1***
B-50A 5-7'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15
B-50A 7-9'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
COMP 1A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	BRL	0.42	BRL	0.42	0.63
COMP 1A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	BRL	0.42	BRL	0.42	0.63
COMP 1A 1-2'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.44	0.67	0.44	0.77	0.44	**1.66**
COMP 1A 2-3'	03/05/2014	EPA 8082A / EPA 3540	BRL	1.1	8.6	1.1	6.3	1.1	***15.45***
COMP 1A 3-4'	03/05/2014	EPA 8082A / EPA 3540	BRL	1.1	10	1.1	6.5	1.1	***17.05***
COMP 1A 4-5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.53	3.0	0.53	3.9	0.53	***7.165***
COMP 2A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	0.57	0.42	0.64	0.42	**1.42**

Prepared By: MDW / DH
Reviewd By: EAF
Revision Date: 06/20/2014

TABLE 2.2.1
SUMMARY OF SOIL AND ASPHALT ANALYTICAL DATA:
POLYCHLORINATED BIPHENYLS (PCBs)
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]
COMP 2A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	2.1	BRL	2.1	6.8	2.1	***8.9***
COMP 5A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.10	0.12	0.10	0.12	0.10	0.29
COMP 5A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.34	0.11	0.85	0.11	**1.245**
COMP 5A 1-2'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
COMP 5A 2-3'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
COMP 6A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.35	0.11	0.63	0.11	**1.035**
COMP 6A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.18	0.11	0.21	0.11	0.445
COMP 6A 1-2'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.45	2.0	0.45	2.4	0.45	***4.625***
COMP 6A 2-3'	03/05/2014	EPA 8082A / EPA 3540	BRL	11	26	11	61	11	***92.5***
B-51B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.20	8.60	1.20	7.60	1.20	***16.8***
B-51B 2-3'	06/04/2014	EPA 8082A / EPA 3540	0.58	0.24	1.50	0.24	BRL	0.24	**2.20**
B-51B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.13	BRL	0.13	BRL	0.13	0.195
B-52B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.21	1.80	0.21	1.20	0.21	**3.105**
B-52B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.55	4.40	0.55	4.90	0.55	***9.575***
B-52B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-55B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	0.14	0.11	0.25
B-55B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.47	0.11	0.45	0.11	0.975
B-55B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	1.00	0.11	0.97	0.11	**2.025**
B-56B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.78	0.12	1.20	0.12	**2.04**
B-56B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.74	0.12	1.00	0.12	**1.8**
B-56B 3-4'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18
B-57B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.33	0.11	0.42	0.11	0.805
B-57B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.59	1.70	0.59	3.20	0.59	***5.195***
B-57B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.76	0.12	1.40	0.12	**2.22**
B-69 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-69 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-69 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.57	1.80	0.57	2.90	0.57	***4.985***
B-69 2-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	2.40	22.00	2.40	19.00	2.40	***42.2***
B-69 5-7'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18
B-70 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-70 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.65	0.11	0.44	0.11	**1.145**
B-70 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-70 2-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	1.10	0.12	0.98	0.12	**2.14**
B-70 5-7'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18
B-71 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-71 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-71 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.10	5.30	1.10	4.10	1.10	***9.95***
B-72 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-72 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-72 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	1.20	0.12	0.76	0.12	**2.02**
B-73 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18
B-73 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.12	0.20	0.12	0.315
B-73 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.40	0.11	1.10	0.11	**1.555**
Exterior Courtyard Combined Asphalt and Soil Samples (Combined Depth to 12 Inches)									
ASC-1	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.39	0.11	0.30	0.11	0.75
ASC-2	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.17
ASC-3	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.17
ASC-4	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.93	0.11	0.74	0.11	**1.73**
ASC-5	06/04/2014	EPA 8082A / EPA 3540	BRL	0.56	4.30	0.56	3.10	0.56	***7.68***
ASC-6	06/04/2014	EPA 8082A / EPA 3540	BRL	0.21	2.60	0.21	1.70	0.21	***4.41***

TABLE 2.2.1
SUMMARY OF SOIL AND ASPHALT ANALYTICAL DATA:
POLYCHLORINATED BIPHENYLS (PCBs)
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]
Beneath Existing Mill #3 Building									
B-25 0-3'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15
B-25 3-5'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	0.13	0.11	0.24
B-25 5-7'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15
B-27 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-27 3-5'	10/09/2012	EPA 8082A	BRL	0.10	0.20	0.10	0.20	0.10	0.45
B-27A 0-3'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-27A 3-5'	10/17/2012	EPA 8082A	BRL	0.10	0.18	0.10	0.20	0.10	0.43
B-27A 5-7'	10/17/2012	EPA 8082A	BRL	0.10	0.18	0.10	0.21	0.10	0.44
B-28 0-3'	10/17/2012	EPA 8082A	BRL	0.11	0.19	0.11	0.26	0.11	0.505
B-29 0-3'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-29 3-5'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15
B-29 5-6'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-30 0-3'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	0.37	0.10	0.47
B-30 3-4.5'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	0.11	0.10	0.21
B-36 0-3'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	0.12	0.11	0.23
B-36 3-5'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
Selected MCP Soil Standards									
		MA S-1/GW-2							1
		MA S-1/GW-3							1
		MA S-2/GW-2							4
		MA S-2/GW-3							4
		MA S-3/GW-2							4
		MA S-3/GW-3							4
		Upper Concentration Limits							100
Selected TSCA Soil Standards									
		Self-Implementing High Occupancy							1
		Self-Implementing High Occupancy beneath Cap							>1 to 10
Enclosed Courtyard Samples									
B-6 0-4'	06/06/2011	EPA 8082	BRL	0.082	BRL	0.082	BRL	0.082	BRL
B-7 8-10'	06/06/2011	EPA 8082	BRL	0.096	BRL	0.096	BRL	0.096	BRL
Between Building and Merrimack River									
B-13 0-3'	09/01/2011	EPA 8082	BRL	0.082	BRL	0.0383	BRL	0.0383	BRL
B-13 3-6'	09/01/2011	EPA 8082	BRL	0.096	BRL	0.0368	BRL	0.0368	BRL
Selected Soil Standards									
		MA RCS-1							1

Notes:

RDL = Reported Detection Limit
BRL = Below Reporting Limit
NA = Not Analyzed
EPA 8082 or 8082A = SW-846 Method 8082 or 8082A analysis for PCBs
EPA 3540 = PCB with Method 3540 Soxhlet Extraction

Bold = Exceeds TSCA Self-Implementing High Occupancy Standard and MA S-1 standards
Bold Italic = Exceeds MA S-2 and MA S-3 standards
Red Bold Italic = Exceeds TSCA Self-Implementing High Occupancy beneath cap
Blue Bold Italic = Exceeds MA UCL

[1] - The result for Total Polychlorinated Biphenyls (PCBs) is calculated as the sum of all detects plus one-half detection limit for all Aroclors if not detected in a sample for all Aroclors with at least one detection in one sample. Only three Aroclors were detected in any sample.

Composite 1- Soils collected from borings B-41, B-42, B-43 and B-54 and composited
Composite 2- Soils collected from borings B-44, B-45, B-46 and B-47 and composited
Composite 3- Soils collected from borings B-63, B-64, B-65, B-66, B-67, B-68 and B-40 and composited
Composite 4- Soils collected from borings B-39, B-50 and B-49 and composited
Composite 5- Soils collected from borings B-58, B-59, B-60 and B-61 and composited
Composite 6- Soils collected from borings B-51, B-52, B-55, B-56 and B-57 and composited
Composite 1A- Soils collected from borings B-41A and B-42A and composited
Composite 2A- Soils collected from borings B-44A, B-45A, B-46A and B-47A and composited
Composite 5A- Soils collected from borings B-58A, B-59A, B-60A and B-61A and composited
Composite 6A- Soils collected from borings B-51A, B-52A, B-55A, B-56A and B-57A and composited
Composite ASC-1 Asphalt and soils collected from borings AS-1 through AS-4 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-2 Asphalt and soils collected from borings AS-5 through AS-8 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-3 Asphalt and soils collected from borings AS-9 through AS-12 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-4 Asphalt and soils collected from borings AS-13 through AS-16 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-5 Asphalt and soils collected from borings AS-17 through AS-20 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-6 Asphalt and soils collected from borings AS-21 through AS-24 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches

TABLE 2.2.2
SUMMARY OF SOIL ANALYTICAL DATA:
POLYCHLORINATED BIPHENYL (PCB) CONGENERS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per billion [ppb], ug/kg)

Sample Identification	Sample Date	Analytical Method	C14-BZ#77	RDL	C15-BZ#123/#107	RDL	C15-BZ#118	RDL	C15-BZ#114	RDL	C15-BZ#105	RDL	C16-BZ#167	RDL	C16-BZ#156	RDL	C16-BZ#157	RDL
B-2A 0-1'	3/4/2014	PCB Congeners	0.64	0.28	BRL	0.56	4.3	0.28	BRL	0.28	1.6	0.28	BRL	0.28	BRL	0.28	BRL	0.28
B-11A 0-0.5'	3/4/2014	PCB Congeners	3.1	0.28	1.4	0.56	19	0.28	0.46	0.28	8.1	0.28	0.82	0.28	2.4	0.28	0.53	0.28
B-11A 0-0.5' DUP	3/4/2014	PCB Congeners	3.9	0.28	1.8	0.56	25	0.28	0.58	0.28	9.9	0.28	1.1	0.28	3.0	0.28	0.71	0.28
B-16A 0-1'	3/4/2014	PCB Congeners	BRL	0.28	BRL	0.56	1.3	0.28	BRL	0.28	0.40	0.28	BRL	0.28	BRL	0.28	BRL	0.28
B-21A 0-0.5'	3/5/2014	PCB Congeners	0.36	0.27	BRL	0.55	2.7	0.27	BRL	0.27	0.91	0.27	BRL	0.27	BRL	0.27	BRL	0.27
B-49A 0-1'	3/4/2014	PCB Congeners	BRL	0.28	BRL	0.56	BRL	0.28	BRL	0.28	BRL	0.28	BRL	0.28	BRL	0.28	BRL	0.28
B-50A 0-1'	3/4/2014	PCB Congeners	BRL	0.28	BRL	0.56	BRL	0.28	BRL	0.28	BRL	0.28	BRL	0.28	BRL	0.28	BRL	0.28
COMP 6A 0-0.5'	3/5/2014	PCB Congeners	0.63	0.28	BRL	0.56	5.1	0.28	BRL	0.28	1.8	0.28	BRL	0.28	0.63	0.28	BRL	0.28

C14-BZ#77 = 3,3',4,4'-tetrachlorobiphenyl (TCB)
C15-BZ#123 = 2',3,4,4',5-pentachlorobiphenyl (PeCB)
C15-BZ#118 = 2,3',4,4',5-PeCB
C15-BZ#114 = 2,3,4,4',5-PeCB
C15-BZ#105 = 2,3,3',4,4'-PeCB
C16-BZ#167 = 2,3',4,4',5,5'-hexachlorobiphenyl (HxCB)
C16-BZ#156 = 2,3,3',4,4',5-HxCB
C16-BZ#157 = 2,3,3',4,4',5'-HxCB

TABLE 2.2.3
CALCULATION OF TCDD TOXIC EQUIVALENCE FOR SOIL ANALYTICAL DATA:
POLYCHLORINATED BIPHENYL (PCB) CONGENERS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per billion [ppb], ug/kg)

Sample Identification	Sample Date	Analytical Method	C14-BZ#77	RDL	C15-BZ#123/#107	RDL	C15-BZ#118	RDL	C15-BZ#114	RDL	C15-BZ#105	RDL	C16-BZ#167	RDL	C16-BZ#156	RDL	C16-BZ#157	RDL	TEQ
B-2A 0-1'	3/4/2014	PCB Congeners	0.64	0.28	0.28	0.56	4.3	0.28	0.14	0.28	1.6	0.28	0.14	0.28	0.14	0.28	0.14	0.28	2.66E-04
B-11A 0-0.5'	3/4/2014	PCB Congeners	3.1	0.28	1.4	0.56	19	0.28	0.46	0.28	8.1	0.28	0.82	0.28	2.4	0.28	0.53	0.28	1.29E-03
B-11A 0-0.5' DUP	3/4/2014	PCB Congeners	3.9	0.28	1.8	0.56	25	0.28	0.58	0.28	9.9	0.28	1.1	0.28	3.0	0.28	0.71	0.28	1.65E-03
B-16A 0-1'	3/4/2014	PCB Congeners	0.14	0.28	0.28	0.56	1.3	0.28	0.14	0.28	0.40	0.28	0.14	0.28	0.14	0.28	0.14	0.28	9.02E-05
B-21A 0-0.5'	3/5/2014	PCB Congeners	0.36	0.27	0.28	0.55	2.7	0.27	0.14	0.27	0.91	0.27	0.14	0.27	0.14	0.27	0.14	0.27	1.69E-04
B-49A 0-1'	3/4/2014	PCB Congeners	0.14	0.28	0.28	0.56	0.14	0.28	0.14	0.28	0.14	0.28	0.14	0.28	0.14	0.28	0.14	0.28	4.76E-05
B-50A 0-1'	3/4/2014	PCB Congeners	0.14	0.28	0.28	0.56	0.14	0.28	0.14	0.28	0.14	0.28	0.14	0.28	0.14	0.28	0.14	0.28	4.76E-05
COMP 6A 0-0.5'	3/5/2014	PCB Congeners	0.63	0.28	0.28	0.56	5.1	0.28	0.14	0.28	1.8	0.28	0.14	0.28	0.63	0.28	0.14	0.28	3.10E-04

PCB Congener	TEF
C14-BZ#77 = 3,3',4,4'-tetrachlorobiphenyl (TCB)	0.0001
C15-BZ#123 = 2',3,4,4',5-pentachlorobiphenyl (PeCB)	0.00003
C15-BZ#118 = 2,3',4,4',5-PeCB	0.00003
C15-BZ#114 = 2,3,4,4',5-PeCB	0.00003
C15-BZ#105 = 2,3,3',4,4'-PeCB	0.00003
C16-BZ#167 = 2,3',4,4',5,5'-hexachlorobiphenyl (HxCB)	0.00003
C16-BZ#156 = 2,3,3',4,4',5-HxCB	0.00003
C16-BZ#157 = 2,3,3',4,4',5'-HxCB	0.00003

If no congener detected for a given sample, one-half the RDL was used as a surrogate value.

TEF = TCDD Toxicity Equivalence Factor
TEQ = TCDD Toxic Equivalence
TCDD = 2,3,7,8-tetrachlorodibenzo-p-dioxin
TEQ = Summation of products of congener concentration and TEF, for each congener i

Source: USEPA. Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessment of 2,3,7,8-Tetrachlorodibenzo-p-dioxin and Dioxin-like Compounds [EPA/100/R 10/005/December 2010].

TABLE 2.2.4
COMPARISON OF TOTAL DIOXIN-LIKE PCB CONGENERS TO TCDD TOXIC EQUIVALENCE AND TOTAL PCBS FOR SOIL ANALYTICAL DATA
BOOTT MILLS
130 Foot of John Street, Lowell, MA

Sample Identification	Sample Date	Analytical Method	TOTAL PCBs (mg/kg)	TOTAL DIOXIN-LIKE PCB CONGENERS		TCDD TOXIC EQUIVALENCE (mg/kg)
				(mg/kg)	% of TOTAL PCBs	
B-2A 0-1'	3/4/2014	PCB Congeners	<0.22 *	7.38E-03	<3.35	2.66E-07
B-11A 0-0.5'	3/4/2014	PCB Congeners	1.25	3.58E-02	2.86	1.29E-06
B-11A 0-0.5' DUP	3/4/2014	PCB Congeners	1.35	4.60E-02	3.41	1.65E-06
B-16A 0-1'	3/4/2014	PCB Congeners	<0.22 *	2.68E-03	<1.22	9.02E-08
B-21A 0-0.5'	3/5/2014	PCB Congeners	<0.82 *	4.79E-03	<0.58	1.69E-07
B-49A 0-1'	3/4/2014	PCB Congeners	<0.22 *	1.26E-03	<0.57	4.76E-08
B-50A 0-1'	3/4/2014	PCB Congeners	<0.82 *	1.26E-03	<0.15	4.76E-08
COMP 6A 0-0.5'	3/5/2014	PCB Congeners	0.98	8.86E-03	0.90	3.10E-07

PCB Congener
C14-BZ#77 = 3,3',4,4'-tetrachlorobiphenyl (TCB)
C15-BZ#123 = 2',3,4,4',5-pentachlorobiphenyl (PeCB)
C15-BZ#118 = 2,3',4,4',5-PeCB
C15-BZ#114 = 2,3,4,4',5-PeCB
C15-BZ#105 = 2,3,3',4,4'-PeCB
C16-BZ#167 = 2,3',4,4',5,5'-hexachlorobiphenyl (HxCB)
C16-BZ#156 = 2,3,3',4,4',5-HxCB
C16-BZ#157 = 2,3,3',4,4',5'-HxCB 29.89

TEF = TCDD Toxicity Equivalence Factor
TEQ = TCDD Toxic Equivalence
TCDD = 2,3,7,8-tetrachlorodibenzo-p-dioxin
TEQ = Summation of products of congener concentration and TEF, for each congener i
If no congener detected for a given sample, one-half the RDL was used as a surrogate value.
* Sum of reported detection limits (RDLs) for Aroclor 1248 and Aroclor 1254.

TABLE 2.3
SUMMARY OF SOIL ANALYTICAL DATA:
TOTAL TRACE METALS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Antimony, Total	RDL	Arsenic, Total	RDL	Barium, Total	RDL	Beryllium, Total	RDL	Cadmium, Total	RDL
Exterior Courtyard Samples												
B-1 1-5'	06/06/2011	EPA 6010B/7471A	2.6	1.1	5.0	3.2	**54**	5.3	BRL	0.32	0.65	0.53
B-1 10-15'	06/06/2011	EPA 6010B/7471A	BRL	1.3	BRL	3.9	28	6.5	BRL	0.39	BRL	0.65
B-2 1-5'	06/06/2011	EPA 6010B/7471A	3.4	1.1	4.2	3.3	73	5.5	BRL	0.33	BRL	0.55
B-2 10-15'	06/06/2011	EPA 6010B/7471A	4	1.1	BRL	3.4	**91**	5.7	BRL	0.34	1.3	0.57
B-3 5-10'	06/06/2011	EPA 6010B/7471A	2.8	1.2	6.2	3.6	33	5.9	BRL	0.36	0.63	0.59
B-4 2-5'	06/06/2011	EPA 6010B/7471A	3.6	1.2	6.3	3.5	**410**	5.8	BRL	0.35	0.94	0.58
B-4 12-15'	06/06/2011	EPA 6010B/7471A	BRL	1.2	BRL	3.5	25	5.8	BRL	0.35	BRL	0.58
B-5 10-15'	06/06/2011	EPA 6010B/7471A	3.8	1.3	BRL	3.9	35	6.6	BRL	0.39	BRL	0.66
B-8 0-3'	09/01/2011	EPA 6010B/7471A	BRL	2.2	5.4	0.43	**65**	0.43	0.48	0.22	BRL	0.43
B-8 5-10'	09/01/2011	EPA 6010B/7471A	BRL	2.5	2.7	0.5	32	0.5	0.51	0.25	BRL	0.5
B-9 0-3'	09/01/2011	EPA 6010B/7471A	BRL	2	6.7	0.41	37	0.41	0.27	0.2	BRL	0.41
B-10 0-3'	09/01/2011	EPA 6010B/7471A	BRL	2.3	6.6	0.46	**74**	0.46	0.48	0.23	BRL	0.46
B-11 0-3'	09/01/2011	EPA 6010B/7471A	BRL	2.1	3.6	0.41	**110**	0.41	0.4	0.21	BRL	0.41
B-12 0-3'	09/01/2011	EPA 6010B/7471A	BRL	2.2	9.1	0.45	**110**	0.45	0.48	0.22	BRL	0.45
WC-1 (B-16 1-5')	10/05/2012	EPA 6010C / 7471B / 1311	NA		BRL	2.7	**76**	2.7	NA		0.31	0.27
B-16 0-3'	10/05/2012	EPA 6010C/7196A / SM2580A /SM9045C	NA		NA		NA		NA		NA	
B-16 3-5'	10/05/2012	EPA 6010C/7196A / SM2580A /SM9045C	NA		NA		NA		NA		NA	
B-17 0-3'	10/05/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-17 3-5'	10/05/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-17 5-7'	10/05/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-21 0-3'	10/10/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-21 3-5'	10/10/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-22 0-3'	10/05/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-22 3-5'	10/05/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-23 0-3'	10/05/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-23 3-5'	10/05/2012	EPA 6010C	NA		NA		NA		NA		NA	
WC-2 (B-26 2-5')	10/09/2012	EPA 6010C / 7471B / 1311	NA		BRL	2.6	47	2.6	NA		0.35	0.26
B-30 0-3'	10/17/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-30 3-4.5'	10/17/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-31 0-3'	10/09/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-31 3-5'	10/09/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-32 0-3'	10/09/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-32 3-5'	10/09/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-33 0-3'	10/10/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-33 3-5'	10/10/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-34 0-3'	10/05/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-34 3-5'	10/05/2012	EPA 6010C	NA		NA		NA		NA		NA	
Selected Soil Standards												
		MA S-1/GW-2	20		20		1,000		100		2	
		MA S-1/GW-3	20		20		1,000		100		2	
		MA S-2/GW-2	30		20		3,000		200		30	
		MA S-2/GW-3	30		20		3,000		200		30	
		MA S-3/GW-2	30		20		5,000		200		30	
		MA S-3/GW-3	30		20		5,000		200		30	
		MADEP Background - Urban Fill	7		20		50		0.9		3	
Enclosed Courtyard Samples												
B-6 0-4'	06/06/2011	EPA 6010B/7471A	4.6	1.3	5.6	3.8	110	6.4	BRL	0.38	0.97	0.64
B-6 4-6'	6/06/2011 *	EPA 6010B	NA		NA		NA		NA		NA	
B-6A 0-2'	09/13/2011	EPA 6010B	NA		NA		NA		NA		NA	
B-6B 0-4'	09/13/2011	EPA 6010B	NA		NA		NA		NA		NA	
B-6C 0-4'	09/13/2011	EPA 6010B	NA		NA		NA		NA		NA	
B-6D 0-4'	10/09/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-6D 4-6'	10/09/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-6E 0-4'	10/09/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-6E 4-6'	10/09/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-7 8-10'	06/06/2011	EPA 6010B/7471A	BRL	1.3	BRL	3.8	20	6.3	BRL	0.38	BRL	0.63
Between Building and Merrimack River												
B-13 0-3'	09/01/2011	EPA 6010B/7471A	BRL	4.4	7.8	0.87	97	0.87	0.46	0.44	BRL	0.87
Selected Soil Standards												
		MA RCS-1	20		20		1,000		100		2	
		MADEP Background - Urban Fill	7		20		50		0.9		3	

Notes:

RDL = Reported Detection Limit
BRL = Below Reporting Limit
NA = Not Analyzed
Bold = Exceeds One or More Selected Standards

* Chain of custody lists sample date as 9/14/2011. Sample was collected on 6/6/2011, and submitted to the lab on 9/14/2011.
ORP = Oxidation Reduction Potential
Standards for Total Chromium are for Cr III, because no Cr VI detected.

Prepared By: MDW
Reviewed By: EAF
Revision Date: 9/26/2011

TABLE 2.3
SUMMARY OF SOIL ANALYTICAL DATA:
TOTAL TRACE METALS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Chromium, Total	RDL	Hexavalent Chromium	RDL	ORP (mV)	pH	Lead, Total	RDL	Lead, TCLP (mg/l)	RDL
Exterior Courtyard Samples												
B-1 1-5'	06/06/2011	EPA 6010B/7471A	14	1.1	NA	5.3	NA	NA	95	5.3	NA	
B-1 10-15'	06/06/2011	EPA 6010B/7471A	12	1.3	NA	6.5	NA	NA	BRL	6.5	NA	
B-2 1-5'	06/06/2011	EPA 6010B/7471A	15	1.1	NA	5.5	NA	NA	290	5.5	NA	
B-2 10-15'	06/06/2011	EPA 6010B/7471A	38	1.1	NA	5.7	NA	NA	590	5.7	NA	
B-3 5-10'	06/06/2011	EPA 6010B/7471A	18	1.2	NA	5.9	NA	NA	17	5.9	NA	
B-4 2-5'	06/06/2011	EPA 6010B/7471A	20	1.2	NA	5.8	NA	NA	530	5.8	NA	
B-4 12-15'	06/06/2011	EPA 6010B/7471A	8.6	1.2	NA	5.8	NA	NA	BRL	5.8	NA	
B-5 10-15'	06/06/2011	EPA 6010B/7471A	13	1.3	NA	6.6	NA	NA	6.6	6.6	NA	
B-8 0-3'	09/01/2011	EPA 6010B/7471A	29	0.43	NA	2.2	NA	NA	170	2.2	NA	
B-8 5-10'	09/01/2011	EPA 6010B/7471A	10	0.5	NA	2.5	NA	NA	5.1	2.5	NA	
B-9 0-3'	09/01/2011	EPA 6010B/7471A	**48**	0.41	NA	2	NA	NA	90	2	NA	
B-10 0-3'	09/01/2011	EPA 6010B/7471A	19	0.46	NA	2.3	NA	NA	**1,400**	2.3	NA	
B-11 0-3'	09/01/2011	EPA 6010B/7471A	22	0.41	NA	2.1	NA	NA	**1,800**	2.1	NA	
B-12 0-3'	09/01/2011	EPA 6010B/7471A	34	0.45	NA	2.2	NA	NA	**620**	2.2	NA	
WC-1 (B-16 1-5')	10/05/2012	EPA 6010C / 7471B / 1311	27	0.55	NA		NA	NA	340	0.82	1.7	0.010
B-16 0-3'	10/05/2012	EPA 6010C/7196A / SM2580A /SM9045C	**78**	0.51	BRL	0.17	60	9.0	7.9	0.76	NA	
B-16 3-5'	10/05/2012	EPA 6010C/7196A / SM2580A /SM9045C	14	0.59	BRL	0.18	56	9.1	350	0.89	NA	
B-17 0-3'	10/05/2012	EPA 6010C	25	0.57	NA		NA	NA	220	0.85	NA	
B-17 3-5'	10/05/2012	EPA 6010C	11	0.55	NA		NA	NA	19	0.83	NA	
B-17 5-7'	10/05/2012	EPA 6010C	NA		NA		NA	NA	110	0.82	NA	
B-21 0-3'	10/10/2012	EPA 6010C	20	0.51	NA		NA	NA	150	0.77	NA	
B-21 3-5'	10/10/2012	EPA 6010C	28	0.54	NA		NA	NA	130	0.80	NA	
B-22 0-3'	10/05/2012	EPA 6010C	NA		NA		NA	NA	170	0.78	NA	
B-22 3-5'	10/05/2012	EPA 6010C	NA		NA		NA	NA	200	0.83	NA	
B-23 0-3'	10/05/2012	EPA 6010C	NA		NA		NA	NA	55	0.82	NA	
B-23 3-5'	10/05/2012	EPA 6010C	NA		NA		NA	NA	17	0.80	NA	
WC-2 (B-26 2-5')	10/09/2012	EPA 6010C / 7471B / 1311	**42**	0.52	NA		NA	NA	170	0.78	1.1	0.010
B-30 0-3'	10/17/2012	EPA 6010C	NA		NA		NA	NA	23	0.77	NA	
B-30 3-4.5'	10/17/2012	EPA 6010C	NA		NA		NA	NA	24	0.75	NA	
B-31 0-3'	10/09/2012	EPA 6010C	NA		NA		NA	NA	200	0.78	NA	
B-31 3-5'	10/09/2012	EPA 6010C	NA		NA		NA	NA	16	0.80	NA	
B-32 0-3'	10/09/2012	EPA 6010C	NA		NA		NA	NA	120	0.78	NA	
B-32 3-5'	10/09/2012	EPA 6010C	NA		NA		NA	NA	4.6	0.81	NA	
B-33 0-3'	10/10/2012	EPA 6010C	NA		NA		NA	NA	460	0.80	NA	
B-33 3-5'	10/10/2012	EPA 6010C	NA		NA		NA	NA	21	0.78	NA	
B-34 0-3'	10/05/2012	EPA 6010C	NA		NA		NA	NA	**860**	0.80	NA	
B-34 3-5'	10/05/2012	EPA 6010C	NA		NA		NA	NA	**800**	0.75	NA	
Selected Soil Standards												
		MA S-1/GW-2	1,000		30				300			
		MA S-1/GW-3	1,000		30				300			
		MA S-2/GW-2	3,000		200				300			
		MA S-2/GW-3	3,000		200				300			
		MA S-3/GW-2	5,000		200				300			
		MA S-3/GW-3	5,000		200				300			
		MADEP Background - Urban Fill	40		40				600			
Enclosed Courtyard Samples												
B-6 0-4'	06/06/2011	EPA 6010B/7471A	20	1.3	NA		NA	NA	**900**	6.4	NA	
B-6 4-6'	6/06/2011 *	EPA 6010B	NA		NA		NA	NA	110	1.1	NA	
B-6A 0-2'	09/13/2011	EPA 6010B	NA		NA		NA	NA	**930**	0.79	NA	
B-6B 0-4'	09/13/2011	EPA 6010B	NA		NA		NA	NA	310	0.86	NA	
B-6C 0-4'	09/13/2011	EPA 6010B	NA		NA		NA	NA	390	1.1	NA	
B-6D 0-4'	10/09/2012	EPA 6010C	NA		NA		NA	NA	170	0.85	NA	
B-6D 4-6'	10/09/2012	EPA 6010C	NA		NA		NA	NA	91	0.83	NA	
B-6E 0-4'	10/09/2012	EPA 6010C	NA		NA		NA	NA	360	0.83	NA	
B-6E 4-6'	10/09/2012	EPA 6010C	NA		NA		NA	NA	77	0.82	NA	
B-7 8-10'	06/06/2011	EPA 6010B/7471A	10	1.3	NA		NA	NA	6.9	6.3	NA	
Between Building and Merrimack River												
B-13 0-3'	09/01/2011	EPA 6010B/7471A	19	0.87	NA	4.4	NA	NA	110	4.4	NA	
Selected Soil Standards												
		MA RCS-1	1,000		30				300			
		MADEP Background - Urban Fill	40		40				600			

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

Bold = Exceeds One or More Selected Standards

Prepared By: MDW
Reviewed By: EAF
Revision Date: 9/26/2011

TABLE 2.3
SUMMARY OF SOIL ANALYTICAL DATA:
TOTAL TRACE METALS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Mercury, Total	RDL	Nickel, Total	RDL	Vanadium, Total	RDL	Zinc, Total	RDL
Exterior Courtyard Samples										
B-1 1-5'	06/06/2011	EPA 6010B/7471A	0.15	0.017	10	5.3	16	1.1	66	5.3
B-1 10-15'	06/06/2011	EPA 6010B/7471A	BRL	0.021	7.2	6.5	24	1.3	35	6.5
B-2 1-5'	06/06/2011	EPA 6010B/7471A	0.34	0.019	11	5.5	25	1.1	68	5.5
B-2 10-15'	06/06/2011	EPA 6010B/7471A	0.39	0.02	22	5.7	47	1.1	140	5.7
B-3 5-10'	06/06/2011	EPA 6010B/7471A	0.061	0.021	13	5.9	24	1.2	37	5.9
B-4 2-5'	06/06/2011	EPA 6010B/7471A	**2.5**	0.19	14	5.8	28	1.2	220	5.8
B-4 12-15'	06/06/2011	EPA 6010B/7471A	BRL	0.02	6.2	5.8	16	1.2	33	5.8
B-5 10-15'	06/06/2011	EPA 6010B/7471A	BRL	0.022	8.7	6.6	24	1.3	41	6.6
B-8 0-3'	09/01/2011	EPA 6010B/7471A	0.24	0.09	22	1.1	20	0.43	74	2.2
B-8 5-10'	09/01/2011	EPA 6010B/7471A	BRL	0.11	6.4	1.3	13	0.5	32	2.5
B-9 0-3'	09/01/2011	EPA 6010B/7471A	0.32	0.09	**48**	1	28	0.41	43	2
B-10 0-3'	09/01/2011	EPA 6010B/7471A	0.35	0.09	17	1.2	20	0.46	100	2.3
B-11 0-3'	09/01/2011	EPA 6010B/7471A	0.79	0.08	26	1	20	0.41	170	2.1
B-12 0-3'	09/01/2011	EPA 6010B/7471A	0.28	0.1	**41**	1.1	27	0.45	130	2.2
WC-1 (B-16 1-5')	10/05/2012	EPA 6010C / 7471B / 1311	0.41	0.028	NA		NA		NA	
B-16 0-3'	10/05/2012	EPA 6010C/7196A / SM2580A /SM9045C	NA		**100**	0.51	NA		NA	
B-16 3-5'	10/05/2012	EPA 6010C/7196A / SM2580A /SM9045C	NA		11	0.59	NA		NA	
B-17 0-3'	10/05/2012	EPA 6010C	NA		20	0.57	NA		NA	
B-17 3-5'	10/05/2012	EPA 6010C	NA		7.5	0.55	NA		NA	
B-17 5-7'	10/05/2012	EPA 6010C	NA		NA		NA		NA	
B-21 0-3'	10/10/2012	EPA 6010C	NA		12	0.51	NA		NA	
B-21 3-5'	10/10/2012	EPA 6010C	NA		25	0.54	NA		NA	
B-22 0-3'	10/05/2012	EPA 6010C	NA		NA		NA		NA	
B-22 3-5'	10/05/2012	EPA 6010C	NA		NA		NA		NA	
B-23 0-3'	10/05/2012	EPA 6010C	NA		NA		NA		NA	
B-23 3-5'	10/05/2012	EPA 6010C	NA		NA		NA		NA	
WC-2 (B-26 2-5')	10/09/2012	EPA 6010C / 7471B / 1311	0.61	0.055	NA		NA		NA	
B-30 0-3'	10/17/2012	EPA 6010C	NA		NA		NA		NA	
B-30 3-4.5'	10/17/2012	EPA 6010C	NA		NA		NA		NA	
B-31 0-3'	10/09/2012	EPA 6010C	NA		NA		NA		NA	
B-31 3-5'	10/09/2012	EPA 6010C	NA		NA		NA		NA	
B-32 0-3'	10/09/2012	EPA 6010C	NA		NA		NA		NA	
B-32 3-5'	10/09/2012	EPA 6010C	NA		NA		NA		NA	
B-33 0-3'	10/10/2012	EPA 6010C	NA		NA		NA		NA	
B-33 3-5'	10/10/2012	EPA 6010C	NA		NA		NA		NA	
B-34 0-3'	10/05/2012	EPA 6010C	NA		**37**	0.54	NA		NA	
B-34 3-5'	10/05/2012	EPA 6010C	NA		15	0.50	NA		NA	
Selected Soil Standards										
		MA S-1/GW-2	20		20		600		2,500	
		MA S-1/GW-3	20		20		600		2,500	
		MA S-2/GW-2	30		700		1,000		3,000	
		MA S-2/GW-3	30		700		1,000		3,000	
		MA S-3/GW-2	30		700		1,000		5,000	
		MA S-3/GW-3	30		700		1,000		5,000	
		MADEP Background - Urban Fill	1		30		30		300	
Enclosed Courtyard Samples										
B-6 0-4'	06/06/2011	EPA 6010B/7471A	0.69	0.021	13	6.4	23	1.3	220	6.4
B-6 4-6'	6/06/2011 *	EPA 6010B	NA		NA		NA		NA	
B-6A 0-2'	09/13/2011	EPA 6010B	NA		NA		NA		NA	
B-6B 0-4'	09/13/2011	EPA 6010B	NA		NA		NA		NA	
B-6C 0-4'	09/13/2011	EPA 6010B	NA		NA		NA		NA	
B-6D 0-4'	10/09/2012	EPA 6010C	NA		NA		NA		NA	
B-6D 4-6'	10/09/2012	EPA 6010C	NA		NA		NA		NA	
B-6E 0-4'	10/09/2012	EPA 6010C	NA		NA		NA		NA	
B-6E 4-6'	10/09/2012	EPA 6010C	NA		NA		NA		NA	
B-7 8-10'	06/06/2011	EPA 6010B/7471A	BRL	0.021	6.9	6.3	18	1.3	35	6.3
Between Building and Merrimack River										
B-13 0-3'	09/01/2011	EPA 6010B/7471A	0.64	0.1	20	2.2	19	0.87	95	4.4
Selected Soil Standards										
		MA RCS-1	20		20		600		2,500	
		MADEP Background - Urban Fill	1		30		30		300	

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

Bold = Exceeds One or More Selected Standards

Prepared By: MDW
Reviewed By: EAF
Revision Date: 9/26/2011

Table 3
Summary of Soil Vapor Data: Polychlorinated Biphenyls (PCBs)

Sample Location		SV-1	SV-2	FB
Analytical Method		USEPA TO-10A	USEPA TO-10A	USEPA TO-10A
Date Sampled		15-Sep-11	15-Sep-11	15-Sep-11
		Soil Vapor	Soil Vapor	Field Blank
Analyte	Units			
Aroclor-1016	µg/m^3	<0.048	<0.049	<0.040
Aroclor-1221	µg/m^3	<0.048	<0.049	<0.040
Aroclor-1232	µg/m^3	<0.048	<0.049	<0.040
Aroclor-1242	µg/m^3	<0.048	<0.049	<0.040
Aroclor-1248	µg/m^3	<0.048	<0.049	<0.040
Aroclor-1254	µg/m^3	<0.048	<0.049	<0.040
Aroclor-1260	µg/m^3	<0.048	<0.049	<0.040
Aroclor-1262	µg/m^3	<0.048	<0.049	<0.040
Aroclor-1268	µg/m^3	<0.048	<0.049	<0.040
Total PCBs		ND	ND	ND
Lowest Residential Risk-Based Number *		0.01	0.01	0.01
Soil Vapor Screening Value **		0.70	0.70	0.70

ND = None Detected

ELCR = Excess Lifetime Cancer Risk

USEPA IRIS = U.S. Environmental Protection Agency's Integrated Risk Information System

* Risk-based inhalation concentration for ELCR of 1E-06 (USEPA, IRIS)

** Residential Soil Vapor Screening Value presumes a soil vapor to indoor air attenuation factor of 70

Table 4
GROUNDWATER ELEVATION MEASUREMENTS
Boott Mills
130 Foot of John Street
Lowell, Massachusetts
(units, feet)

Well Number	Gauging Date	Screening Interval	Casing Elevation	Depth to Water	Groundwater Elevation
GEC-1	6/8/2011	7.3 - 17.3	100.40	17.30	83.10
	6/15/2011			15.66	84.74
	9/2/2011			11.54	88.86
	9/7/2011			15.10	85.30
	9/12/2011			14.20	86.20
GEC-2	6/8/2011	7.88 - 17.88	100.08	16.23	83.85
	6/15/2011			16.15	83.93
	9/2/2011			11.19	88.89
	9/7/2011			--	NA
	9/12/2011			13.93	86.15
GEC-3	6/8/2011	6.22 - 16.22	100.00	14.30	85.70
	6/15/2011			14.17	85.83
	9/2/2011			11.04	88.96
	9/7/2011			13.28	86.72
	9/12/2011			13.05	86.95
GEC-4	6/15/2011	8.78-13.78	100.02	10.07	89.95
	9/2/2011			--	NA
	9/7/2011			--	NA
	9/12/2011			--	NA
GEC-5	9/2/2011	1.8 - 11.8	100.04	11.18	88.86
	9/7/2011			--[1]	NA
	9/12/2011			--[1]	NA
GEC-6	9/2/2011	6.5 - 16.5	100.42	11.55	88.87
	9/7/2011			15.53	84.89
	9/12/2011			14.32	86.10
GEC-7	9/2/2011	3 - 13	97.73	9.15	88.58
	9/7/2011			12.97	84.76
	9/12/2011			11.73	86.00

Notes:
1 - Well Dry
- Benchmark (BM)= Southern corner of the catch basin rim located within the stormwater system 20ft northwest of GEC-3 . Assumed 100 ft elevation at BM.

Prepared by : MDW
Reviewed by: BTB
Revised: 7/17/2014

TABLE 5.1
EVALUATION OF GROUNDWATER ANALYTICAL DATA:
EPH
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per billion [ppb], ug/L)

Sample Identification	Sample Date	Analytical Method	n-C19 to n-C36 Aliphatic Hydrocarbons	RDL	n-C11 to n-C22 Aromatic Hydrocarbons	RDL
GEC-1	06/15/2011	MA DEP EPH	190	110	160	110
	10/22/2012	MA DEP EPH	BRL	100	BRL	100
	10/22/2012 *	MA DEP EPH	BRL	110	BRL	110
GEC-2	06/15/2011	MA DEP EPH	150	110	130	110
	10/22/2012	MA DEP EPH	BRL	100	BRL	100
	10/22/2012 **	MA DEP EPH	BRL	130	BRL	130
GEC-3	06/15/2011	MA DEP EPH	BRL	110	BRL	110
GEC-4	06/15/2011	MA DEP EPH	BRL	120	BRL	120
Groundwater Evaluation						
Maximum Concentration			190		160	
Maximum Dissolved-Phase Concentration			none detected		none detected	
Evaluation for Vapor Intrusion						
Does maximum conc. Exceed GW-2?			No		No	
Groundwater data suggest indoor issue?			No		No	
Evaluation for Impact to Surface Water						
Any dissolved-phase detection?			No		No	
Potential impact to Merrimack River?			No		No	
Comparison to Upper Concentration Limit (UCL)						
Does maximum conc. exceed UCL?			No		No	
Selected Groundwater Standards						
MA GW-2			NA		50,000	
Upper Concentration Limit			100,000		100,000	

Notes:
RDL = Reported Detection Limit
BRL = Below Reporting Limit
NA = Not Analyzed
Bold = Exceeds One or More Selected Standards
- On 9/12/2011, groundwater samples were collected from GEC-2 and GEC-6 for analysis of VPH via MADEP's Method. No VPH constituents were detected in either sample.
- On 9/7/2011, a groundwater sample was collected from GEC-1 for analysis of VPH via MADEP's Method; however due to the closure of the original receiving laboratory the sample was lost during the transfer of samples to Alpha Analytical. No VPH data from GEC-1 is available.
* Sample was field filtered prior to laboratory analysis.
** Sample was laboratory filtered prior to laboratory analysis.

Prepared By: EAF
Reviewed By:
Revision Date: 2/11/2013

TABLE 5.2
EVALUATION OF GROUNDWATER ANALYTICAL DATA:
PAHs
BOOTT MILLS
130 Foot of John Street, Lowell, MA

(unit, parts per billion [ppb], ug/L)

Sample Identification	Sample Date	Analytical Method	Phenanthrene	RDL	Fluoranthene	RDL	Pyrene	RDL	Benzo[a]anthracene	RDL	Chrysene	RDL	Benzo[b]fluoranthene	RDL
GEC-1	06/15/2011	EPA 8270C Mod	1.1	0.60	2.1	0.60	2.0	0.60	1.0	0.10	0.90	0.10	1.3	0.10
	9/7/2011	EPA 8270C Mod	BRL	0.20	0.25	0.20	0.24	0.20	BRL	0.20	BRL	0.20	0.27	0.20
	9/7/2011 *	EPA 8270C Mod	BRL	0.20	BRL	0.20	BRL	0.20	BRL	0.20	BRL	0.20	BRL	0.20
	10/22/2012	EPA 8270D	NA		NA		NA		0.18	0.050	BRL	0.20	0.29	0.050
	10/22/2012	MADEP-EPH-04-1.1	BRL	2.0	BRL	2.0	BRL	2.0	BRL	2.0	BRL	2.0	BRL	2.0
	10/22/2012 *	EPA 8270D	NA		NA		NA		0.079	0.056	BRL	0.22	0.11	0.056
	10/22/2012 *	MADEP-EPH-04-1.1	BRL	2.2	BRL	2.2	BRL	2.2	BRL	2.2	BRL	2.2	BRL	2.2
GEC-2	06/15/2011	EPA 8270C Mod	BRL	0.60	1.3	0.60	1.2	0.60	0.70	0.10	0.60	0.10	0.90	0.10
	09/12/2011	EPA 8270C Mod	BRL	5	BRL	5	BRL	5	BRL	5	BRL	5	BRL	5
	9/12/2011 *	EPA 8270C Mod	BRL	5	BRL	5	BRL	5	BRL	5	BRL	5	BRL	5
	10/22/2012	EPA 8270D	NA		NA		NA		0.27	0.050	0.29	0.20	0.39	0.050
	10/22/2012	MADEP-EPH-04-1.1	BRL	2.0	BRL	2.0	BRL	2.0	BRL	2.0	BRL	2.0	BRL	2.0
	10/22/2012 **	EPA 8270D	NA		NA		NA		BRL	0.063	BRL	0.25	BRL	0.063
	10/22/2012 **	MADEP-EPH-04-1.1	BRL	2.5	BRL	2.5	BRL	2.5	BRL	2.5	BRL	2.5	BRL	2.5
GEC-3	06/15/2011	EPA 8270C Mod	BRL	0.60	BRL	0.60	BRL	0.60	0.20	0.10	0.20	0.10	0.30	0.10
GEC-4	06/15/2011	EPA 8270C Mod	BRL	0.60	BRL	0.60	BRL	0.60	BRL	0.10	BRL	0.10	BRL	0.10
Groundwater Evaluation														
Maximum Concentration			1.1		2.1		2.0		1.0		0.90		1.3	
Maximum Dissolved-Phase Concentration			none detected		none detected		none detected		0.079		none detected		0.11	
Evaluation for Vapor Intrusion														
Does maximum conc. Exceed GW-2?			not applicable		not applicable		not applicable		not applicable		not applicable		not applicable	
Groundwater data suggest indoor issue?			not applicable		not applicable		not applicable		not applicable		not applicable		not applicable	
Evaluation for Impact to Surface Water														
Any dissolved-phase detection?			No		No		No		Yes		No		Yes	
Potential impact to Merrimack River?			No		No		No		Unlikely, presume yes		No		Unlikely, presume yes	
Wells impacted									GEC-1				GEC-1	
Does maximum dissolved-phase conc. Exceed surface water benchmark?									No				No	
Comparison to Upper Concentration Limit (UCL)														
Does maximum conc. exceed UCL?			No		No		No		No		No		No	
Selected Groundwater Standards and Guidance														
MA GW-2			NA		NA		NA		NA		NA		NA	
MA GW-3			10,000		200		20		1,000		70		400	
Upper Concentration Limit			100,000		2,000		800		10,000		700		4,000	
Surface Water Benchmark			38		0.9		0.089		1		0.07		0.42	

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

Bold = Exceeds One or More Selected Standards

* = Groundwater samples were field filtered prior to analysis.

** = Groundwater sample was laboratory filtered prior to analysis.

- Surface Water Benchmark values were from MADEP's spreadworks used to derive Method 1 GW-3 Standards

Prepared By: EAF
Reviewed By:
Revision Date: 2/11/2013

TABLE 5.2
EVALUATION OF GROUNDWATER ANALYTICAL DATA:
PAHs
BOOTT MILLS
130 Foot of John Street, Lowell, MA

(unit, parts per billion [ppb], ug/L)

Sample Identification	Sample Date	Analytical Method	Benzo[k]fluoranthene	RDL	Benzo[a]pyrene	RDL	Indeno[1,2,3-c,d]pyrene	RDL	Dibenzo[a,h]anthracene	RDL	Benzo[g,h,i]perylene	RDL
GEC-1	06/15/2011	EPA 8270C Mod	0.50	0.10	1.1	0.10	0.90	0.10	0.20	0.10	0.70	0.10
	9/7/2011	EPA 8270C Mod	BRL	0.20	0.28	0.20	0.37	0.20	BRL	0.20	0.36	0.20
	9/7/2011 *	EPA 8270C Mod	BRL	0.20	BRL	0.20	BRL	0.20	BRL	0.20	BRL	0.20
	10/22/2012	EPA 8270D	BRL	0.20	0.23	0.10	BRL	0.20	BRL	0.20	BRL	0.20
	10/22/2012	MADEP-EPH-04-1.1	BRL	2.0	BRL	2.0	BRL	2.0	BRL	2.0	BRL	2.0
	10/22/2012 *	EPA 8270D	BRL	0.22	BRL	0.11	BRL	0.22	BRL	0.22	BRL	0.56
	10/22/2012 *	MADEP-EPH-04-1.1	BRL	2.2	BRL	2.2	BRL	2.2	BRL	2.2	BRL	2.2
GEC-2	06/15/2011	EPA 8270C Mod	0.40	0.10	0.80	0.10	0.60	0.10	0.10	0.10	0.50	0.10
	09/12/2011	EPA 8270C Mod	BRL	5	BRL	5	BRL	5	BRL	5	BRL	5
	9/12/2011 *	EPA 8270C Mod	BRL	5	BRL	5	BRL	5	BRL	5	BRL	5
	10/22/2012	EPA 8270D	BRL	0.20	0.31	0.10	0.24	0.20	BRL	0.20	BRL	0.20
	10/22/2012	MADEP-EPH-04-1.1	BRL	2.0	BRL	2.0	BRL	2.0	BRL	2.0	BRL	2.0
	10/22/2012 **	EPA 8270D	BRL	0.25	BRL	0.13	BRL	0.25	BRL	0.25	BRL	0.25
	10/22/2012 **	MADEP-EPH-04-1.1	BRL	2.5	BRL	2.5	BRL	2.5	BRL	2.5	BRL	2.5
GEC-3	06/15/2011	EPA 8270C Mod	0.20	0.10	0.30	0.10	0.20	0.10	BRL	0.10	0.20	0.10
GEC-4	06/15/2011	EPA 8270C Mod	BRL	0.10	BRL	0.10	BRL	0.10	BRL	0.10	BRL	0.10
Groundwater Evaluation												
Maximum Concentration			0.50		1.1		0.90		0.20		0.70	
Maximum Dissolved-Phase Concentration			none detected		none detected		none detected		none detected		none detected	
Evaluation for Vapor Intrusion												
Does maximum conc. Exceed GW-2?			not applicable		not applicable		not applicable		not applicable		not applicable	
Groundwater data suggest indoor issue?			not applicable		not applicable		not applicable		not applicable		not applicable	
Evaluation for Impact to Surface Water												
Any dissolved-phase detection?			No		No		No		No		No	
Potential impact to Merrimack River?			No		No		No		No		No	
Wells impacted												
Does maximum dissolved-phase conc. Exceed surface water benchmark?												
Comparison to Upper Concentration Limit (UCL)												
Does maximum conc. exceed UCL?			No		No		No		No		No	
Selected Groundwater Standards and Guidance												
MA GW-2			NA		NA		NA		NA		NA	
MA GW-3			100		500		100		40		20	
Upper Concentration Limit			1,000		5,000		1,000		400		500	
Surface Water Benchmark			0.14		0.5		0.14		0.04		0.02	

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

Bold = Exceeds One or More Selected Standards

Prepared By: EAF
Reviewed By:
Revision Date: 2/11/2013

TABLE 5.3
EVALUATION OF GROUNDWATER ANALYTICAL DATA:
TRACE METALS
BOOT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per billion [ppb], ug/L)

Sample Identification	Sample Date	Analytical Method	Barium, Dissolved	RDL	Lead, Dissolved	RDL	Lead, Total	RDL	Hardness (mg/l)	RDL
GEC-1	6/15/2011	EPA 6010B	100	50	**12**	5.0	NA		NA	
	9/7/2011	EPA 6010B / SM18-20 2340B	NA		BRL	10	71	10	120	0.66
GEC-2	06/15/2011	EPA 6010B	BRL	50	BRL	5.0	NA		NA	
GEC-3	06/15/2011	EPA 6010B	BRL	50	BRL	5.0	NA		NA	
GEC-4	06/15/2011	EPA 6010B	BRL	50	BRL	5.0	NA		NA	
GEC-6	09/12/2011	EPA 6010B / SM18-20 2340B	NA		BRL	10	BRL	10	230	3.0
Groundwater Evaluation										
Maximum Concentration			100		12		71			
Maximum Dissolved-Phase Concentration			100		12					
Evaluation for Vapor Intrusion										
Does maximum conc. Exceed GW-2?			Not applicable		Not applicable		Not applicable			
Groundwater data suggest indoor issue?			Not applicable		Not applicable		Not applicable			
Evaluation for Impact to Surface Water										
Any dissolved-phase detection?			Yes		Yes					
Potential impact to Merrimack River?			Yes		Maybe					
Mean concentration for all wells			44		4.9					
Groundwater to Surface Water Attenuation			10		10					
Surface water EPC*			4.4		0.49					
Does mean dissolved-phase EPC exceed surface water benchmark or AWQC?			No		No					
Comparison to Upper Concentration Limit (UCL)										
Does maximum conc. exceed UCL?			No		No		No			
Selected Groundwater Standards										
MA GW-2			NS		NS		NS			
Upper Concentration Limit			100,000		150		150			
Lowest AWQC			NS		0.5		Not applicable			
Surface Water Benchmark			41,000		0.5		0.5			

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

NS = No applicable Standard

Bold = Exceeds One or More Selected Standards

Surface water exposure point concentration (EPC) = mean groundwater conc. / groundwater to surface water attenuation factor

AWQC = Ambient Water Quality Criteria

- On 6/15/2011 GEC-1 and GEC-2 were sampled using bailers and could not be filtered in the field. Samples were filtered by the laboratory prior to preservation. GEC-3 and GEC-4 were field filtered prior to preservation.
- The Sept. 2011 samples from GEC-1 and GEC-6 were field filtered prior to preservation.

Prepared By: EAF
Reviewed By:
Revision Date: 2/11/2013

TABLE 5.4
EVALUATION OF GROUNDWATER ANALYTICAL DATA:
POLYCHORINATED BIPHENYLS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per billion [ppb], ug/L)

Sample Identification	Sample Date	Analytical Method	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	RDL
GEC-1	06/15/2011	EPA 8082	3.5	0.20	1.6	0.20	**5.1**	0.20
	9/7/2011	EPA 8082	BRL	0.25	0.43	0.25	BRL	0.25
	9/7/2011 *	EPA 8082	BRL	0.25	BRL	0.25	BRL	0.25
GEC-2	06/15/2011	EPA 8082	4.5	0.20	3.3	0.20	**7.8**	0.20
	09/12/2011	EPA 8082	BRL	0.20	BRL	0.20	BRL	0.20
	9/12/2011 *	EPA 8082	BRL	0.20	BRL	0.20	BRL	0.20
GEC-3	06/15/2011	EPA 8082	BRL	0.20	BRL	0.20	BRL	0.20
GEC-4	06/15/2011	EPA 8082	BRL	0.20	BRL	0.20	BRL	0.20
GEC-6	09/12/2011	EPA 8082	BRL	0.20	BRL	0.20	BRL	0.20
GEC-7	09/12/2011	EPA 8082	BRL	0.20	BRL	0.20	BRL	0.20
Groundwater Evaluation								
Maximum Concentration							7.8	
Maximum Dissolved-Phase Concentration							none detected	
Evaluation for Vapor Intrusion								
Does maximum conc. exceed GW-2?							Yes	
Groundwater data suggest indoor issue?							No	
If no, why							Particulate bound - not mobile	
Supporting evidence							No PCB detected in soil vapor	
Evaluation for Impact to Surface Water								
Any dissolved-phase detection?							No	
Potential impact to Merrimack River?							No	
Comparison to Upper Concentration Limit (UCL)								
Does maximum conc. exceed UCL?							No	
Selected Groundwater Standards								
MA GW-2							5	
Upper Concentration Limit							100	

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

Bold = Exceeds One or More Selected Standards

1 = Total PCBs is a combination of separte aroclor compounds

* A sample of groundwater from GEC-1 and GEC-2 was filtered prior to analysis via EPA 8082.

Prepared By: EAF
Reviewed By:
Revision Date: 2/11/2013

TABLE 5.5
EVALUATION OF GROUNDWATER ANALYTICAL DATA:
VOLATILE ORGANIC COMPOUNDS
BOOT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per billion [ppb], ug/L)

Sample Identification	Sample Date	Analytical Method	Acetone	RDL
GEC-1	9/7/2011	EPA 8260B	BRL	5
GEC-2	09/12/2011	EPA 8260B	BRL	10
GEC-4	06/15/2011	EPA 8260B	BRL	10
GEC-6	09/12/2011	EPA 8260B	BRL	10
GEC-7	09/12/2011	EPA 8260B	11	10
Groundwater Evaluation				
Maximum Concentration			11	
Maximum Dissolved-Phase Concentration			11	
Evaluation for Vapor Intrusion				
Does maximum conc. Exceed GW-2?			No	
Groundwater data suggest indoor issue?			No	
Evaluation for Impact to Surface Water				
Any dissolved-phase detection?			Yes	
Potential impact to Merrimack River?			Yes	
Wells impacted			GEC-7	
Maximum concentration for GEC-7			11	
Does maximum dissolved-phase EPC exceed surface water benchmark?			No	
Comparison to Upper Concentration Limit (UCL)				
Does maximum conc. exceed UCL?			No	
Selected Groundwater Standards				
MA GW-2			50,000	
MA GW-3			50,000	
Upper Concentration Limit			100,000	
Surface Water Benchmark			3,400	

Notes:

ˌ = Reported Detection Limit

L = Below Reporting Limit

NA = Not Analyzed

ɐeds One or More Selected Standards

Prepared By: EAF
Date: 2/11/2013

Goldman Environmental Consultants, Inc.

TABLE 6.1.1
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY CONTAMINANTS OF CONCERN:
EPH, TPH AND PAHs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	n-C19 to n-C36 Aliphatic Hydrocarbons	RDL	n-C11 to n-C22 Aromatic Hydrocarbons	RDL	Total Petroleum Hydrocarbons	RDL	Phenanthrene	RDL	Acenaphthene	RDL	Fluorene	RDL	Anthracene	RDL	Acenaph-thylene	RDL
Exterior Courtyard Samples																		
B-1 1-5'	06/06/2011	MA DEP EPH	210	20	150	20	NA		1.9	0.5	BRL	0.5	BRL	0.5	0.6	0.5	BRL	0.5
B-1 10-15'	06/06/2011	MA DEP EPH	29	25	BRL	25	NA		BRL	0.62	BRL	0.62	BRL	0.62	BRL	0.62	BRL	0.62
B-2 1-5'	06/06/2011	MA DEP EPH	160	22	200	22	NA		8.4	0.54	0.7	0.54	0.85	0.54	2.3	0.54	BRL	0.54
B-2 10-15'	06/06/2011	MA DEP EPH	69	22	38	22	NA		BRL	0.56	BRL	0.56	BRL	0.56	BRL	0.56	BRL	0.56
B-3 5-10'	06/06/2011	MA DEP EPH	30	24	BRL	24	NA		BRL	0.6	BRL	0.6	BRL	0.6	BRL	0.6	BRL	0.6
B-4 12-15'	06/06/2011	MA DEP EPH	BRL	23	BRL	23	NA		BRL	0.58	BRL	0.58	BRL	0.58	BRL	0.58	BRL	0.58
B-4 2-5'	06/06/2011	MA DEP EPH	610	23	560	110	NA		17	2.8	BRL	2.8	BRL	2.8	**4.5**	2.8	BRL	2.8
B-5 10-15'	06/06/2011	MA DEP EPH	BRL	25	BRL	25	NA		BRL	0.63	BRL	0.63	BRL	0.63	BRL	0.63	BRL	0.63
B-8 0-3'	09/01/2011	EPA 8270C	NA		NA		NA		BRL	0.22	BRL	0.30	BRL	0.38	BRL	0.22	BRL	0.30
B-8 0-3'	09/01/2011	EPA 8260B	NA		NA		NA		NA		NA		NA		NA		NA	
B-8 5-10'	09/01/2011	EPA 8270C	NA		NA		NA		6.0	0.25	BRL	0.34	BRL	0.42	1.5	0.25	**1.1**	0.34
B-8 5-10'	09/01/2011	EPA 8260B	NA		NA		NA		NA		NA		NA		NA		NA	
B-8 10-15'	09/01/2011	EPA 8260B	NA		NA		NA		NA		NA		NA		NA		NA	
B-9 0-3'	09/01/2011	EPA 8270C	NA		NA		NA		3.5	0.21	BRL	0.29	BRL	0.36	0.99	0.21	0.46	0.29
B-9 0-3'	09/01/2011	EPA 8260B	NA		NA		NA		NA		NA		NA		NA		NA	
B-10 0-3'	09/01/2011	EPA 8270C	NA		NA		NA		8.2	0.23	0.45	0.30	0.56	0.38	2.1	0.23	0.74	0.30
B-11 0-3'	09/01/2011	EPA 8270C	NA		NA		NA		0.43	0.21	BRL	0.28	BRL	0.35	BRL	0.21	BRL	0.28
B-11 0-3'	09/01/2011	EPA 8260B	NA		NA		NA		NA		NA		NA		NA		NA	
B-12 0-3'	09/01/2011	EPA 8270C	NA		NA		NA		0.66	0.23	BRL	0.31	BRL	0.39	BRL	0.23	BRL	0.31
WC-1 (B-16 1-5')	10/05/2012	EPA 8270D / 8100M	NA		NA		1,400	190	2.0	0.38	BRL	0.38	BRL	0.38	BRL	0.38	BRL	0.38
WC-1 (B-16 1-5')	10/05/2012	EPA 8260C	NA		NA		NA		NA		NA		NA		NA		NA	
WC-2 (B-26 2-5')	10/09/2012	EPA 8270D / 8100M	NA		NA		740	190	3.9	0.38	BRL	0.38	BRL	0.38	1.0	0.38	BRL	0.38
WC-2 (B-26 2-5')	10/09/2012	EPA 8260C	NA		NA		NA		NA		NA		NA		NA		NA	
Data Evaluation																		
Maximum Concentration			610		560				17		0.70		0.85		4.5		1.1	
Maximum exceed Background?			Not applicable		Not applicable				No		No		No		Yes		Yes	
Soil Contaminant of Concern?			Yes		Yes		No - EPH used instead of TPH		No		No		No		No - comment 1		No - comment 1	
Selected Soil Standards																		
2014 MA S-2/GW-2			5,000		3,000		3,000		1,000		3,000		3,000		3,000		600	
2014 MA S-2/GW-3			5,000		3,000		3,000		1,000		3,000		3,000		3,000		10	
2014 MA S-3/GW-2			5,000		5,000		5,000		3,000		5,000		5,000		5,000		600	
2014 MA S-3/GW-3			5,000		5,000		5,000		3,000		5,000		5,000		5,000		10	
MADEP Background - Urban Fill									20		2		2		4		1	

Notes:

RDL = Reported Detection Limit
BRL = Below Reporting Limit
NA = Not Analyzed

Bold = Exceeds background concentration and S-1/GW-2 or S-1/GW-3 standard

1. The samples with one or more PAHs at levels above background for soils associated with fill containing coal ash or wood ash also contained ash or gasified coal. No headspace PID readings above 0.0 ppm, odors or visible evidence of petroleum were noted in any of the samples. Therefore, PAHs attributable to coal ash in soils.

Prepared By: EAF
Reviewed By:
Revision Date: 4/30/2014

TABLE 6.1.1
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY CONTAMINANTS OF CONCERN:
EPH, TPH AND PAHs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Naphthalene	RDL	2-Methyl-naphthalene	RDL	Fluoranthene	RDL	Pyrene	RDL	Benzo[a] anthracene	RDL	Chrysene	RDL
Exterior Courtyard Samples														
B-1 1-5'	06/06/2011	MA DEP EPH	BRL	0.5	BRL	0.5	3.2	0.5	3	0.5	1.7	0.5	2	0.5
B-1 10-15'	06/06/2011	MA DEP EPH	BRL	0.62	BRL	0.62	BRL	0.62	BRL	0.62	BRL	0.62	BRL	0.62
B-2 1-5'	06/06/2011	MA DEP EPH	BRL	0.54	BRL	0.54	**12**	0.54	11	0.54	5.9	0.54	6.6	0.54
B-2 10-15'	06/06/2011	MA DEP EPH	BRL	0.56	BRL	0.56	1	0.56	0.95	0.56	BRL	0.56	0.68	0.56
B-3 5-10'	06/06/2011	MA DEP EPH	BRL	0.6	BRL	0.6	BRL	0.6	BRL	0.6	BRL	0.6	BRL	0.6
B-4 12-15'	06/06/2011	MA DEP EPH	BRL	0.58	BRL	0.58	BRL	0.58	BRL	0.58	BRL	0.58	BRL	0.58
B-4 2-5'	06/06/2011	MA DEP EPH	BRL	2.8	BRL	2.8	**24**	2.8	19	2.8	**9.8**	2.8	**11**	2.8
B-5 10-15'	06/06/2011	MA DEP EPH	BRL	0.63	BRL	0.63	BRL	0.63	BRL	0.63	BRL	0.63	BRL	0.63
B-8 0-3'	09/01/2011	EPA 8270C	BRL	0.38	BRL	0.45	BRL	0.22	BRL	0.22	BRL	0.22	BRL	0.22
B-8 0-3'	09/01/2011	EPA 8260B	BRL	0.21	NA		NA		NA		NA		NA	
B-8 5-10'	09/01/2011	EPA 8270C	0.47	0.42	BRL	0.50	**14**	0.25	12	0.25	7.1	0.25	6.4	0.25
B-8 5-10'	09/01/2011	EPA 8260B	BRL	0.28	NA		NA		NA		NA		NA	
B-8 10-15'	09/01/2011	EPA 8260B	BRL	0.26	NA		NA		NA		NA		NA	
B-9 0-3'	09/01/2011	EPA 8270C	BRL	0.36	BRL	0.43	8.2	0.21	7.0	0.21	3.7	0.21	3.6	0.21
B-9 0-3'	09/01/2011	EPA 8260B	0.24	0.20	NA		NA		NA		NA		NA	
B-10 0-3'	09/01/2011	EPA 8270C	BRL	0.38	BRL	0.46	**14**	0.23	12	0.23	5.8	0.23	5.3	0.23
B-11 0-3'	09/01/2011	EPA 8270C	BRL	0.35	BRL	0.42	1.1	0.21	1.0	0.21	0.61	0.21	0.62	0.21
B-11 0-3'	09/01/2011	EPA 8260B	BRL	0.21	NA		NA		NA		NA		NA	
B-12 0-3'	09/01/2011	EPA 8270C	BRL	0.39	BRL	0.47	1.3	0.23	1.3	0.23	0.75	0.23	0.74	0.23
WC-1 (B-16 1-5')	10/05/2012	EPA 8270D / 8100M	BRL	0.38	BRL	0.38	1.9	0.38	2.0	0.38	0.97	0.38	1.1	0.38
WC-1 (B-16 1-5')	10/05/2012	EPA 8260C	0.0074	0.0036	NA		NA		NA		NA		NA	
WC-2 (B-26 2-5')	10/09/2012	EPA 8270D / 8100M	BRL	0.38	BRL	0.38	6.7	0.38	7.9	0.38	4.5	0.38	4.1	0.38
WC-2 (B-26 2-5')	10/09/2012	EPA 8260C	BRL	0.12	NA		NA		NA		NA		NA	
Data Evaluation														
Maximum Concentration			0.47		none detected		24		19		9.8		11	
Maximum exceed Background?			No				No		No		Yes		Yes	
Soil Contaminant of Concern?			No				No		No		No - comment 1		No - comment 1	
Selected Soil Standards														
2014 MA S-2/GW-2			40		80		3,000		3,000		40		400	
2014 MA S-2/GW-3			1,000		500		3,000		3,000		40		400	
2014 MA S-3/GW-2			40		80		5,000		5,000		300		3,000	
2014 MA S-3/GW-3			3,000		500		5,000		5,000		300		3,000	
MADEP Background - Urban Fill			1		1		10		20		9		7	

Notes:
RDL = Reported Detection Limit
BRL = Below Reporting Limit
NA = Not Analyzed

TABLE 6.1.1
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY CONTAMINANTS OF CONCERN:
EPH, TPH AND PAHs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Benzo[b] fluoranthene	RDL	Benzo[k] fluoranthene	RDL	Benzo[a] pyrene	RDL	Indeno[1,2,3-c,d] pyrene	RDL	Dibenzo[a,h] anthracene	RDL	Benzo[g,h,i] perylene	RDL
Exterior Courtyard Samples														
B-1 1-5'	06/06/2011	MA DEP EPH	1.5	0.5	1.4	0.5	1.9	0.5	1.2	0.5	BRL	0.5	1.2	0.5
B-1 10-15'	06/06/2011	MA DEP EPH	BRL	0.62	BRL	0.62	BRL	0.62	BRL	0.62	BRL	0.62	BRL	0.62
B-2 1-5'	06/06/2011	MA DEP EPH	6.1	0.54	**4.1**	0.54	6.1	0.54	**3.9**	0.54	1.0	0.54	**3.5**	0.54
B-2 10-15'	06/06/2011	MA DEP EPH	0.59	0.56	BRL	0.56	0.64	0.56	BRL	0.56	BRL	0.56	BRL	0.56
B-3 5-10'	06/06/2011	MA DEP EPH	BRL	0.6	BRL	0.6	BRL	0.6	BRL	0.6	BRL	0.6	BRL	0.6
B-4 12-15'	06/06/2011	MA DEP EPH	BRL	0.58	BRL	0.58	BRL	0.58	BRL	0.58	BRL	0.58	BRL	0.58
B-4 2-5'	06/06/2011	MA DEP EPH	**8.7**	2.8	**8.1**	2.8	**9.8**	2.8	**6.0**	2.8	BRL	2.8	**5.8**	2.8
B-5 10-15'	06/06/2011	MA DEP EPH	BRL	0.63	BRL	0.63	BRL	0.63	BRL	0.63	BRL	0.63	BRL	0.63
B-8 0-3'	09/01/2011	EPA 8270C	BRL	0.22	BRL	0.22	BRL	0.30	BRL	0.30	BRL	0.22	BRL	0.30
B-8 0-3'	09/01/2011	EPA 8260B	NA		NA		NA		NA		NA		NA	
B-8 5-10'	09/01/2011	EPA 8270C	7.8	0.25	3.3	0.25	6.5	0.34	**4.9**	0.34	**1.2**	0.25	**4.2**	0.34
B-8 5-10'	09/01/2011	EPA 8260B	NA		NA		NA		NA		NA		NA	
B-8 10-15'	09/01/2011	EPA 8260B	NA		NA		NA		NA		NA		NA	
B-9 0-3'	09/01/2011	EPA 8270C	4.4	0.21	1.7	0.21	3.5	0.29	2.9	0.29	0.58	0.21	2.5	0.29
B-9 0-3'	09/01/2011	EPA 8260B	NA		NA		NA		NA		NA		NA	
B-10 0-3'	09/01/2011	EPA 8270C	6.4	0.23	2.5	0.23	5.0	0.30	4.1	0.30	1.0	0.23	**3.6**	0.30
B-11 0-3'	09/01/2011	EPA 8270C	0.74	0.21	0.30	0.21	0.63	0.28	0.51	0.28	BRL	0.21	0.43	0.28
B-11 0-3'	09/01/2011	EPA 8260B	NA		NA		NA		NA		NA		NA	
B-12 0-3'	09/01/2011	EPA 8270C	0.84	0.23	0.32	0.23	0.65	0.31	0.53	0.31	BRL	0.23	0.46	0.31
WC-1 (B-16 1-5')	10/05/2012	EPA 8270D / 8100M	0.98	0.38	BRL	0.38	0.76	0.38	0.57	0.38	BRL	0.38	0.49	0.38
WC-1 (B-16 1-5')	10/05/2012	EPA 8260C	NA		NA		NA		NA		NA		NA	
WC-2 (B-26 2-5')	10/09/2012	EPA 8270D / 8100M	4.4	0.38	1.7	0.38	4.3	0.38	2.8	0.38	0.65	0.38	2.2	0.38
WC-2 (B-26 2-5')	10/09/2012	EPA 8260C	NA		NA		NA		NA		NA		NA	
Data Evaluation														
Maximum Concentration			8.7		8.1		9.8		6.0		1.2		5.8	
Maximum exceed Background?			Yes		Yes		Yes		Yes		Yes		Yes	
Soil Contaminant of Concern?			No - comment 1		No - comment 1		No - comment 1		No - comment 1		No - comment 1		No - comment 1	
Selected Soil Standards														
2014 MA S-2/GW-2			40		400		7		40		4		3,000	
2014 MA S-2/GW-3			40		400		7		40		4		3,000	
2014 MA S-3/GW-2			300		3,000		30		300		30		5,000	
2014 MA S-3/GW-3			300		3,000		30		300		30		5,000	
MADEP Background - Urban Fill			8		4		7		3		1		3	

Notes:
RDL = Reported Detection Limit
BRL = Below Reporting Limit
NA = Not Analyzed

TABLE 6.1.2
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY METHOD TO DERIVE EPCs:
EPH
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	n-C19 to n-C36 Aliphatic Hydrocarbons	RDL	n-C11 to n-C22 Aromatic Hydrocarbons	RDL
Exterior Courtyard: 0-3 and 0-6 Foot Interval						
B-1 1-5'	06/06/2011	MA DEP EPH	210	20	150	20
B-2 1-5'	06/06/2011	MA DEP EPH	160	22	200	22
B-4 2-5'	06/06/2011	MA DEP EPH	610	23	560	110
Data Evaluation						
		Maximum Concentration	610		560	
		Does Maximum Exceed S-2 or S-3 standard?	No		No	
		Applicable Method to Derive EPC	Mean		Mean	
Exterior Courtyard: 0-15 Foot Interval						
B-1 1-5'	06/06/2011	MA DEP EPH	210	20	150	20
B-2 1-5'	06/06/2011	MA DEP EPH	160	22	200	22
B-4 2-5'	06/06/2011	MA DEP EPH	610	23	560	110
B-1 10-15'	06/06/2011	MA DEP EPH	29	25	BRL	25
B-2 10-15'	06/06/2011	MA DEP EPH	69	22	38	22
B-3 5-10'	06/06/2011	MA DEP EPH	30	24	BRL	24
B-4 12-15'	06/06/2011	MA DEP EPH	BRL	23	BRL	23
B-5 10-15'	06/06/2011	MA DEP EPH	BRL	25	BRL	25
Data Evaluation						
		Maximum Concentration	610		560	
		Does Maximum Exceed S-2 or S-3 standard?	No		No	
		Applicable Method to Derive EPC	Mean		Mean	
Selected Soil Standards						
		2014 MA S-2/GW-2	5,000		3,000	
		2014 MA S-2/GW-3	5,000		3,000	
		2014 MA S-3/GW-2	5,000		5,000	
		2014 MA S-3/GW-3	5,000		5,000	
		MADEP Background - Urban Fill				

Notes:
RDL = Reported Detection Limit
BRL = Below Reporting Limit
NA = Not Analyzed
EPC = Exposure Point Concentration

Prepared By: EAF
Reviewed By:
Revision Date: 4/30/2014

TABLE 6.1.3
DERIVATION OF SOIL EXPOSURE POINT CONCENTRATIONS:
EPH
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	n-C19 to n-C36 Aliphatic Hydrocarbons	RDL	n-C11 to n-C22 Aromatic Hydrocarbons	RDL
Exterior Courtyard: 0-3 and 0-6 Foot Interval						
B-1 1-5'	06/06/2011	MA DEP EPH	210	20	150	20
B-2 1-5'	06/06/2011	MA DEP EPH	160	22	200	22
B-4 2-5'	06/06/2011	MA DEP EPH	610	23	560	110
Data Evaluation						
Mean Concentration			327		303	
Applicable Method to Derive EPC			Mean		Mean	
Exterior Courtyard: 0-15 Foot Interval						
B-1 1-5'	06/06/2011	MA DEP EPH	210	20	150	20
B-2 1-5'	06/06/2011	MA DEP EPH	160	22	200	22
B-4 2-5'	06/06/2011	MA DEP EPH	610	23	560	110
B-1 10-15'	06/06/2011	MA DEP EPH	29	25	13	25
B-2 10-15'	06/06/2011	MA DEP EPH	69	22	38	22
B-3 5-10'	06/06/2011	MA DEP EPH	30	24	12	24
B-4 12-15'	06/06/2011	MA DEP EPH	12	23	12	23
B-5 10-15'	06/06/2011	MA DEP EPH	13	25	13	25
Data Evaluation						
Mean Concentration			142		125	
Applicable Method to Derive EPC			Mean		Mean	
Comparison to Upper Concentration Limits (UCL)						
Does Mean Concentration Exceed UCL?			No		No	
Selected Soil Standards						
2014 Upper Concentration Limit			20,000		10,000	

Notes:
RDL = Reported Detection Limit
BRL = Below Reporting Limit
NA = Not Analyzed
EPC = Exposure Point Concentration

TABLE 6.2.1
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY SOIL CONTAMINANTS OF CONCERN:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]
Exterior Courtyard Samples									
B-1 1-5'	06/06/2011	EPA 8082	BRL	0.084	0.57	0.084	0.53	0.084	**1.142**
B-1 10-15'	06/06/2011	EPA 8082	BRL	0.1	BRL	0.1	BRL	0.1	0.15
B-2 1-5'	06/06/2011	EPA 8082	BRL	4.3	20	4.3	11	4.3	***33.15***
B-2 10-15'	06/06/2011	EPA 8082	BRL	0.091	1.8	0.091	2.3	0.46	***4.1455***
B-3 5-10'	06/06/2011	EPA 8082	BRL	0.097	BRL	0.097	BRL	0.097	0.1455
B-4 2-5'	06/06/2011	EPA 8082	BRL	9	60	9	64	9	***128.5***
B-4 12-15'	06/06/2011	EPA 8082	BRL	0.095	BRL	0.095	BRL	0.095	0.1425
B-5 10-15'	06/06/2011	EPA 8082	BRL	0.1	BRL	0.1	BRL	0.1	0.15
B-8 0-1'	09/01/2011	EPA 8082	BRL	0.0342	0.119	0.0342	0.149	0.0342	0.2851
B-8 1-3'	09/01/2011	EPA 8082	BRL	0.0381	BRL	0.0381	BRL	0.0381	0.05715
B-8 0-3'	09/01/2011	EPA 8082	BRL	0.04	BRL	0.04	0.0699	0.04	0.1099
B-8 5-10'	09/01/2011	EPA 8082	BRL	0.0455	BRL	0.0455	BRL	0.0455	0.06825
B-9 0-1'	09/01/2011	EPA 8082	BRL	0.0364	BRL	0.0364	BRL	0.0364	0.0546
B-9 1-3'	09/01/2011	EPA 8082	BRL	0.719	4.86	0.719	3.35	0.719	***8.5695***
B-10 0-3'	09/01/2011	EPA 8082	BRL	0.382	1.05	0.382	2.27	0.382	**3.511**
B-10 3-6'	09/01/2011	EPA 8082	BRL	0.426	BRL	0.426	0.691	0.426	**1.117**
B-11 0-3'	09/01/2011	EPA 8082	BRL	0.731	6.14	0.731	5.05	0.731	***11.5555***
B-11 3-6'	09/01/2011	EPA 8082	BRL	0.036	BRL	0.036	BRL	0.036	0.054
B-12 0-3'	09/01/2011	EPA 8082	BRL	0.0371	0.0649	0.0371	0.184	0.0371	0.26745
B-12 3-6'	09/01/2011	EPA 8082	BRL	0.0368	BRL	0.0368	BRL	0.0368	0.0552
B-15 0-3'	10/05/2012	EPA 8082A	BRL	1.1	5.8	1.1	4.0	1.1	***10.35***
B-15 3-5'	10/05/2012	EPA 8082A	BRL	1.1	6.3	1.1	5.1	1.1	***11.95***
B-15 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
WC-1 (B-16 1-5')	10/05/2012	EPA 8082A	BRL	1.1	7.4	1.1	7.6	1.1	***15.55***
B-16 5-7'	10/05/2012	EPA 8082A	BRL	0.54	4.6	0.54	3.0	0.54	***7.87***
B-16 7-9'	10/05/2012	EPA 8082A	BRL	0.52	2.5	0.52	1.7	0.52	***4.46***
B-16 9-12'	10/05/2012	EPA 8082A	BRL	0.22	1.7	0.22	1.0	0.22	**2.81**
B-17 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-17 3-5'	10/05/2012	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18
B-17 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-20 '0-3	10/05/2012	EPA 8082A	BRL	0.11	1.2	0.11	1.1	0.11	**2.355**
B-20 3-5'	10/05/2012	EPA 8082A	BRL	0.11	0.46	0.11	0.39	0.11	0.905
B-20 5-7'	10/05/2012	EPA 8082A	BRL	0.11	0.95	0.11	0.71	0.11	**1.715**
B-21 0-3'	10/05/2012	EPA 8082A	BRL	0.55	3.1	0.55	3.1	0.55	***6.475***
B-21 3-5'	10/05/2012	EPA 8082A	BRL	0.11	0.63	0.11	0.50	0.11	**1.185**
B-22 3-5'	10/05/2012	EPA 8082A	BRL	0.22	0.90	0.22	1.9	0.22	**2.91**
B-22 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-23 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-23 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
WC-2 (B-26 2-5')	10/09/2012	EPA 8082A	BRL	2.3	15	2.3	17	2.3	***33.15***
B-26 5-7'	10/09/2012	EPA 8082A	BRL	2.2	14	2.2	12	2.2	***27.1***
B-26 7-9'	10/09/2012	EPA 8082A	BRL	0.23	1.8	0.23	1.2	0.23	**3.115**
B-26 9-12'	10/09/2012	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18
B-31 0-3'	10/09/2012	EPA 8082A	BRL	0.11	0.12	0.11	0.15	0.11	0.325
B-31 3-5'	10/09/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15
B-32 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-32 3-5'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-34 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-35 0-3'	10/05/2012	EPA 8082A	BRL	0.21	1.6	0.21	1.4	0.21	**3.105**
B-35 3-5'	10/05/2012	EPA 8082A	BRL	1.1	9.3	1.1	8.0	1.1	***17.85***
B-35 5-7'	10/05/2012	EPA 8082A	BRL	5.7	18	5.7	27	5.7	***47.85***
B-35 7-9'	10/05/2012	EPA 8082A	BRL	1.1	5.8	1.1	7.7	1.1	***14.05***
B-37 0-3'	10/05/2012	EPA 8082A	BRL	0.11	0.66	0.11	0.44	0.11	**1.155**
B-37 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-38 0-9'	05/08/2013	EPA 8082A	BRL	5.4	BRL	5.4	37	5.4	***42.4***
B-38 9-12'	05/08/2013	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18
B-48 0-3'	05/09/2013	EPA 8082A	BRL	0.1	0.93	0.1	0.91	0.1	**1.89**
B-48 3-9'	05/09/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
Composite 1 0-5'	05/08/2013	EPA 8082A	BRL	1.1	4.8	1.1	2.9	1.1	***8.25***
Composite 2 0-5'	05/08/2013	EPA 8082A	BRL	0.11	0.44	0.11	0.45	0.11	0.945
Composite 3 0-3'	05/08/2013	EPA 8082A	BRL	0.11	0.14	0.11	0.26	0.11	0.455
Composite 3 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165

TABLE 6.2.1
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY SOIL CONTAMINANTS OF CONCERN:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]
Composite 4 0-3'	05/08/2013	EPA 8082A	BRL	2.1	9.2	2.1	7.5	2.1	***17.75***
Composite 4 3-9'	05/08/2013	EPA 8082A	BRL	0.11	0.72	0.11	0.59	0.11	**1.365**
Composite 5 0-3'	05/09/2013	EPA 8082A	BRL	0.11	0.81	0.11	1.2	0.11	**2.065**
Composite 5 3-9'	05/09/2013	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18
Composite 6 0-3'	05/09/2013	EPA 8082A	BRL	0.55	2	0.55	1.9	0.55	***4.175***
Composite 6 3-9'	05/09/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-39 0-3'	05/08/2013	EPA 8082A	BRL	0.10	BRL	0.10	0.42	0.10	0.52
B-39 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	0.25	0.11	0.36
B-49 0-3'	05/08/2013	EPA 8082A	BRL	1.1	8.9	1.1	9.8	1.1	***19.25***
B-49 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-50 0-3'	05/08/2013	EPA 8082A	BRL	2.2	14	2.2	22	2.2	***37.1***
B-50 3-9'	05/08/2013	EPA 8082A	BRL	0.43	3.4	0.43	2.2	0.43	***5.815***
B-2A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-2A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15
B-2A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15
B-2A 3-4'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.67	0.10	0.67	0.10	**1.39**
B-2A 4-5'	03/04/2014	EPA 8082A / EPA 3540	BRL	1.1	6.1	1.1	3.5	1.1	***10.15***
B-2A 4-5' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	5.4	37	5.4	24	5.4	***63.7***
B-10A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15
B-10A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.15	0.11	0.32	0.11	0.525
B-10A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	2.0	0.43	1.50	0.43	**3.715**
B-10A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	11	BRL	11	110	11	***121***
B-10A 2-3' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	11	BRL	11	91	11	***102***
B-11A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.69	0.10	0.56	0.10	**1.3**
B-11A 0-0.5' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.68	0.10	0.67	0.10	**1.4**
B-11A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	2.10	0.43	1.50	0.43	**3.815**
B-11A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.14	0.12	BRL	0.12	0.26
B-11A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-16A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-16A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-16A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	0.59	0.41	0.95	0.41	**1.745**
B-16A 3-4'	03/04/2014	EPA 8082A / EPA 3540	BRL	2.2	10	2.2	7.1	2.2	***18.2***
B-16A 4-5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.91	0.11	0.65	0.11	**1.615**
B-20A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-20A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-20A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.26	0.11	0.20	0.11	0.515
B-20A 1-2' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.27	0.10	0.21	0.10	0.53
B-20A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	5.40	40	5.40	20	5.40	***62.7***
B-21A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615
B-21A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615
B-21A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.38	0.11	0.27	0.11	0.705
B-21A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	1.1	4.0	1.1	7.5	1.1	***12.05***
B-48A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	BRL	0.43	BRL	0.43	0.645
B-48A 0-0.5' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615
B-48A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615
B-48A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.45	2.5	0.45	2.6	0.45	***5.325***
B-48A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.44	1.5	0.44	1.2	0.44	**2.92**
B-49A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-49A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.82	0.10	0.58	0.10	**1.45**
B-49A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.53	3.8	0.53	2.7	0.53	***6.765***
B-50A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615
B-50A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.82	0.11	0.54	0.11	**1.415**
B-50A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	2.2	16	2.2	20	2.2	***37.1***
B-50A 2-3' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	2.2	20	2.2	16	2.2	***37.1***
B-50A 5-7'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15
B-50A 7-9'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
COMP 1A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	BRL	0.42	BRL	0.42	0.63
COMP 1A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	BRL	0.42	BRL	0.42	0.63
COMP 1A 1-2'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.44	0.67	0.44	0.77	0.44	**1.66**
COMP 1A 2-3'	03/05/2014	EPA 8082A / EPA 3540	BRL	1.1	8.6	1.1	6.3	1.1	***15.45***
COMP 1A 3-4'	03/05/2014	EPA 8082A / EPA 3540	BRL	1.1	10	1.1	6.5	1.1	***17.05***
COMP 1A 4-5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.53	3.0	0.53	3.9	0.53	***7.165***
COMP 2A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	0.57	0.42	0.64	0.42	**1.42**

TABLE 6.2.1
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY SOIL CONTAMINANTS OF CONCERN:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]
COMP 2A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	2.1	BRL	2.1	6.8	2.1	***8.9***
COMP 5A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.10	0.12	0.10	0.12	0.10	0.29
COMP 5A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.34	0.11	0.85	0.11	**1.245**
COMP 5A 1-2'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
COMP 5A 2-3'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
COMP 6A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.35	0.11	0.63	0.11	**1.035**
COMP 6A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.18	0.11	0.21	0.11	0.445
COMP 6A 1-2'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.45	2.0	0.45	2.4	0.45	***4.625***
COMP 6A 2-3'	03/05/2014	EPA 8082A / EPA 3540	BRL	11	26	11	61	11	***92.5***
B-51B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.20	8.60	1.20	7.60	1.20	***16.8***
B-51B 2-3'	06/04/2014	EPA 8082A / EPA 3540	0.58	0.24	1.50	0.24	BRL	0.24	**2.20**
B-51B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.13	BRL	0.13	BRL	0.13	0.195
B-52B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.21	1.80	0.21	1.20	0.21	**3.105**
B-52B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.55	4.40	0.55	4.90	0.55	***9.575***
B-52B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-55B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	0.14	0.11	0.25
B-55B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.47	0.11	0.45	0.11	0.975
B-55B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	1.00	0.11	0.97	0.11	**2.025**
B-56B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.78	0.12	1.20	0.12	**2.04**
B-56B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.74	0.12	1.00	0.12	**1.8**
B-56B 3-4'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18
B-57B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.33	0.11	0.42	0.11	0.805
B-57B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.59	1.70	0.59	3.20	0.59	***5.195***
B-57B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.76	0.12	1.40	0.12	**2.22**
B-69 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-69 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-69 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.57	1.80	0.57	2.90	0.57	***4.985***
B-69 2-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	2.40	22.00	2.40	19.00	2.40	***42.2***
B-69 5-7'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18
B-70 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-70 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.65	0.11	0.44	0.11	**1.145**
B-70 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-70 2-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	1.10	0.12	0.98	0.12	**2.14**
B-70 5-7'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18
B-71 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-71 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-71 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.10	5.30	1.10	4.10	1.10	***9.95***
B-72 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-72 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-72 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	1.20	0.12	0.76	0.12	**2.02**
B-73 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18
B-73 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.12	0.20	0.12	0.315
B-73 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.40	0.11	1.10	0.11	**1.555**
Data Evaluation									
		Maximum Concentration	See Total PCBs		See Total PCBs		See Total PCBs		***128.50***
		Soil Contaminant of Concern							Yes

Prepared By:
Reviewd By: EAF
Revision Date: 06/23/2014

TABLE 6.2.1
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY SOIL CONTAMINANTS OF CONCERN:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]
Beneath Existing Mill #3 Building									
B-25 0-3'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15
B-25 3-5'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	0.13	0.11	0.24
B-25 5-7'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15
B-27 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-27 3-5'	10/09/2012	EPA 8082A	BRL	0.10	0.20	0.10	0.20	0.10	0.45
B-27A 0-3'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-27A 3-5'	10/17/2012	EPA 8082A	BRL	0.10	0.18	0.10	0.20	0.10	0.43
B-27A 5-7'	10/17/2012	EPA 8082A	BRL	0.10	0.18	0.10	0.21	0.10	0.44
B-28 0-3'	10/17/2012	EPA 8082A	BRL	0.11	0.19	0.11	0.26	0.11	0.505
B-29 0-3'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-29 3-5'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15
B-29 5-6'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
B-30 0-3'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	0.37	0.10	0.47
B-30 3-4.5'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	0.11	0.10	0.21
B-36 0-3'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	0.12	0.11	0.23
B-36 3-5'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165
Data Evaluation									
		Maximum Concentration	See Total PCBs		See Total PCBs		See Total PCBs		0.51
		Soil Contaminant of Concern							Yes
Selected MCP Soil Standards									
		MA S-1/GW-2							1
		MA S-1/GW-3							1
		MA S-2/GW-2							4
		MA S-2/GW-3							4
		MA S-3/GW-2							4
		MA S-3/GW-3							4
		Upper Concentration Limits							100
Selected TSCA Soil Standards									
		Self-Implementing High Occupancy							1
		Self-Implementing High Occupancy beneath Cap							>1 to 10
Exterior Courtyard Combined Asphalt and Soil Samples (Combined Depth to 12 Inches)									
ASC-1	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.39	0.11	0.30	0.11	0.75
ASC-2	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.17
ASC-3	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.17
ASC-4	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.93	0.11	0.74	0.11	**1.73**
ASC-5	06/04/2014	EPA 8082A / EPA 3540	BRL	0.56	4.30	0.56	3.10	0.56	***7.68***
ASC-6	06/04/2014	EPA 8082A / EPA 3540	BRL	0.21	2.60	0.21	1.70	0.21	***4.41***
Data Evaluation									
		Maximum Concentration	See Total PCBs		See Total PCBs		See Total PCBs		***7.68***
		Soil Contaminant of Concern							No - Asphalt and base
									layer will be removed

Prepared By:
Reviewd By: EAF
Revision Date: 06/23/2014

TABLE 6.2.1
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY SOIL CONTAMINANTS OF CONCERN:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]
Enclosed Courtyard Samples									
B-6 0-4'	06/06/2011	EPA 8082	BRL	0.082	BRL	0.082	BRL	0.082	BRL
B-7 8-10'	06/06/2011	EPA 8082	BRL	0.096	BRL	0.096	BRL	0.096	BRL
Data Evaluation									
		Maximum Concentration	See Total PCBs		See Total PCBs		See Total PCBs		None Detected
		Soil Contaminant of Concern							No
Between Building and Merrimack River									
B-13 0-3'	09/01/2011	EPA 8082	BRL	0.082	BRL	0.0383	BRL	0.0383	BRL
B-13 3-6'	09/01/2011	EPA 8082	BRL	0.096	BRL	0.0368	BRL	0.0368	BRL
Data Evaluation									
		Maximum Concentration	See Total PCBs		See Total PCBs		See Total PCBs		None Detected
		Soil Contaminant of Concern							No
Selected MCP Soil Standards									
		2014 MA S-1/GW-2							1
		2014 MA S-1/GW-3							1
		2014 MA S-2/GW-2							4
		2014 MA S-2/GW-3							4
		2014 MA S-3/GW-2							4
		2014 MA S-3/GW-3							4
		2014 Upper Concentration Limits							100
Selected Soil Standards									
		MA RCS-1							1

Notes:

RDL = Reported Detection Limit
BRL = Below Reporting Limit
NA = Not Analyzed
EPA 8082 or 8082A = SW-846 Method 8082 or 8082A analysis for PCBs
EPA 3540 = PCB with Method 3540 Soxhlet Extraction

Bold = Exceeds TSCA Self-Implementing High Occupancy Standard and MA S-1 standards
Bold Italic = Exceeds MA S-2 and MA S-3 standards
Red Bold Italic = Exceeds TSCA Self-Implementing High Occupancy beneath cap
Blue Bold Italic = Exceeds MA UCL

[1] - The result for Total Polychlorinated Biphenyls (PCBs) is calculated as the sum of all detects plus one-half detection limit for all Aroclors if not detected in a sample for all Aroclors with at least one detection in one sample. Only three Aroclors were detected in any sample.

Composite 1- Soils collected from borings B-41, B-42, B-43 and B-54 and composited
Composite 2- Soils collected from borings B-44, B-45, B-46 and B-47 and composited
Composite 3- Soils collected from borings B-63, B-64, B-65, B-66, B-67, B-68 and B-40 and composited
Composite 4- Soils collected from borings B-39, B-50 and B-49 and composited
Composite 5- Soils collected from borings B-58, B-59, B-60 and B-61 and composited
Composite 6- Soils collected from borings B-51, B-52, B-55, B-56 and B-57 and composited
Composite 1A- Soils collected from borings B-41A and B-42A and composited
Composite 2A- Soils collected from borings B-44A, B-45A, B-46A and B-47A and composited
Composite 5A- Soils collected from borings B-58A, B-59A, B-60A and B-61A and composited
Composite 6A- Soils collected from borings B-51A, B-52A, B-55A, B-56A and B-57A and composited
Composite ASC-1 Asphalt and soils collected from borings AS-1 through AS-4 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-2 Asphalt and soils collected from borings AS-5 through AS-8 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-3 Asphalt and soils collected from borings AS-9 through AS-12 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-4 Asphalt and soils collected from borings AS-13 through AS-16 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-5 Asphalt and soils collected from borings AS-17 through AS-20 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-6 Asphalt and soils collected from borings AS-21 through AS-24 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches

TABLE 6.2.2
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY HOT SPOTS AND EXPOSURE POINTS:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Note 1	Note 2
Exterior Courtyard: Hot Spot 1 (2-4 feet)											
B-10 0-3'	09/01/2011	EPA 8082	BRL	0.382	1.05	0.382	2.27	0.382	**3.511**	Part of Hot Spot	Eliminate (Use B-10A data)
B-10 3-6'	09/01/2011	EPA 8082	BRL	0.426	BRL	0.426	0.691	0.426	**1.117**	Below Hot Spot	
B-10A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15	Above Hot Spot	
B-10A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.15	0.11	0.32	0.11	0.525	Above Hot Spot	
B-10A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	2.0	0.43	1.50	0.43	**3.715**	Above Hot Spot	
B-10A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	11	BRL	11	110	11	***121***	Hot Spot	Will be removed
B-10A 2-3' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	11	BRL	11	91	11	***102***	Hot Spot	Will be removed
Exterior Courtyard: Hot Spot 2 (2-7 feet)											
B-4 2-5'	06/06/2011	EPA 8082	BRL	9	60	9	64	9	***128.5***	Hot Spot	Will be removed
B-4 12-15'	06/06/2011	EPA 8082	BRL	0.095	BRL	0.095	BRL	0.095	0.1425	Below Hot Spot	
WC-2 (B-26 2-5')	10/09/2012	EPA 8082A	BRL	2.3	15	2.3	17	2.3	***33.15***	Hot Spot	Will be removed
B-26 5-7'	10/09/2012	EPA 8082A	BRL	2.2	14	2.2	12	2.2	***27.1***	Hot Spot	Will be removed
B-26 7-9'	10/09/2012	EPA 8082A	BRL	0.23	1.8	0.23	1.2	0.23	**3.115**	Below Hot Spot	
B-26 9-12'	10/09/2012	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18	Below Hot Spot	
B-35 0-3'	10/05/2012	EPA 8082A	BRL	0.21	1.6	0.21	1.4	0.21	**3.105**	Mostly Above Hot Spot	Will be removed (2 to 3 foot interval)
B-35 3-5'	10/05/2012	EPA 8082A	BRL	1.1	9.3	1.1	8.0	1.1	***17.85***	Hot Spot	Will be removed
B-35 5-7'	10/05/2012	EPA 8082A	BRL	5.7	18	5.7	27	5.7	***47.85***	Hot Spot	Will be removed
B-35 7-9'	10/05/2012	EPA 8082A	BRL	1.1	5.8	1.1	7.7	1.1	***14.05***	Below Hot Spot	
B-38 0-9'	05/08/2013	EPA 8082A	BRL	5.4	BRL	5.4	37	5.4	***42.4***	Partly within Hot Spot	Will be removed (2 to 7 foot interval)
B-38 9-12'	05/08/2013	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18	Below Hot Spot	
B-71 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	Above Hot Spot	
B-71 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	Above Hot Spot	
B-71 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.10	5.30	1.10	4.10	1.10	***9.95***	Above Hot Spot	
B-72 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	Above Hot Spot	
B-72 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	Above Hot Spot	
B-72 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	1.20	0.12	0.76	0.12	**2.02**	Above Hot Spot	
B-73 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18	Above Hot Spot	
B-73 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.12	0.20	0.12	0.315	Above Hot Spot	
B-73 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.40	0.11	1.10	0.11	**1.555**	Above Hot Spot	

TABLE 6.2.2
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY HOT SPOTS AND EXPOSURE POINTS:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Note 1	Note 2
Exterior Courtyard: Hot Spot 3 (2-5 feet)											
B-2 1-5'	06/06/2011	EPA 8082	BRL	4.3	20	4.3	11	4.3	***33.15***	Part of Hot Spot	Will be removed (2-5 feet)
B-2 10-15'	06/06/2011	EPA 8082	BRL	0.091	1.8	0.091	2.3	0.46	***4.1455***	Below Hot Spot	
B-2A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	Above Hot Spot	
B-2A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15	Above Hot Spot	
B-2A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15	Hot Spot	Will be removed
B-2A 3-4'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.67	0.10	0.67	0.10	**1.39**	Hot Spot	Will be removed
B-2A 4-5'	03/04/2014	EPA 8082A / EPA 3540	BRL	1.1	6.1	1.1	3.5	1.1	***10.15***	Hot Spot	Will be removed
B-2A 4-5' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	5.4	37	5.4	24	5.4	***63.7***	Hot Spot	Will be removed
B-9 0-1'	09/01/2011	EPA 8082	BRL	0.036	BRL	0.036	BRL	0.036	0.0546	Above Hot Spot	
B-9 1-3'	09/01/2011	EPA 8082	BRL	0.719	4.86	0.719	3.35	0.719	***8.5695***	Above Hot Spot	
B-20 0-3'	10/05/2012	EPA 8082A	BRL	0.11	1.2	0.11	1.1	0.11	**2.355**	Mostly Above Hot Spot	Will be removed (2-3 feet)
B-20 3-5'	10/05/2012	EPA 8082A	BRL	0.11	0.46	0.11	0.39	0.11	0.905	Hot Spot	Will be removed
B-20 5-7'	10/05/2012	EPA 8082A	BRL	0.11	0.95	0.11	0.71	0.11	**1.715**	Below Hot Spot	
B-20A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	Above Hot Spot	
B-20A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	Above Hot Spot	
B-20A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.26	0.11	0.20	0.11	0.515	Above Hot Spot	
B-20A 1-2' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.27	0.10	0.21	0.10	0.53	Above Hot Spot	
B-20A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	5.40	40	5.40	20	5.40	***62.7***	Hot Spot	Will be removed

TABLE 6.2.2
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY HOT SPOTS AND EXPOSURE POINTS:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Note 1	Note 2
Remainder of Exterior Courtyard											
B-1 1-5'	06/06/2011	EPA 8082	BRL	0.084	0.57	0.084	0.53	0.084	**1.142**		
B-1 10-15'	06/06/2011	EPA 8082	BRL	0.1	BRL	0.1	BRL	0.1	0.15		
B-3 5-10'	06/06/2011	EPA 8082	BRL	0.097	BRL	0.097	BRL	0.097	0.1455		
B-5 10-15'	06/06/2011	EPA 8082	BRL	0.1	BRL	0.1	BRL	0.1	0.15		
B-8 0-1'	09/01/2011	EPA 8082	BRL	0.034	0.119	0.034	0.149	0.034	0.2851		
B-8 1-3'	09/01/2011	EPA 8082	BRL	0.038	BRL	0.038	BRL	0.038	0.05715		
B-8 0-3'	09/01/2011	EPA 8082	BRL	0.04	BRL	0.04	0.0699	0.04	0.1099		
B-8 5-10'	09/01/2011	EPA 8082	BRL	0.046	BRL	0.046	BRL	0.046	0.06825		
B-11 0-3'	09/01/2011	EPA 8082	BRL	0.731	6.14	0.731	5.05	0.731	***11.5555***		
B-11 3-6'	09/01/2011	EPA 8082	BRL	0.036	BRL	0.036	BRL	0.036	0.054		
B-12 0-3'	09/01/2011	EPA 8082	BRL	0.037	0.0649	0.037	0.184	0.037	0.26745		
B-12 3-6'	09/01/2011	EPA 8082	BRL	0.037	BRL	0.037	BRL	0.037	0.0552		
B-15 0-3'	10/05/2012	EPA 8082A	BRL	1.1	5.8	1.1	4.0	1.1	***10.35***		
B-15 3-5'	10/05/2012	EPA 8082A	BRL	1.1	6.3	1.1	5.1	1.1	***11.95***		
B-15 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
WC-1 (B-16 1-5')	10/05/2012	EPA 8082A	BRL	1.1	7.4	1.1	7.6	1.1	***15.55***		
B-16 5-7'	10/05/2012	EPA 8082A	BRL	0.54	4.6	0.54	3.0	0.54	***7.87***		
B-16 7-9'	10/05/2012	EPA 8082A	BRL	0.52	2.5	0.52	1.7	0.52	***4.46***		
B-16 9-12'	10/05/2012	EPA 8082A	BRL	0.22	1.7	0.22	1.0	0.22	**2.81**		
B-17 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-17 3-5'	10/05/2012	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18		
B-17 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-21 0-3'	10/05/2012	EPA 8082A	BRL	0.55	3.1	0.55	3.1	0.55	***6.475***		
B-21 3-5'	10/05/2012	EPA 8082A	BRL	0.11	0.63	0.11	0.50	0.11	**1.185**		
B-22 3-5'	10/05/2012	EPA 8082A	BRL	0.22	0.90	0.22	1.9	0.22	**2.91**		
B-22 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-23 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-23 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-31 0-3'	10/09/2012	EPA 8082A	BRL	0.11	0.12	0.11	0.15	0.11	0.325		
B-31 3-5'	10/09/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15		
B-32 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-32 3-5'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-34 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-37 0-3'	10/05/2012	EPA 8082A	BRL	0.11	0.66	0.11	0.44	0.11	**1.155**		
B-37 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-48 0-3'	05/09/2013	EPA 8082A	BRL	0.1	0.93	0.1	0.91	0.1	**1.89**		
B-48 3-9'	05/09/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
Composite 1 0-5'	05/08/2013	EPA 8082A	BRL	1.1	4.8	1.1	2.9	1.1	***8.25***		
Composite 2 0-5'	05/08/2013	EPA 8082A	BRL	0.11	0.44	0.11	0.45	0.11	0.945		
Composite 3 0-3'	05/08/2013	EPA 8082A	BRL	0.11	0.14	0.11	0.26	0.11	0.455		
Composite 3 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
Composite 4 0-3'	05/08/2013	EPA 8082A	BRL	2.1	9.2	2.1	7.5	2.1	***17.75***		

Prepared By:
Reviewd By: EAF
Revision Date: 06/23/2014

TABLE 6.2.2
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY HOT SPOTS AND EXPOSURE POINTS:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Note 1	Note 2
Composite 4 3-9'	05/08/2013	EPA 8082A	BRL	0.11	0.72	0.11	0.59	0.11	**1.365**		
Composite 5 0-3'	05/09/2013	EPA 8082A	BRL	0.11	0.81	0.11	1.2	0.11	**2.065**		
Composite 5 3-9'	05/09/2013	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18		
Composite 6 0-3'	05/09/2013	EPA 8082A	BRL	0.55	2	0.55	1.9	0.55	***4.175***		
Composite 6 3-9'	05/09/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-39 0-3'	05/08/2013	EPA 8082A	BRL	0.10	BRL	0.10	0.42	0.10	0.52		
B-39 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	0.25	0.11	0.36		
B-49 0-3'	05/08/2013	EPA 8082A	BRL	1.1	8.9	1.1	9.8	1.1	***19.25***		
B-49 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-50 0-3'	05/08/2013	EPA 8082A	BRL	2.2	14	2.2	22	2.2	***37.1***		
B-50 3-9'	05/08/2013	EPA 8082A	BRL	0.43	3.4	0.43	2.2	0.43	***5.815***		
B-11A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.69	0.10	0.56	0.10	**1.3**		
B-11A 0-0.5' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.68	0.10	0.67	0.10	**1.4**		
B-11A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	2.10	0.43	1.50	0.43	**3.815**		
B-11A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.14	0.12	BRL	0.12	0.26		
B-11A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-16A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-16A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-16A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	0.59	0.41	0.95	0.41	**1.745**		
B-16A 3-4'	03/04/2014	EPA 8082A / EPA 3540	BRL	2.2	10	2.2	7.1	2.2	***18.2***		
B-16A 4-5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.91	0.11	0.65	0.11	**1.615**		
B-21A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615		
B-21A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615		
B-21A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.38	0.11	0.27	0.11	0.705		
B-21A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	1.1	4.0	1.1	7.5	1.1	***12.05***		
B-48A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	BRL	0.43	BRL	0.43	0.645		
B-48A 0-0.5' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615		
B-48A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615		
B-48A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.45	2.5	0.45	2.6	0.45	***5.325***		
B-48A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.44	1.5	0.44	1.2	0.44	**2.92**		
B-49A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-49A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.82	0.10	0.58	0.10	**1.45**		
B-49A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.53	3.8	0.53	2.7	0.53	***6.765***		
B-50A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615		
B-50A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.82	0.11	0.54	0.11	**1.415**		
B-50A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	2.2	16	2.2	20	2.2	***37.1***		
B-50A 2-3' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	2.2	20	2.2	16	2.2	***37.1***		
B-50A 5-7'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15		
B-50A 7-9'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
COMP 1A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	BRL	0.42	BRL	0.42	0.63		
COMP 1A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	BRL	0.42	BRL	0.42	0.63		
COMP 1A 1-2'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.44	0.67	0.44	0.77	0.44	**1.66**		
COMP 1A 2-3'	03/05/2014	EPA 8082A / EPA 3540	BRL	1.1	8.6	1.1	6.3	1.1	***15.45***		

TABLE 6.2.2
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY HOT SPOTS AND EXPOSURE POINTS:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Note 1	Note 2
COMP 1A 3-4'	03/05/2014	EPA 8082A / EPA 3540	BRL	1.1	10	1.1	6.5	1.1	***17.05***		
COMP 1A 4-5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.53	3.0	0.53	3.9	0.53	***7.165***		
COMP 2A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	0.57	0.42	0.64	0.42	**1.42**		
COMP 2A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	2.1	BRL	2.1	6.8	2.1	***8.9***		
COMP 5A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.10	0.12	0.10	0.12	0.10	0.29		
COMP 5A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.34	0.11	0.85	0.11	**1.245**		
COMP 5A 1-2'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
COMP 5A 2-3'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
COMP 6A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.35	0.11	0.63	0.11	**1.035**		
COMP 6A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.18	0.11	0.21	0.11	0.445		
COMP 6A 1-2'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.45	2.0	0.45	2.4	0.45	***4.625***		
COMP 6A 2-3'	03/05/2014	EPA 8082A / EPA 3540	BRL	11	26	11	61	11	***92.5***		
B-51B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.20	8.60	1.20	7.60	1.20	***16.8***		
B-51B 2-3'	06/04/2014	EPA 8082A / EPA 3540	0.58	0.24	1.50	0.24	BRL	0.24	**2.20**		
B-51B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.13	BRL	0.13	BRL	0.13	0.195		
B-52B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.21	1.80	0.21	1.20	0.21	**3.105**		
B-52B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.55	4.40	0.55	4.90	0.55	***9.575***		
B-52B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-55B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	0.14	0.11	0.25		
B-55B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.47	0.11	0.45	0.11	0.975		
B-55B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	1.00	0.11	0.97	0.11	**2.025**		
B-56B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.78	0.12	1.20	0.12	**2.04**		
B-56B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.74	0.12	1.00	0.12	**1.8**		
B-56B 3-4'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		
B-57B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.33	0.11	0.42	0.11	0.805		
B-57B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.59	1.70	0.59	3.20	0.59	***5.195***		
B-57B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.76	0.12	1.40	0.12	**2.22**		
B-69 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-69 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-69 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.57	1.80	0.57	2.90	0.57	***4.985***		
B-69 2-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	2.40	22.00	2.40	19.00	2.40	***42.2***		
B-69 5-7'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		
B-70 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-70 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.65	0.11	0.44	0.11	**1.145**		
B-70 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-70 2-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	1.10	0.12	0.98	0.12	**2.14**		
B-70 5-7'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		

TABLE 6.2.2
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY HOT SPOTS AND EXPOSURE POINTS:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Note 1	Note 2
Beneath Existing Mill #3 Building											
B-25 0-3'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15		
B-25 3-5'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	0.13	0.11	0.24		
B-25 5-7'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15		
B-27 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-27 3-5'	10/09/2012	EPA 8082A	BRL	0.10	0.20	0.10	0.20	0.10	0.45		
B-27A 0-3'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-27A 3-5'	10/17/2012	EPA 8082A	BRL	0.10	0.18	0.10	0.20	0.10	0.43		
B-27A 5-7'	10/17/2012	EPA 8082A	BRL	0.10	0.18	0.10	0.21	0.10	0.44		
B-28 0-3'	10/17/2012	EPA 8082A	BRL	0.11	0.19	0.11	0.26	0.11	0.505		
B-29 0-3'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-29 3-5'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15		
B-29 5-6'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-30 0-3'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	0.37	0.10	0.47		
B-30 3-4.5'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	0.11	0.10	0.21		
B-36 0-3'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	0.12	0.11	0.23		
B-36 3-5'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		

TABLE 6.2.2
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY HOT SPOTS AND EXPOSURE POINTS:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Note 1	Note 2
Exterior Courtyard Combined Asphalt and Soil Samples (Combined Depth to 12 Inches)											
ASC-1	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.39	0.11	0.30	0.11	0.75		Will be removed
ASC-2	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.17		Will be removed
ASC-3	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.17		Will be removed
ASC-4	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.93	0.11	0.74	0.11	**1.73**		Will be removed
ASC-5	06/04/2014	EPA 8082A / EPA 3540	BRL	0.56	4.30	0.56	3.10	0.56	***7.68***		Will be removed
ASC-6	06/04/2014	EPA 8082A / EPA 3540	BRL	0.21	2.60	0.21	1.70	0.21	***4.41***		Will be removed
Selected MCP Soil Standards											
		2014 MA S-1/GW-2							1		
		2014 MA S-1/GW-3							1		
		2014 MA S-2/GW-2							4		
		2014 MA S-2/GW-3							4		
		2014 MA S-3/GW-2							4		
		2014 MA S-3/GW-3							4		
		2014 Upper Concentration Limits							100		
Selected Soil Standards											
		MA RCS-1							1		

Notes:

RDL = Reported Detection Limit
BRL = Below Reporting Limit
NA = Not Analyzed

EPA 8082 or 8082A = SW-846 Method 8082 or 8082A analysis for PCBs
EPA 3540 = PCB with Method 3540 Soxhlet Extraction

Bold = Exceeds TSCA Self-Implementing High Occupancy Standard and MA S-1 standards
Bold Italic = Exceeds MA S-2 and MA S-3 standards
Red Bold Italic = Exceeds TSCA Self-Implementing High Occupancy beneath cap
Blue Bold Italic = Exceeds MA UCL

[1] - The result for Total Polychlorinated Biphenyls (PCBs) is calculated as the sum of all detects plus one-half detection limit for all Aroclors if not detected in a sample for all Aroclors with at least one detection in one sample. Only three Aroclors were detected in any sample.

Composite 1- Soils collected from borings B-41, B-42, B-43 and B-54 and composited
Composite 2- Soils collected from borings B-44, B-45, B-46 and B-47 and composited
Composite 3- Soils collected from borings B-63, B-64, B-65, B-66, B-67, B-68 and B-40 and composited
Composite 4- Soils collected from borings B-39, B-50 and B-49 and composited
Composite 5- Soils collected from borings B-58, B-59, B-60 and B-61 and composited
Composite 6- Soils collected from borings B-51, B-52, B-55, B-56 and B-57 and composited
Composite 1A- Soils collected from borings B-41A and B-42A and composited
Composite 2A- Soils collected from borings B-44A, B-45A, B-46A and B-47A and composited
Composite 5A- Soils collected from borings B-58A, B-59A, B-60A and B-61A and composited
Composite 6A- Soils collected from borings B-51A, B-52A, B-55A, B-56A and B-57A and composited
Composite ASC-1 Asphalt and soils collected from borings AS-1 through AS-4 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-2 Asphalt and soils collected from borings AS-5 through AS-8 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-3 Asphalt and soils collected from borings AS-9 through AS-12 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-4 Asphalt and soils collected from borings AS-13 through AS-16 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-5 Asphalt and soils collected from borings AS-17 through AS-20 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-6 Asphalt and soils collected from borings AS-21 through AS-24 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches

Prepared By:
Reviewd By: EAF
Revision Date: 06/23/2014

TABLE 6.2.3
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY REPRESENTATIVE SOIL SAMPLES:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Note 1	Note 2
Exterior Courtyard: Hot Spot 1 (2-4 feet)											
B-10 0-3'	09/01/2011	EPA 8082	BRL	0.382	1.05	0.382	2.27	0.382	**3.511**	Part of Hot Spot	Partly excavated - not representative (Use B-10A data for 0-2 foot data)
B-10 3-6'	09/01/2011	EPA 8082	BRL	0.426	BRL	0.426	0.691	0.426	**1.117**	Below Hot Spot	See below
B-10A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15	Above Hot Spot	See below
B-10A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.15	0.11	0.32	0.11	0.525	Above Hot Spot	See below
B-10A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	2.0	0.43	1.50	0.43	**3.715**	Above Hot Spot	See below
B-10A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	11	BRL	11	110	11	***121***	Hot Spot	Not Representative - will be excavated
B-10A 2-3' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	11	BRL	11	91	11	***102***	Hot Spot	Not Representative - will be excavated
Exterior Courtyard: Hot Spot 2 (2-7 feet)											
B-4 2-5'	06/06/2011	EPA 8082	BRL	9	60	9	64	9	***128.5***	Hot Spot	Not Representative - will be excavated
B-4 12-15'	06/06/2011	EPA 8082	BRL	0.095	BRL	0.095	BRL	0.095	0.1425	Below Hot Spot	See below
B-72 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	Above Hot Spot	See below
B-72 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	Above Hot Spot	See below
B-72 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	1.20	0.12	0.76	0.12	**2.02**	Above Hot Spot	See below
B-73 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18	Above Hot Spot	See below
B-73 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.12	0.20	0.12	0.315	Above Hot Spot	See below
B-73 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.40	0.11	1.10	0.11	**1.555**	Above Hot Spot	See below
Exterior Courtyard: Hot Spot 3 (2-5 feet)											
B-2 1-5'	06/06/2011	EPA 8082	BRL	4.3	20	4.3	11	4.3	***33.15***	Part of Hot Spot	Partly excavated - not representative (Use B-2A data for 0-2 foot data)
B-2 10-15'	06/06/2011	EPA 8082	BRL	0.091	1.8	0.091	2.3	0.46	***4.1455***	Below Hot Spot	See below
B-2A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	Above Hot Spot	See below
B-2A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15	Above Hot Spot	See below
B-2A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15	Hot Spot	Not Representative - will be excavated
B-2A 3-4'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.67	0.10	0.67	0.10	**1.39**	Hot Spot	Not Representative - will be excavated
B-2A 4-5'	03/04/2014	EPA 8082A / EPA 3540	BRL	1.1	6.1	1.1	3.5	1.1	***10.15***	Hot Spot	Not Representative - will be excavated
B-2A 4-5' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	5.4	37	5.4	24	5.4	***63.7***	Hot Spot	Not Representative - will be excavated
B-9 0-1'	09/01/2011	EPA 8082	BRL	0.036	BRL	0.036	BRL	0.036	0.0546	Above Hot Spot	See below
B-9 1-3'	09/01/2011	EPA 8082	BRL	0.719	4.86	0.719	3.35	0.719	***8.5695***	Above Hot Spot	See below
B-20 0-3'	10/05/2012	EPA 8082A	BRL	0.11	1.2	0.11	1.1	0.11	**2.355**	Mostly Above Hot Spot	Partly excavated - not representative (Use B-20A data for 0-2 foot data)
B-20 3-5'	10/05/2012	EPA 8082A	BRL	0.11	0.46	0.11	0.39	0.11	0.905	Hot Spot	Not Representative - will be excavated
B-20 5-7'	10/05/2012	EPA 8082A	BRL	0.11	0.95	0.11	0.71	0.11	**1.715**	Below Hot Spot	See below
B-20A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	Above Hot Spot	See below
B-20A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	Above Hot Spot	See below
B-20A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.26	0.11	0.20	0.11	0.515	Above Hot Spot	See below
B-20A 1-2' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.27	0.10	0.21	0.10	0.53	Above Hot Spot	See below
B-20A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	5.40	40	5.40	20	5.40	***62.7***	Hot Spot	Not Representative - will be excavated

TABLE 6.2.3
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY REPRESENTATIVE SOIL SAMPLES:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Note 1	Note 2
Exterior Courtyard: Remainder (0-3 Foot Interval)											
B-1 1-5'	06/06/2011	EPA 8082	BRL	0.084	0.57	0.084	0.53	0.084	**1.142**		Representative of B-1
B-2A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		Representative of B-2 / B-2A
B-2A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15		
B-8 0-1'	09/01/2011	EPA 8082	BRL	0.034	0.119	0.034	0.149	0.034	0.2851		Representative of B-8
B-8 1-3'	09/01/2011	EPA 8082	BRL	0.038	BRL	0.038	BRL	0.038	0.05715		
B-8 0-3'	09/01/2011	EPA 8082	BRL	0.04	BRL	0.04	0.0699	0.04	0.1099		
B-9 0-1'	09/01/2011	EPA 8082	BRL	0.036	BRL	0.036	BRL	0.036	0.0546		
B-9 1-3'	09/01/2011	EPA 8082	BRL	0.719	4.86	0.719	3.35	0.719	***8.5695***		Representative of B-9
B-10A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15		
B-10A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.15	0.11	0.32	0.11	0.525		
B-10A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	2.0	0.43	1.50	0.43	**3.715**		Representative of B-10A
B-11 0-3'	09/01/2011	EPA 8082	BRL	0.731	6.14	0.731	5.05	0.731	***11.5555***		Representative of B-11 / B-11A
B-11A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.69	0.10	0.56	0.10	**1.3**		
B-11A 0-0.5' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.68	0.10	0.67	0.10	**1.4**		
B-11A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	2.10	0.43	1.50	0.43	**3.815**		
B-11A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.14	0.12	BRL	0.12	0.26		
B-11A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-12 0-3'	09/01/2011	EPA 8082	BRL	0.037	0.0649	0.037	0.184	0.037	0.26745		Representative of B-12
B-15 0-3'	10/05/2012	EPA 8082A	BRL	1.1	5.8	1.1	4.0	1.1	***10.35***		Representative of B-15
WC-1 (B-16 1-5')	10/05/2012	EPA 8082A	BRL	1.1	7.4	1.1	7.6	1.1	***15.55***		Contamination present in 3-5': Not Representative
B-16A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-16A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-16A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	0.59	0.41	0.95	0.41	**1.745**		Representative of B-16 / B-16A
B-17 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		Representative of B-17
B-20A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-20A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-20A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.26	0.11	0.20	0.11	0.515		
B-20A 1-2' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.27	0.10	0.21	0.10	0.53		Representative of B-20A
B-21 0-3'	10/05/2012	EPA 8082A	BRL	0.55	3.1	0.55	3.1	0.55	***6.475***		
B-21A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615		
B-21A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615		
B-21A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.38	0.11	0.27	0.11	0.705		
B-21A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	1.1	4.0	1.1	7.5	1.1	***12.05***		Representative of B-21 / B-21A
B-23 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		Representative of B-23
WC-2 (B-26 2-5')	10/09/2012	EPA 8082A	BRL	2.3	15	2.3	17	2.3	***33.15***		Representative of B-26 (Conservative)
B-31 0-3'	10/09/2012	EPA 8082A	BRL	0.11	0.12	0.11	0.15	0.11	0.325		Representative of B-31
B-32 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		Representative of B-32
B-35 0-3'	10/05/2012	EPA 8082A	BRL	0.21	1.6	0.21	1.4	0.21	**3.105**		Partly excavated - not representative (Use B-71 data for 0-2 foot data)
B-37 0-3'	10/05/2012	EPA 8082A	BRL	0.11	0.66	0.11	0.44	0.11	**1.155**		Representative of B-37
B-48 0-3'	05/09/2013	EPA 8082A	BRL	0.1	0.93	0.1	0.91	0.1	**1.89**		
B-48A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	BRL	0.43	BRL	0.43	0.645		
B-48A 0-0.5' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615		
B-48A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615		
B-48A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.45	2.5	0.45	2.6	0.45	***5.325***		Representative of B-48 / B-48A
B-48A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.44	1.5	0.44	1.2	0.44	**2.92**		

TABLE 6.2.3
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY REPRESENTATIVE SOIL SAMPLES:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Note 1	Note 2
B-69 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-69 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-69 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.57	1.80	0.57	2.90	0.57	***4.985***		Representative of B-69
B-70 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-70 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.65	0.11	0.44	0.11	**1.145**		Representative of B-70
B-70 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-71 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-71 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-71 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.10	5.30	1.10	4.10	1.10	***9.95***		Representative of B-71
B-72 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-72 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-72 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	1.20	0.12	0.76	0.12	**2.02**		Representative of B-72
B-73 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		
B-73 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.12	0.20	0.12	0.315		
B-73 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.40	0.11	1.10	0.11	**1.555**		Representative of B-73
Composite 1 0-5'	05/08/2013	EPA 8082A	BRL	1.1	4.8	1.1	2.9	1.1	***8.25***		Not representative - data for 3-5 foot interval exists below
COMP 1A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	BRL	0.42	BRL	0.42	0.63		
COMP 1A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	BRL	0.42	BRL	0.42	0.63		
COMP 1A 1-2'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.44	0.67	0.44	0.77	0.44	**1.66**		
COMP 1A 2-3'	03/05/2014	EPA 8082A / EPA 3540	BRL	1.1	8.6	1.1	6.3	1.1	***15.45***		Representative of Composite 1 / COMP 1A
Composite 2 0-5'	05/08/2013	EPA 8082A	BRL	0.11	0.44	0.11	0.45	0.11	0.945		
COMP 2A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	0.57	0.42	0.64	0.42	**1.42**		
COMP 2A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	2.1	BRL	2.1	6.8	2.1	***8.9***		Representative of Composite 2 / COMP 2A
Composite 3 0-3'	05/08/2013	EPA 8082A	BRL	0.11	0.14	0.11	0.26	0.11	0.455		Representative of Composite 3
Composite 4 0-3'	05/08/2013	EPA 8082A	BRL	2.1	9.2	2.1	7.5	2.1	***17.75***		Represented by B-39 to B-50A
B-39 0-3'	05/08/2013	EPA 8082A	BRL	0.10	BRL	0.10	0.42	0.10	0.52		Representative of B-39
B-49 0-3'	05/08/2013	EPA 8082A	BRL	1.1	8.9	1.1	9.8	1.1	***19.25***		Representative of B-49 / B-49A
B-49A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-49A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.82	0.10	0.58	0.10	**1.45**		
B-49A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.53	3.8	0.53	2.7	0.53	***6.765***		
B-50 0-3'	05/08/2013	EPA 8082A	BRL	2.2	14	2.2	22	2.2	***37.1***		Representative of B-50 / B-50A
B-50A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615		
B-50A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.82	0.11	0.54	0.11	**1.415**		
B-50A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	2.2	16	2.2	20	2.2	***37.1***		
B-50A 2-3' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	2.2	20	2.2	16	2.2	***37.1***		
Composite 5 0-3'	05/09/2013	EPA 8082A	BRL	0.11	0.81	0.11	1.2	0.11	**2.065**		Representative of Composite 5 / COMP 5A
COMP 5A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.10	0.12	0.10	0.12	0.10	0.29		
COMP 5A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.34	0.11	0.85	0.11	**1.245**		
COMP 5A 1-2'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
COMP 5A 2-3'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
Composite 6 0-3'	05/09/2013	EPA 8082A	BRL	0.55	2	0.55	1.9	0.55	***4.175***		
COMP 6A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.35	0.11	0.63	0.11	**1.035**		
COMP 6A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.18	0.11	0.21	0.11	0.445		
COMP 6A 1-2'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.45	2.0	0.45	2.4	0.45	***4.625***		

TABLE 6.2.3
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY REPRESENTATIVE SOIL SAMPLES:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Note 1	Note 2
COMP 6A 2-3'	03/05/2014	EPA 8082A / EPA 3540	BRL	11	26	11	61	11	***92.5***		Inconsistent with Composite 6, B-51B, B-52B, B-55B to B-57B
B-51B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.20	8.60	1.20	7.60	1.20	***16.8***		Representative of B-51B
B-51B 2-3'	06/04/2014	EPA 8082A / EPA 3540	0.58	0.24	1.50	0.24	BRL	0.24	**2.20**		
B-52B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.21	1.80	0.21	1.20	0.21	**3.105**		
B-52B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.55	4.40	0.55	4.90	0.55	***9.575***		Representative of B-52B
B-55B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	0.14	0.11	0.25		
B-55B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.47	0.11	0.45	0.11	0.975		Representative of B-55B
B-56B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.78	0.12	1.20	0.12	**2.04**		Representative of B-56B
B-56B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.74	0.12	1.00	0.12	**1.8**		
B-57B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.33	0.11	0.42	0.11	0.805		
B-57B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.59	1.70	0.59	3.20	0.59	***5.195***		Representative of B-57B

TABLE 6.2.3
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY REPRESENTATIVE SOIL SAMPLES:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Note 1	Note 2
Exterior Courtyard: Remainder 0-6 Foot Interval)											
B-1 1-5'	06/06/2011	EPA 8082	BRL	0.084	0.57	0.084	0.53	0.084	**1.142**		Representative of B-1
B-2A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of B-2 / B-2A
B-2A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15		1/2 Representative of B-2 / B-2A
B-8 0-1'	09/01/2011	EPA 8082	BRL	0.034	0.119	0.034	0.149	0.034	0.2851		1/3 Representative of B-8
B-8 1-3'	09/01/2011	EPA 8082	BRL	0.038	BRL	0.038	BRL	0.038	0.05715		2/3 Representative of B-8
B-8 0-3'	09/01/2011	EPA 8082	BRL	0.04	BRL	0.04	0.0699	0.04	0.1099		
B-9 0-1'	09/01/2011	EPA 8082	BRL	0.036	BRL	0.036	BRL	0.036	0.0546		1/3 Representative of B-9
B-9 1-3'	09/01/2011	EPA 8082	BRL	0.719	4.86	0.719	3.35	0.719	***8.5695***		2/3 Representative of B-9
B-10A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15		1/10 Representative of B-10A
B-10A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.15	0.11	0.32	0.11	0.525		1/10 Representative of B-10A
B-10A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	2.0	0.43	1.50	0.43	**3.715**		1/5 Representative of B-10A
B-10 3-6'	09/01/2011	EPA 8082	BRL	0.426	BRL	0.426	0.691	0.426	**1.117**		3/5 Representative of B-10
B-11 0-3'	09/01/2011	EPA 8082	BRL	0.731	6.14	0.731	5.05	0.731	***11.5555***		1/2 Representative of B-11 / B-11A
B-11A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.69	0.10	0.56	0.10	**1.3**		
B-11A 0-0.5' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.68	0.10	0.67	0.10	**1.4**		
B-11A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	2.10	0.43	1.50	0.43	**3.815**		
B-11A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.14	0.12	BRL	0.12	0.26		
B-11A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-11 3-6'	09/01/2011	EPA 8082	BRL	0.036	BRL	0.036	BRL	0.036	0.054		1/2 Representative of B-11 / B-11A
B-12 0-3'	09/01/2011	EPA 8082	BRL	0.037	0.0649	0.037	0.184	0.037	0.26745		1/2 Representative of B-12
B-12 3-6'	09/01/2011	EPA 8082	BRL	0.037	BRL	0.037	BRL	0.037	0.0552		1/2 Representative of B-12
B-15 0-3'	10/05/2012	EPA 8082A	BRL	1.1	5.8	1.1	4.0	1.1	***10.35***		1/2 Representative of B-15
B-15 3-5'	10/05/2012	EPA 8082A	BRL	1.1	6.3	1.1	5.1	1.1	***11.95***		2/6 Representative of B-15
B-15 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/6 Representative of B-15
WC-1 (B-16 1-5')	10/05/2012	EPA 8082A	BRL	1.1	7.4	1.1	7.6	1.1	***15.55***		Representative of B-16 / B-16A
B-16A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-16A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-16A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	0.59	0.41	0.95	0.41	**1.745**		
B-16 5-7'	10/05/2012	EPA 8082A	BRL	0.54	4.6	0.54	3.0	0.54	***7.87***		
B-16A 3-4'	03/04/2014	EPA 8082A / EPA 3540	BRL	2.2	10	2.2	7.1	2.2	***18.2***		
B-16A 4-5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.91	0.11	0.65	0.11	**1.615**		
B-17 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of B-17
B-17 3-5'	10/05/2012	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/6 Representative of B-17
B-17 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/6 Representative of B-17
B-20A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/8 Representative of B-20A
B-20A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/8 Representative of B-20A
B-20A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.26	0.11	0.20	0.11	0.515		
B-20A 1-2' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.27	0.10	0.21	0.10	0.53		1/4 Representative of B-20A
B-20 5-7'	10/05/2012	EPA 8082A	BRL	0.11	0.95	0.11	0.71	0.11	**1.715**		1/2 Representative of B-20
B-21 0-3'	10/05/2012	EPA 8082A	BRL	0.55	3.1	0.55	3.1	0.55	***6.475***		3/5 Representative of B-21 / B-21A
B-21A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615		
B-21A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615		
B-21A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.38	0.11	0.27	0.11	0.705		
B-21A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	1.1	4.0	1.1	7.5	1.1	***12.05***		
B-21 3-5'	10/05/2012	EPA 8082A	BRL	0.11	0.63	0.11	0.50	0.11	**1.185**		2/5 Representative of B-21
B-22 3-5'	10/05/2012	EPA 8082A	BRL	0.22	0.90	0.22	1.9	0.22	**2.91**		1/2 Representative of B-22

TABLE 6.2.3
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY REPRESENTATIVE SOIL SAMPLES:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Note 1	Note 2
B-22 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of B-22
B-23 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		3/5 Representative of B-23
B-23 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/5 Representative of B-23
WC-2 (B-26 2-5')	10/09/2012	EPA 8082A	BRL	2.3	15	2.3	17	2.3	***33.15***		3/5 Representative of B-26
B-26 5-7'	10/09/2012	EPA 8082A	BRL	2.2	14	2.2	12	2.2	***27.1***		2/5 Representative of B-26
B-31 0-3'	10/09/2012	EPA 8082A	BRL	0.11	0.12	0.11	0.15	0.11	0.325		3/5 Representative of B-31
B-31 3-5'	10/09/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15		2/5 Representative of B-31
B-32 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		3/5 Representative of B-32
B-32 3-5'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/5 Representative of B-32
B-34 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		Representative of B-34
B-35 0-3'	10/05/2012	EPA 8082A	BRL	0.21	1.6	0.21	1.4	0.21	**3.105**		1/2 Representative of B-35
B-35 3-5'	10/05/2012	EPA 8082A	BRL	1.1	9.3	1.1	8.0	1.1	***17.85***		2/6 Representative of B-35
B-35 5-7'	10/05/2012	EPA 8082A	BRL	5.7	18	5.7	27	5.7	***47.85***		1/6 Representative of B-35
B-37 0-3'	10/05/2012	EPA 8082A	BRL	0.11	0.66	0.11	0.44	0.11	**1.155**		3/5 Representative of B-37
B-37 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/5 Representative of B-37
B-48 0-3'	05/09/2013	EPA 8082A	BRL	0.1	0.93	0.1	0.91	0.1	**1.89**		Represented by B-48A Samples
B-48A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	BRL	0.43	BRL	0.43	0.645		1/12 Representative of B-48 / B-48A
B-48A 0-0.5' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615		
B-48A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615		1/12 Repesentative of B-48 / B-48A
B-48A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.45	2.5	0.45	2.6	0.45	***5.325***		1/6 Representative of B-48 / B-48A
B-48A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.44	1.5	0.44	1.2	0.44	**2.92**		1/6 Representative of B-48 / B-48A
B-48 3-9'	05/09/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of B-48 / B-48A
B-69 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/12 Representative of B-69
B-69 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/12 Representative of B-69
B-69 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.57	1.80	0.57	2.90	0.57	***4.985***		1/6 Representative of B-69
B-69 2-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	2.40	22.00	2.40	19.00	2.40	***42.2***		3/6 Representative of B-69
B-69 5-7'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		1/6 Representative of B-69
B-70 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/12 Representative of B-70
B-70 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.65	0.11	0.44	0.11	**1.145**		1/12 Representative of B-70
B-70 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/6 representative of B-70
B-70 2-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	1.10	0.12	0.98	0.12	**2.14**		3/6 Representative of B-70
B-70 5-7'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		1/6 Representative of B-70
B-71 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/4 Representative of B-71
B-71 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/4 Representative of B-71
B-71 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.10	5.30	1.10	4.10	1.10	***9.95***		1/2 Representative of B-71
B-72 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/4 Representative of B-72
B-72 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/4 Representative of B-72
B-72 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	1.20	0.12	0.76	0.12	**2.02**		1/2 Representative of B-72
B-73 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		1/4 Representative of B-73
B-73 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.12	0.20	0.12	0.315		1/4 Representative of B-73
B-73 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.40	0.11	1.10	0.11	**1.555**		1/2 Representative of B-73
Composite 1 0-5'	05/08/2013	EPA 8082A	BRL	1.1	4.8	1.1	2.9	1.1	***8.25***		Represented by COMP 1A Samples
COMP 1A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	BRL	0.42	BRL	0.42	0.63		1/10 Representative of COMP 1A
COMP 1A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	BRL	0.42	BRL	0.42	0.63		1/10 Representative of COMP 1A
COMP 1A 1-2'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.44	0.67	0.44	0.77	0.44	**1.66**		1/5 Representative of COMP 1A
COMP 1A 2-3'	03/05/2014	EPA 8082A / EPA 3540	BRL	1.1	8.6	1.1	6.3	1.1	***15.45***		1/5 Representative of COMP 1A

TABLE 6.2.3
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY REPRESENTATIVE SOIL SAMPLES:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Note 1	Note 2
COMP 1A 3-4'	03/05/2014	EPA 8082A / EPA 3540	BRL	1.1	10	1.1	6.5	1.1	***17.05***		1/5 Representative of COMP 1A
COMP 1A 4-5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.53	3.0	0.53	3.9	0.53	***7.165***		1/5 Representative of COMP 1A
Composite 2 0-5'	05/08/2013	EPA 8082A	BRL	0.11	0.44	0.11	0.45	0.11	0.945		Represented by COMP 2A Samples
COMP 2A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	0.57	0.42	0.64	0.42	**1.42**		1/2 Representative of COMP 2A
COMP 2A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	2.1	BRL	2.1	6.8	2.1	***8.9***		1/2 Representative of COMP 2A
Composite 3 0-3'	05/08/2013	EPA 8082A	BRL	0.11	0.14	0.11	0.26	0.11	0.455		1/2 Representative of Composite 3
Composite 3 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of Composite 3
Composite 4 0-3'	05/08/2013	EPA 8082A	BRL	2.1	9.2	2.1	7.5	2.1	***17.75***		Represented by B-39 to B-50A
Composite 4 3-9'	05/08/2013	EPA 8082A	BRL	0.11	0.72	0.11	0.59	0.11	**1.365**		See B-39, B-49, B-50 / B-50A
B-39 0-3'	05/08/2013	EPA 8082A	BRL	0.10	BRL	0.10	0.42	0.10	0.52		1/2 Representative of B-39
B-39 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	0.25	0.11	0.36		1/2 Representative of B-39
B-49 0-3'	05/08/2013	EPA 8082A	BRL	1.1	8.9	1.1	9.8	1.1	***19.25***		1/2 Representative of B-49 / B-49A
B-49A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-49A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.82	0.10	0.58	0.10	**1.45**		
B-49A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.53	3.8	0.53	2.7	0.53	***6.765***		
B-49 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of B-49
B-50 0-3'	05/08/2013	EPA 8082A	BRL	2.2	14	2.2	22	2.2	***37.1***		1/2 Representative of B-50 / B-50A
B-50A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615		
B-50A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.82	0.11	0.54	0.11	**1.415**		
B-50A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	2.2	16	2.2	20	2.2	***37.1***		
B-50A 2-3' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	2.2	20	2.2	16	2.2	***37.1***		
B-50 3-9'	05/08/2013	EPA 8082A	BRL	0.43	3.4	0.43	2.2	0.43	***5.815***		1/2 Representative of B-50 / B-50A
B-50A 5-7'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15		
Composite 5 0-3'	05/09/2013	EPA 8082A	BRL	0.11	0.81	0.11	1.2	0.11	**2.065**		1/2 Representative of Composite 5 / COMP 5A
COMP 5A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.10	0.12	0.10	0.12	0.10	0.29		
COMP 5A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.34	0.11	0.85	0.11	**1.245**		
COMP 5A 1-2'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
COMP 5A 2-3'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
Composite 5 3-9'	05/09/2013	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18		1/2 Representative of Composite 5
Composite 6 0-3'	05/09/2013	EPA 8082A	BRL	0.55	2	0.55	1.9	0.55	***4.175***		
COMP 6A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.35	0.11	0.63	0.11	**1.035**		1/2 Representative of COMP 6A Area
COMP 6A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.18	0.11	0.21	0.11	0.445		1/2 Representative of COMP 6A Area
COMP 6A 1-2'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.45	2.0	0.45	2.4	0.45	***4.625***		See B-51B, B-52B, B-55B to B-57B
COMP 6A 2-3'	03/05/2014	EPA 8082A / EPA 3540	BRL	11	26	11	61	11	***92.5***		Inconsistent with Composite 6, B-51B, B-52B, B-55B to B-57B
Composite 6 3-9'	05/09/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		See B-51B, B-52B, B-55B to B-57B
B-51B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.20	8.60	1.20	7.60	1.20	***16.8***		1/4 Representative of B-51B
B-51B 2-3'	06/04/2014	EPA 8082A / EPA 3540	0.58	0.24	1.50	0.24	BRL	0.24	**2.20**		1/4 Representative of B-51B
B-51B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.13	BRL	0.13	BRL	0.13	0.195		2/4 Representative of B-51B
B-52B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.21	1.80	0.21	1.20	0.21	**3.105**		1/4 Representative of B-52B
B-52B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.55	4.40	0.55	4.90	0.55	***9.575***		1/4 Representative of B-52B
B-52B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/4 Representative of B-52B
B-55B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	0.14	0.11	0.25		1/4 Representative of B-55B
B-55B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.47	0.11	0.45	0.11	0.975		1/4 Representative of B-55B
B-55B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	1.00	0.11	0.97	0.11	**2.025**		2/4 Representative of B-55B
B-56B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.78	0.12	1.20	0.12	**2.04**		1/4 Representative of B-56B

TABLE 6.2.3
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY REPRESENTATIVE SOIL SAMPLES:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Note 1	Note 2
B-56B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.74	0.12	1.00	0.12	**1.8**		1/4 Representative of B-56B
B-56B 3-4'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/4 Representative of B-56B
B-57B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.33	0.11	0.42	0.11	0.805		1/4 Representative of B-57B
B-57B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.59	1.70	0.59	3.20	0.59	***5.195***		1/4 Representative of B-57B
B-57B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.76	0.12	1.40	0.12	**2.22**		2/4 Representative of B-57B

TABLE 6.2.3
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY REPRESENTATIVE SOIL SAMPLES:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Note 1	Note 2
Exterior Courtyard: Remainder (0-15 Foot Interval)											
B-1 1-5'	06/06/2011	EPA 8082	BRL	0.084	0.57	0.084	0.53	0.084	**1.142**		1/2 Representative of B-1
B-1 10-15'	06/06/2011	EPA 8082	BRL	0.1	BRL	0.1	BRL	0.1	0.15		1/2 Representative of B-1
B-2A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of B-2 / B-2A
B-2A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15		1/2 Representative of B-2 / B-2A
B-3 5-10'	06/06/2011	EPA 8082	BRL	0.097	BRL	0.097	BRL	0.097	0.1455		Representative of B-3
B-4 12-15'	06/06/2011	EPA 8082	BRL	0.095	BRL	0.095	BRL	0.095	0.1425		Representative of B-4
B-5 10-15'	06/06/2011	EPA 8082	BRL	0.1	BRL	0.1	BRL	0.1	0.15		Representative of B-5
B-8 0-1'	09/01/2011	EPA 8082	BRL	0.034	0.119	0.034	0.149	0.034	0.2851		1/8 Representative of B-8
B-8 1-3'	09/01/2011	EPA 8082	BRL	0.038	BRL	0.038	BRL	0.038	0.05715		2/8 Representative of B-8
B-8 0-3'	09/01/2011	EPA 8082	BRL	0.04	BRL	0.04	0.0699	0.04	0.1099		
B-8 5-10'	09/01/2011	EPA 8082	BRL	0.046	BRL	0.046	BRL	0.046	0.06825		5/8 Representative of B-8
B-9 0-1'	09/01/2011	EPA 8082	BRL	0.036	BRL	0.036	BRL	0.036	0.0546		1/3 Representative of B-9
B-9 1-3'	09/01/2011	EPA 8082	BRL	0.719	4.86	0.719	3.35	0.719	***8.5695***		2/3 Representative of B-9
B-10A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15		1/8 Representative of B-10A
B-10A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.15	0.11	0.32	0.11	0.525		1/8 Representative of B-10A
B-10A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	2.0	0.43	1.50	0.43	**3.715**		1/4 Representative of B-10A
B-10 3-6'	09/01/2011	EPA 8082	BRL	0.426	BRL	0.426	0.691	0.426	**1.117**		1/2 Representative of B-10
B-11 0-3'	09/01/2011	EPA 8082	BRL	0.731	6.14	0.731	5.05	0.731	***11.5555***		1/2 Representative of B-11 / B-11A
B-11A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.69	0.10	0.56	0.10	**1.3**		
B-11A 0-0.5' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.68	0.10	0.67	0.10	**1.4**		
B-11A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	2.10	0.43	1.50	0.43	**3.815**		
B-11A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.14	0.12	BRL	0.12	0.26		
B-11A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-11 3-6'	09/01/2011	EPA 8082	BRL	0.036	BRL	0.036	BRL	0.036	0.054		1/2 Representative of B-11 / B-11A
B-12 0-3'	09/01/2011	EPA 8082	BRL	0.037	0.0649	0.037	0.184	0.037	0.26745		1/2 Representative of B-12
B-12 3-6'	09/01/2011	EPA 8082	BRL	0.037	BRL	0.037	BRL	0.037	0.0552		1/2 Representative of B-12
B-15 0-3'	10/05/2012	EPA 8082A	BRL	1.1	5.8	1.1	4.0	1.1	***10.35***		3/7 Representative of B-15
B-15 3-5'	10/05/2012	EPA 8082A	BRL	1.1	6.3	1.1	5.1	1.1	***11.95***		2/7 Representative of B-15
B-15 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/7 Representative of B-15
WC-1 (B-16 1-5')	10/05/2012	EPA 8082A	BRL	1.1	7.4	1.1	7.6	1.1	***15.55***		4/11 Representative of B-16 / B-16A
B-16A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-16A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-16A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	0.59	0.41	0.95	0.41	**1.745**		
B-16A 3-4'	03/04/2014	EPA 8082A / EPA 3540	BRL	2.2	10	2.2	7.1	2.2	***18.2***		
B-16A 4-5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.91	0.11	0.65	0.11	**1.615**		
B-16 5-7'	10/05/2012	EPA 8082A	BRL	0.54	4.6	0.54	3.0	0.54	***7.87***		2/11 Representative of B-16 / B-16A
B-16 7-9'	10/05/2012	EPA 8082A	BRL	0.52	2.5	0.52	1.7	0.52	***4.46***		2/11 Representative of B-16 / B-16A
B-16 9-12'	10/05/2012	EPA 8082A	BRL	0.22	1.7	0.22	1.0	0.22	**2.81**		3/11 Representative of B-16 / B-16A
B-17 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		3/7 Representative of B-17
B-17 3-5'	10/05/2012	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/7 Representative of B-17
B-17 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/7 Representative of B-17
B-20A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/8 Representative of B-20A
B-20A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/8 Representative of B-20A
B-20A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.26	0.11	0.20	0.11	0.515		
B-20A 1-2' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.27	0.10	0.21	0.10	0.53		1/4 Representative of B-20A
B-20 5-7'	10/05/2012	EPA 8082A	BRL	0.11	0.95	0.11	0.71	0.11	**1.715**		2/4 Representative of B-20

TABLE 6.2.3
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY REPRESENTATIVE SOIL SAMPLES:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Note 1	Note 2
B-21 0-3'	10/05/2012	EPA 8082A	BRL	0.55	3.1	0.55	3.1	0.55	***6.475***		3/5 Representative of B-21 / B-21A
B-21A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615		
B-21A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615		
B-21A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.38	0.11	0.27	0.11	0.705		
B-21A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	1.1	4.0	1.1	7.5	1.1	***12.05***		
B-21 3-5'	10/05/2012	EPA 8082A	BRL	0.11	0.63	0.11	0.50	0.11	**1.185**		2/5 Representative of B-21
B-22 3-5'	10/05/2012	EPA 8082A	BRL	0.22	0.90	0.22	1.9	0.22	**2.91**		1/2 Representative of B-22
B-22 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of B-22
B-23 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		3/5 Representative of B-23
B-23 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/5 Representative of B-23
WC-2 (B-26 2-5')	10/09/2012	EPA 8082A	BRL	2.3	15	2.3	17	2.3	***33.15***		3/10 Representative of B-26
B-26 5-7'	10/09/2012	EPA 8082A	BRL	2.2	14	2.2	12	2.2	***27.1***		2/10 Representative of B-26
B-26 7-9'	10/09/2012	EPA 8082A	BRL	0.23	1.8	0.23	1.2	0.23	**3.115**		2/10 Representative of B-26
B-26 9-12'	10/09/2012	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18		3/10 Representative of B-26
B-31 0-3'	10/09/2012	EPA 8082A	BRL	0.11	0.12	0.11	0.15	0.11	0.325		3/5 Representative of B-31
B-31 3-5'	10/09/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15		2/5 Representative of B-31
B-32 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		3/5 Representative of B-32
B-32 3-5'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/5 Representative of B-32
B-34 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		Representative of B-34
B-35 0-3'	10/05/2012	EPA 8082A	BRL	0.21	1.6	0.21	1.4	0.21	**3.105**		3/9 Representative of B-35
B-35 3-5'	10/05/2012	EPA 8082A	BRL	1.1	9.3	1.1	8.0	1.1	***17.85***		2/9 Representative of B-35
B-35 5-7'	10/05/2012	EPA 8082A	BRL	5.7	18	5.7	27	5.7	***47.85***		2/9 Representative of B-35
B-35 7-9'	10/05/2012	EPA 8082A	BRL	1.1	5.8	1.1	7.7	1.1	***14.05***		2/9 Representative of B-35
B-37 0-3'	10/05/2012	EPA 8082A	BRL	0.11	0.66	0.11	0.44	0.11	**1.155**		3/5 Representative of B-37
B-37 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/5 Representative of B-37
B-38 9-12'	05/08/2013	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18		Representative of B-38
B-48 0-3'	05/09/2013	EPA 8082A	BRL	0.1	0.93	0.1	0.91	0.1	**1.89**		Represented by B-48A Samples
B-48A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	BRL	0.43	BRL	0.43	0.645		1/18 Representative of B-48 / B-48A
B-48A 0-0.5' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615		
B-48A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615		1/18 Repesentative of B-48 / B-48A
B-48A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.45	2.5	0.45	2.6	0.45	***5.325***		1/9 Representative of B-48 / B-48A
B-48A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.44	1.5	0.44	1.2	0.44	**2.92**		1/9 Representative of B-48 / B-48A
B-48 3-9'	05/09/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		6/9 Representative of B-48 / B-48A
B-69 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/14 Representative of B-69
B-69 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/14 Representative of B-69
B-69 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.57	1.80	0.57	2.90	0.57	***4.985***		1/7 Representative of B-69
B-69 2-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	2.40	22.00	2.40	19.00	2.40	***42.2***		3/7 Representative of B-69
B-69 5-7'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/7 Representative of B-69
B-70 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/14 Representative of B-70
B-70 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.65	0.11	0.44	0.11	**1.145**		1/14 Representative of B-70
B-70 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/7 representative of B-70
B-70 2-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	1.10	0.12	0.98	0.12	**2.14**		3/7 Representative of B-70
B-70 5-7'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/7 Representative of B-70
B-71 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/4 Representative of B-71
B-71 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/4 Representative of B-71
B-71 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.10	5.30	1.10	4.10	1.10	***9.95***		1/2 Representative of B-71
B-72 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/4 Representative of B-72

TABLE 6.2.3
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY REPRESENTATIVE SOIL SAMPLES:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Note 1	Note 2
B-72 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/4 Representative of B-72
B-72 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	1.20	0.12	0.76	0.12	**2.02**		1/2 Representative of B-72
B-73 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		1/4 Representative of B-73
B-73 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.12	0.20	0.12	0.315		1/4 Representative of B-73
B-73 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.40	0.11	1.10	0.11	**1.555**		1/2 Representative of B-73
Composite 1 0-5'	05/08/2013	EPA 8082A	BRL	1.1	4.8	1.1	2.9	1.1	***8.25***		Represented by COMP 1A Samples
COMP 1A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	BRL	0.42	BRL	0.42	0.63		1/10 Representative of COMP 1A
COMP 1A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	BRL	0.42	BRL	0.42	0.63		1/10 Representative of COMP 1A
COMP 1A 1-2'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.44	0.67	0.44	0.77	0.44	**1.66**		1/5 Representative of COMP 1A
COMP 1A 2-3'	03/05/2014	EPA 8082A / EPA 3540	BRL	1.1	8.6	1.1	6.3	1.1	***15.45***		1/5 Representative of COMP 1A
COMP 1A 3-4'	03/05/2014	EPA 8082A / EPA 3540	BRL	1.1	10	1.1	6.5	1.1	***17.05***		1/5 Representative of COMP 1A
COMP 1A 4-5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.53	3.0	0.53	3.9	0.53	***7.165***		1/5 Representative of COMP 1A
Composite 2 0-5'	05/08/2013	EPA 8082A	BRL	0.11	0.44	0.11	0.45	0.11	0.945		Represented by COMP 2A Samples
COMP 2A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	0.57	0.42	0.64	0.42	**1.42**		1/2 Representative of COMP 2A
COMP 2A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	2.1	BRL	2.1	6.8	2.1	***8.9***		1/2 Representative of COMP 2A
Composite 3 0-3'	05/08/2013	EPA 8082A	BRL	0.11	0.14	0.11	0.26	0.11	0.455		1/2 Representative of Composite 3
Composite 3 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of Composite 3
Composite 4 0-3'	05/08/2013	EPA 8082A	BRL	2.1	9.2	2.1	7.5	2.1	***17.75***		Represented by B-39 to B-50A
Composite 4 3-9'	05/08/2013	EPA 8082A	BRL	0.11	0.72	0.11	0.59	0.11	**1.365**		See B-39, B-49, B-50 / B-50A
B-39 0-3'	05/08/2013	EPA 8082A	BRL	0.10	BRL	0.10	0.42	0.10	0.52		1/2 Representative of B-39
B-39 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	0.25	0.11	0.36		1/2 Representative of B-39
B-49 0-3'	05/08/2013	EPA 8082A	BRL	1.1	8.9	1.1	9.8	1.1	***19.25***		1/2 Representative of B-49 / B-49A
B-49A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
B-49A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.82	0.10	0.58	0.10	**1.45**		
B-49A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.53	3.8	0.53	2.7	0.53	***6.765***		
B-49 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of B-49
B-50 0-3'	05/08/2013	EPA 8082A	BRL	2.2	14	2.2	22	2.2	***37.1***		1/3 Representative of B-50 / B-50A
B-50A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615		
B-50A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.82	0.11	0.54	0.11	**1.415**		
B-50A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	2.2	16	2.2	20	2.2	***37.1***		
B-50A 2-3' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	2.2	20	2.2	16	2.2	***37.1***		
B-50 3-9'	05/08/2013	EPA 8082A	BRL	0.43	3.4	0.43	2.2	0.43	***5.815***		2/3 Representative of B-50 / B-50A
B-50A 5-7'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15		
B-50A 7-9'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
Composite 5 0-3'	05/09/2013	EPA 8082A	BRL	0.11	0.81	0.11	1.2	0.11	**2.065**		1/3 Representative of Composite 5 / COMP 5A
COMP 5A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.10	0.12	0.10	0.12	0.10	0.29		
COMP 5A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.34	0.11	0.85	0.11	**1.245**		
COMP 5A 1-2'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
COMP 5A 2-3'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		
Composite 5 3-9'	05/09/2013	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/3 Representative of Composite 5
Composite 6 0-3'	05/09/2013	EPA 8082A	BRL	0.55	2	0.55	1.9	0.55	***4.175***		
COMP 6A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.35	0.11	0.63	0.11	**1.035**		1/2 Representative of COMP 6A Area
COMP 6A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.18	0.11	0.21	0.11	0.445		1/2 Representative of COMP 6A Area
COMP 6A 1-2'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.45	2.0	0.45	2.4	0.45	***4.625***		See B-51B, B-52B, B-55B to B-57B

TABLE 6.2.3
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY REPRESENTATIVE SOIL SAMPLES:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Note 1	Note 2
COMP 6A 2-3'	03/05/2014	EPA 8082A / EPA 3540	BRL	11	26	11	61	11	***92.5***		Inconsistent with Composite 6, B-51B, B-52B, B-55B to B-57B
Composite 6 3-9'	05/09/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		See B-51B, B-52B, B-55B to B-57B
B-51B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.20	8.60	1.20	7.60	1.20	***16.8***		1/4 Representative of B-51B
B-51B 2-3'	06/04/2014	EPA 8082A / EPA 3540	0.58	0.24	1.50	0.24	BRL	0.24	**2.20**		1/4 Representative of B-51B
B-51B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.13	BRL	0.13	BRL	0.13	0.195		2/4 Representative of B-51B
B-52B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.21	1.80	0.21	1.20	0.21	**3.105**		1/4 Representative of B-52B
B-52B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.55	4.40	0.55	4.90	0.55	***9.575***		1/4 Representative of B-52B
B-52B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/4 Representative of B-52B
B-55B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	0.14	0.11	0.25		1/4 Representative of B-55B
B-55B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.47	0.11	0.45	0.11	0.975		1/4 Representative of B-55B
B-55B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	1.00	0.11	0.97	0.11	**2.025**		2/4 Representative of B-55B
B-56B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.78	0.12	1.20	0.12	**2.04**		1/4 Representative of B-56B
B-56B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.74	0.12	1.00	0.12	**1.8**		1/4 Representative of B-56B
B-56B 3-4'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/4 Representative of B-56B
B-57B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.33	0.11	0.42	0.11	0.805		1/4 Representative of B-57B
B-57B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.59	1.70	0.59	3.20	0.59	***5.195***		1/4 Representative of B-57B
B-57B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.76	0.12	1.40	0.12	**2.22**		2/4 Representative of B-57B

TABLE 6.2.3
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY REPRESENTATIVE SOIL SAMPLES:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Note 1	Note 2
Beneath Existing Mill #3 Building											
B-25 0-3'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15		Representative
B-25 3-5'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	0.13	0.11	0.24		Representative
B-25 5-7'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15		Representative
B-27 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		Representative
B-27 3-5'	10/09/2012	EPA 8082A	BRL	0.10	0.20	0.10	0.20	0.10	0.45		Representative
B-27A 0-3'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		Representative
B-27A 3-5'	10/17/2012	EPA 8082A	BRL	0.10	0.18	0.10	0.20	0.10	0.43		Representative
B-27A 5-7'	10/17/2012	EPA 8082A	BRL	0.10	0.18	0.10	0.21	0.10	0.44		Representative
B-28 0-3'	10/17/2012	EPA 8082A	BRL	0.11	0.19	0.11	0.26	0.11	0.505		Representative
B-29 0-3'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		Representative
B-29 3-5'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15		Representative
B-29 5-6'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		Representative
B-30 0-3'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	0.37	0.10	0.47		Representative
B-30 3-4.5'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	0.11	0.10	0.21		Representative
B-36 0-3'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	0.12	0.11	0.23		Representative
B-36 3-5'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		Representative

TABLE 6.2.3
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY REPRESENTATIVE SOIL SAMPLES:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Note 1	Note 2
Exterior Courtyard Combined Asphalt and Soil Samples (Combined Depth to 12 Inches)											
ASC-1	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.39	0.11	0.30	0.11	0.75		Will be removed
ASC-2	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.17		Will be removed
ASC-3	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.17		Will be removed
ASC-4	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.93	0.11	0.74	0.11	**1.73**		Will be removed
ASC-5	06/04/2014	EPA 8082A / EPA 3540	BRL	0.56	4.30	0.56	3.10	0.56	***7.68***		Will be removed
ASC-6	06/04/2014	EPA 8082A / EPA 3540	BRL	0.21	2.60	0.21	1.70	0.21	***4.41***		Will be removed
Selected MCP Soil Standards											
		2014 MA S-1/GW-2							1		
		2014 MA S-1/GW-3							1		
		2014 MA S-2/GW-2							4		
		2014 MA S-2/GW-3							4		
		2014 MA S-3/GW-2							4		
		2014 MA S-3/GW-3							4		
		2014 Upper Concentration Limits							100		

Notes:

RDL = Reported Detection Limit
BRL = Below Reporting Limit
NA = Not Analyzed

EPA 8082 or 8082A = SW-846 Method 8082 or 8082A analysis for PCBs
EPA 3540 = PCB with Method 3540 Soxhlet Extraction

Bold = Exceeds TSCA Self-Implementing High Occupancy Standard and MA S-1 standards
Bold Italic = Exceeds MA S-2 and MA S-3 standards
Red Bold Italic = Exceeds TSCA Self-Implementing High Occupancy beneath cap
Blue Bold Italic = Exceeds MA UCL

[1] - The result for Total Polychlorinated Biphenyls (PCBs) is calculated as the sum of all detects plus one-half detection limit for all Aroclors if not detected in a sample for all Aroclors with at least one detection in one sample. Only three Aroclors were detected in any sample.

Composite 1- Soils collected from borings B-41, B-42, B-43 and B-54 and composited
Composite 2- Soils collected from borings B-44, B-45, B-46 and B-47 and composited
Composite 3- Soils collected from borings B-63, B-64, B-65, B-66, B-67, B-68 and B-40 and composited
Composite 4- Soils collected from borings B-39, B-50 and B-49 and composited
Composite 5- Soils collected from borings B-58, B-59, B-60 and B-61 and composited
Composite 6- Soils collected from borings B-51, B-52, B-55, B-56 and B-57 and composited
Composite 1A- Soils collected from borings B-41A and B-42A and composited
Composite 2A- Soils collected from borings B-44A, B-45A, B-46A and B-47A and composited
Composite 5A- Soils collected from borings B-58A, B-59A, B-60A and B-61A and composited
Composite 6A- Soils collected from borings B-51A, B-52A, B-55A, B-56A and B-57A and composited
Composite ASC-1 Asphalt and soils collected from borings AS-1 through AS-4 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-2 Asphalt and soils collected from borings AS-5 through AS-8 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-3 Asphalt and soils collected from borings AS-9 through AS-12 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-4 Asphalt and soils collected from borings AS-13 through AS-16 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-5 Asphalt and soils collected from borings AS-17 through AS-20 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-6 Asphalt and soils collected from borings AS-21 through AS-24 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches

TABLE 6.2.4
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY METHOD TO DERIVE EXPOSURE POINT CONCENTRATIONS:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1
Exterior Courtyard: Remainder (0-3 Foot Interval)											
B-1 1-5'	06/06/2011	EPA 8082	BRL	0.084	0.57	0.084	0.53	0.084	**1.142**	1.142	Representative of B-1
B-2A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative of B-2 / B-2A
B-8 0-1'	09/01/2011	EPA 8082	BRL	0.034	0.119	0.034	0.149	0.034	0.2851	0.2851	Representative of B-8
B-9 1-3'	09/01/2011	EPA 8082	BRL	0.719	4.86	0.719	3.35	0.719	***8.5695***	8.5695	Representative of B-9
B-10A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	2.0	0.43	1.50	0.43	**3.715**	3.715	Representative of B-10A
B-11 0-3'	09/01/2011	EPA 8082	BRL	0.731	6.14	0.731	5.05	0.731	***11.5555***	11.5555	Representative of B-11 / B-11A
B-12 0-3'	09/01/2011	EPA 8082	BRL	0.037	0.0649	0.037	0.184	0.037	0.26745	0.26745	Representative of B-12
B-15 0-3'	10/05/2012	EPA 8082A	BRL	1.1	5.8	1.1	4.0	1.1	***10.35***	10.35	Representative of B-15
B-16A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	0.59	0.41	0.95	0.41	**1.745**	1.745	Representative of B-16 / B-16A
B-17 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative of B-17
B-20A 1-2' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.27	0.10	0.21	0.10	0.53	0.53	Representative of B-20A
B-21A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	1.1	4.0	1.1	7.5	1.1	***12.05***	12.05	Representative of B-21 / B-21A
B-23 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative of B-23
B-31 0-3'	10/09/2012	EPA 8082A	BRL	0.11	0.12	0.11	0.15	0.11	0.325	0.325	Representative of B-31
B-32 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative of B-32
B-37 0-3'	10/05/2012	EPA 8082A	BRL	0.11	0.66	0.11	0.44	0.11	**1.155**	1.155	Representative of B-37
B-48A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.45	2.5	0.45	2.6	0.45	***5.325***	5.325	Representative of B-48 / B-48A
B-69 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.57	1.80	0.57	2.90	0.57	***4.985***	4.985	Representative of B-69
B-70 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.65	0.11	0.44	0.11	**1.145**	1.145	Representative of B-70
B-71 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.10	5.30	1.10	4.10	1.10	***9.95***	9.95	Representative of B-71
B-72 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	1.20	0.12	0.76	0.12	**2.02**	2.02	Representative of B-72
B-73 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.40	0.11	1.10	0.11	**1.555**	1.555	Representative of B-73
COMP 1A 2-3'	03/05/2014	EPA 8082A / EPA 3540	BRL	1.1	8.6	1.1	6.3	1.1	***15.45***	15.45	Representative of Composite 1 / COMP 1A
COMP 2A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	2.1	BRL	2.1	6.8	2.1	***8.9***	8.9	Representative of Composite 2 / COMP 2A
Composite 3 0-3'	05/08/2013	EPA 8082A	BRL	0.11	0.14	0.11	0.26	0.11	0.455	0.455	Representative of Composite 3
B-39 0-3'	05/08/2013	EPA 8082A	BRL	0.10	BRL	0.10	0.42	0.10	0.52	0.52	Representative of B-39
B-49 0-3'	05/08/2013	EPA 8082A	BRL	1.1	8.9	1.1	9.8	1.1	***19.25***	19.25	Representative of B-49 / B-49A
B-50 0-3'	05/08/2013	EPA 8082A	BRL	2.2	14	2.2	22	2.2	***37.1***	37.1	Representative of B-50 / B-50A
Composite 5 0-3'	05/09/2013	EPA 8082A	BRL	0.11	0.81	0.11	1.2	0.11	**2.065**	2.065	Representative of Composite 5 / COMP 5A
B-51B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.20	8.60	1.20	7.60	1.20	***16.8***	16.8	Representative of B-51B
B-52B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.55	4.40	0.55	4.90	0.55	***9.575***	9.575	Representative of B-52B
B-55B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.47	0.11	0.45	0.11	0.975	0.975	Representative of B-55B
B-56B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.78	0.12	1.20	0.12	**2.04**	2.04	Representative of B-56B
B-57B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.59	1.70	0.59	3.20	0.59	***5.195***	5.195	Representative of B-57B
Data Evaluation: 0-3 Foot Interval											
		Maximum Concentration								37.1	
		Number >10X S-2/S-3 Standard								0	
		Number Data Points								34	
		Number >S-2/S-3 Standard								14	
		Percent >S-2/S-3								41	
		Method to Derive EPC								95% UCL on mean	

Prepared By:
Reviewd By: EAF
Revision Date: 06/23/2014

TABLE 6.2.4
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY METHOD TO DERIVE EXPOSURE POINT CONCENTRATIONS:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1
Exterior Courtyard: Remainder 0-6 Foot Interval)											
B-1 1-5'	06/06/2011	EPA 8082	BRL	0.084	0.57	0.084	0.53	0.084	**1.142**	1.142	Representative of B-1
B-2A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.1575	1/2 Representative of B-2 / B-2A
B-2A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15		1/2 Representative of B-2 / B-2A
B-8 0-1'	09/01/2011	EPA 8082	BRL	0.034	0.119	0.034	0.149	0.034	0.2851	0.133133333	1/3 Representative of B-8
B-8 1-3'	09/01/2011	EPA 8082	BRL	0.038	BRL	0.038	BRL	0.038	0.05715		2/3 Representative of B-8
B-9 0-1'	09/01/2011	EPA 8082	BRL	0.036	BRL	0.036	BRL	0.036	0.0546	5.7312	1/3 Representative of B-9
B-9 1-3'	09/01/2011	EPA 8082	BRL	0.719	4.86	0.719	3.35	0.719	***8.5695***		2/3 Representative of B-9
B-10A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15	1.4807	1/10 Representative of B-10A
B-10A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.15	0.11	0.32	0.11	0.525		1/10 Representative of B-10A
B-10A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	2.0	0.43	1.50	0.43	**3.715**		1/5 Representative of B-10A
B-10 3-6'	09/01/2011	EPA 8082	BRL	0.426	BRL	0.426	0.691	0.426	**1.117**		3/5 Representative of B-10
B-11 0-3'	09/01/2011	EPA 8082	BRL	0.731	6.14	0.731	5.05	0.731	***11.5555***	5.80475	1/2 Representative of B-11 / B-11A
B-11 3-6'	09/01/2011	EPA 8082	BRL	0.036	BRL	0.036	BRL	0.036	0.054		1/2 Representative of B-11 / B-11A
B-12 0-3'	09/01/2011	EPA 8082	BRL	0.037	0.0649	0.037	0.184	0.037	0.26745	0.161325	1/2 Representative of B-12
B-12 3-6'	09/01/2011	EPA 8082	BRL	0.037	BRL	0.037	BRL	0.037	0.0552		1/2 Representative of B-12
B-15 0-3'	10/05/2012	EPA 8082A	BRL	1.1	5.8	1.1	4.0	1.1	***10.35***	9.185833333	1/2 Representative of B-15
B-15 3-5'	10/05/2012	EPA 8082A	BRL	1.1	6.3	1.1	5.1	1.1	***11.95***		2/6 Representative of B-15
B-15 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/6 Representative of B-15
WC-1 (B-16 1-5')	10/05/2012	EPA 8082A	BRL	1.1	7.4	1.1	7.6	1.1	***15.55***	15.55	Representative of B-16 / B-16A
B-17 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.17	1/2 Representative of B-17
B-17 3-5'	10/05/2012	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/6 Representative of B-17
B-17 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/6 Representative of B-17
B-20A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	1.03125	1/8 Representative of B-20A
B-20A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/8 Representative of B-20A
B-20A 1-2' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.27	0.10	0.21	0.10	0.53		1/4 Representative of B-20A
B-20 5-7'	10/05/2012	EPA 8082A	BRL	0.11	0.95	0.11	0.71	0.11	**1.715**		1/2 Representative of B-20
B-21 0-3'	10/05/2012	EPA 8082A	BRL	0.55	3.1	0.55	3.1	0.55	***6.475***	4.359	3/5 Representative of B-21 / B-21A
B-21 3-5'	10/05/2012	EPA 8082A	BRL	0.11	0.63	0.11	0.50	0.11	**1.185**		2/5 Representative of B-21
B-22 3-5'	10/05/2012	EPA 8082A	BRL	0.22	0.90	0.22	1.9	0.22	**2.91**	1.5375	1/2 Representative of B-22
B-22 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of B-22
B-23 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	3/5 Representative of B-23
B-23 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/5 Representative of B-23
WC-2 (B-26 2-5')	10/09/2012	EPA 8082A	BRL	2.3	15	2.3	17	2.3	***33.15***	30.73	3/5 Representative of B-26
B-26 5-7'	10/09/2012	EPA 8082A	BRL	2.2	14	2.2	12	2.2	***27.1***		2/5 Representative of B-26
B-31 0-3'	10/09/2012	EPA 8082A	BRL	0.11	0.12	0.11	0.15	0.11	0.325	0.255	3/5 Representative of B-31
B-31 3-5'	10/09/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15		2/5 Representative of B-31
B-32 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	3/5 Representative of B-32
B-32 3-5'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/5 Representative of B-32
B-34 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative of B-34
B-35 0-3'	10/05/2012	EPA 8082A	BRL	0.21	1.6	0.21	1.4	0.21	**3.105**	15.4775	1/2 Representative of B-35
B-35 3-5'	10/05/2012	EPA 8082A	BRL	1.1	9.3	1.1	8.0	1.1	***17.85***		2/6 Representative of B-35
B-35 5-7'	10/05/2012	EPA 8082A	BRL	5.7	18	5.7	27	5.7	***47.85***		1/6 Representative of B-35

TABLE 6.2.4
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY METHOD TO DERIVE EXPOSURE POINT CONCENTRATIONS:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1
B-37 0-3'	10/05/2012	EPA 8082A	BRL	0.11	0.66	0.11	0.44	0.11	**1.155**	0.759	3/5 Representative of B-37
B-37 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/5 Representative of B-37
B-48A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	BRL	0.43	BRL	0.43	0.645	1.817916667	1/12 Representative of B-48 / B-48A
B-48A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615		1/12 Repesentative of B-48 / B-48A
B-48A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.45	2.5	0.45	2.6	0.45	***5.325***		1/6 Representative of B-48 / B-48A
B-48A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.44	1.5	0.44	1.2	0.44	**2.92**		1/6 Representative of B-48 / B-48A
B-48 3-9'	05/09/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of B-48 / B-48A
B-69 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	21.98833333	1/12 Representative of B-69
B-69 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/12 Representative of B-69
B-69 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.57	1.80	0.57	2.90	0.57	***4.985***		1/6 Representative of B-69
B-69 2-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	2.40	22.00	2.40	19.00	2.40	***42.2***		3/6 Representative of B-69
B-69 5-7'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		1/6 Representative of B-69
B-70 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	1.236666667	1/12 Representative of B-70
B-70 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.65	0.11	0.44	0.11	**1.145**		1/12 Representative of B-70
B-70 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/6 representative of B-70
B-70 2-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	1.10	0.12	0.98	0.12	**2.14**		3/6 Representative of B-70
B-70 5-7'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		1/6 Representative of B-70
B-71 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	5.0575	1/4 Representative of B-71
B-71 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/4 Representative of B-71
B-71 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.10	5.30	1.10	4.10	1.10	***9.95***		1/2 Representative of B-71
B-72 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	1.0925	1/4 Representative of B-72
B-72 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/4 Representative of B-72
B-72 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	1.20	0.12	0.76	0.12	**2.02**		1/2 Representative of B-72
B-73 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18	0.90125	1/4 Representative of B-73
B-73 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.12	0.20	0.12	0.315		1/4 Representative of B-73
B-73 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.40	0.11	1.10	0.11	**1.555**		1/2 Representative of B-73
COMP 1A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	BRL	0.42	BRL	0.42	0.63	8.391	1/10 Representative of COMP 1A
COMP 1A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	BRL	0.42	BRL	0.42	0.63		1/10 Representative of COMP 1A
COMP 1A 1-2'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.44	0.67	0.44	0.77	0.44	**1.66**		1/5 Representative of COMP 1A
COMP 1A 2-3'	03/05/2014	EPA 8082A / EPA 3540	BRL	1.1	8.6	1.1	6.3	1.1	***15.45***		1/5 Representative of COMP 1A
COMP 1A 3-4'	03/05/2014	EPA 8082A / EPA 3540	BRL	1.1	10	1.1	6.5	1.1	***17.05***		1/5 Representative of COMP 1A
COMP 1A 4-5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.53	3.0	0.53	3.9	0.53	***7.165***		1/5 Representative of COMP 1A
COMP 2A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	0.57	0.42	0.64	0.42	**1.42**	5.16	1/2 Representative of COMP 2A
COMP 2A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	2.1	BRL	2.1	6.8	2.1	***8.9***		1/2 Representative of COMP 2A
Composite 3 0-3'	05/08/2013	EPA 8082A	BRL	0.11	0.14	0.11	0.26	0.11	0.455	0.31	1/2 Representative of Composite 3
Composite 3 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of Composite 3
B-39 0-3'	05/08/2013	EPA 8082A	BRL	0.10	BRL	0.10	0.42	0.10	0.52	0.44	1/2 Representative of B-39
B-39 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	0.25	0.11	0.36		1/2 Representative of B-39
B-49 0-3'	05/08/2013	EPA 8082A	BRL	1.1	8.9	1.1	9.8	1.1	***19.25***	9.7075	1/2 Representative of B-49 / B-49A
B-49 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of B-49
B-50 0-3'	05/08/2013	EPA 8082A	BRL	2.2	14	2.2	22	2.2	***37.1***	21.4575	1/2 Representative of B-50 / B-50A
B-50 3-9'	05/08/2013	EPA 8082A	BRL	0.43	3.4	0.43	2.2	0.43	***5.815***		1/2 Representative of B-50 / B-50A
Composite 5 0-3'	05/09/2013	EPA 8082A	BRL	0.11	0.81	0.11	1.2	0.11	**2.065**	1.1225	1/2 Representative of Composite 5 / COMP 5A

TABLE 6.2.4
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY METHOD TO DERIVE EXPOSURE POINT CONCENTRATIONS:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1
Composite 5 3-9'	05/09/2013	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18		1/2 Representative of Composite 5
COMP 6A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.35	0.11	0.63	0.11	**1.035**	0.74	1/2 Representative of COMP 6A Area
COMP 6A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.18	0.11	0.21	0.11	0.445		1/2 Representative of COMP 6A Area
B-51B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.20	8.60	1.20	7.60	1.20	***16.8***	4.8475	1/4 Representative of B-51B
B-51B 2-3'	06/04/2014	EPA 8082A / EPA 3540	0.58	0.24	1.50	0.24	BRL	0.24	**2.20**		1/4 Representative of B-51B
B-51B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.13	BRL	0.13	BRL	0.13	0.195		2/4 Representative of B-51B
B-52B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.21	1.80	0.21	1.20	0.21	**3.105**	3.2525	1/4 Representative of B-52B
B-52B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.55	4.40	0.55	4.90	0.55	***9.575***		1/4 Representative of B-52B
B-52B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/4 Representative of B-52B
B-55B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	0.14	0.11	0.25	1.31875	1/4 Representative of B-55B
B-55B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.47	0.11	0.45	0.11	0.975		1/4 Representative of B-55B
B-55B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	1.00	0.11	0.97	0.11	**2.025**		2/4 Representative of B-55B
B-56B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.78	0.12	1.20	0.12	**2.04**	1.05	1/4 Representative of B-56B
B-56B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.74	0.12	1.00	0.12	**1.8**		1/4 Representative of B-56B
B-56B 3-4'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/4 Representative of B-56B
B-57B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.33	0.11	0.42	0.11	0.805	2.61	1/4 Representative of B-57B
B-57B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.59	1.70	0.59	3.20	0.59	***5.195***		1/4 Representative of B-57B
B-57B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.76	0.12	1.40	0.12	**2.22**		2/4 Representative of B-57B
Data Evaluation: 0-6 Foot Interval											
		Maximum Concentration								30.73	
		Number >10X S-2/S-3 Standard								0	
		Number Data Points								39	
		Number >S-2/S-3 Standard								14	
		Percent >S-2/S-3								36	
		Method to Derive EPC								95% UCL on mean	
Exterior Courtyard: Remainder (0-15 Foot Interval)											
B-1 1-5'	06/06/2011	EPA 8082	BRL	0.084	0.57	0.084	0.53	0.084	**1.142**	0.646	1/2 Representative of B-1
B-1 10-15'	06/06/2011	EPA 8082	BRL	0.1	BRL	0.1	BRL	0.1	0.15		1/2 Representative of B-1
B-2A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.1575	1/2 Representative of B-2 / B-2A
B-2A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15		1/2 Representative of B-2 / B-2A
B-3 5-10'	06/06/2011	EPA 8082	BRL	0.097	BRL	0.097	BRL	0.097	0.1455	0.1455	Representative of B-3
B-4 12-15'	06/06/2011	EPA 8082	BRL	0.095	BRL	0.095	BRL	0.095	0.1425	0.1425	Representative of B-4
B-5 10-15'	06/06/2011	EPA 8082	BRL	0.1	BRL	0.1	BRL	0.1	0.15	0.15	Representative of B-5
B-8 0-1'	09/01/2011	EPA 8082	BRL	0.034	0.119	0.034	0.149	0.034	0.2851	0.09258125	1/8 Representative of B-8
B-8 1-3'	09/01/2011	EPA 8082	BRL	0.038	BRL	0.038	BRL	0.038	0.05715		2/8 Representative of B-8
B-8 5-10'	09/01/2011	EPA 8082	BRL	0.046	BRL	0.046	BRL	0.046	0.06825		5/8 Representative of B-8
B-9 0-1'	09/01/2011	EPA 8082	BRL	0.036	BRL	0.036	BRL	0.036	0.0546	5.7312	1/3 Representative of B-9
B-9 1-3'	09/01/2011	EPA 8082	BRL	0.719	4.86	0.719	3.35	0.719	***8.5695***		2/3 Representative of B-9
B-10A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15	1.571625	1/8 Representative of B-10A
B-10A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.15	0.11	0.32	0.11	0.525		1/8 Representative of B-10A
B-10A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	2.0	0.43	1.50	0.43	**3.715**		1/4 Representative of B-10A
B-10 3-6'	09/01/2011	EPA 8082	BRL	0.426	BRL	0.426	0.691	0.426	**1.117**		1/2 Representative of B-10
B-11 0-3'	09/01/2011	EPA 8082	BRL	0.731	6.14	0.731	5.05	0.731	***11.5555***	5.80475	1/2 Representative of B-11 / B-11A

TABLE 6.2.4
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY METHOD TO DERIVE EXPOSURE POINT CONCENTRATIONS:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1
B-11 3-6'	09/01/2011	EPA 8082	BRL	0.036	BRL	0.036	BRL	0.036	0.054		1/2 Representative of B-11 / B-11A
B-12 0-3'	09/01/2011	EPA 8082	BRL	0.037	0.0649	0.037	0.184	0.037	0.26745	0.161325	1/2 Representative of B-12
B-12 3-6'	09/01/2011	EPA 8082	BRL	0.037	BRL	0.037	BRL	0.037	0.0552		1/2 Representative of B-12
B-15 0-3'	10/05/2012	EPA 8082A	BRL	1.1	5.8	1.1	4.0	1.1	***10.35***	7.897142857	3/7 Representative of B-15
B-15 3-5'	10/05/2012	EPA 8082A	BRL	1.1	6.3	1.1	5.1	1.1	***11.95***		2/7 Representative of B-15
B-15 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/7 Representative of B-15
WC-1 (B-16 1-5')	10/05/2012	EPA 8082A	BRL	1.1	7.4	1.1	7.6	1.1	***15.55***	8.662727273	4/11 Representative of B-16 / B-16A
B-16 5-7'	10/05/2012	EPA 8082A	BRL	0.54	4.6	0.54	3.0	0.54	***7.87***		2/11 Representative of B-16 / B-16A
B-16 7-9'	10/05/2012	EPA 8082A	BRL	0.52	2.5	0.52	1.7	0.52	***4.46***		2/11 Representative of B-16 / B-16A
B-16 9-12'	10/05/2012	EPA 8082A	BRL	0.22	1.7	0.22	1.0	0.22	**2.81**		3/11 Representative of B-16 / B-16A
B-17 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.169285714	3/7 Representative of B-17
B-17 3-5'	10/05/2012	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/7 Representative of B-17
B-17 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/7 Representative of B-17
B-20A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	1.03125	1/8 Representative of B-20A
B-20A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/8 Representative of B-20A
B-20A 1-2' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.27	0.10	0.21	0.10	0.53		1/4 Representative of B-20A
B-20 5-7'	10/05/2012	EPA 8082A	BRL	0.11	0.95	0.11	0.71	0.11	**1.715**		2/4 Representative of B-20
B-21 0-3'	10/05/2012	EPA 8082A	BRL	0.55	3.1	0.55	3.1	0.55	***6.475***	4.359	3/5 Representative of B-21 / B-21A
B-21 3-5'	10/05/2012	EPA 8082A	BRL	0.11	0.63	0.11	0.50	0.11	**1.185**		2/5 Representative of B-21
B-22 3-5'	10/05/2012	EPA 8082A	BRL	0.22	0.90	0.22	1.9	0.22	**2.91**	1.5375	1/2 Representative of B-22
B-22 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of B-22
B-23 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	3/5 Representative of B-23
B-23 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/5 Representative of B-23
WC-2 (B-26 2-5')	10/09/2012	EPA 8082A	BRL	2.3	15	2.3	17	2.3	***33.15***	16.042	3/10 Representative of B-26
B-26 5-7'	10/09/2012	EPA 8082A	BRL	2.2	14	2.2	12	2.2	***27.1***		2/10 Representative of B-26
B-26 7-9'	10/09/2012	EPA 8082A	BRL	0.23	1.8	0.23	1.2	0.23	**3.115**		2/10 Representative of B-26
B-26 9-12'	10/09/2012	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18		3/10 Representative of B-26
B-31 0-3'	10/09/2012	EPA 8082A	BRL	0.11	0.12	0.11	0.15	0.11	0.325	0.255	3/5 Representative of B-31
B-31 3-5'	10/09/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15		2/5 Representative of B-31
B-32 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	3/5 Representative of B-32
B-32 3-5'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/5 Representative of B-32
B-34 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative of B-34
B-35 0-3'	10/05/2012	EPA 8082A	BRL	0.21	1.6	0.21	1.4	0.21	**3.105**	18.75722222	3/9 Representative of B-35
B-35 3-5'	10/05/2012	EPA 8082A	BRL	1.1	9.3	1.1	8.0	1.1	***17.85***		2/9 Representative of B-35
B-35 5-7'	10/05/2012	EPA 8082A	BRL	5.7	18	5.7	27	5.7	***47.85***		2/9 Representative of B-35
B-35 7-9'	10/05/2012	EPA 8082A	BRL	1.1	5.8	1.1	7.7	1.1	***14.05***		2/9 Representative of B-35
B-37 0-3'	10/05/2012	EPA 8082A	BRL	0.11	0.66	0.11	0.44	0.11	**1.155**	0.759	3/5 Representative of B-37
B-37 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/5 Representative of B-37
B-38 9-12'	05/08/2013	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18	0.18	Representative of B-38
B-48A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	BRL	0.43	BRL	0.43	0.645	1.096111111	1/18 Representative of B-48 / B-48A
B-48A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615		1/18 Repesentative of B-48 / B-48A
B-48A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.45	2.5	0.45	2.6	0.45	***5.325***		1/9 Representative of B-48 / B-48A
B-48A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.44	1.5	0.44	1.2	0.44	**2.92**		1/9 Representative of B-48 / B-48A

TABLE 6.2.4
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY METHOD TO DERIVE EXPOSURE POINT CONCENTRATIONS:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1
B-48 3-9'	05/09/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		6/9 Representative of B-48 / B-48A
B-69 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	18.87285714	1/14 Representative of B-69
B-69 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/14 Representative of B-69
B-69 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.57	1.80	0.57	2.90	0.57	***4.985***		1/7 Representative of B-69
B-69 2-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	2.40	22.00	2.40	19.00	2.40	***42.2***		3/7 Representative of B-69
B-69 5-7'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/7 Representative of B-69
B-70 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	1.085714286	1/14 Representative of B-70
B-70 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.65	0.11	0.44	0.11	**1.145**		1/14 Representative of B-70
B-70 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/7 representative of B-70
B-70 2-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	1.10	0.12	0.98	0.12	**2.14**		3/7 Representative of B-70
B-70 5-7'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/7 Representative of B-70
B-71 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	5.0575	1/4 Representative of B-71
B-71 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/4 Representative of B-71
B-71 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.10	5.30	1.10	4.10	1.10	***9.95***		1/2 Representative of B-71
B-72 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	1.0925	1/4 Representative of B-72
B-72 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/4 Representative of B-72
B-72 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	1.20	0.12	0.76	0.12	**2.02**		1/2 Representative of B-72
B-73 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18	0.90125	1/4 Representative of B-73
B-73 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.12	0.20	0.12	0.315		1/4 Representative of B-73
B-73 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.40	0.11	1.10	0.11	**1.555**		1/2 Representative of B-73
COMP 1A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	BRL	0.42	BRL	0.42	0.63	8.43453	1/10 Representative of COMP 1A
COMP 1A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	BRL	0.42	BRL	0.42	0.63		1/10 Representative of COMP 1A
COMP 1A 1-2'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.44	0.67	0.44	0.77	0.44	**1.66**		1/5 Representative of COMP 1A
COMP 1A 2-3'	03/05/2014	EPA 8082A / EPA 3540	BRL	1.1	8.6	1.1	6.3	1.1	***15.45***		1/5 Representative of COMP 1A
COMP 1A 3-4'	03/05/2014	EPA 8082A / EPA 3540	BRL	1.1	10	1.1	6.5	1.1	***17.05***		1/5 Representative of COMP 1A
COMP 1A 4-5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.53	3.0	0.53	3.9	0.53	***7.165***		1/5 Representative of COMP 1A
COMP 2A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	0.57	0.42	0.64	0.42	**1.42**	5.16	1/2 Representative of COMP 2A
COMP 2A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	2.1	BRL	2.1	6.8	2.1	***8.9***		1/2 Representative of COMP 2A
Composite 3 0-3'	05/08/2013	EPA 8082A	BRL	0.11	0.14	0.11	0.26	0.11	0.455	0.31	1/2 Representative of Composite 3
Composite 3 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of Composite 3
B-39 0-3'	05/08/2013	EPA 8082A	BRL	0.10	BRL	0.10	0.42	0.10	0.52	0.44	1/2 Representative of B-39
B-39 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	0.25	0.11	0.36		1/2 Representative of B-39
B-49 0-3'	05/08/2013	EPA 8082A	BRL	1.1	8.9	1.1	9.8	1.1	***19.25***	9.7075	1/2 Representative of B-49 / B-49A
B-49 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of B-49
B-50 0-3'	05/08/2013	EPA 8082A	BRL	2.2	14	2.2	22	2.2	***37.1***	16.24333333	1/3 Representative of B-50 / B-50A
B-50 3-9'	05/08/2013	EPA 8082A	BRL	0.43	3.4	0.43	2.2	0.43	***5.815***		2/3 Representative of B-50 / B-50A
Composite 5 0-3'	05/09/2013	EPA 8082A	BRL	0.11	0.81	0.11	1.2	0.11	**2.065**	0.808333333	1/3 Representative of Composite 5 / COMP 5A
Composite 5 3-9'	05/09/2013	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/3 Representative of Composite 5
COMP 6A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.35	0.11	0.63	0.11	**1.035**	0.74	1/2 Representative of COMP 6A Area
COMP 6A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.18	0.11	0.21	0.11	0.445		1/2 Representative of COMP 6A Area
B-51B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.20	8.60	1.20	7.60	1.20	***16.8***	4.8475	1/4 Representative of B-51B
B-51B 2-3'	06/04/2014	EPA 8082A / EPA 3540	0.58	0.24	1.50	0.24	BRL	0.24	**2.20**		1/4 Representative of B-51B
B-51B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.13	BRL	0.13	BRL	0.13	0.195		2/4 Representative of B-51B

TABLE 6.2.4
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY METHOD TO DERIVE EXPOSURE POINT CONCENTRATIONS:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1
B-52B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.21	1.80	0.21	1.20	0.21	**3.105**	3.2525	1/4 Representative of B-52B
B-52B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.55	4.40	0.55	4.90	0.55	***9.575***		1/4 Representative of B-52B
B-52B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/4 Representative of B-52B
B-55B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	0.14	0.11	0.25	1.31875	1/4 Representative of B-55B
B-55B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.47	0.11	0.45	0.11	0.975		1/4 Representative of B-55B
B-55B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	1.00	0.11	0.97	0.11	**2.025**		2/4 Representative of B-55B
B-56B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.78	0.12	1.20	0.12	**2.04**	1.05	1/4 Representative of B-56B
B-56B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.74	0.12	1.00	0.12	**1.8**		1/4 Representative of B-56B
B-56B 3-4'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/4 Representative of B-56B
B-57B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.33	0.11	0.42	0.11	0.805	2.61	1/4 Representative of B-57B
B-57B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.59	1.70	0.59	3.20	0.59	***5.195***		1/4 Representative of B-57B
B-57B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.76	0.12	1.40	0.12	**2.22**		2/4 Representative of B-57B
Data Evaluation: 0-15 Foot Interval											
		Maximum Concentration								18.87285714	
		Number >10X S-2/S-3 Standard								0	
		Number Data Points								43	
		Number >S-2/S-3 Standard								13	
		Percent >S-2/S-3								30	
		Method to Derive EPC								95% UCL on mean	
Beneath Existing Mill #3 Building											
B-25 0-3'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15	0.15	Representative
B-25 3-5'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	0.13	0.11	0.24	0.24	Representative
B-25 5-7'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15	0.15	Representative
B-27 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative
B-27 3-5'	10/09/2012	EPA 8082A	BRL	0.10	0.20	0.10	0.20	0.10	0.45	0.45	Representative
B-27A 0-3'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative
B-27A 3-5'	10/17/2012	EPA 8082A	BRL	0.10	0.18	0.10	0.20	0.10	0.43	0.43	Representative
B-27A 5-7'	10/17/2012	EPA 8082A	BRL	0.10	0.18	0.10	0.21	0.10	0.44	0.44	Representative
B-28 0-3'	10/17/2012	EPA 8082A	BRL	0.11	0.19	0.11	0.26	0.11	0.505	0.505	Representative
B-29 3-5'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15	0.15	Representative
B-29 5-6'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative
B-30 0-3'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	0.37	0.10	0.47	0.47	Representative
B-30 3-4.5'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	0.11	0.10	0.21	0.21	Representative
B-36 0-3'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	0.12	0.11	0.23	0.23	Representative
B-36 3-5'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative
Data Evaluation: All Intervals											
		Maximum Concentration								0.505	
		Number >10X S-1 Standard								0	
		Number Data Points								16	
		Number >S-1 Standard								0	
		Percent >S-1								0	
		Method to Derive EPC								Maximum	

Prepared By:
Reviewd By: EAF
Revision Date: 06/23/2014

TABLE 6.2.4
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY METHOD TO DERIVE EXPOSURE POINT CONCENTRATIONS:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1
Selected MCP Soil Standards											
2014 MA S-1/GW-2									1	1	
2014 MA S-1/GW-3									1	1	
2014 MA S-2/GW-2									4	4	
2014 MA S-2/GW-3									4	4	
2014 MA S-3/GW-2									4	4	
2014 MA S-3/GW-3									4	4	
2014 Upper Concentration Limits									100	100	

Notes:

RDL = Reported Detection Limit
BRL = Below Reporting Limit
NA = Not Analyzed
Bold = Exceeds TSCA Self-Implementing High Occupancy Standard and MA S-1 standards
Bold Italic = Exceeds MA S-2 and MA S-3 standards
Red Bold Italic = Exceeds TSCA Self-Implementing High Occupancy beneath cap
Blue Bold Italic = Exceeds MA UCL

EPA 8082 or 8082A = SW-846 Method 8082 or 8082A analysis for PCBs
EPA 3540 = PCB with Method 3540 Soxhlet Extraction

95% UCL on Mean = 95% Upper Confidence Limit on the Mean
If no Aroclor detected, one-half of summed RDLs (for all three Aroclors) was used as the surrogate representative data point concentration

[1] - The result for Total Polychlorinated Biphenyls (PCBs) is calculated as the sum of all detects plus one-half detection limit for all Aroclors if not detected in a sample for all Aroclors with at least one detection in one sample. Only three Aroclors were detected in any sample.

Composite 1- Soils collected from borings B-41, B-42, B-43 and B-54 and composited
Composite 2- Soils collected from borings B-44, B-45, B-46 and B-47 and composited
Composite 3- Soils collected from borings B-63, B-64, B-65, B-66, B-67, B-68 and B-40 and composited
Composite 4- Soils collected from borings B-39, B-50 and B-49 and composited
Composite 5- Soils collected from borings B-58, B-59, B-60 and B-61 and composited
Composite 6- Soils collected from borings B-51, B-52, B-55, B-56 and B-57 and composited
Composite 1A- Soils collected from borings B-41A and B-42A and composited
Composite 2A- Soils collected from borings B-44A, B-45A, B-46A and B-47A and composited
Composite 5A- Soils collected from borings B-58A, B-59A, B-60A and B-61A and composited
Composite 6A- Soils collected from borings B-51A, B-52A, B-55A, B-56A and B-57A and composited
Composite ASC-1 Asphalt and soils collected from borings AS-1 through AS-4 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-2 Asphalt and soils collected from borings AS-5 through AS-8 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-3 Asphalt and soils collected from borings AS-9 through AS-12 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-4 Asphalt and soils collected from borings AS-13 through AS-16 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-5 Asphalt and soils collected from borings AS-17 through AS-20 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-6 Asphalt and soils collected from borings AS-21 through AS-24 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches

TABLE 6.2.5
DERIVATION OF EXPOSURE POINT CONCENTRATIONS:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1

TABLE 6.2.5
DERIVATION OF EXPOSURE POINT CONCENTRATIONS:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1
Exterior Courtyard: Remainder (0-3 Foot Interval)											
B-1 1-5'	06/06/2011	EPA 8082	BRL	0.084	0.57	0.084	0.53	0.084	**1.142**	1.142	Representative of B-1
B-2A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative of B-2 / B-2A
B-8 0-1'	09/01/2011	EPA 8082	BRL	0.034	0.119	0.034	0.149	0.034	0.2851	0.2851	Representative of B-8
B-9 1-3'	09/01/2011	EPA 8082	BRL	0.719	4.86	0.719	3.35	0.719	***8.5695***	8.5695	Representative of B-9
B-10A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	2.0	0.43	1.50	0.43	**3.715**	3.715	Representative of B-10A
B-11 0-3'	09/01/2011	EPA 8082	BRL	0.731	6.14	0.731	5.05	0.731	***11.5555***	11.5555	Representative of B-11 / B-11A
B-12 0-3'	09/01/2011	EPA 8082	BRL	0.037	0.0649	0.037	0.184	0.037	0.26745	0.26745	Representative of B-12
B-15 0-3'	10/05/2012	EPA 8082A	BRL	1.1	5.8	1.1	4.0	1.1	***10.35***	10.35	Representative of B-15
B-16A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	0.59	0.41	0.95	0.41	**1.745**	1.745	Representative of B-16 / B-16A
B-17 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative of B-17
B-20A 1-2' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.27	0.10	0.21	0.10	0.53	0.53	Representative of B-20A
B-21A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	1.1	4.0	1.1	7.5	1.1	***12.05***	12.05	Representative of B-21 / B-21A
B-23 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative of B-23
B-31 0-3'	10/09/2012	EPA 8082A	BRL	0.11	0.12	0.11	0.15	0.11	0.325	0.325	Representative of B-31
B-32 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative of B-32
B-37 0-3'	10/05/2012	EPA 8082A	BRL	0.11	0.66	0.11	0.44	0.11	**1.155**	1.155	Representative of B-37
B-48A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.45	2.5	0.45	2.6	0.45	***5.325***	5.325	Representative of B-48 / B-48A
B-69 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.57	1.80	0.57	2.90	0.57	***4.985***	4.985	Representative of B-69
B-70 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.65	0.11	0.44	0.11	**1.145**	1.145	Representative of B-70
B-71 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.10	5.30	1.10	4.10	1.10	***9.95***	9.95	Representative of B-71
B-72 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	1.20	0.12	0.76	0.12	**2.02**	2.02	Representative of B-72
B-73 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.40	0.11	1.10	0.11	**1.555**	1.555	Representative of B-73
COMP 1A 2-3'	03/05/2014	EPA 8082A / EPA 3540	BRL	1.1	8.6	1.1	6.3	1.1	***15.45***	15.45	Representative of Composite 1 / COMP 1A
COMP 2A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	2.1	BRL	2.1	6.8	2.1	***8.9***	8.9	Representative of Composite 2 / COMP 2A
Composite 3 0-3'	05/08/2013	EPA 8082A	BRL	0.11	0.14	0.11	0.26	0.11	0.455	0.455	Representative of Composite 3
B-39 0-3'	05/08/2013	EPA 8082A	BRL	0.10	BRL	0.10	0.42	0.10	0.52	0.52	Representative of B-39
B-49 0-3'	05/08/2013	EPA 8082A	BRL	1.1	8.9	1.1	9.8	1.1	***19.25***	19.25	Representative of B-49 / B-49A
B-50 0-3'	05/08/2013	EPA 8082A	BRL	2.2	14	2.2	22	2.2	***37.1***	37.1	Representative of B-50 / B-50A
Composite 5 0-3'	05/09/2013	EPA 8082A	BRL	0.11	0.81	0.11	1.2	0.11	**2.065**	2.065	Representative of Composite 5 / COMP 5A
B-51B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.20	8.60	1.20	7.60	1.20	***16.8***	16.8	Representative of B-51B
B-52B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.55	4.40	0.55	4.90	0.55	***9.575***	9.575	Representative of B-52B
B-55B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.47	0.11	0.45	0.11	0.975	0.975	Representative of B-55B
B-56B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.78	0.12	1.20	0.12	**2.04**	2.04	Representative of B-56B
B-57B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.59	1.70	0.59	3.20	0.59	***5.195***	5.195	Representative of B-57B
Derivation of Exposure Point Concentration: 0-3 Foot Interval											
Mean Concentration										5.754545588	
Number Data Points										34	
Standard Deviation of Population										7.648886662	
95th confidence interval										2.571028307	
95th confidence limit on the mean										8.33	
Method to Derive EPC										95% UCL on mean	

TABLE 6.2.5
DERIVATION OF EXPOSURE POINT CONCENTRATIONS:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1
Exterior Courtyard: Remainder 0-6 Foot Interval)											
B-1 1-5'	06/06/2011	EPA 8082	BRL	0.084	0.57	0.084	0.53	0.084	**1.142**	1.142	Representative of B-1
B-2A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.1575	1/2 Representative of B-2 / B-2A
B-2A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15		1/2 Representative of B-2 / B-2A
B-8 0-1'	09/01/2011	EPA 8082	BRL	0.034	0.119	0.034	0.149	0.034	0.2851	0.133133333	1/3 Representative of B-8
B-8 1-3'	09/01/2011	EPA 8082	BRL	0.038	BRL	0.038	BRL	0.038	0.05715		2/3 Representative of B-8
B-9 0-1'	09/01/2011	EPA 8082	BRL	0.036	BRL	0.036	BRL	0.036	0.0546	5.7312	1/3 Representative of B-9
B-9 1-3'	09/01/2011	EPA 8082	BRL	0.719	4.86	0.719	3.35	0.719	***8.5695***		2/3 Representative of B-9
B-10A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15	1.4807	1/10 Representative of B-10A
B-10A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.15	0.11	0.32	0.11	0.525		1/10 Representative of B-10A
B-10A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	2.0	0.43	1.50	0.43	**3.715**		1/5 Representative of B-10A
B-10 3-6'	09/01/2011	EPA 8082	BRL	0.426	BRL	0.426	0.691	0.426	**1.117**		3/5 Representative of B-10
B-11 0-3'	09/01/2011	EPA 8082	BRL	0.731	6.14	0.731	5.05	0.731	***11.5555***	5.80475	1/2 Representative of B-11 / B-11A
B-11 3-6'	09/01/2011	EPA 8082	BRL	0.036	BRL	0.036	BRL	0.036	0.054		1/2 Representative of B-11 / B-11A
B-12 0-3'	09/01/2011	EPA 8082	BRL	0.037	0.0649	0.037	0.184	0.037	0.26745	0.161325	1/2 Representative of B-12
B-12 3-6'	09/01/2011	EPA 8082	BRL	0.037	BRL	0.037	BRL	0.037	0.0552		1/2 Representative of B-12
B-15 0-3'	10/05/2012	EPA 8082A	BRL	1.1	5.8	1.1	4.0	1.1	***10.35***	9.185833333	1/2 Representative of B-15
B-15 3-5'	10/05/2012	EPA 8082A	BRL	1.1	6.3	1.1	5.1	1.1	***11.95***		2/6 Representative of B-15
B-15 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/6 Representative of B-15
WC-1 (B-16 1-5')	10/05/2012	EPA 8082A	BRL	1.1	7.4	1.1	7.6	1.1	***15.55***	15.55	Representative of B-16 / B-16A
B-17 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.17	1/2 Representative of B-17
B-17 3-5'	10/05/2012	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/6 Representative of B-17
B-17 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/6 Representative of B-17
B-20A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	1.03125	1/8 Representative of B-20A
B-20A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/8 Representative of B-20A
B-20A 1-2' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.27	0.10	0.21	0.10	0.53		1/4 Representative of B-20A
B-20 5-7'	10/05/2012	EPA 8082A	BRL	0.11	0.95	0.11	0.71	0.11	**1.715**		1/2 Representative of B-20
B-21 0-3'	10/05/2012	EPA 8082A	BRL	0.55	3.1	0.55	3.1	0.55	***6.475***	4.359	3/5 Representative of B-21 / B-21A
B-21 3-5'	10/05/2012	EPA 8082A	BRL	0.11	0.63	0.11	0.50	0.11	**1.185**		2/5 Representative of B-21
B-22 3-5'	10/05/2012	EPA 8082A	BRL	0.22	0.90	0.22	1.9	0.22	**2.91**	1.5375	1/2 Representative of B-22
B-22 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of B-22
B-23 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	3/5 Representative of B-23
B-23 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/5 Representative of B-23
WC-2 (B-26 2-5')	10/09/2012	EPA 8082A	BRL	2.3	15	2.3	17	2.3	***33.15***	30.73	3/5 Representative of B-26
B-26 5-7'	10/09/2012	EPA 8082A	BRL	2.2	14	2.2	12	2.2	***27.1***		2/5 Representative of B-26
B-31 0-3'	10/09/2012	EPA 8082A	BRL	0.11	0.12	0.11	0.15	0.11	0.325	0.255	3/5 Representative of B-31
B-31 3-5'	10/09/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15		2/5 Representative of B-31
B-32 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	3/5 Representative of B-32
B-32 3-5'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/5 Representative of B-32
B-34 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative of B-34
B-35 0-3'	10/05/2012	EPA 8082A	BRL	0.21	1.6	0.21	1.4	0.21	**3.105**	15.4775	1/2 Representative of B-35
B-35 3-5'	10/05/2012	EPA 8082A	BRL	1.1	9.3	1.1	8.0	1.1	***17.85***		2/6 Representative of B-35
B-35 5-7'	10/05/2012	EPA 8082A	BRL	5.7	18	5.7	27	5.7	***47.85***		1/6 Representative of B-35

TABLE 6.2.5
DERIVATION OF EXPOSURE POINT CONCENTRATIONS:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1
B-37 0-3'	10/05/2012	EPA 8082A	BRL	0.11	0.66	0.11	0.44	0.11	**1.155**	0.759	3/5 Representative of B-37
B-37 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/5 Representative of B-37
B-48A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	BRL	0.43	BRL	0.43	0.645	1.817916667	1/12 Representative of B-48 / B-48A
B-48A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615		1/12 Repesentative of B-48 / B-48A
B-48A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.45	2.5	0.45	2.6	0.45	***5.325***		1/6 Representative of B-48 / B-48A
B-48A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.44	1.5	0.44	1.2	0.44	**2.92**		1/6 Representative of B-48 / B-48A
B-48 3-9'	05/09/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of B-48 / B-48A
B-69 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	21.98833333	1/12 Representative of B-69
B-69 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/12 Representative of B-69
B-69 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.57	1.80	0.57	2.90	0.57	***4.985***		1/6 Representative of B-69
B-69 2-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	2.40	22.00	2.40	19.00	2.40	***42.2***		3/6 Representative of B-69
B-69 5-7'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		1/6 Representative of B-69
B-70 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	1.236666667	1/12 Representative of B-70
B-70 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.65	0.11	0.44	0.11	**1.145**		1/12 Representative of B-70
B-70 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/6 representative of B-70
B-70 2-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	1.10	0.12	0.98	0.12	**2.14**		3/6 Representative of B-70
B-70 5-7'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		1/6 Representative of B-70
B-71 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	5.0575	1/4 Representative of B-71
B-71 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/4 Representative of B-71
B-71 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.10	5.30	1.10	4.10	1.10	***9.95***		1/2 Representative of B-71
B-72 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	1.0925	1/4 Representative of B-72
B-72 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/4 Representative of B-72
B-72 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	1.20	0.12	0.76	0.12	**2.02**		1/2 Representative of B-72
B-73 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18	0.90125	1/4 Representative of B-73
B-73 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.12	0.20	0.12	0.315		1/4 Representative of B-73
B-73 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.40	0.11	1.10	0.11	**1.555**		1/2 Representative of B-73
COMP 1A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	BRL	0.42	BRL	0.42	0.63	8.391	1/10 Representative of COMP 1A
COMP 1A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	BRL	0.42	BRL	0.42	0.63		1/10 Representative of COMP 1A
COMP 1A 1-2'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.44	0.67	0.44	0.77	0.44	**1.66**		1/5 Representative of COMP 1A
COMP 1A 2-3'	03/05/2014	EPA 8082A / EPA 3540	BRL	1.1	8.6	1.1	6.3	1.1	***15.45***		1/5 Representative of COMP 1A
COMP 1A 3-4'	03/05/2014	EPA 8082A / EPA 3540	BRL	1.1	10	1.1	6.5	1.1	***17.05***		1/5 Representative of COMP 1A
COMP 1A 4-5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.53	3.0	0.53	3.9	0.53	***7.165***		1/5 Representative of COMP 1A
COMP 2A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	0.57	0.42	0.64	0.42	**1.42**	5.16	1/2 Representative of COMP 2A
COMP 2A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	2.1	BRL	2.1	6.8	2.1	***8.9***		1/2 Representative of COMP 2A
Composite 3 0-3'	05/08/2013	EPA 8082A	BRL	0.11	0.14	0.11	0.26	0.11	0.455	0.31	1/2 Representative of Composite 3
Composite 3 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of Composite 3
B-39 0-3'	05/08/2013	EPA 8082A	BRL	0.10	BRL	0.10	0.42	0.10	0.52	0.44	1/2 Representative of B-39
B-39 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	0.25	0.11	0.36		1/2 Representative of B-39
B-49 0-3'	05/08/2013	EPA 8082A	BRL	1.1	8.9	1.1	9.8	1.1	***19.25***	9.7075	1/2 Representative of B-49 / B-49A
B-49 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of B-49
B-50 0-3'	05/08/2013	EPA 8082A	BRL	2.2	14	2.2	22	2.2	***37.1***	21.4575	1/2 Representative of B-50 / B-50A
B-50 3-9'	05/08/2013	EPA 8082A	BRL	0.43	3.4	0.43	2.2	0.43	***5.815***		1/2 Representative of B-50 / B-50A
Composite 5 0-3'	05/09/2013	EPA 8082A	BRL	0.11	0.81	0.11	1.2	0.11	**2.065**	1.1225	1/2 Representative of Composite 5 / COMP 5A

TABLE 6.2.5
DERIVATION OF EXPOSURE POINT CONCENTRATIONS:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1
Composite 5 3-9'	05/09/2013	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18		1/2 Representative of Composite 5
COMP 6A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.35	0.11	0.63	0.11	**1.035**	0.74	1/2 Representative of COMP 6A Area
COMP 6A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.18	0.11	0.21	0.11	0.445		1/2 Representative of COMP 6A Area
B-51B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.20	8.60	1.20	7.60	1.20	***16.8***	4.8475	1/4 Representative of B-51B
B-51B 2-3'	06/04/2014	EPA 8082A / EPA 3540	0.58	0.24	1.50	0.24	BRL	0.24	**2.20**		1/4 Representative of B-51B
B-51B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.13	BRL	0.13	BRL	0.13	0.195		2/4 Representative of B-51B
B-52B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.21	1.80	0.21	1.20	0.21	**3.105**	3.2525	1/4 Representative of B-52B
B-52B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.55	4.40	0.55	4.90	0.55	***9.575***		1/4 Representative of B-52B
B-52B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/4 Representative of B-52B
B-55B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	0.14	0.11	0.25	1.31875	1/4 Representative of B-55B
B-55B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.47	0.11	0.45	0.11	0.975		1/4 Representative of B-55B
B-55B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	1.00	0.11	0.97	0.11	**2.025**		2/4 Representative of B-55B
B-56B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.78	0.12	1.20	0.12	**2.04**	1.05	1/4 Representative of B-56B
B-56B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.74	0.12	1.00	0.12	**1.8**		1/4 Representative of B-56B
B-56B 3-4'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/4 Representative of B-56B
B-57B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.33	0.11	0.42	0.11	0.805	2.61	1/4 Representative of B-57B
B-57B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.59	1.70	0.59	3.20	0.59	***5.195***		1/4 Representative of B-57B
B-57B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.76	0.12	1.40	0.12	**2.22**		2/4 Representative of B-57B
Derivation of Exposure Point Concentration: 0-6 Foot Interval											
		Mean Concentration								4.786207906	
		Number Data Points								39	
		Standard Deviation of Population								7.022634909	
		95th confidence interval								2.204021763	
		95th confidence limit on the mean								6.99	
		Method to Derive EPC								95% UCL on mean	
Exterior Courtyard: Remainder (0-15 Foot Interval)											
B-1 1-5'	06/06/2011	EPA 8082	BRL	0.084	0.57	0.084	0.53	0.084	**1.142**	0.646	1/2 Representative of B-1
B-1 10-15'	06/06/2011	EPA 8082	BRL	0.1	BRL	0.1	BRL	0.1	0.15		1/2 Representative of B-1
B-2A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.1575	1/2 Representative of B-2 / B-2A
B-2A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15		1/2 Representative of B-2 / B-2A
B-3 5-10'	06/06/2011	EPA 8082	BRL	0.097	BRL	0.097	BRL	0.097	0.1455	0.1455	Representative of B-3
B-4 12-15'	06/06/2011	EPA 8082	BRL	0.095	BRL	0.095	BRL	0.095	0.1425	0.1425	Representative of B-4
B-5 10-15'	06/06/2011	EPA 8082	BRL	0.1	BRL	0.1	BRL	0.1	0.15	0.15	Representative of B-5
B-8 0-1'	09/01/2011	EPA 8082	BRL	0.034	0.119	0.034	0.149	0.034	0.2851	0.09258125	1/8 Representative of B-8
B-8 1-3'	09/01/2011	EPA 8082	BRL	0.038	BRL	0.038	BRL	0.038	0.05715		2/8 Representative of B-8
B-8 5-10'	09/01/2011	EPA 8082	BRL	0.046	BRL	0.046	BRL	0.046	0.06825		5/8 Representative of B-8
B-9 0-1'	09/01/2011	EPA 8082	BRL	0.036	BRL	0.036	BRL	0.036	0.0546	5.7312	1/3 Representative of B-9
B-9 1-3'	09/01/2011	EPA 8082	BRL	0.719	4.86	0.719	3.35	0.719	***8.5695***		2/3 Representative of B-9
B-10A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15	1.571625	1/8 Representative of B-10A
B-10A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.15	0.11	0.32	0.11	0.525		1/8 Representative of B-10A
B-10A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	2.0	0.43	1.50	0.43	**3.715**		1/4 Representative of B-10A
B-10 3-6'	09/01/2011	EPA 8082	BRL	0.426	BRL	0.426	0.691	0.426	**1.117**		1/2 Representative of B-10
B-11 0-3'	09/01/2011	EPA 8082	BRL	0.731	6.14	0.731	5.05	0.731	***11.5555***	5.80475	1/2 Representative of B-11 / B-11A

TABLE 6.2.5
DERIVATION OF EXPOSURE POINT CONCENTRATIONS:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1
B-11 3-6'	09/01/2011	EPA 8082	BRL	0.036	BRL	0.036	BRL	0.036	0.054		1/2 Representative of B-11 / B-11A
B-12 0-3'	09/01/2011	EPA 8082	BRL	0.037	0.0649	0.037	0.184	0.037	0.26745	0.161325	1/2 Representative of B-12
B-12 3-6'	09/01/2011	EPA 8082	BRL	0.037	BRL	0.037	BRL	0.037	0.0552		1/2 Representative of B-12
B-15 0-3'	10/05/2012	EPA 8082A	BRL	1.1	5.8	1.1	4.0	1.1	***10.35***	7.897142857	3/7 Representative of B-15
B-15 3-5'	10/05/2012	EPA 8082A	BRL	1.1	6.3	1.1	5.1	1.1	***11.95***		2/7 Representative of B-15
B-15 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/7 Representative of B-15
WC-1 (B-16 1-5')	10/05/2012	EPA 8082A	BRL	1.1	7.4	1.1	7.6	1.1	***15.55***	8.662727273	4/11 Representative of B-16 / B-16A
B-16 5-7'	10/05/2012	EPA 8082A	BRL	0.54	4.6	0.54	3.0	0.54	***7.87***		2/11 Representative of B-16 / B-16A
B-16 7-9'	10/05/2012	EPA 8082A	BRL	0.52	2.5	0.52	1.7	0.52	***4.46***		2/11 Representative of B-16 / B-16A
B-16 9-12'	10/05/2012	EPA 8082A	BRL	0.22	1.7	0.22	1.0	0.22	**2.81**		3/11 Representative of B-16 / B-16A
B-17 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.169285714	3/7 Representative of B-17
B-17 3-5'	10/05/2012	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/7 Representative of B-17
B-17 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/7 Representative of B-17
B-20A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	1.03125	1/8 Representative of B-20A
B-20A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/8 Representative of B-20A
B-20A 1-2' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.27	0.10	0.21	0.10	0.53		1/4 Representative of B-20A
B-20 5-7'	10/05/2012	EPA 8082A	BRL	0.11	0.95	0.11	0.71	0.11	**1.715**		2/4 Representative of B-20
B-21 0-3'	10/05/2012	EPA 8082A	BRL	0.55	3.1	0.55	3.1	0.55	***6.475***	4.359	3/5 Representative of B-21 / B-21A
B-21 3-5'	10/05/2012	EPA 8082A	BRL	0.11	0.63	0.11	0.50	0.11	**1.185**		2/5 Representative of B-21
B-22 3-5'	10/05/2012	EPA 8082A	BRL	0.22	0.90	0.22	1.9	0.22	**2.91**	1.5375	1/2 Representative of B-22
B-22 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of B-22
B-23 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	3/5 Representative of B-23
B-23 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/5 Representative of B-23
WC-2 (B-26 2-5')	10/09/2012	EPA 8082A	BRL	2.3	15	2.3	17	2.3	***33.15***	16.042	3/10 Representative of B-26
B-26 5-7'	10/09/2012	EPA 8082A	BRL	2.2	14	2.2	12	2.2	***27.1***		2/10 Representative of B-26
B-26 7-9'	10/09/2012	EPA 8082A	BRL	0.23	1.8	0.23	1.2	0.23	**3.115**		2/10 Representative of B-26
B-26 9-12'	10/09/2012	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18		3/10 Representative of B-26
B-31 0-3'	10/09/2012	EPA 8082A	BRL	0.11	0.12	0.11	0.15	0.11	0.325	0.255	3/5 Representative of B-31
B-31 3-5'	10/09/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15		2/5 Representative of B-31
B-32 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	3/5 Representative of B-32
B-32 3-5'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/5 Representative of B-32
B-34 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative of B-34
B-35 0-3'	10/05/2012	EPA 8082A	BRL	0.21	1.6	0.21	1.4	0.21	**3.105**	18.75722222	3/9 Representative of B-35
B-35 3-5'	10/05/2012	EPA 8082A	BRL	1.1	9.3	1.1	8.0	1.1	***17.85***		2/9 Representative of B-35
B-35 5-7'	10/05/2012	EPA 8082A	BRL	5.7	18	5.7	27	5.7	***47.85***		2/9 Representative of B-35
B-35 7-9'	10/05/2012	EPA 8082A	BRL	1.1	5.8	1.1	7.7	1.1	***14.05***		2/9 Representative of B-35
B-37 0-3'	10/05/2012	EPA 8082A	BRL	0.11	0.66	0.11	0.44	0.11	**1.155**	0.759	3/5 Representative of B-37
B-37 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/5 Representative of B-37
B-38 9-12'	05/08/2013	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18	0.18	Representative of B-38
B-48A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	BRL	0.43	BRL	0.43	0.645	1.096111111	1/18 Representative of B-48 / B-48A
B-48A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615		1/18 Repesentative of B-48 / B-48A
B-48A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.45	2.5	0.45	2.6	0.45	***5.325***		1/9 Representative of B-48 / B-48A
B-48A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.44	1.5	0.44	1.2	0.44	**2.92**		1/9 Representative of B-48 / B-48A

TABLE 6.2.5
DERIVATION OF EXPOSURE POINT CONCENTRATIONS:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1
B-48 3-9'	05/09/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		6/9 Representative of B-48 / B-48A
B-69 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	18.87285714	1/14 Representative of B-69
B-69 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/14 Representative of B-69
B-69 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.57	1.80	0.57	2.90	0.57	***4.985***		1/7 Representative of B-69
B-69 2-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	2.40	22.00	2.40	19.00	2.40	***42.2***		3/7 Representative of B-69
B-69 5-7'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/7 Representative of B-69
B-70 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	1.085714286	1/14 Representative of B-70
B-70 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.65	0.11	0.44	0.11	**1.145**		1/14 Representative of B-70
B-70 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/7 representative of B-70
B-70 2-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	1.10	0.12	0.98	0.12	**2.14**		3/7 Representative of B-70
B-70 5-7'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/7 Representative of B-70
B-71 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	5.0575	1/4 Representative of B-71
B-71 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/4 Representative of B-71
B-71 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.10	5.30	1.10	4.10	1.10	***9.95***		1/2 Representative of B-71
B-72 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	1.0925	1/4 Representative of B-72
B-72 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/4 Representative of B-72
B-72 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	1.20	0.12	0.76	0.12	**2.02**		1/2 Representative of B-72
B-73 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18	0.90125	1/4 Representative of B-73
B-73 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.12	0.20	0.12	0.315		1/4 Representative of B-73
B-73 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.40	0.11	1.10	0.11	**1.555**		1/2 Representative of B-73
COMP 1A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	BRL	0.42	BRL	0.42	0.63	8.43453	1/10 Representative of COMP 1A
COMP 1A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	BRL	0.42	BRL	0.42	0.63		1/10 Representative of COMP 1A
COMP 1A 1-2'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.44	0.67	0.44	0.77	0.44	**1.66**		1/5 Representative of COMP 1A
COMP 1A 2-3'	03/05/2014	EPA 8082A / EPA 3540	BRL	1.1	8.6	1.1	6.3	1.1	***15.45***		1/5 Representative of COMP 1A
COMP 1A 3-4'	03/05/2014	EPA 8082A / EPA 3540	BRL	1.1	10	1.1	6.5	1.1	***17.05***		1/5 Representative of COMP 1A
COMP 1A 4-5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.53	3.0	0.53	3.9	0.53	***7.165***		1/5 Representative of COMP 1A
COMP 2A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	0.57	0.42	0.64	0.42	**1.42**	5.16	1/2 Representative of COMP 2A
COMP 2A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	2.1	BRL	2.1	6.8	2.1	***8.9***		1/2 Representative of COMP 2A
Composite 3 0-3'	05/08/2013	EPA 8082A	BRL	0.11	0.14	0.11	0.26	0.11	0.455	0.31	1/2 Representative of Composite 3
Composite 3 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of Composite 3
B-39 0-3'	05/08/2013	EPA 8082A	BRL	0.10	BRL	0.10	0.42	0.10	0.52	0.44	1/2 Representative of B-39
B-39 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	0.25	0.11	0.36		1/2 Representative of B-39
B-49 0-3'	05/08/2013	EPA 8082A	BRL	1.1	8.9	1.1	9.8	1.1	***19.25***	9.7075	1/2 Representative of B-49 / B-49A
B-49 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of B-49
B-50 0-3'	05/08/2013	EPA 8082A	BRL	2.2	14	2.2	22	2.2	***37.1***	16.24333333	1/3 Representative of B-50 / B-50A
B-50 3-9'	05/08/2013	EPA 8082A	BRL	0.43	3.4	0.43	2.2	0.43	***5.815***		2/3 Representative of B-50 / B-50A
Composite 5 0-3'	05/09/2013	EPA 8082A	BRL	0.11	0.81	0.11	1.2	0.11	**2.065**	0.808333333	1/3 Representative of Composite 5 / COMP 5A
Composite 5 3-9'	05/09/2013	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/3 Representative of Composite 5
COMP 6A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.35	0.11	0.63	0.11	**1.035**	0.74	1/2 Representative of COMP 6A Area
COMP 6A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.18	0.11	0.21	0.11	0.445		1/2 Representative of COMP 6A Area
B-51B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.20	8.60	1.20	7.60	1.20	***16.8***	4.8475	1/4 Representative of B-51B
B-51B 2-3'	06/04/2014	EPA 8082A / EPA 3540	0.58	0.24	1.50	0.24	BRL	0.24	**2.20**		1/4 Representative of B-51B
B-51B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.13	BRL	0.13	BRL	0.13	0.195		2/4 Representative of B-51B

TABLE 6.2.5
DERIVATION OF EXPOSURE POINT CONCENTRATIONS:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1
B-52B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.21	1.80	0.21	1.20	0.21	**3.105**	3.2525	1/4 Representative of B-52B
B-52B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.55	4.40	0.55	4.90	0.55	***9.575***		1/4 Representative of B-52B
B-52B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/4 Representative of B-52B
B-55B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	0.14	0.11	0.25	1.31875	1/4 Representative of B-55B
B-55B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.47	0.11	0.45	0.11	0.975		1/4 Representative of B-55B

TABLE 6.2.5
DERIVATION OF EXPOSURE POINT CONCENTRATIONS:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1
B-55B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	1.00	0.11	0.97	0.11	**2.025**		2/4 Representative of B-55B
B-56B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.78	0.12	1.20	0.12	**2.04**	1.05	1/4 Representative of B-56B
B-56B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.74	0.12	1.00	0.12	**1.8**		1/4 Representative of B-56B
B-56B 3-4'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/4 Representative of B-56B
B-57B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.33	0.11	0.42	0.11	0.805	2.61	1/4 Representative of B-57B
B-57B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.59	1.70	0.59	3.20	0.59	***5.195***		1/4 Representative of B-57B
B-57B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.76	0.12	1.40	0.12	**2.22**		2/4 Representative of B-57B
Derivation of Exposure Point Concentration: 0-15 Foot Interval											
		Mean Concentration								3.669220663	
		Number Data Points								43	
		Standard Deviation of Population								5.166199447	
		95th confidence interval								1.544134164	
		95th confidence limit on the mean								5.21	
		Method to Derive EPC								95% UCL on mean	
Beneath Existing Mill #3 Building											
B-25 0-3'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15	0.15	Representative
B-25 3-5'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	0.13	0.11	0.24	0.24	Representative
B-25 5-7'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15	0.15	Representative
B-27 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative
B-27 3-5'	10/09/2012	EPA 8082A	BRL	0.10	0.20	0.10	0.20	0.10	0.45	0.45	Representative
B-27A 0-3'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative
B-27A 3-5'	10/17/2012	EPA 8082A	BRL	0.10	0.18	0.10	0.20	0.10	0.43	0.43	Representative
B-27A 5-7'	10/17/2012	EPA 8082A	BRL	0.10	0.18	0.10	0.21	0.10	0.44	0.44	Representative
B-28 0-3'	10/17/2012	EPA 8082A	BRL	0.11	0.19	0.11	0.26	0.11	0.505	0.505	Representative

TABLE 6.2.5
DERIVATION OF EXPOSURE POINT CONCENTRATIONS:
PCBs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1
B-29 3-5'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15	0.15	Representative
B-29 5-6'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative
B-30 0-3'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	0.37	0.10	0.47	0.47	Representative
B-30 3-4.5'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	0.11	0.10	0.21	0.21	Representative
B-36 0-3'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	0.12	0.11	0.23	0.23	Representative
B-36 3-5'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative
Data Evaluation: All Intervals											
		Maximum Concentration								0.51	
		Method to Derive EPC								Maximum	
Selected MCP Soil Standards											
		2014 MA S-1/GW-2							1	1	
		2014 MA S-1/GW-3							1	1	
		2014 MA S-2/GW-2							4	4	
		2014 MA S-2/GW-3							4	4	
		2014 MA S-3/GW-2							4	4	
		2014 MA S-3/GW-3							4	4	
		2014 Upper Concentration Limits							100	100	

Notes:

RDL = Reported Detection Limit
BRL = Below Reporting Limit
NA = Not Analyzed
Bold = Exceeds TSCA Self-Implementing High Occupancy Standard and MA S-1 standards
Bold Italic = Exceeds MA S-2 and MA S-3 standards
Red Bold Italic = Exceeds TSCA Self-Implementing High Occupancy beneath cap
Blue Bold Italic = Exceeds MA UCL

EPA 8082 or 8082A = SW-846 Method 8082 or 8082A analysis for PCBs
EPA 3540 = PCB with Method 3540 Soxhlet Extraction

95% UCL on Mean = 95% Upper Confidence Limit on the Mean
If no Aroclor detected, one-half of summed RDLs (for all three Aroclors) was used as the surrogate representative data point concentration

[1] - The result for Total Polychlorinated Biphenyls (PCBs) is calculated as the sum of all detects plus one-half detection limit for all Aroclors if not detected in a sample for all Aroclors with at least one detection in one sample. Only three Aroclors were detected in any sample.

Composite 1- Soils collected from borings B-41, B-42, B-43 and B-54 and composited
Composite 2- Soils collected from borings B-44, B-45, B-46 and B-47 and composited
Composite 3- Soils collected from borings B-63, B-64, B-65, B-66, B-67, B-68 and B-40 and composited
Composite 4- Soils collected from borings B-39, B-50 and B-49 and composited
Composite 5- Soils collected from borings B-58, B-59, B-60 and B-61 and composited
Composite 6- Soils collected from borings B-51, B-52, B-55, B-56 and B-57 and composited
Composite 1A- Soils collected from borings B-41A and B-42A and composited
Composite 2A- Soils collected from borings B-44A, B-45A, B-46A and B-47A and composited
Composite 5A- Soils collected from borings B-58A, B-59A, B-60A and B-61A and composited
Composite 6A- Soils collected from borings B-51A, B-52A, B-55A, B-56A and B-57A and composited
Composite ASC-1 Asphalt and soils collected from borings AS-1 through AS-4 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-2 Asphalt and soils collected from borings AS-5 through AS-8 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-3 Asphalt and soils collected from borings AS-9 through AS-12 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-4 Asphalt and soils collected from borings AS-13 through AS-16 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-5 Asphalt and soils collected from borings AS-17 through AS-20 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-6 Asphalt and soils collected from borings AS-21 through AS-24 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches

TABLE 6.3.1
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY CONTAMINANTS OF CONCERN:
METALS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Antimony, Total	RDL	Arsenic, Total	RDL	Barium, Total	RDL	Beryllium, Total	RDL	Cadmium, Total	RDL	Chromium, Total	RDL	Hexavalent Chromium	RDL	ORP (mV)	pH	Lead, Total	RDL	Lead, TCLP (mg/l)	RDL
Exterior Courtyard Samples																						
B-1 1-5'	06/06/2011	EPA 6010B/7471A	2.6	1.1	5.0	3.2	**54**	5.3	BRL	0.32	0.65	0.53	14	1.1	NA		NA	NA	95	5.3	NA	
B-1 10-15'	06/06/2011	EPA 6010B/7471A	BRL	1.3	BRL	3.9	28	6.5	BRL	0.39	BRL	0.65	12	1.3	NA		NA	NA	BRL	6.5	NA	
B-2 1-5'	06/06/2011	EPA 6010B/7471A	3.4	1.1	4.2	3.3	73	5.5	BRL	0.33	BRL	0.55	15	1.1	NA		NA	NA	290	5.5	NA	
B-2 10-15'	06/06/2011	EPA 6010B/7471A	4	1.1	BRL	3.4	**91**	5.7	BRL	0.34	1.3	0.57	38	1.1	NA		NA	NA	590	5.7	NA	
B-3 5-10'	06/06/2011	EPA 6010B/7471A	2.8	1.2	6.2	3.6	33	5.9	BRL	0.36	0.63	0.59	18	1.2	NA		NA	NA	17	5.9	NA	
B-4 2-5'	06/06/2011	EPA 6010B/7471A	3.6	1.2	6.3	3.5	**410**	5.8	BRL	0.35	0.94	0.58	20	1.2	NA		NA	NA	530	5.8	NA	
B-4 12-15'	06/06/2011	EPA 6010B/7471A	BRL	1.2	BRL	3.5	25	5.8	BRL	0.35	BRL	0.58	8.6	1.2	NA		NA	NA	BRL	5.8	NA	
B-5 10-15'	06/06/2011	EPA 6010B/7471A	3.8	1.3	BRL	3.9	35	6.6	BRL	0.39	BRL	0.66	13	1.3	NA		NA	NA	6.6	6.6	NA	
B-8 0-3'	09/01/2011	EPA 6010B/7471A	BRL	2.2	5.4	0.43	**65**	0.43	0.48	0.22	BRL	0.43	29	0.43	NA		NA	NA	170	2.2	NA	
B-8 5-10'	09/01/2011	EPA 6010B/7471A	BRL	2.5	2.7	0.5	32	0.5	0.51	0.25	BRL	0.5	10	0.5	NA		NA	NA	5.1	2.5	NA	
B-9 0-3'	09/01/2011	EPA 6010B/7471A	BRL	2	6.7	0.41	37	0.41	0.27	0.2	BRL	0.41	**48**	0.41	NA		NA	NA	90	2	NA	
B-10 0-3'	09/01/2011	EPA 6010B/7471A	BRL	2.3	6.6	0.46	**74**	0.46	0.48	0.23	BRL	0.46	19	0.46	NA		NA	NA	**1,400**	2.3	NA	
B-11 0-3'	09/01/2011	EPA 6010B/7471A	BRL	2.1	3.6	0.41	**110**	0.41	0.4	0.21	BRL	0.41	22	0.41	NA		NA	NA	**1,800**	2.1	NA	
B-12 0-3'	09/01/2011	EPA 6010B/7471A	BRL	2.2	9.1	0.45	**110**	0.45	0.48	0.22	BRL	0.45	34	0.45	NA		NA	NA	**620**	2.2	NA	
WC-1 (B-16 1-5')	10/05/2012	EPA 6010C / 7471B / 1311	NA		BRL	2.7	**76**	2.7	NA		0.31	0.27	27	0.55	NA		NA	NA	340	0.82	1.7	0.010
B-16 0-3'	10/05/2012	EPA 6010C/7196A / SM2580A /SM9045C	NA		NA		NA		NA		NA		**78**	0.51	BRL	0.17	60	9.0	7.9	0.76	NA	
B-16 3-5'	10/05/2012	EPA 6010C/7196A / SM2580A /SM9045C	NA		NA		NA		NA		NA		14	0.59	BRL	0.18	56	9.1	350	0.89	NA	
B-17 0-3'	10/05/2012	EPA 6010C	NA		NA		NA		NA		NA		25	0.57	NA		NA	NA	220	0.85	NA	
B-17 3-5'	10/05/2012	EPA 6010C	NA		NA		NA		NA		NA		11	0.55	NA		NA	NA	19	0.83	NA	
B-17 5-7'	10/05/2012	EPA 6010C	NA		NA		NA		NA		NA		NA		NA		NA	NA	110	0.82	NA	
B-21 0-3'	10/10/2012	EPA 6010C	NA		NA		NA		NA		NA		20	0.51	NA		NA	NA	150	0.77	NA	
B-21 3-5'	10/10/2012	EPA 6010C	NA		NA		NA		NA		NA		28	0.54	NA		NA	NA	130	0.80	NA	
B-22 0-3'	10/05/2012	EPA 6010C	NA		NA		NA		NA		NA		NA		NA		NA	NA	170	0.78	NA	
B-22 3-5'	10/05/2012	EPA 6010C	NA		NA		NA		NA		NA		NA		NA		NA	NA	200	0.83	NA	
B-23 0-3'	10/05/2012	EPA 6010C	NA		NA		NA		NA		NA		NA		NA		NA	NA	55	0.82	NA	
B-23 3-5'	10/05/2012	EPA 6010C	NA		NA		NA		NA		NA		NA		NA		NA	NA	17	0.80	NA	
WC-2 (B-26 2-5')	10/09/2012	EPA 6010C / 7471B / 1311	NA		BRL	2.6	47	2.6	NA		0.35	0.26	**42**	0.52	NA		NA	NA	170	0.78	1.1	0.010
B-31 0-3'	10/09/2012	EPA 6010C	NA		NA		NA		NA		NA		NA		NA		NA	NA	200	0.78	NA	
B-31 3-5'	10/09/2012	EPA 6010C	NA		NA		NA		NA		NA		NA		NA		NA	NA	16	0.80	NA	
B-32 0-3'	10/09/2012	EPA 6010C	NA		NA		NA		NA		NA		NA		NA		NA	NA	120	0.78	NA	
B-32 3-5'	10/09/2012	EPA 6010C	NA		NA		NA		NA		NA		NA		NA		NA	NA	4.6	0.81	NA	
B-33 0-3'	10/10/2012	EPA 6010C	NA		NA		NA		NA		NA		NA		NA		NA	NA	460	0.80	NA	
B-33 3-5'	10/10/2012	EPA 6010C	NA		NA		NA		NA		NA		NA		NA		NA	NA	21	0.78	NA	
B-34 0-3'	10/05/2012	EPA 6010C	NA		NA		NA		NA		NA		NA		NA		NA	NA	**860**	0.80	NA	
B-34 3-5'	10/05/2012	EPA 6010C	NA		NA		NA		NA		NA		NA		NA		NA	NA	**800**	0.75	NA	
Data Evaluation																						
		Maximum Concentration	4.0		9.1		410		0.51		1.3		78		None detected				1800			
		Maximum exceed Background?	No		No		Yes		No		No		Yes						Yes			
		Soil Contaminant of Concern?	No		No		Yes		No		No		Yes, as trivalent						Yes		Not applicable	

Prepared By: EAF
Reviewed By:
Revision Date: 4/30/2014

TABLE 6.3.1
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY CONTAMINANTS OF CONCERN:
METALS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Antimony, Total	RDL	Arsenic, Total	RDL	Barium, Total	RDL	Beryllium, Total	RDL	Cadmium, Total	RDL	Chromium, Total	RDL	Hexavalent Chromium	RDL	ORP (mV)	pH	Lead, Total	RDL	Lead, TCLP (mg/l)	RDL
Beneath Existing Mill #3 Building																						
B-30 0-3'	10/17/2012	EPA 6010C	NA		NA		NA		NA		NA		NA		NA		NA	NA	23	0.77	NA	
B-30 3-4.5'	10/17/2012	EPA 6010C	NA		NA		NA		NA		NA		NA		NA		NA	NA	24	0.75	NA	
Data Evaluation																						
		Maximum Concentration																	24			
		Maximum exceed Background?																	No			
		Soil Contaminant of Concern?																	No			
Selected Soil Standards																						
		2014 MA S-2/GW-2	30		20		3,000		200		100		3,000		200				600			
		2014 MA S-2/GW-3	30		20		3,000		200		100		3,000		200				600			
		2014 MA S-3/GW-2	30		20		5,000		200		30		5,000		200				600			
		2014 MA S-3/GW-3	30		20		5,000		200		30		5,000		200				600			
		MADEP Background - Urban Fill	7		20		50		0.9		3		40		40				600			

Notes:

RDL = Reported Detection Limit
BRL = Below Reporting Limit
NA = Not Analyzed
Bold = Exceeds Background Concentration

* Chain of custody lists sample date as 9/14/2011. Sample was collected on 6/6/2011, and submitted to the lab on 9/14/2011.
ORP = Oxidation Reduction Potential
Standards for Total Chromium are for Cr III, because no Cr VI detected.
Note 1: Although barium is present above background concentration, it is not detected at a level above RCS-1 Reportable Concentration and it is located outside the disposal site boundary.

TABLE 6.3.1
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY CONTAMINANTS OF CONCERN:
METALS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Mercury, Total	RDL	Nickel, Total	RDL	Vanadium, Total	RDL	Zinc, Total	RDL
Exterior Courtyard Samples										
B-1 1-5'	06/06/2011	EPA 6010B/7471A	0.15	0.017	10	5.3	16	1.1	66	5.3
B-1 10-15'	06/06/2011	EPA 6010B/7471A	BRL	0.021	7.2	6.5	24	1.3	35	6.5
B-2 1-5'	06/06/2011	EPA 6010B/7471A	0.34	0.019	11	5.5	25	1.1	68	5.5
B-2 10-15'	06/06/2011	EPA 6010B/7471A	0.39	0.02	22	5.7	47	1.1	140	5.7
B-3 5-10'	06/06/2011	EPA 6010B/7471A	0.061	0.021	13	5.9	24	1.2	37	5.9
B-4 2-5'	06/06/2011	EPA 6010B/7471A	**2.5**	0.19	14	5.8	28	1.2	220	5.8
B-4 12-15'	06/06/2011	EPA 6010B/7471A	BRL	0.02	6.2	5.8	16	1.2	33	5.8
B-5 10-15'	06/06/2011	EPA 6010B/7471A	BRL	0.022	8.7	6.6	24	1.3	41	6.6
B-8 0-3'	09/01/2011	EPA 6010B/7471A	0.24	0.09	22	1.1	20	0.43	74	2.2
B-8 5-10'	09/01/2011	EPA 6010B/7471A	BRL	0.11	6.4	1.3	13	0.5	32	2.5
B-9 0-3'	09/01/2011	EPA 6010B/7471A	0.32	0.09	**48**	1	28	0.41	43	2
B-10 0-3'	09/01/2011	EPA 6010B/7471A	0.35	0.09	17	1.2	20	0.46	100	2.3
B-11 0-3'	09/01/2011	EPA 6010B/7471A	0.79	0.08	26	1	20	0.41	170	2.1
B-12 0-3'	09/01/2011	EPA 6010B/7471A	0.28	0.1	**41**	1.1	27	0.45	130	2.2
WC-1 (B-16 1-5')	10/05/2012	EPA 6010C / 7471B / 1311	0.41	0.028	NA		NA		NA	
B-16 0-3'	10/05/2012	EPA 6010C/7196A / SM2580A /SM9045C	NA		**100**	0.51	NA		NA	
B-16 3-5'	10/05/2012	EPA 6010C/7196A / SM2580A /SM9045C	NA		11	0.59	NA		NA	
B-17 0-3'	10/05/2012	EPA 6010C	NA		20	0.57	NA		NA	
B-17 3-5'	10/05/2012	EPA 6010C	NA		7.5	0.55	NA		NA	
B-17 5-7'	10/05/2012	EPA 6010C	NA		NA		NA		NA	
B-21 0-3'	10/10/2012	EPA 6010C	NA		12	0.51	NA		NA	
B-21 3-5'	10/10/2012	EPA 6010C	NA		25	0.54	NA		NA	
B-22 0-3'	10/05/2012	EPA 6010C	NA		NA		NA		NA	
B-22 3-5'	10/05/2012	EPA 6010C	NA		NA		NA		NA	
B-23 0-3'	10/05/2012	EPA 6010C	NA		NA		NA		NA	
B-23 3-5'	10/05/2012	EPA 6010C	NA		NA		NA		NA	
WC-2 (B-26 2-5')	10/09/2012	EPA 6010C / 7471B / 1311	0.61	0.055	NA		NA		NA	
B-31 0-3'	10/09/2012	EPA 6010C	NA		NA		NA		NA	
B-31 3-5'	10/09/2012	EPA 6010C	NA		NA		NA		NA	
B-32 0-3'	10/09/2012	EPA 6010C	NA		NA		NA		NA	
B-32 3-5'	10/09/2012	EPA 6010C	NA		NA		NA		NA	
B-33 0-3'	10/10/2012	EPA 6010C	NA		NA		NA		NA	
B-33 3-5'	10/10/2012	EPA 6010C	NA		NA		NA		NA	
B-34 0-3'	10/05/2012	EPA 6010C	NA		**37**	0.54	NA		NA	
B-34 3-5'	10/05/2012	EPA 6010C	NA		15	0.50	NA		NA	
Data Evaluation										
		Maximum Concentration	2.5		100		47		220	
		Maximum exceed Background?	Yes		Yes		Yes		No	
		Soil Contaminant of Concern?	Yes		Yes		Yes		No	

TABLE 6.3.1
EVALUATION OF SOIL ANALYTICAL DATA TO IDENTIFY CONTAMINANTS OF CONCERN:
METALS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Mercury, Total	RDL	Nickel, Total	RDL	Vanadium, Total	RDL	Zinc, Total	RDL
Beneath Existing Mill #3 Building										
B-30 0-3'	10/17/2012	EPA 6010C	NA		NA		NA		NA	
B-30 3-4.5'	10/17/2012	EPA 6010C	NA		NA		NA		NA	
Data Evaluation										
		Maximum Concentration								
		Maximum exceed Background?								
		Soil Contaminant of Concern?								
Selected Soil Standards										
		2014 MA S-2/GW-2	30		1000		700		3,000	
		2014 MA S-2/GW-3	30		1000		700		3,000	
		2014 MA S-3/GW-2	30		1000		700		5,000	
		2014 MA S-3/GW-3	30		1000		700		5,000	
		MADEP Background - Urban Fill	1		30		30		300	

Notes:
RDL = Reported Detection Limit
BRL = Below Reporting Limit
NA = Not Analyzed
Bold = Exceeds Background Concentration

TABLE 6.3.2
EVALUATION OF SOIL ANALYTICAL DATA TO DETERMINE METHOD TO DERIVE EPCS:
METALS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Barium, Total	RDL	Chromium, Total as III	RDL	Lead, Total	RDL	Mercury, Total	RDL	Nickel, Total	RDL	Vanadium, Total	RDL
Exterior Courtyard: 0-3 Foot Interval														
B-1 1-5'	06/06/2011	EPA 6010B/7471A	54	5.3	14	1.1	95	5.3	0.15	0.017	10	5.3	16	1.1
B-2 1-5'	06/06/2011	EPA 6010B/7471A	73	5.5	15	1.1	290	5.5	0.34	0.019	11	5.5	25	1.1
B-8 0-3'	09/01/2011	EPA 6010B/7471A	65	0.43	29	0.43	170	2.2	0.24	0.09	22	1.1	20	0.43
B-9 0-3'	09/01/2011	EPA 6010B/7471A	37	0.41	48	0.41	90	2	0.32	0.09	48	1	28	0.41
B-10 0-3'	09/01/2011	EPA 6010B/7471A	74	0.46	19	0.46	**1,400**	2.3	0.35	0.09	17	1.2	20	0.46
B-11 0-3'	09/01/2011	EPA 6010B/7471A	110	0.41	22	0.41	**1,800**	2.1	0.79	0.08	26	1	20	0.41
B-12 0-3'	09/01/2011	EPA 6010B/7471A	110	0.45	34	0.45	**620**	2.2	0.28	0.1	41	1.1	27	0.45
B-16 0-3'	10/05/2012	EPA 6010C/7196A / SM2580A /SM9045C			78	0.51	7.9	0.76			100	0.51		
B-17 0-3'	10/05/2012	EPA 6010C			25	0.57	220	0.85			20	0.57		
B-21 0-3'	10/10/2012	EPA 6010C			20	0.51	150	0.77			12	0.51		
B-22 0-3'	10/05/2012	EPA 6010C					170	0.78						
B-23 0-3'	10/05/2012	EPA 6010C					55	0.82						
B-31 0-3'	10/09/2012	EPA 6010C					200	0.78						
B-32 0-3'	10/09/2012	EPA 6010C					120	0.78						
B-33 0-3'	10/10/2012	EPA 6010C					460	0.80						
B-34 0-3'	10/05/2012	EPA 6010C					**860**	0.80			37	0.54		
Data Evaluation: 0-3 Foot Interval														
		Maximum Concentration	110		78		1800		0.79		100		28	
		Number >10X S-2 Standard	0		0		0		0		0		0	
		Number Analyzed	7		10		16		7		11		7	
		Number >S-2 Standard	0		0		4		0		0		0	
		Percent >S-2	0		0		25		0		0		0	
		Method to Derive EPC	Mean		Mean		Mean		Mean		Mean		Mean	

TABLE 6.3.2
EVALUATION OF SOIL ANALYTICAL DATA TO DETERMINE METHOD TO DERIVE EPCS:
METALS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Barium, Total	RDL	Chromium, Total as III	RDL	Lead, Total	RDL	Mercury, Total	RDL	Nickel, Total	RDL	Vanadium, Total	RDL
Exterior Courtyard: 0-6 Foot Interval														
B-1 1-5'	06/06/2011	EPA 6010B/7471A	54	5.3	14	1.1	95	5.3	0.15	0.017	10	5.3	16	1.1
B-2 1-5'	06/06/2011	EPA 6010B/7471A	73	5.5	15	1.1	290	5.5	0.34	0.019	11	5.5	25	1.1
B-4 2-5'	06/06/2011	EPA 6010B/7471A	410	5.8	20	1.2	530	5.8	2.5	0.19	14	5.8	28	1.2
B-8 0-3'	09/01/2011	EPA 6010B/7471A	65	0.43	29	0.43	170	2.2	0.24	0.09	22	1.1	20	0.43
B-9 0-3'	09/01/2011	EPA 6010B/7471A	37	0.41	48	0.41	90	2	0.32	0.09	48	1	28	0.41
B-10 0-3'	09/01/2011	EPA 6010B/7471A	74	0.46	19	0.46	**1,400**	2.3	0.35	0.09	17	1.2	20	0.46
B-11 0-3'	09/01/2011	EPA 6010B/7471A	110	0.41	22	0.41	**1,800**	2.1	0.79	0.08	26	1	20	0.41
B-12 0-3'	09/01/2011	EPA 6010B/7471A	110	0.45	34	0.45	**620**	2.2	0.28	0.1	41	1.1	27	0.45
WC-1 (B-16 1-5')	10/05/2012	EPA 6010C / 7471B / 1311	76	2.7	27	0.55	340	0.82	0.41	0.028				
B-16 0-3'	10/05/2012	EPA 6010C/7196A / SM2580A /SM9045C			78	0.51	7.9	0.76			100	0.51		
B-16 3-5'	10/05/2012	EPA 6010C/7196A / SM2580A /SM9045C			14	0.59	350	0.89			11	0.59		
B-17 0-3'	10/05/2012	EPA 6010C			25	0.57	220	0.85			20	0.57		
B-17 3-5'	10/05/2012	EPA 6010C			11	0.55	19	0.83			7.5	0.55		
B-17 5-7'	10/05/2012	EPA 6010C					110	0.82						
B-21 0-3'	10/10/2012	EPA 6010C			20	0.51	150	0.77			12	0.51		
B-21 3-5'	10/10/2012	EPA 6010C			28	0.54	130	0.80			25	0.54		
B-22 0-3'	10/05/2012	EPA 6010C					170	0.78						
B-22 3-5'	10/05/2012	EPA 6010C					200	0.83						
B-23 0-3'	10/05/2012	EPA 6010C					55	0.82						
B-23 3-5'	10/05/2012	EPA 6010C					17	0.80						
WC-2 (B-26 2-5')	10/09/2012	EPA 6010C / 7471B / 1311	47	2.6	42	0.52	170	0.78	0.61	0.055				
B-31 0-3'	10/09/2012	EPA 6010C					200	0.78						
B-31 3-5'	10/09/2012	EPA 6010C					16	0.80						
B-32 0-3'	10/09/2012	EPA 6010C					120	0.78						
B-32 3-5'	10/09/2012	EPA 6010C					4.6	0.81						
B-33 0-3'	10/10/2012	EPA 6010C					460	0.80						
B-33 3-5'	10/10/2012	EPA 6010C					21	0.78						
B-34 0-3'	10/05/2012	EPA 6010C					**860**	0.80			37	0.54		
B-34 3-5'	10/05/2012	EPA 6010C					**800**	0.75			15	0.50		
Data Evaluation: 0-6 Foot Interval														
Maximum Concentration			410		78		1800		2.5		100		28	
Number >10X S-2 or S-3 Standard			0		0		0		0		0		0	
Number Analyzed			10		16		29		10		16		8	
Number >S-2 or S-3 Standard			0		0		5		0		0		0	
Percent >S-2 or S-3			0		0		17		0		0		0	
Method to Derive EPC			Mean		Mean		Mean		Mean		Mean		Mean	

TABLE 6.3.2
EVALUATION OF SOIL ANALYTICAL DATA TO DETERMINE METHOD TO DERIVE EPCS:
METALS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Barium, Total	RDL	Chromium, Total as III	RDL	Lead, Total	RDL	Mercury, Total	RDL	Nickel, Total	RDL	Vanadium, Total	RDL
Exterior Courtyard: 0-15 Foot Interval														
B-1 1-5'	06/06/2011	EPA 6010B/7471A	54	5.3	14	1.1	95	5.3	0.15	0.017	10	5.3	16	1.1
B-2 1-5'	06/06/2011	EPA 6010B/7471A	73	5.5	15	1.1	290	5.5	0.34	0.019	11	5.5	25	1.1
B-4 2-5'	06/06/2011	EPA 6010B/7471A	410	5.8	20	1.2	530	5.8	2.5	0.19	14	5.8	28	1.2
B-8 0-3'	09/01/2011	EPA 6010B/7471A	65	0.43	29	0.43	170	2.2	0.24	0.09	22	1.1	20	0.43
B-9 0-3'	09/01/2011	EPA 6010B/7471A	37	0.41	48	0.41	90	2	0.32	0.09	48	1	28	0.41
B-10 0-3'	09/01/2011	EPA 6010B/7471A	74	0.46	19	0.46	**1,400**	2.3	0.35	0.09	17	1.2	20	0.46
B-11 0-3'	09/01/2011	EPA 6010B/7471A	110	0.41	22	0.41	**1,800**	2.1	0.79	0.08	26	1	20	0.41
B-12 0-3'	09/01/2011	EPA 6010B/7471A	110	0.45	34	0.45	**620**	2.2	0.28	0.1	41	1.1	27	0.45
WC-1 (B-16 1-5')	10/05/2012	EPA 6010C / 7471B / 1311	76	2.7	27	0.55	340	0.82	0.41	0.028				
B-16 0-3'	10/05/2012	EPA 6010C/7196A / SM2580A /SM9045C			78	0.51	7.9	0.76			100	0.51		
B-16 3-5'	10/05/2012	EPA 6010C/7196A / SM2580A /SM9045C			14	0.59	350	0.89			11	0.59		
B-17 0-3'	10/05/2012	EPA 6010C			25	0.57	220	0.85			20	0.57		
B-17 3-5'	10/05/2012	EPA 6010C			11	0.55	19	0.83			7.5	0.55		
B-17 5-7'	10/05/2012	EPA 6010C					110	0.82						
B-21 0-3'	10/10/2012	EPA 6010C			20	0.51	150	0.77			12	0.51		
B-21 3-5'	10/10/2012	EPA 6010C			28	0.54	130	0.80			25	0.54		
B-22 0-3'	10/05/2012	EPA 6010C					170	0.78						
B-22 3-5'	10/05/2012	EPA 6010C					200	0.83						
B-23 0-3'	10/05/2012	EPA 6010C					55	0.82						
B-23 3-5'	10/05/2012	EPA 6010C					17	0.80						
WC-2 (B-26 2-5')	10/09/2012	EPA 6010C / 7471B / 1311	47	2.6	42	0.52	170	0.78	0.61	0.055				
B-31 0-3'	10/09/2012	EPA 6010C					200	0.78						
B-31 3-5'	10/09/2012	EPA 6010C					16	0.80						
B-32 0-3'	10/09/2012	EPA 6010C					120	0.78						
B-32 3-5'	10/09/2012	EPA 6010C					4.6	0.81						
B-33 0-3'	10/10/2012	EPA 6010C					460	0.80						
B-33 3-5'	10/10/2012	EPA 6010C					21	0.78						
B-34 0-3'	10/05/2012	EPA 6010C					**860**	0.80			37	0.54		
B-34 3-5'	10/05/2012	EPA 6010C					**800**	0.75			15	0.50		
B-1 10-15'	06/06/2011	EPA 6010B/7471A	28	6.5	12	1.3	BRL	6.5	BRL	0.021	7.2	6.5	24	1.3
B-2 10-15'	06/06/2011	EPA 6010B/7471A	91	5.7	38	1.1	590	5.7	0.39	0.02	22	5.7	47	1.1
B-3 5-10'	06/06/2011	EPA 6010B/7471A	33	5.9	18	1.2	17	5.9	0.061	0.021	13	5.9	24	1.2
B-4 12-15'	06/06/2011	EPA 6010B/7471A	25	5.8	8.6	1.2	BRL	5.8	BRL	0.02	6.2	5.8	16	1.2
B-5 10-15'	06/06/2011	EPA 6010B/7471A	35	6.6	13	1.3	6.6	6.6	BRL	0.022	8.7	6.6	24	1.3
B-8 5-10'	09/01/2011	EPA 6010B/7471A	32	0.5	10	0.5	5.1	2.5	BRL	0.11	6.4	1.3	13	0.5
Data Evaluation: 0-15 Foot Interval														
Maximum Concentration			410		78		1800		2.5		100		47	
Number >10X S-2 or S-3 Standard			0		0		0		0		0		0	
Number Analyzed			16		22		35		16		22		14	
Number >S-2 or S-3 Standard			0		0		5		0		0		0	
Percent >S-2 or S-3			0		0		14		0		0		0	
Method to Derive EPC			Mean		Mean		Mean		Mean		Mean		Mean	

TABLE 6.3.2
EVALUATION OF SOIL ANALYTICAL DATA TO DETERMINE METHOD TO DERIVE EPCS:
METALS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Barium, Total	RDL	Chromium, Total as III	RDL	Lead, Total	RDL	Mercury, Total	RDL	Nickel, Total	RDL	Vanadium, Total	RDL
Selected Soil Standards														
		2014 MA S-2/GW-2	3,000		3,000		600		30		1,000		700	
		2014 MA S-2/GW-3	3,000		3,000		600		30		1,000		700	
		2014 MA S-3/GW-2	5,000		5,000		600		30		1,000		700	
		2014 MA S-3/GW-3	5,000		5,000		600		30		1,000		700	
		2014 Upper Concentration Limit	10,000		10,000		6,000		300		10,000		7,000	
		MADEP Background - Urban Fill	50		40		600		1		30		30	

Notes:
RDL = Reported Detection Limit
BRL = Below Reporting Limit
NA = Not Analyzed
Bold = Exceeds One or More S-2 or S-3 Standard
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit

TABLE 6.3.3
DERIVATION OF SOIL EXPOSURE POINT CONCENTRATIONS:
METALS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Barium, Total	RDL	Chromium, Total	RDL	Lead, Total	RDL	Mercury, Total	RDL	Nickel, Total	RDL	Vanadium, Total	RDL
Exterior Courtyard: 0-3 Foot Interval														
B-1 1-5'	06/06/2011	EPA 6010B/7471A	54	5.3	14	1.1	95	5.3	0.15	0.017	10	5.3	16	1.1
B-2 1-5'	06/06/2011	EPA 6010B/7471A	73	5.5	15	1.1	290	5.5	0.34	0.019	11	5.5	25	1.1
B-8 0-3'	09/01/2011	EPA 6010B/7471A	65	0.43	29	0.43	170	2.2	0.24	0.09	22	1.1	20	0.43
B-9 0-3'	09/01/2011	EPA 6010B/7471A	37	0.41	48	0.41	90	2	0.32	0.09	48	1	28	0.41
B-10 0-3'	09/01/2011	EPA 6010B/7471A	74	0.46	19	0.46	1,400	2.3	0.35	0.09	17	1.2	20	0.46
B-11 0-3'	09/01/2011	EPA 6010B/7471A	110	0.41	22	0.41	1,800	2.1	0.79	0.08	26	1	20	0.41
B-12 0-3'	09/01/2011	EPA 6010B/7471A	110	0.45	34	0.45	620	2.2	0.28	0.1	41	1.1	27	0.45
B-16 0-3'	10/05/2012	EPA 6010C/7196A / SM2580A /SM9045C			78	0.51	7.9	0.76			100	0.51		
B-17 0-3'	10/05/2012	EPA 6010C			25	0.57	220	0.85			20	0.57		
B-21 0-3'	10/10/2012	EPA 6010C			20	0.51	150	0.77			12	0.51		
B-22 0-3'	10/05/2012	EPA 6010C					170	0.78						
B-23 0-3'	10/05/2012	EPA 6010C					55	0.82						
B-31 0-3'	10/09/2012	EPA 6010C					200	0.78						
B-32 0-3'	10/09/2012	EPA 6010C					120	0.78						
B-33 0-3'	10/10/2012	EPA 6010C					460	0.80						
B-34 0-3'	10/05/2012	EPA 6010C					860	0.80			37	0.54		
Data Evaluation: 0-3 Foot Interval														
		Mean Concentration	75		30		419		0.35		31		22	
		Method to Derive EPC	Mean		Mean		Mean		Mean		Mean		Mean	

TABLE 6.3.3
DERIVATION OF SOIL EXPOSURE POINT CONCENTRATIONS:
METALS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Barium, Total	RDL	Chromium, Total	RDL	Lead, Total	RDL	Mercury, Total	RDL	Nickel, Total	RDL	Vanadium, Total	RDL
Exterior Courtyard: 0-6 Foot Interval														
B-1 1-5'	06/06/2011	EPA 6010B/7471A	54	5.3	14	1.1	95	5.3	0.15	0.017	10	5.3	16	1.1
B-2 1-5'	06/06/2011	EPA 6010B/7471A	73	5.5	15	1.1	290	5.5	0.34	0.019	11	5.5	25	1.1
B-4 2-5'	06/06/2011	EPA 6010B/7471A	410	5.8	20	1.2	530	5.8	2.5	0.19	14	5.8	28	1.2
B-8 0-3'	09/01/2011	EPA 6010B/7471A	65	0.43	29	0.43	170	2.2	0.24	0.09	22	1.1	20	0.43
B-9 0-3'	09/01/2011	EPA 6010B/7471A	37	0.41	48	0.41	90	2	0.32	0.09	48	1	28	0.41
B-10 0-3'	09/01/2011	EPA 6010B/7471A	74	0.46	19	0.46	1,400	2.3	0.35	0.09	17	1.2	20	0.46
B-11 0-3'	09/01/2011	EPA 6010B/7471A	110	0.41	22	0.41	1,800	2.1	0.79	0.08	26	1	20	0.41
B-12 0-3'	09/01/2011	EPA 6010B/7471A	110	0.45	34	0.45	620	2.2	0.28	0.1	41	1.1	27	0.45
WC-1 (B-16 1-5')	10/05/2012	EPA 6010C / 7471B / 1311	76	2.7	27	0.55	340	0.82	0.41	0.028				
B-16 0-3'	10/05/2012	EPA 6010C/7196A / SM2580A /SM9045C			78	0.51	7.9	0.76			100	0.51		
B-16 3-5'	10/05/2012	EPA 6010C/7196A / SM2580A /SM9045C			14	0.59	350	0.89			11	0.59		
B-17 0-3'	10/05/2012	EPA 6010C			25	0.57	220	0.85			20	0.57		
B-17 3-5'	10/05/2012	EPA 6010C			11	0.55	19	0.83			7.5	0.55		
B-17 5-7'	10/05/2012	EPA 6010C					110	0.82						
B-21 0-3'	10/10/2012	EPA 6010C			20	0.51	150	0.77			12	0.51		
B-21 3-5'	10/10/2012	EPA 6010C			28	0.54	130	0.80			25	0.54		
B-22 0-3'	10/05/2012	EPA 6010C					170	0.78						
B-22 3-5'	10/05/2012	EPA 6010C					200	0.83						
B-23 0-3'	10/05/2012	EPA 6010C					55	0.82						
B-23 3-5'	10/05/2012	EPA 6010C					17	0.80						
WC-2 (B-26 2-5')	10/09/2012	EPA 6010C / 7471B / 1311	47	2.6	42	0.52	170	0.78	0.61	0.055				
B-31 0-3'	10/09/2012	EPA 6010C					200	0.78						
B-31 3-5'	10/09/2012	EPA 6010C					16	0.80						
B-32 0-3'	10/09/2012	EPA 6010C					120	0.78						
B-32 3-5'	10/09/2012	EPA 6010C					4.6	0.81						
B-33 0-3'	10/10/2012	EPA 6010C					460	0.80						
B-33 3-5'	10/10/2012	EPA 6010C					21	0.78						
B-34 0-3'	10/05/2012	EPA 6010C					860	0.80			37	0.54		
B-34 3-5'	10/05/2012	EPA 6010C					800	0.75			15	0.50		
Data Evaluation: 0-6 Foot Interval														
		Mean Concentration	106		28		325		0.60		26		23	
		Method to Derive EPC	Mean		Mean		Mean		Mean		Mean		Mean	

TABLE 6.3.3
DERIVATION OF SOIL EXPOSURE POINT CONCENTRATIONS:
METALS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Barium, Total	RDL	Chromium, Total	RDL	Lead, Total	RDL	Mercury, Total	RDL	Nickel, Total	RDL	Vanadium, Total	RDL
Exterior Courtyard: 0-15 Foot Interval														
B-1 1-5'	06/06/2011	EPA 6010B/7471A	54	5.3	14	1.1	95	5.3	0.15	0.017	10	5.3	16	1.1
B-2 1-5'	06/06/2011	EPA 6010B/7471A	73	5.5	15	1.1	290	5.5	0.34	0.019	11	5.5	25	1.1
B-4 2-5'	06/06/2011	EPA 6010B/7471A	410	5.8	20	1.2	530	5.8	2.5	0.19	14	5.8	28	1.2
B-8 0-3'	09/01/2011	EPA 6010B/7471A	65	0.43	29	0.43	170	2.2	0.24	0.09	22	1.1	20	0.43
B-9 0-3'	09/01/2011	EPA 6010B/7471A	37	0.41	48	0.41	90	2	0.32	0.09	48	1	28	0.41
B-10 0-3'	09/01/2011	EPA 6010B/7471A	74	0.46	19	0.46	1,400	2.3	0.35	0.09	17	1.2	20	0.46
B-11 0-3'	09/01/2011	EPA 6010B/7471A	110	0.41	22	0.41	1,800	2.1	0.79	0.08	26	1	20	0.41
B-12 0-3'	09/01/2011	EPA 6010B/7471A	110	0.45	34	0.45	620	2.2	0.28	0.1	41	1.1	27	0.45
WC-1 (B-16 1-5')	10/05/2012	EPA 6010C / 7471B / 1311	76	2.7	27	0.55	340	0.82	0.41	0.028				
B-16 0-3'	10/05/2012	EPA 6010C/7196A / SM2580A /SM9045C			78	0.51	7.9	0.76			100	0.51		
B-16 3-5'	10/05/2012	EPA 6010C/7196A / SM2580A /SM9045C			14	0.59	350	0.89			11	0.59		
B-17 0-3'	10/05/2012	EPA 6010C			25	0.57	220	0.85			20	0.57		
B-17 3-5'	10/05/2012	EPA 6010C			11	0.55	19	0.83			7.5	0.55		
B-17 5-7'	10/05/2012	EPA 6010C					110	0.82						
B-21 0-3'	10/10/2012	EPA 6010C			20	0.51	150	0.77			12	0.51		
B-21 3-5'	10/10/2012	EPA 6010C			28	0.54	130	0.80			25	0.54		
B-22 0-3'	10/05/2012	EPA 6010C					170	0.78						
B-22 3-5'	10/05/2012	EPA 6010C					200	0.83						
B-23 0-3'	10/05/2012	EPA 6010C					55	0.82						
B-23 3-5'	10/05/2012	EPA 6010C					17	0.80						
WC-2 (B-26 2-5')	10/09/2012	EPA 6010C / 7471B / 1311	47	2.6	42	0.52	170	0.78	0.61	0.055				
B-31 0-3'	10/09/2012	EPA 6010C					200	0.78						
B-31 3-5'	10/09/2012	EPA 6010C					16	0.80						
B-32 0-3'	10/09/2012	EPA 6010C					120	0.78						
B-32 3-5'	10/09/2012	EPA 6010C					4.6	0.81						
B-33 0-3'	10/10/2012	EPA 6010C					460	0.80						
B-33 3-5'	10/10/2012	EPA 6010C					21	0.78						
B-34 0-3'	10/05/2012	EPA 6010C					860	0.80			37	0.54		
B-34 3-5'	10/05/2012	EPA 6010C					800	0.75			15	0.50		
B-1 10-15'	06/06/2011	EPA 6010B/7471A	28	6.5	12	1.3	3.25	6.5	0.0105	0.021	7.2	6.5	24	1.3
B-2 10-15'	06/06/2011	EPA 6010B/7471A	91	5.7	38	1.1	590	5.7	0.39	0.02	22	5.7	47	1.1
B-3 5-10'	06/06/2011	EPA 6010B/7471A	33	5.9	18	1.2	17	5.9	0.061	0.021	13	5.9	24	1.2
B-4 12-15'	06/06/2011	EPA 6010B/7471A	25	5.8	8.6	1.2	2.9	5.8	0.01	0.02	6.2	5.8	16	1.2
B-5 10-15'	06/06/2011	EPA 6010B/7471A	35	6.6	13	1.3	6.6	6.6	0.011	0.022	8.7	6.6	24	1.3
B-8 5-10'	09/01/2011	EPA 6010B/7471A	32	0.5	10	0.5	5.1	2.5	0.055	0.11	6.4	1.3	13	0.5
Data Evaluation: 0-15 Foot Interval														
Mean Concentration			81		25		287		0.41		22		24	
Method to Derive EPC			Mean		Mean		Mean		Mean		Mean		Mean	
Comparison to Upper Concentration Limits (UCL)														
Does EPC for 0-15 foot interval exceed UCL?			No		No		No		No		No		No	
Selected Soil Standards														
2014 Upper Concentration Limits			10,000		10,000		6,000		300		10,000		7,000	

Notes:
RDL = Reported Detection Limit
BRL = Below Reporting Limit
NA = Not Analyzed
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit

Table 6.4
Summary of Soil Exposure Point Concentrations
(milligrams per kilogram (mg/kg))

Exposure Point	Maximum Concentration	Outer Courtyard	Outer Courtyard	Outer Courtyard	Beneath Existing Mill #3 Building	Clean Up Standards (in Bold)	Comment Regarding Clean Up Standard
Depth Interval (feet)		**0-3**	**0-6**	**0-15**	**0-3, 0-6 and 0-15**		
Contaminant of Concern							
Polychlorinated biphenyls **	47.85	8.33	6.99	5.21	0.51	**10**	95th % Upper Confidence Limit on the Mean, with a Maximum Concentration of 50 mg/kg
Dioxin-Like PCBs * **		1.05E-05	8.54E-06	6.37E-06	6.23E-07	**1.22E-05**	Derived from 95th % Upper Confidence Limit on the Mean for PCBs
Barium	410	75	106	81		106	
Chromium, as trivalent	78	30	28	25		30	
Lead	1800	419	325	287		**450**	95th % Upper Confidence Limit on the Mean
Mercury	2.5	0.35	0.60	0.41		0.60	
Nickel	100	31	26	22		31	
Vanadium	47	22	23	24		24	
C19-C36 aliphatic hydrocarbons	610	327	327	142		327	
C11-C22 aromatic hydrocarbons	560	303	303	125		303	
Receptors for each exposure point and soil interval	Compare to Upper Concentration Limit	On-Site Worker	Utility Worker	Construction Worker	Utility Worker	Utility Worker	
		On-Site Resident	On-Site Resident	On-Site Resident	Construction Worker	Construction Workers	
			On-Site Worker	On-Site Worker	On-Site Resident	On-Site Resident	
					On-Site Worker		

PCBs = Polychlorinated Biphenyls
Exposure point concentrations derived on Tables 6.1.3, 6.2.5 and 6.3.3

* Dioxin-like PCBs assumed to comprise approximately 3.4% of total PCBs (see Table 2.2.2 and 2.2.3, where maximum % PCB was calculated to be 3.4%). The sample with the maximum total PCB (1.35 mg/kg) contained the maximum % PCB that was dioxin like. This sample contained TCDD toxic equivalence of 1.65E-06 mg/kg, which is also the highest of the eight samples analyzed for total PCBs and total dioxin-like congeners. This information was used to estimate the amount of TCDD toxic equivalence likely representative of each exposure point and soil interval, as documented below.

	mg/kg	Because such a small portion of
Total PCBs in reference sample	1.35	total PCBs is dioxin-like PCBs,
Total TCDD Toxic Equiv. in reference sample	1.65E-06	the portion attributable to the dioxin-
Fraction of TCDD Toxic Equiv in PCB	1.22E-06	like PCBs was not subtracted from the total PCB value.

Exposure Point / Soil Interval	Maximum Concentration	Outer Courtyard / 0-3 foot	Outer Courtyard / 0-6 foot	Outer Courtyard / 0-15 foot	Beneath Mill #3 Building / All Intervals	Clean-up Standard
Total PCBs	47.85	8.55	6.99	5.21	0.51	10
Estimated TCDD Toxic Equival.	5.85E-05	1.05E-05	8.54E-06	6.37E-06	6.23E-07	1.22E-05

** Excludes the three PCB soil hot spots, which will be excavated and removed from the Site.

Table 6.5
Exposure Point Concentrations for Dust

Chemical Name	CAS Number	Outer Courtyard (0-3 Foot Interval)	Outer Courtyard (0-6 Foot Interval)	Outer Courtyard (0-15 Foot Interval)	Beneath Mill #3 Building	0.00	0.00	0.00
barium	7440-39-3	4.50E-03	6.36E-03	4.86E-03				
chromium (III)	16065-83-1	1.80E-03	1.68E-03	1.50E-03				
dioxin (TCDD equivalents)	1746-01-6	6.30E-10	5.12E-10	3.82E-10	3.74E-11			
lead	7439-92-1	2.51E-02	1.95E-02	1.72E-02				
mercury (from mercuric chloride)	7439-97-6	2.10E-05	3.60E-05	2.46E-05				
nickel (soluble salts)	7440-02-0	1.86E-03	1.56E-03	1.32E-03				
polychlorinated biphenyls, as PCB-1254	1336-36-3	5.00E-04	4.19E-04	3.13E-04	3.06E-05			
vanadium	7440-62-2	1.32E-03	1.38E-03	1.44E-03				
C19-C36 Aliphatics	N/A	1.96E-02	1.96E-02	8.52E-03				
C11-C22 Aromatics	N/A	1.82E-02	1.82E-02	7.50E-03				

Formula: EPC-air = [OHM]-soil * PF * PM-10 * CF

where,
EPC-air = Exposure Point Concentration (ug/cu m)
[OHM]-soil = soil concentration (mg/kg)
PM-10 = respirable particulate concentration in air (60 ug/cu m)
PF = proportion of respirable particulate concentrations attributable to the site (1.0)
CF = conversion factor (1E-06 kg/ug)

Units: Soil EPC = mg/kg
Dust EPC = ug/cu m

Refer to Table 6.4 for Soil Concentrations used to derive Dust Exposure Point Concentrations

Prepared By: EAF
Reviewed By:
Preparation Date: 6/30/2014
Revision Date:

Table 7
Summary of Baseline Risk Assessment Results

Receptor	Commercial Worker		Resident			Construction Worker		Utility Worker	
Risk Type	Cancer	Chronic Non-Cancer	Cancer	Chronic Non-Cancer	Subchronic Non-cancer	Cancer	Subchronic Non-cancer	Cancer	Subchronic Non-cancer
Risk Assessment Spreadsheet Location	Attachment 2A		Attachment 2B			Attachment 2C		Attachment 2D	
Exposure Point and Depth Interval									
Eastern Courtyard (0 - 3 Foot Interval)*	2.3E-06	0.22	1.4E-06		0.42				
% Risk Due to Lead (419 mg/kg)	none	35	none		49				
% Risk due to PCB (8.3 mg/kg) and Dioxin-Like PCB	100	63	100		47				
Eastern Courtyard (0-6 Foot Interval)*	1.9E-06	0.18	1.2E-06		0.35			2.8E-07	0.74
% Risk Due to Lead (325 mg/kg)	none	33	none		47			none	43
% Risk due to PCB (7.0 mg/kg) and Dioxin-Like PCB	100	66	100		49			98	53
Eastern Courtyard (0-15 Foot Interval)*	1.4E-06	0.14	8.7E-07		0.28	2.1E-07	0.60		
% Risk Due to Lead (287 mg/kg)	none	37	none		52	none	47		
% Risk due to PCB (5.2 mg/kg) and Dioxin-Like PCB	100	63	99		46	99	49		
Beneath Mill #3 Building (All Soil Intervals)**	1.4E-07	0.0086	8.5E-07	0.12	0.068	2.0E-08	0.029	2.0E-08	0.029
PCB exposure point concentration: xx mg/kg									
Exposure Types for Each Soil Interval, As Applicable									
Ingestion	x	x	x	x	x				
Enhanced Ingestion						x	x	x	x
Dermal Contact	x	x	x	x	x	x	x	x	x
Inhalation of Dust			x	x	x	x	x	x	x

Notes: * Exposure Point: Exterior Courtyard - Excludes all PCB Hot Spots, which are presumed to be excavated
Assumptions for this exposure point include the following:

1 Protective barrier will be installed and maintained over the soils, subject to a Notice of Activity and Use Limitation
2 No gardening of edible produce is presumed to occur in soils impacted by release
3 OHM found to be present at levels consistent with fill containing coal ash or wood ash were excluded from this risk characterization

**Exposure Point: Beneath Mill #3 Building - Assumptions for this exposure point include the following:

1 No gardening of edible produce is presumed to occur in soils impacted by release
2 OHM found to be present at levels consistent with fill containing coal ash or wood ash were excluded from this risk characterization

Table 8
Summary of Derived PCB and Lead Cleanup Standards for Soil

Receptor	Construction / Utility Worker	Resident	Site-Specific Soil Cleanup Standards					
Risk Type	Subchronic Non-Cancer	Subchronic Non-Cancer	95th % Upper Confidence Limit on the Mean	Source	Application	Maximum Concentration	Source	Application
Risk Assessment Spreadsheet Location	Attachment 2F	Attachment 2E						
Cleanup Standard Risk Calculations *	**1.0**	**0.49**						
% Risk Due to Lead	44	47						
% Risk due to PCB and Dioxin-Like PCB	56	50						
Site-Specific Cleanup Standards								
Lead			450	Risk Calculation	This "cleanup standard" is not directly used as such. It is calculated to determine what proportion of the non-cancer risk limit is left to calculate the cleanup standard for PCBs.			
PCB **			10	Risk Calculation	95th % Upper Confidence Limit on the Mean for entire exterior courtyard cannot exceed 450 mg/kg for PCB	50	USEPA TSCA Limit ***	No soil sample can exceed 50 mg/kg PCB

Notes: ** Exposure Point: Exterior Courtyard - Risk Calculations for Hot Spot Soil Cleanup Standards
Assumptions for this exposure point include the following:

1 Protective barrier will be installed and maintained over the soils, subject to a Notice of Activity and Use Limitation
2 No gardening of edible produce is presumed to occur in soils impacted by release
3 OHM found to be present at levels consistent with fill containing coal ash or wood ash were excluded from this risk characterization

** PCB = Polychlorinated biphenyl. Cleanup Standard for PCB reflects contribution to risk by dioxin-like congeners of PCB.
*** USEPA Region I suggested a cleanup standard of 50 mg/kg using a cap over residual soil contamination

Table 9
Comparison of Soil and Groundwater Maximum Concentrations to Upper Concentration Limits

Contaminant of Concern	Soil Upper Concentration Limit (S-UCL)	Soil Maximum Concentration	Does Maximun Concentration Exceed S-UCL?	Groundwater Upper Concentration Limit (G-UCL)	Groundwater Maximum Concentration	Does Maximun Concentration Exceed G-UCL? **
Polychlorinated biphenyls *	100	47.85	No			
Dioxin-Like PCBs *	5.E-04	5.85E-05	No			
Barium	10,000	410	No			
Chromium, as trivalent	10,000	78	No			
Lead	6,000	1,800	No			
Mercury	300	2.5	No			
Nickel	10,000	100	No			
Vanadium	7,000	47	No			
C19-C36 aliphatic hydrocarbons	20,000	610	No			
C11-C22 aromatic hydrocarbons	10,000	560	No			

Soil unit, milligram per kilogram (mg/kg)
Groundwater unit, micrograms per liter (μg/l)

* Excludes the three PCB hot spots of soil contamination, which will be excavated and removed from the Site.
All soil maximum soil concentrations for comparison to Upper Concentration Limits are provided in Table 6.4.

** See Tables 5.1 to 5.5 for comparison of maximum concentration detected of each groundwater contaminant of concern to its Groundwater Upper Concentration Limit. No contaminant of concern had a maximum concentration that exceeded its Upper Concentration Limit.

ATTACHMENT 1

Release Abatement Measure Status Report, Boott Mills, dated March 2014

GEC Project No. 911JR-3117

RELEASE ABATEMENT MEASURE (RAM) STATUS REPORT
EASTERN EXTERIOR COURTYARD

BOOTT MILLS
130 FOOT of JOHN STREET
LOWELL, MASSACHUSETTS
MADEP RTN: 3-26688

March 7, 2014

Prepared For:
Boott Mill Developer LLC
6 Faneuil Hall Marketplace
Boston, MA 02109

Submitted to:
Massachusetts Department of Environmental Protection
Northeast Regional Office
205 B Lowell Street
Wilmington, Massachusetts 01887

Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781)356-9140 Fax: (781)356-9147
info@goldmanenvironmental.com

TABLE OF CONTENTS

SECTION **PAGE**

1.0 INTRODUCTION.....1

2.0 SITE CONDITIONS AND SURROUNDING RECEPTORS 2

3.0 PRIOR SITE ACTIVITIES.....3

4.0 STATUS OF RAM RESPONSE ACTIONS.....6

5.0 SIGNIFICANT NEW SITE INFORMATION OR DATA 7

6.0 MANAGEMENT OF REMEDIATION WASTE, REMEDIAL WASTEWATER AND/OR REMEDIAL ADDITIVES.....8

7.0 OTHER INFORMATION REQUIRED BY MADEP OR EPA REGION 1 9

8.0 LSP OPINION (310 CMR 40.0445(2)(e)) 9

9.0 PUBLIC INVOLVEMENT.....10

FIGURES

Figure 1: Site Locus

Figure 2: MADEP Site Scoring Map

Figure 3: Site Plan

Figure 3A: Site Plan (Eastern Courtyard)

Figure 3B: Site Plan (Eastern Courtyard with Grid Overlay)

Figure 3C: Site Plan Showing Disposal Site Boundaries and Area Subject to AUL

Figure 4: Groundwater Contour Plan (Eastern Courtyard)

Figure 5A: Eastern Courtyard Plan, Soil PCB Concentrations-Discrete Samples

Figure 5B: Eastern Courtyard Plan, Soil PCB Concentrations- Composite Samples

Figure 5C: Eastern Courtyard Plan, Soil PCB Concentrations- Excavation Areas & Hot Spots

Figure 6A: Eastern Courtyard Plan, Soil Lead Concentrations- 0-3 Foot Interval

Figure 6B: Eastern Courtyard Plan, Soil Lead Concentrations- 3-7 Foot Interval

TABLE OF CONTENTS

(Continued)

TABLES

Table 1.1: Summary of Groundwater Analytical Data: EPH and VPH

Table 1.2: Summary of Groundwater Analytical Data: PAHs

Table 1.3: Summary of Groundwater Analytical Data: Metals

Table 1.4: Summary of Groundwater Analytical Data: PCBs

Table 1.5: Summary of Groundwater Analytical Data: VOCs

Table 2.1: Summary of Soil Analytical Data: EPH, TPH and PAHs

Table 2.2: Summary of Soil Analytical Data: PCBs

Table 2.3: Summary of Soil Analytical Data: Metals

Table 3: Summary of Soil Vapor Data: PCBs

Table 4: Groundwater Elevation Measurements

APPENDICES

Appendix A: GEC's Response to EPA's Comments

Appendix B: Proposed Soil Sampling Plan

1.0 INTRODUCTION

Goldman Environmental Consultants, Inc. (GEC) on behalf of Boott Mill Developer, LLC, the property owner, submits the following Release Abatement Measure (RAM) Status Report for the release of oil and hazardous materials (OHM) to soil located at 130 Foot of John Street in Lowell, Massachusetts. The release is mostly within two courtyards associated with 130 Foot of John Street. The eastern exterior courtyard is impacted by a release of polychlorinated biphenyls (PCBs) and lead. The western interior courtyard is impacted by a release of lead. The PCB release is assigned release tracking numbers (RTN) 3-26688, which is the primary RTN for the property. RTN 3-30667 is a secondary RTN linked to RTN 3-26688, and is associated with the lead release.

Initially a RAM Plan for both the eastern exterior courtyard and western interior courtyard was electronically submitted to the Massachusetts Department of Environmental Protection (MADEP) on August 2, 2012 and was mailed to Region 1 of the United States Environmental Protection Agency (EPA) on August 2, 2012. Following the submittal of the RAM Plan, subsurface investigations were conducted in both courtyards which were summarized in a RAM Status Report dated November 30, 2012 . Following the submittal of the November 30, 2012 RAM Status Report to MADEP, GEC submitted separate RAM Status Reports for the eastern exterior courtyard and for the western interior courtyards. On June 7, 2013 separate RAM Status Reports, dated June 6, 2013, were submitted to the MADEP. On August 30, 2013 a RAM Plan Modification and Application for Risk Based Cleanup of PCBs was submitted to MADEP and the EPA for the eastern exterior courtyard. On December 12, 2013 a RAM Completion Report was submitted to MADEP for the western interior courtyard. All RAM work associated with the western interior courtyard has been completed. This RAM Status Report pertains to the eastern exterior courtyard only and details activities conducted in association with the eastern exterior courtyard since the submittal of the RAM Modification Plan and Application for Risk Based Cleanup of PCBs submitted to MADEP and EPA on August 30, 2013.

Since submittal of the RAM Plan Modification and Application for Risk Based Cleanup of PCBs, no additional assessment activities have been conducted in the eastern exterior courtyard. The only activities that have been conducted in association with the eastern exterior courtyard are correspondences between EPA and GEC. This RAM Status Report documents the correspondences and additional proposed sampling, and is prepared compliant with 310 CMR 40.0445. This RAM Status Report has a submittal deadline of 6 months following submittal of the RAM Modification Plan submitted to MADEP on August 30, 2013 or on or about March 3, 2014.

Provided below are the following required elements of a RAM Status Report: (1) status of response operations; (2) any significant new site information or data; (3) details of and/or plans for the management of Remediation Waste, Remedial Wastewater and/or Remedial Additives; (4) any other information required by MADEP; and (5) an LSP Opinion regarding whether the RAM is being conducted in conformance with the RAM Plan and any conditions of approval specified by MADEP. Also included is a description of issues related to the planned remediation of the PCB-contaminated soils under both the MCP and TSCA standards.

2.0 SITE CONDITIONS AND SURROUNDING RECEPTORS

A detailed description of the Site conditions and surrounding receptors can be found in the *Phase I Initial Site Investigation (ISI) Report* prepared by GEC and dated April 11, 2012 for RTNs 3-26688 & 3-30667. Pertinent information obtained from the report is provided below.

The property is located at 130 Foot of John Street and consists of a 1.7-acre parcel that is occupied by three adjoining mill buildings identified as Mill buildings 3, 4, and 5. The longitude and latitude of 130 Foot of John Street, Lowell, MA are 42°38'54" north and 71°18'29" east/west. The Universal Transverse Mercator (UTM) coordinates are 310807 meters east and 4724354 meters north. Currently the property buildings contains 39 occupied residential condo units, 78 finished apartments, 6,000 square feet of occupied commercial space, and 37,000 square feet of unfinished commercial space. The current usage of the surrounding Mill buildings is mixed usage consisting of residential, office, commercial, museum and empty space

The Site Locus is provided as Figure 1. The MADEP Site Scoring Map, showing 500-foot and ½-mile radii, is provided as Figure 2. The Site Plan is provided as Figure 3. The eastern courtyard is depicted in Figure 3A and 3B. The Disposal Site Boundaries and Area to be subject to a Notice of Activity and Use Limitation (AUL) are depicted in Figure 3C.

No schools or day cares are known to be located within 500 feet of the property.

Institutions are defined at 310 CMR 40.0006 as any publicly or privately owned hospital, health care facility, orphanage, nursing home, convalescent home, educational facility or correctional facility, where such facility in whole or in part provides overnight housing. No institutions are known to be located within 500 feet of the property.

Natural resource areas include: (1) all surface waters, including wetlands, vernal pools, ponds, lakes, streams, rivers and reservoirs; (2) drinking water supplies consisting of Zone II areas, Interim Wellhead Protection Areas, Zone A areas, Potentially Productive Aquifers, and

private wells; (3) Areas of Critical Environmental Concern (ACEC); (4) Sole Source Aquifers; (5) local, state and/or federal protected open space; (6) fish habitats; and (7) habitats of Species of Special Concern or Threatened or Endangered Species.

The Merrimack River abuts the property to the north and the Merrimack Canal abuts the property to the west. Other canals located within ½-mile of the disposal site include, the Northern Canal, the Hamilton Canal, and the Eastern Canal. The Concord River is located approximately ½-mile southeast of the disposal site.

The Merrimack River generally flows from northwest to southeast in the vicinity of the property. In the vicinity of the disposal site, the Merrimack River is a Class B (Warm Water, Treated Water Supply, CSO) water body according to the Massachusetts Surface Water Quality Standards [314 CMR 4.00] for unlisted waters. Class B water bodies are designated as a habitat for fish, other aquatic life and wildlife, and for primary and secondary contact recreation. Class B (Warm Water) water bodies are subject to dissolved oxygen and temperature criteria for warm water fisheries. Class B (Treated Water Supply) water bodies denotes those Class B waters that are used as a source of public water supply after appropriate treatment. Class B (CSO) water bodies occasionally are subject to short-term impairment of swimming or other recreational uses due to untreated combined sewer overflow discharges in a typical year, and the aquatic life community may suffer adverse impact yet is still generally viable.

Based on a review of the MADEP Site Scoring Map (Figure 2), the disposal site is located within a 100-year flood plain. Other 100-year flood plains are located within ½-mile of the disposal site along the Merrimack River, the Eastern Canal, the Hamilton Canal and the Concord River. A Natural Heritage and Endangered Species Program (NHESP) estimated rare wetland habitat is located in the portion of the Merrimack River that abuts the property. Protected Open Spaces are located approximately 500-feet southeast, 500-feet north, ¼-mile southwest, ¼-mile southeast, ½-mile west, ½-mile southwest, ½-mile east and ½-mile north of the property.

The property and surrounding areas are serviced by the municipal potable water supply. Based on the MADEP Site scoring map, the property is not located within a potential or actual drinking water source area. No private water supply wells are located nearby.

3.0 PRIOR SITE ACTIVITIES

Based on the RAM Completion Report prepared by Environmental Compliance Services, Inc. (ECS), dated January 29, 2008, a release of PCBs was discovered in the eastern courtyard by

TRC Solutions, Inc. of Lowell, MA in November 2006. ECS, submitted a RAM Plan to the MADEP on December 8, 2006, that provided details on the planned excavation of PCB-contaminated soils. The presence of PCBs in soils at a concentration (22.73 mg/kg) greater than the applicable Reportable Concentration RCS-1 (2 mg/kg) was reported to the MADEP as a 120-day reportable condition on March 20, 2007. The PCB release condition was assigned RTN 3-26688.

Soil excavation was conducted on March 29 and 30, 2007 under the December 2006 RAM Plan. Excavated soils were directly loaded onto trucks and transported to Turnkey Landfill in Rochester, New Hampshire. A total of 209 tons of soil was transported off-site for disposal. On April 5, 2007, nine soil samples were collected from the sidewalls and bottom of the excavation for confirmatory analysis. PCB levels ranged from none detected to 6.15 mg/kg. Polycyclic aromatic hydrocarbons (PAHs) and lead were detected at levels above Method 1 S-1 standards. No separate release notification appears to have occurred for the PAHs and lead. On April 30, 2007, the excavation was backfilled with clean soils and gravel. ECS submitted a RAM Completion Report to the MADEP on January 29, 2008, on behalf of Boott Cotton Mill Development Corporation. A stormwater management system was installed in the excavated area subsequent to the RAM. Presumably no RAM Plan was needed because the work was done within the clean backfill.

The activities described above were conducted under a previous owner unrelated to Boott Mill Developer LLC, and prior to GEC's involvement at the site. To the best of our knowledge the USEPA was not notified of the PCB release, provided a copy of the RAM Plan prior to conducting RAM activities, or provided a copy of the RAM Completion Report (presumably because all concentrations of PCBs were detected below 50 mg/kg).

In February 2010 GEC was contracted by an entity interested in purchasing the property to conduct a due diligence Phase I Environmental Site Assessment (ESA) for the property. Subsequently, in June and September, 2011, due diligence subsurface investigations were conducted by GEC to evaluate the extent and magnitude of contamination across the Site. Subsurface investigations included: the advancement of thirteen test borings within both the exterior and enclosed courtyards, with seven completed as groundwater monitoring wells; the collection of soil samples from all thirteen borings; the collection of groundwater samples from the recently installed monitoring wells; the installation of two permanent soil vapor points (SVPs); and the collection of soil vapor samples from both SVPs. Soil and groundwater samples were submitted under chain of custody to either Groundwater Analytical, Inc. (GWA) of Buzzards Bay, Massachusetts, Con-Test Analytical Laboratory (Con-Test) of East Longmeadow,

Massachusetts, or Alpha Analytical, Inc. (Alpha) of Westborough, Massachusetts for laboratory analysis. GWA was a state-certified laboratory at the time of the June 2011 sampling, but currently is no longer in business. As a result the September 2011 samples were sent to Con-Test or Alpha; both labs are state-certified laboratories. Refer to Figures 3 and 3A for Site Plans depicting test boring and monitoring well locations. Groundwater analytical data are summarized in Tables 1.1 to 1.5; soil analytical data in Tables 2.1 to 2.3; and soil vapor analytical data in Table 3. Groundwater elevation measurements are provided in Table 4.

GEC's subsurface investigation within the eastern exterior courtyard found evidence of residual PCB contamination in soil above the applicable MADEP Method 1 S-1 Standard (2 mg/kg), with one soil sample containing PCB (124 mg/kg) at a level exceeding its MCP Upper Concentration Limit (UCL) (100 mg/kg) for soil and TSCA limit (50 mg/kg). The full extent of PCB contamination in soils, including whether the contamination extends beneath Mill buildings 3 or 5, was not known at the time the RAM Plan was submitted.

No PCBs were detected in any of the groundwater samples collected for dissolved PCB analysis. In addition, little or no volatile petroleum hydrocarbons (VPH) or volatile organic compounds (VOCs) were detected in the groundwater samples. Based on these results, PCBs, VOCs, and VPH in groundwater is not a significant issue. Insufficient VOCs and VPH are present in groundwater to result in the co-solution of PCBs in groundwater.

No PCBs were detected in the soil vapor samples. The sample detection limit for individual Aroclors ranged from 0.040 to 0.049 $\mu g/m^3$. A Residential Soil Vapor Screening Value was calculated using the PCB ambient air cancer risk concentration (0.01 $\mu g/m^3$) for a cancer risk of 1E-06, obtained from EPA's Integrated Risk Information System (IRIS), and a soil vapor to indoor air attenuation factor of 70, consistent with MADEP's Interim Final Vapor Intrusion Guidance document. The EPA derived the ambient air cancer risk concentration from the upper-bound cancer unit risk for inhalation of 1E-04 per $\mu g/m^3$, which is also provided in IRIS. The resulting Residential Soil Vapor Screening Value is 0.70 $\mu g/m^3$, which is far above the highest Aroclor detection limit for the soil vapor samples. Therefore, vapor intrusion of PCBs from the subsurface into indoor air of the mill buildings is unlikely to occur. This comparison is documented in Table 3.

For the eastern exterior courtyard, concentrations of lead in shallow soils (0-3 feet) collected from borings B-10, B-11, and B-12 exceed the MADEP's background concentrations for soils associated with fill containing coal ash or wood ash. The levels of lead also exceed the Method 1 S-1 soil standards.

For monitoring well GEC-1, located in the eastern exterior courtyard, total lead was detected (71 ug/l) above its Method 1 GW-3 standard (10 ug/l) in the sample collected on September 7, 2011. Yet, no dissolved lead was detected in the filtered sample collected at the same time from GEC-1, thereby suggesting that lead is adsorbed to soil particles and is not mobilized within the water column.

GEC's investigation in the eastern exterior courtyard also found levels of the following PAHs above their MADEP-published background concentrations and Method 1 S-1 soil standards: benzo[a]anthracene, benzo[b]fluoranthene, benzo[a]pyrene and dibenzo[a,h]anthracene. These exceedences were detected in samples obtained from soil recoveries that contained fly ash, coal, gasified coal and / or coal ash. The presence of PAHs is due at least in part to the presence of coal ash in the soils, which is a background condition; however, the transformer oil release may have contributed to the presence of PAHs in soils.

Chromium was detected in one soil sample and nickel in two soil samples at levels greater than their Method 1 S-1 standards and slightly greater than background concentrations. The presence of chromium and nickel may be attributable to the observed presence of coal ash, fly ash and coal in the fill, and/or to historic industrial operations at the subject property.

The Phase I ISI Report was submitted to the MADEP in April 2012. All work not described in the Phase I ISI Report was conducted as a RAM and has been summarized in the RAM Plan, dated August 2, 2012, RAM Status Reports, dated November 30, 2012 and June 6, 2013 and the RAM Plan Modification and Application for Risk-Based Cleanup of PCBs, dated August 27, 2013. Refer to Figures 5A and 5B for a depiction of PCB concentrations detected in soils in the eastern courtyard, in discrete samples and composite samples, respectively. Refer to Figures 6A and 6B for a depiction of lead concentrations detected in soils in the eastern courtyard, in the 0-3 foot interval and in the 3-7 foot interval, respectively. Refer to Figure 5C for the locations of identified hot spots and for the extents of proposed soil excavations.

4.0 STATUS OF RAM RESPONSE ACTIONS

The original RAM Plan, dated August 2, 2012, had three general objectives: (1) conduct additional subsurface investigations within the eastern courtyard of the Site to address data gaps and more accurately determine the horizontal and vertical extent of PCB and lead contamination; (2) conduct soil removal activities, if appropriate, to reduce the concentration of PCB and lead in soils to applicable MCP and TSCA standards; and (3) properly dispose of contaminated soils in accordance with applicable state and federal requirements. The RAM Plan Modification Report and Application for Risk-Based Cleanup of PCBs, dated August 27, 2013 was submitted to

modify objectives 2 and 3 to include specifics about soil excavation locations and extents and to provide details about soil removal and disposal.

Since the submittal of the RAM Plan Modification Report and Application for Risk-Based Cleanup of PCBs, dated August 27, 2013, GEC received comments back from EPA in a letter dated, October 22, 2013. GEC responded to EPA's comments in a letter dated, December 20, 2013, included as Appendix A. It is unclear when EPA will be able to review and comment on our response letter. As a result, additional subsurface investigations commenced on March 4, 2014 as outlined in GEC's response letter to EPA.

To satisfy EPA's concerns GEC proposed to conduct additional soil sampling through the installation of additional soil borings under Objective 1. A table outlining the proposed soil borings and sample collection and a figure of the proposed soil boring locations is attached in Appendix B. This soil sampling program includes the installation of 24 soil borings and the collection of 59 soil samples for Aroclor PCB analysis and the collection of 8 soil samples for PCB Congener analysis. This soil sampling program is scheduled to be completed by March 5, 2014.

Following the completion of the March 2014 soil sampling program, the data will be re-evaluated and Objectives 2 and/or 3 of the RAM Plan Modification Report and Application for Risk-Based Cleanup of PCBs, dated August 27, 2013 will be modified if needed.

5.0 SIGNIFICANT NEW SITE INFORMATION OR DATA

5.1 New Property Ownership

The ownership of the property was transferred from Boott Properties LLC to Boott Mill Developer LLC on September 27, 2012. Responsibility for the RAM and further response actions under the MCP and TSCA were transferred to the new owner through a Tier II Transfer Submittal that became effective on January 17, 2013, 45 days after it was submitted to MADEP. The contact information for the new owner is provided below:

Boott Mill Developer LLC
Attn: Gilbert Winn, Exec. VP, Boott II Winn LLC, Manager, Boott Mill Developer, LLC
Six Faneuil Hall Marketplace
Boston, MA 02109
Tel 617-742-4500

5.2 Analytical data

No new PCB data is available at the time of this submittal or since the submittal of the RAM Plan Modification Report and Application for Risk-Based Cleanup of PCBs, dated August 27, 2013.

Following the collection of the proposed soil samples presented in Appendix B, the new soil data collected for the Site will be evaluated and used to determine if the soil volumes to be remediated and presented in the RAM Plan Modification Report and Application for Risk-Based Cleanup of PCBs, dated August 27, 2013 need to be adjusted. Should it be determined that the soil volumes require adjustment, the modifications will be documented in a RAM Plan Modification for submittal to MADEP and EPA Region 1.

5.3 TSCA Issues

For the eastern courtyard, within the RAM Plan, the planned method of cleanup under TSCA was identified as self-implementing [40 CFR 761.61(a)]. Due to the presence of numerous subsurface utilities in the eastern courtyard and the potential difficulty in installing a TSCA cap [see 40 CFR 761.61(a)(4)(i)(A) as specified at 40 CFR 40.761(a)(7)], in place of the self-implementing method the TSCA risk-based cleanup method [40 CFR 761.61(c)] has been chosen.

A risk assessment was conducted to determine baseline risk; to develop cleanup standards for PCBs and lead; and to identify and determine the volumes of soils to be excavated. The risk assessment conducted and the cleanup goals developed also meet the requirements of the MCP [310 CMR 40.0000]. The risk assessment was provided in the RAM Plan Modification Report and Application for Risk-Based Cleanup of PCBs, dated August 27, 2013. The risk assessment will be modified, if necessary, based on the results of the ongoing assessment.

6.0 MANAGEMENT OF REMEDIATION WASTE, REMEDIAL WASTEWATER AND / OR REMEDIAL ADDITIVES

To date, no soil excavation has been conducted, which would result in remediation waste. The location and depth of planned soil excavation have been identified and were presented in the RAM Plan Modification Report and Application for Risk-Based Cleanup of PCBs, dated August 27, 2013. Should the extents of the planned soil excavations change after data collected during the March 2014 sampling event, a RAM Plan Modification will be completed.

Tentatively, soils excavated from Excavation # 1 will be live loaded and transported to and disposed at Waste Management Model City, Model City, New York (PCB concentrations > 50 ppm). Tentatively, soils excavated from Excavation #2 and Excavation #3 will be live loaded and transported to and disposed at Turnkey Landfill, Rochester, New Hampshire (PCB concentrations < 50 ppm). Upon EPA's approval to conduct the excavations, GEC will seek final approval from the disposal facilities identified above for soil disposal.

The depth to groundwater is approximately eleven feet or more below grade (Table 4) in the eastern courtyard. Soil excavation will not extend to this depth. Therefore, dewatering of the excavation is unlikely to be needed and remedial wastewater is unlikely to be generated. The use of remedial additives is not planned for this RAM.

7.0 OTHER INFORMATION REQUIRED BY MADEP OR EPA REGION 1

No other information is required by MADEP or EPA Region 1 for this RAM Status Report.

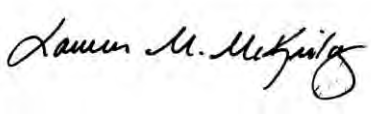
8.0 LISCENSED SITE PROFESSIONAL OPINION (310 CMR 40.0445(2)(e))

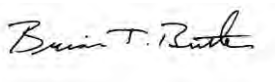
This RAM Status Report has been prepared in accordance with 310 CMR 40.0445 and under the oversight of Brian T. Butler, LSP 5736, of Goldman Environmental Consultants, Inc. To date, the RAM has been conducted in accordance with objective 1 of the RAM Plan, additional subsurface investigations, with the possible exception of this status report being a day or two late. Neither MADEP nor EPA Region 1 provided any conditions of approval for this RAM.

9.0 PUBLIC INVOLVEMENT

There are no specific public notification requirements relative to this RAM Status Report under either TSCA or the MCP.

Respectfully submitted,
Goldman Environmental Consultants, Inc.





Lauren M. McKinlay
Project Manager/Geologist

Brian T. Butler, LSP
Senior V. P., Operations

P:\Projects\911-Winn Management\911-3117 Boott Mills\RAM SR March 2014\RAM Status Report Exterior Courtyard March 2014 Final.doc

FIGURES

USGS 7.5 Minute Topographic

Lowell
Massachusetts Quadrangle

Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781)356-9140 Fax: (781)356-9147
www.goldmanenvironmental.com

SITE LOCUS

Boott Mills
130 Foot of John Street,
Lowell, Massachusetts

GEC Project #: 1717-2030

Figure 1

Scale
1 : 25,000

N

MassDEP - Bureau of Waste Site Cleanup

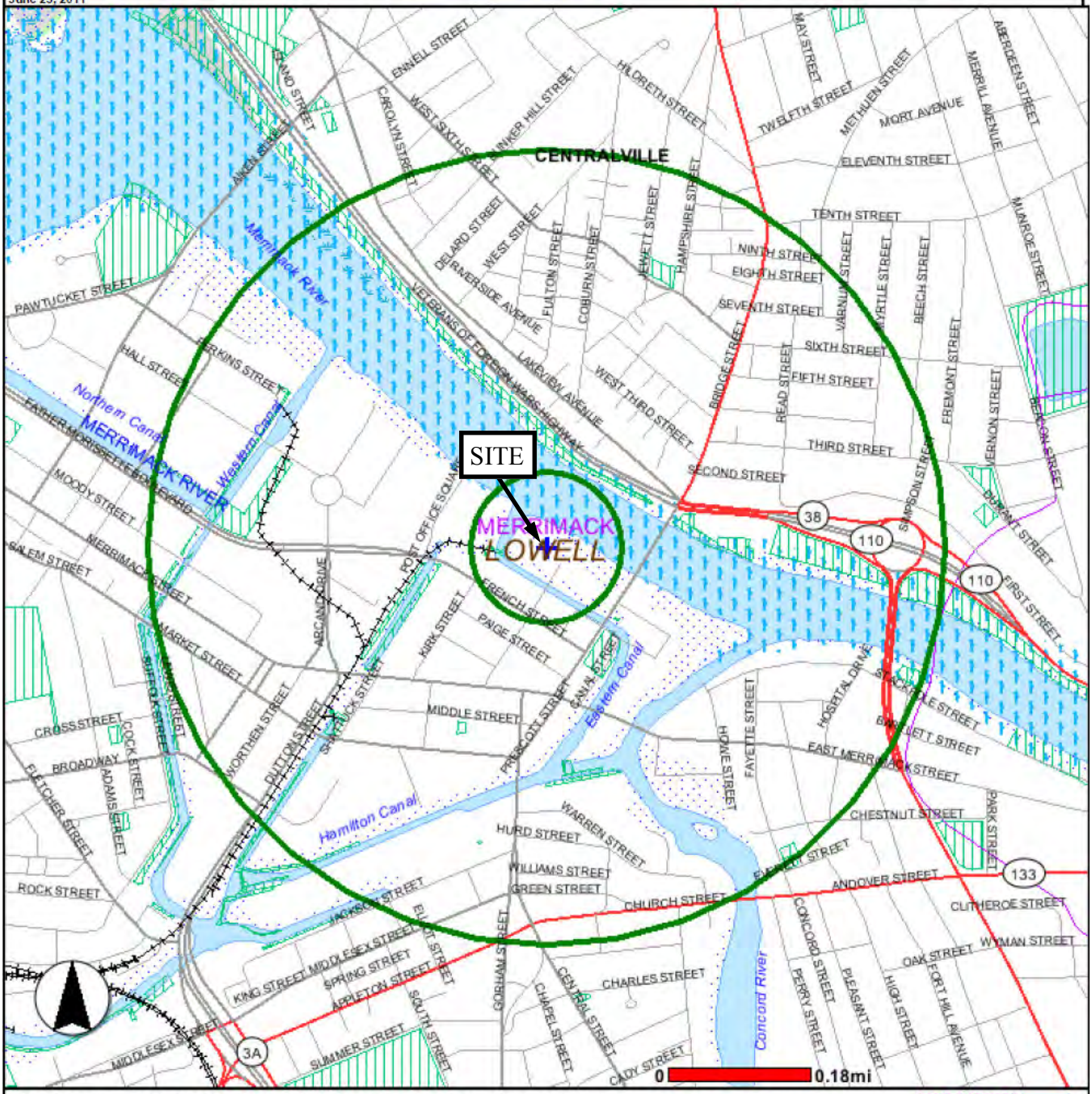
MCP Numerical Ranking System Map: 500 feet & 0.5 Mile Radii

Site Name:
Boott Mills Development
130 Foot of John Street
Lowell, MA
RTN:
NAD83 MA Coordinates:
215766mE, 933083mN

June 23, 2011

The information shown on this map is the best available at the date of printing. For more information please refer to www.mass.gov/mgis/massgis.htm

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, Sub; 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
NHESP: Est Rare Weland Habitat, Certified Vernal Pool
DEP Permitted Solid Waste Landfill

GEC
Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781)356-9140 Fax: (781)356-9147
www.goldmanenvironmental.com

Boott Mills
130 Foot of John Street
Lowell, MA

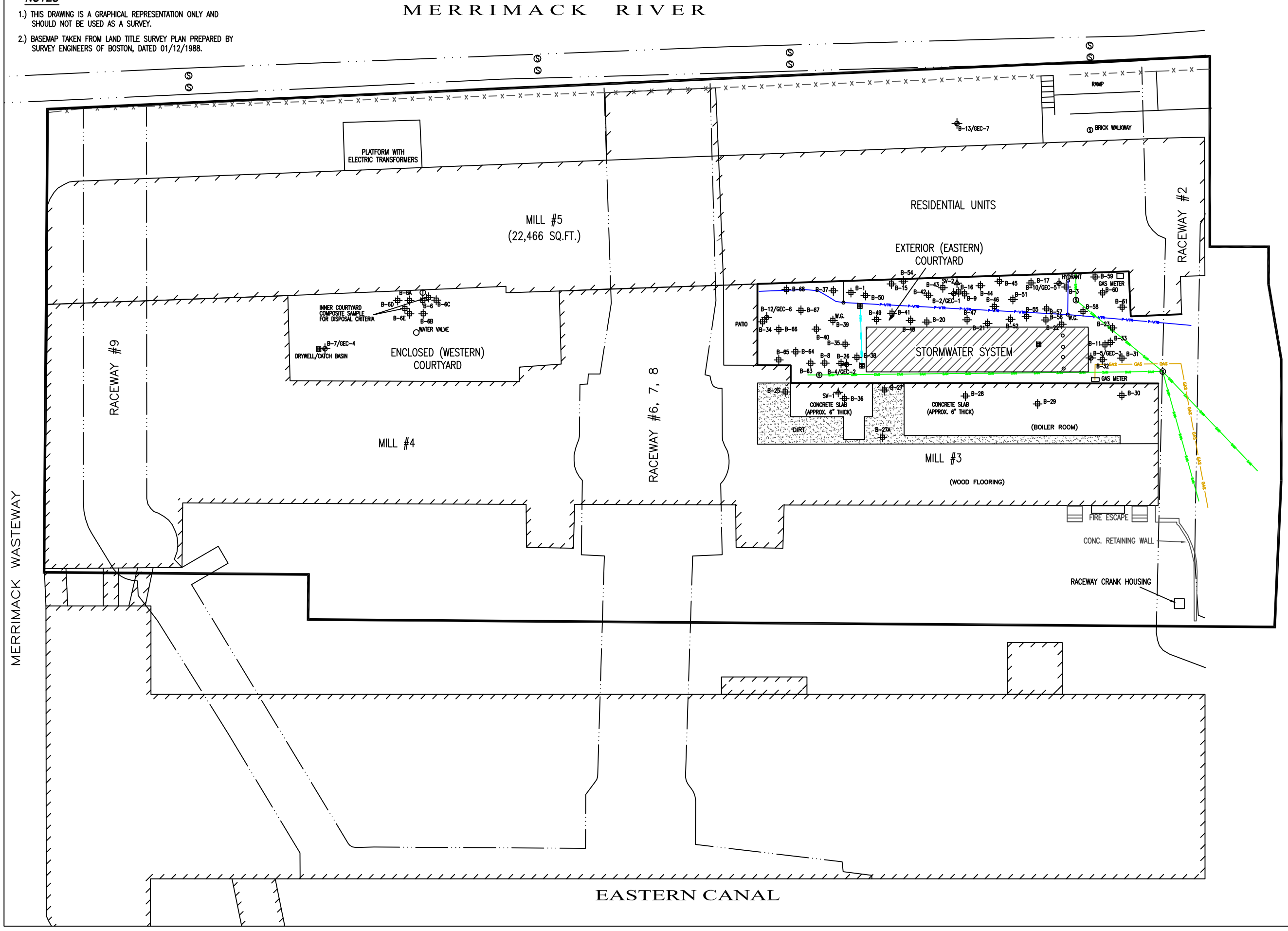
GEC Project #: 1717-2030

Figure 2

NOTES

1.) THIS DRAWING IS A GRAPHICAL REPRESENTATION ONLY AND SHOULD NOT BE USED AS A SURVEY.

2.) BASEMAP TAKEN FROM LAND TITLE SURVEY PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON, DATED 01/12/1988.



Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Soil Boring/ Monitoring Well
- Soil Boring
- Catch Basin
- Wall–Mounted Transformer
- Soil Vapor Point

Site Plan

Boott Mills
130 John Street
Lowell, Massachusetts

GEC Project Number 911-3117
GEC File Number 052913A

FIGURE 3

SCALE
0 20' 40'

N

NOTES

1.) THIS DRAWING IS A GRAPHICAL REPRESENTATION ONLY AND SHOULD NOT BE USED AS A SURVEY.

2.) BASEMAP TAKEN FROM LAND TITLE SURVEY PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON, DATED 01/12/1988.

RESIDENTIAL UNITS

EXTERIOR (EASTERN) COURTYARD

RACEWAY #2

RACEWAY #6, 7, 8

PATIO

STORMWATER SYSTEM

B-54 B-15 B-43 SV-2 B-16 B-45 B-17 B-10/GEC-5 HYDRANT B-59 GAS METER B-60 B-61 B-68 B-37 B-1 B-50 B-42 B-2/GEC-1 B-9 B-44 B-46 B-51 B-3 B-58 B-12/GEC-6 B-67 W.G. B-49 B-41 B-48 B-20 B-47 B-55 B-57 B-56 W.G. B-39 B-34 B-66 B-21 B-52 B-22 B-23 B-40 B-33 B-35 B-11 B-65 B-64 B-8 B-26 B-38 B-5/GEC-3 B-31 B-63 B-4/GEC-2 B-32 GAS METER

B-25 SV-1 B-36 CONCRETE SLAB (APPROX. 6" THICK) B-27 B-28 CONCRETE SLAB (APPROX. 6" THICK) B-29 B-30 DIRT B-27A (BOILER ROOM)

MILL #3

(WOOD FLOORING)

FIRE ESCAPE

CONC. RETAINING WALL

RACEWAY CRANK HOUSING

Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Soil Boring/ Monitoring Well
- Soil Boring
- Catch Basin
- Wall–Mounted Transformer
- Soil Vapor Point

Site Plan
(Eastern Courtyard)

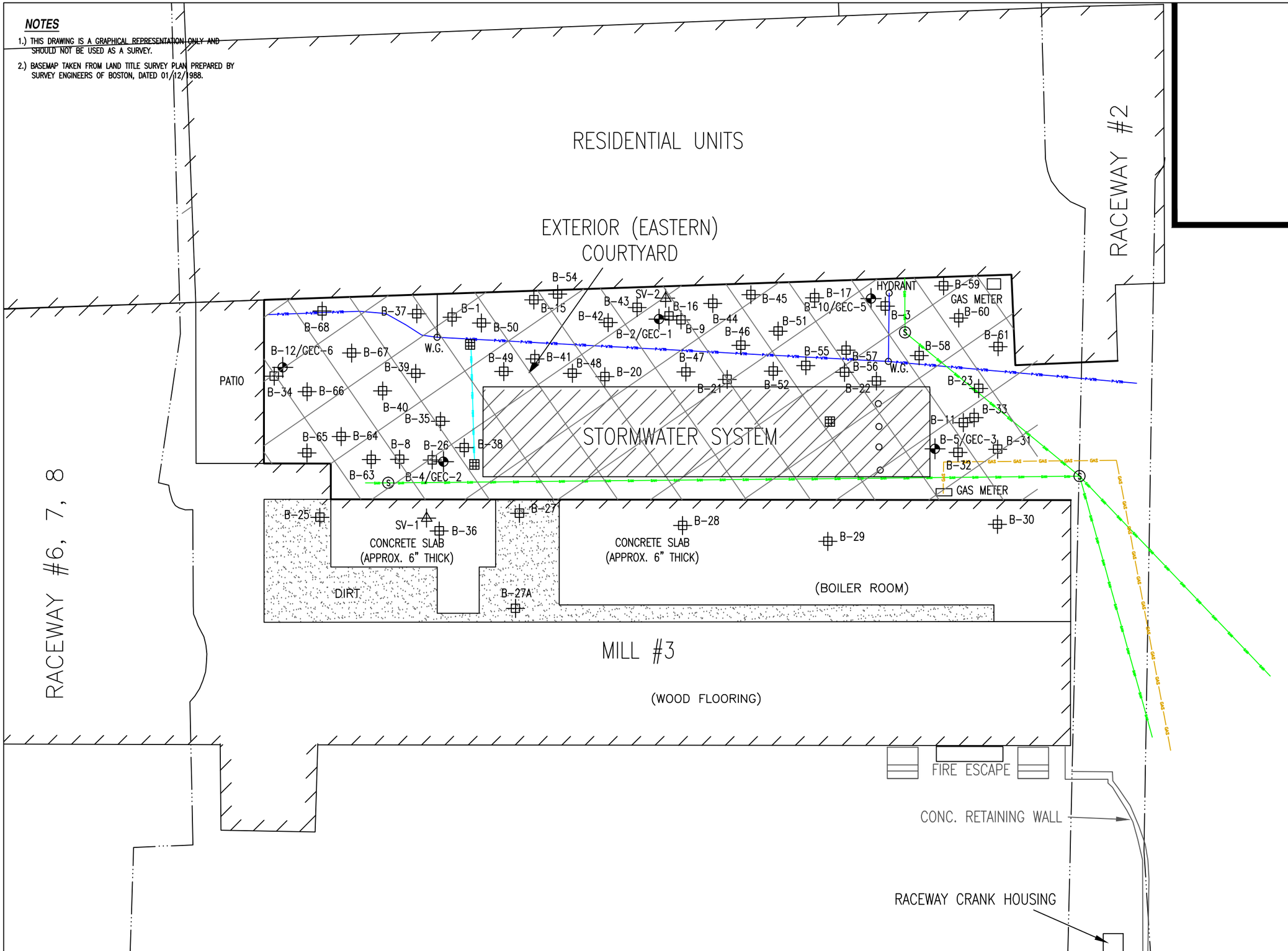
Boott Mills
130 John Street
Lowell, Massachusetts

GEC Project Number 911-3117
GEC File Number 081413A

FIGURE 3A

SCALE 0 10' 20'

N



GEC

Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Soil Boring/ Monitoring Well
- Soil Boring
- Catch Basin
- Wall-Mounted Transformer
- Soil Vapor Point

Site Plan
(Eastern Courtyard with Grid Overlay)

Boott Mills
130 John Street
Lowell, Massachusetts

GEC Project Number 911-3117
GEC File Number 081413A

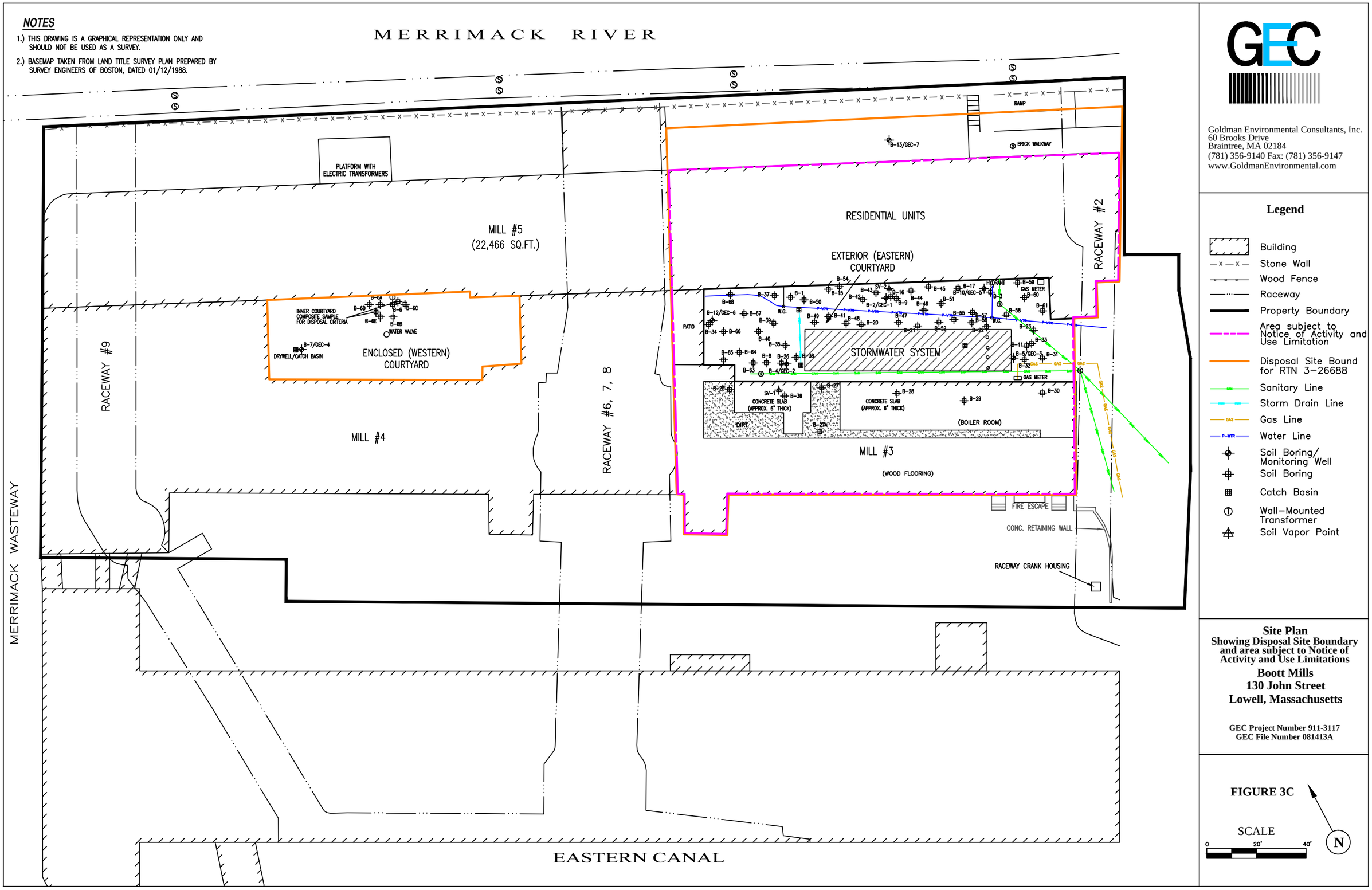
FIGURE 3B

SCALE
0 10' 20'
N

NOTES

1.) THIS DRAWING IS A GRAPHICAL REPRESENTATION ONLY AND SHOULD NOT BE USED AS A SURVEY.

2.) BASEMAP TAKEN FROM LAND TITLE SURVEY PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON, DATED 01/12/1988.



Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

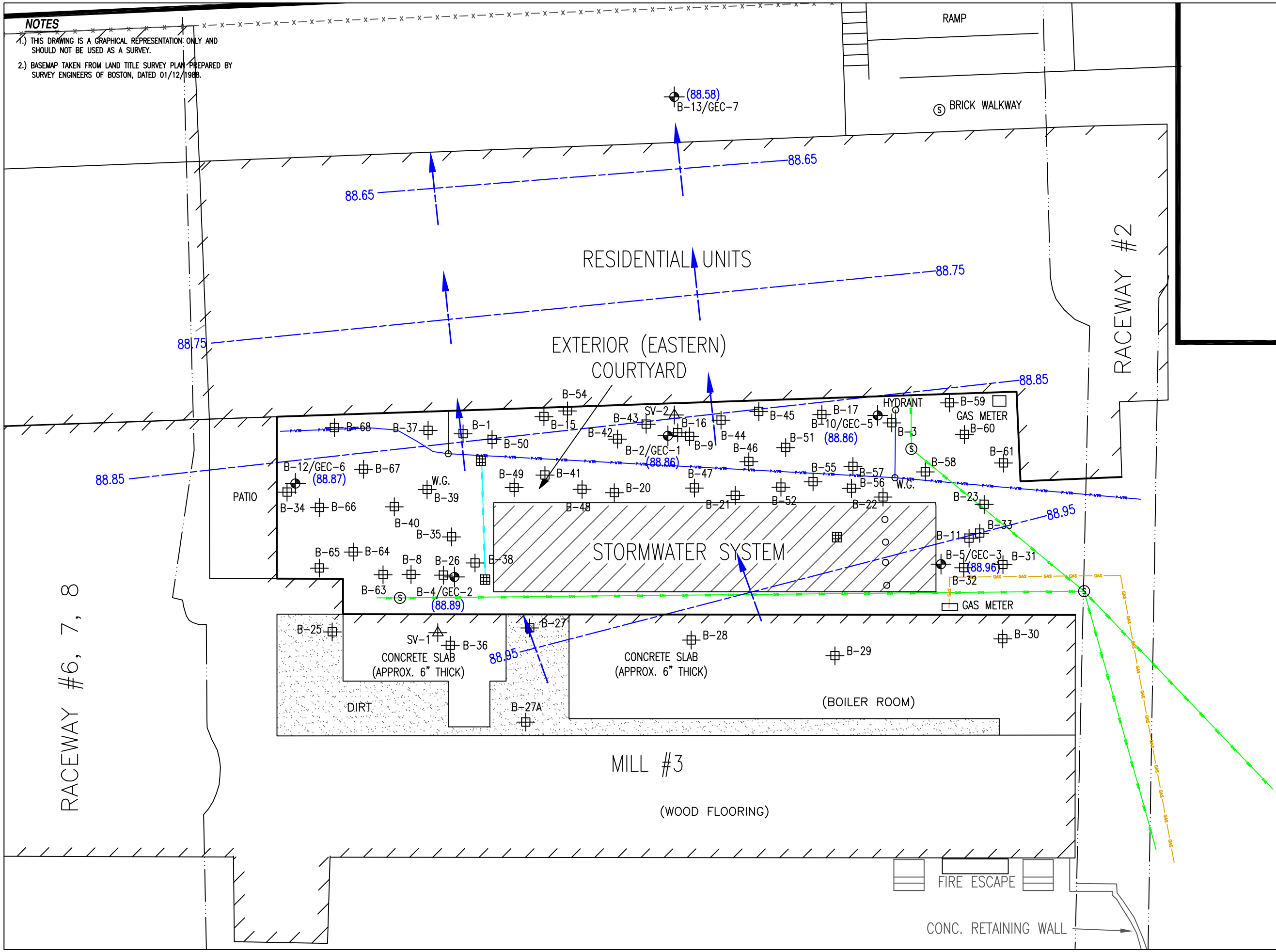
- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Area subject to Notice of Activity and Use Limitation
- Disposal Site Bound for RTN 3-26688
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Soil Boring/ Monitoring Well
- Soil Boring
- Catch Basin
- Wall-Mounted Transformer
- Soil Vapor Point

Site Plan
Showing Disposal Site Boundary and area subject to Notice of Activity and Use Limitations
Boott Mills
130 John Street
Lowell, Massachusetts

GEC Project Number 911-3117
GEC File Number 081413A

FIGURE 3C

SCALE
0 20' 40'
N



GEC

Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Groundwater Contour
- Groundwater Flow
- (88.96) Groundwater Elevation
- Soil Boring/ Monitoring Well
- Soil Boring
- Catch Basin
- Wall-Mounted Transformer
- Soil Vapor Point

Groundwater Contour Plan
(Eastern Courtyard)

Boott Mills
John Street
Lowell, Massachusetts

GEC Project Number 911-3117
GEC File Number 052913A

FIGURE 4

SCALE
0 10' 20'
N

NOTES

1.) THIS DRAWING IS A GRAPHICAL REPRESENTATION ONLY AND SHOULD NOT BE USED AS A SURVEY.

2.) BASEMAP TAKEN FROM LAND TITLE SURVEY PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON, DATED 01/12/1988.

RESIDENTIAL UNITS

EXTERIOR (EASTERN) COURTYARD

RACEWAY #2

RACEWAY #6, 7, 8

STORMWATER SYSTEM

MILL #3

(WOOD FLOORING)

PATIO

DIRT

CONCRETE SLAB (APPROX. 6" THICK)

CONCRETE SLAB (APPROX. 6" THICK)

(BOILER ROOM)

FIRE ESCAPE

CONC. RETAINING WALL

RACEWAY CRANK HOUSING

HYDRANT

GAS METER

GAS METER

W.G.

W.G.

B-68 B-12/GEC-6 B-67 B-34 B-66 B-65 B-64 B-63 B-4/GEC-2 B-25 B-37 B-1 B-50 B-39 B-49 B-40 B-35 B-8 B-26 B-38 B-54 B-15 B-43 B-42 B-2/GEC-1 B-41 B-48 B-20 B-47 B-9 B-16 SV-2 B-44 B-46 B-45 B-51 B-17 10/GEC-5 B-3 B-59 B-60 B-61 B-58 B-55 B-57 B-56 B-52 B-21 B-22 B-23 B-33 B-11 B-5/GEC-3 B-31 B-32 B-30 B-29 B-28 B-27 B-27A B-36 SV-1

1–5' 1.1
10–15' BRL

0–3' 1.1

0–3' 36
3–9' 5.6

1–5' 31
10–15' 4.1

1–5' 15
3–5' 7.6
7–9' 4.2
9–12' 2.7

0–1' BRL
1–3' 8.21

0–3' BRL
3–5' BRL
5–7' BRL

0–3' 3.32
3–6' 0.904

0–3' 0.25
3–6' BRL

3–5' BRL

0–3' BRL

0–3' 9.8
3–5' 11.4
5–7' BRL

0–3' 0.42
3–9' 0.25

0–3' 18.7
3–9' BRL

0–3' 1.84
3–9' BRL

3–5' 0.85
5–7' 1.66

0–3' 6.2
3–5' 1.13

0–3' 3.0
3–5' 17.3

0–4' 37
9–12' BRL

3–5' 2.8
5–7' BRL

0–3' 11.19
3–6' BRL

10–15' BRL

0–3' 0.27
3–5' BRL

0–3' BRL
3–5' BRL

2–5' 124
12–15' BRL

2–5' 32
5–7' 26
7–9' 3.0

0–3' BRL
3–5' 0.19
5–7' BRL

0–1' 0.268
1–3' BRL
0–3' 0.0899
5–10' BRL

0–3' 0.18
3–5' BRL

0–3' BRL
7–9' 0.40

0–3' BRL

0–3' BRL
3–5' BRL
5–6' BRL

0–3' 0.42

0–3' BRL
3–5' 0.38
5–7' 0.39

Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Site Boundary
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Soil Boring/ Monitoring Well
- Soil Boring
- Catch Basin
- Wall–Mounted Transformer
- Soil Vapor Point
- 0–3' Sample Depth (in ft)
- 3.32 PCB Concentration (mg/kg)
- 31 Concentration above 10 mg/kg
- BRL Below Recordable Limit

Eastern Courtyard Plan
Soil PCB Concentrations
Discrete Samples

Boott Mills
130 John Street
Lowell, Massachusetts

GEC Project Number 911-3117
GEC File Number 070813A

FIGURE 5A

SCALE
0 10' 20'

N

NOTES

1.) THIS DRAWING IS A GRAPHICAL REPRESENTATION ONLY AND SHOULD NOT BE USED AS A SURVEY.

2.) BASEMAP TAKEN FROM LAND TITLE SURVEY PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON, DATED 01/12/1988.

RESIDENTIAL UNITS

RACEWAY #2

RACEWAY #6, 7, 8

EXTERIOR (EASTERN) COURTYARD

COMPOSITE 1
0–5' 7.7

COMPOSITE 2
0–5' 0.89

COMPOSITE 3
0–3' 0.40
3–9' BRL

COMPOSITE 4
0–3' 16.7
3–9' 1.31

COMPOSITE 5
0–3' 2.01
3–9' BRL

COMPOSITE 6
0–3' 3.9
3–9' BRL

STORMWATER SYSTEM

PATIO

HYDRANT

GAS METER

W.G.

CONCRETE SLAB
(APPROX. 6" THICK)

DIRT

(BOILER ROOM)

MILL #3

(WOOD FLOORING)

FIRE ESCAPE

CONC. RETAINING WALL

RACEWAY CRANK HOUSING

Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Site Boundary
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Soil Boring/ Monitoring Well
- Soil Boring
- Catch Basin
- Wall–Mounted Transformer
- Soil Vapor Point
- 3–5' Sample Depth (in ft)
- 0.40 PCB Concentration (mg/kg)
- 31 Concentration above 10 mg/kg
- BRL Below Recordable Limit

Eastern Courtyard Plan
Soil PCB Concentrations
Composite Samples

Boott Mills
130 John Street
Lowell, Massachusetts

GEC Project Number 911-3117
GEC File Number 070813A

FIGURE 5B

SCALE
0 10' 20'

N

NOTES

1.) THIS DRAWING IS A GRAPHICAL REPRESENTATION ONLY AND SHOULD NOT BE USED AS A SURVEY.

2.) BASEMAP TAKEN FROM LAND TITLE SURVEY PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON, DATED 01/12/1988.

RESIDENTIAL UNITS

RACEWAY #2

RACEWAY #6, 7, 8

EXTERIOR (EASTERN) COURTYARD

B-15 0-5' 10.44
B-48 0-3' 1.84
B-20 3-5' 0.85
B-2 1-5' 314
B-41 0-5' 7.7
B-42 0-5' 7.7
B-43 0-5' 7.7
B-54 0-5' 7.7
X̄=9.37

B-37 0-3' 1.1
B-1 0-5' 1.1
B-50 0-3' 36
B-39 0-3' 0.42
B-49 0-3' 18.7
X̄=11.464

EXCAVATION #2
EXCAVATE 0-5'

HOT SPOT #2

EXCAVATION #3
EXCAVATE 0-5'

X̄=0.9

X̄=27

PATIO

STORMWATER SYSTEM

HOT SPOT #1

HYDRANT

GAS METER

W.G.

SV-1

SV-2

CONCRETE SLAB (APPROX. 6" THICK)

CONCRETE SLAB (APPROX. 6" THICK)

EXCAVATION #1
EXCAVATE 0-9'

DIRT

(BOILER ROOM)

MILL #3

(WOOD FLOORING)

FIRE ESCAPE

CONC. RETAINING WALL

RACEWAY CRANK HOUSING

Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Soil Boring/ Monitoring Well
- Soil Boring
- Catch Basin
- Wall-Mounted Transformer
- Soil Vapor Point
- 3-5' Sample Depth (in ft)
- 0.40 PCB Concentration (mg/kg)
- Concentration above 10 mg/kg
- BRL Below Recordable Limit
- X̄ Average PCB concentration (mg/kg)

Eastern Courtyard Plan
Soil PCB Concentrations
Excavation Areas & Hot Spots

Boott Mills
130 John Street
Lowell, Massachusetts

GEC Project Number 911-3117
GEC File Number 081413A

FIGURE 5C

SCALE
0 10' 20'

N

NOTES

1.) THIS DRAWING IS A GRAPHICAL REPRESENTATION ONLY AND SHOULD NOT BE USED AS A SURVEY.

2.) BASEMAP TAKEN FROM LAND TITLE SURVEY PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON, DATED 01/12/1988.

RESIDENTIAL UNITS

EXTERIOR (EASTERN) COURTYARD

RACEWAY #2

RACEWAY #6, 7, 8

PATIO

STORMWATER SYSTEM

CONCRETE SLAB (APPROX. 6" THICK)

DIRT

CONCRETE SLAB (APPROX. 6" THICK)

(BOILER ROOM)

MILL #3

(WOOD FLOORING)

FIRE ESCAPE

CONC. RETAINING WALL

RACEWAY CRANK HOUSING

GAS METER

GAS METER

HYDRANT

W.G.

W.G.

B-37 B-1 1-5' 95 B-15 SV-2 1-5' 290 B-2/GEC-1 B-16 B-9 0-3' 90 0-3' 7.9 1-5' 340 0-3' 220 B-17 B-10/GEC-5 0-3' 1,400 B-3

0-3' 620 B-12/GEC-6 B-34 0-3' 860

B-20 B-21 0-3' 150 B-22 0-3' 170 B-23 0-3' 55

B-35 0-3' 170 B-8 B-26 2-5' 170 B-4/GEC-2 2-5' 530

0-3' 1,800 B-11 B-33 0-3' 460 B-5/GEC-3 B-31 0-3' 120 B-32 0-3' 200

B-25 SV-1 B-36 B-27 B-27A B-28 B-29 0-3' 23 B-30

	Building
—x—x—	Stone Wall
—o—o—	Wood Fence
	Raceway
	Property Boundary
	Site Boundary
SAN	Sanitary Line
	Storm Drain Line
GAS	Gas Line
P-WTR	Water Line
	Soil Boring/ Monitoring Well
	Soil Boring
	Catch Basin
T	Wall-Mounted Transformer
	Soil Vapor Point
0-3'	Sample Depth (in ft)
120	Lead Concentration (mg/kg)
ND	Non Detect

Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

Eastern Courtyard Plan
Soil Lead Concentrations
0-3 Foot Interval

Boott Mills
130 John Street
Lowell, Massachusetts

GEC Project Number 1717-2040
GEC File Number 112012B

FIGURE 6A

SCALE 0 10' 20'

N

NOTES

1.) THIS DRAWING IS A GRAPHICAL REPRESENTATION ONLY AND SHOULD NOT BE USED AS A SURVEY.

2.) BASEMAP TAKEN FROM LAND TITLE SURVEY PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON, DATED 01/12/1988.

RESIDENTIAL UNITS

EXTERIOR (EASTERN) COURTYARD

RACEWAY #2

RACEWAY #6, 7, 8

PATIO

STORMWATER SYSTEM

CONCRETE SLAB (APPROX. 6" THICK)

DIRT

CONCRETE SLAB (APPROX. 6" THICK)

(BOILER ROOM)

MILL #3

(WOOD FLOORING)

FIRE ESCAPE

CONC. RETAINING WALL

RACEWAY CRANK HOUSING

GAS METER

HYDRANT

W.G.

B-1 B-2/GEC-1 B-3 B-4/GEC-2 B-5/GEC-3 B-6 B-7 B-8 B-9 B-10/GEC-5 B-11 B-12/GEC-6 B-15 B-16 B-17 B-20 B-21 B-22 B-23 B-25 B-26 B-27 B-27A B-28 B-29 B-30 B-31 B-32 B-33 B-34 B-35 B-36 B-37

SV-1 SV-2

3-5' 19
5-7' 110
3-5' 800
3-5' 130
3-5' 200
3-5' 17
3-5' 21
2-5' 170
3-5' 4.6
3-5' 16
3-4.5' 24

Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Site Boundary
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Soil Boring/ Monitoring Well
- Soil Boring
- Catch Basin
- Wall–Mounted Transformer
- Soil Vapor Point
- 3–5' Sample Depth (in ft)
- 16 Lead Concentration (mg/kg)
- ND Non Detect

Eastern Courtyard Plan
Soil Lead Concentrations
3-7 Foot Interval

Boott Mills
130 John Street
Lowell, Massachusetts

GEC Project Number 1717-2040
GEC File Number 112012B

FIGURE 6B

SCALE 0 10' 20'

N

TABLES

TABLE 1.1
SUMMARY OF GROUNDWATER ANALYTICAL DATA:
MADEP EPH AND VPH
BOOTT MILLS
130 Foot of John Street, Lowell, MA

(unit, parts per billion [ppb], ug/L)

Sample Identification	Sample Date	Analytical Method	n-C19 to n-C36 Aliphatic Hydrocarbons	RDL	n-C11 to n-C22 Aromatic Hydrocarbons	RDL
GEC-1	06/15/2011	MA DEP EPH	190	110	160	110
	10/22/2012	MA DEP EPH	BRL	100	BRL	100
	10/22/2012 *	MA DEP EPH	BRL	110	BRL	110
GEC-2	06/15/2011	MA DEP EPH	150	110	130	110
	10/22/2012	MA DEP EPH	BRL	100	BRL	100
	10/22/2012 **	MA DEP EPH	BRL	130	BRL	130
GEC-3	06/15/2011	MA DEP EPH	BRL	110	BRL	110
GEC-4	06/15/2011	MA DEP EPH	BRL	120	BRL	120
Selected Groundwater Standards						
		MA GW-2	NA		50,000	
		MA GW-3	50,000		5,000	
		Surface Water Benchmark	2,100		5	

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

Bold = Exceeds One or More Selected Standards

- On 9/12/2011, groundwater samples were collected from GEC-2 and GEC-6 for analysis of VPH via MADEP's Method. No VPH constituents were detected in either sample.
- On 9/7/2011, a groundwater sample was collected from GEC-1 for analysis of VPH via MADEP's Method; however due to the closure of the original receiving laboratory the sample was lost during the transfer of samples to Alpha Analytical. No VPH data from GEC-1 is available.

* Sample was field filtered prior to laboratory analysis.

** Sample was laboratory filtered prior to laboratory analysis.

Prepared By: MDW
Reviewed By: EAF
Revision Date: 11/13/2012

TABLE 1.2
SUMMARY OF GROUNDWATER ANALYTICAL DATA:
PAHs
BOOTT MILLS
130 Foot of John Street, Lowell, MA

(unit, parts per billion [ppb], ug/L)

Sample Identification	Sample Date	Analytical Method	Phenanthrene	RDL	Fluoranthene	RDL	Pyrene	RDL	Benzo[a]anthracene	RDL	Chrysene	RDL
GEC-1	06/15/2011	EPA 8270C Mod	1.1	0.60	2.1	0.60	2.0	0.60	1.0	0.10	0.90	0.10
	9/7/2011	EPA 8270C Mod	BRL	0.20	0.25	0.20	0.24	0.20	BRL	0.20	BRL	0.20
	9/7/2011 *	EPA 8270C Mod	BRL	0.20	BRL	0.20	BRL	0.20	BRL	0.20	BRL	0.20
	10/22/2012	EPA 8270D	NA		NA		NA		0.18	0.050	BRL	0.20
	10/22/2012	MADEP-EPH-04-1.1	BRL	2.0	BRL	2.0	BRL	2.0	BRL	2.0	BRL	2.0
	10/22/2012 *	EPA 8270D	NA		NA		NA		0.079	0.056	BRL	0.22
	10/22/2012 *	MADEP-EPH-04-1.1	BRL	2.2	BRL	2.2	BRL	2.2	BRL	2.2	BRL	2.2
GEC-2	06/15/2011	EPA 8270C Mod	BRL	0.60	1.3	0.60	1.2	0.60	0.70	0.10	0.60	0.10
	09/12/2011	EPA 8270C Mod	BRL	5	BRL	5	BRL	5	BRL	5	BRL	5
	9/12/2011 *	EPA 8270C Mod	BRL	5	BRL	5	BRL	5	BRL	5	BRL	5
	10/22/2012	EPA 8270D	NA		NA		NA		0.27	0.050	0.29	0.20
	10/22/2012	MADEP-EPH-04-1.1	BRL	2.0	BRL	2.0	BRL	2.0	BRL	2.0	BRL	2.0
	10/22/2012 **	EPA 8270D	NA		NA		NA		BRL	0.063	BRL	0.25
	10/22/2012 **	MADEP-EPH-04-1.1	BRL	2.5	BRL	2.5	BRL	2.5	BRL	2.5	BRL	2.5
GEC-3	06/15/2011	EPA 8270C Mod	BRL	0.60	BRL	0.60	BRL	0.60	0.20	0.10	0.20	0.10
GEC-4	06/15/2011	EPA 8270C Mod	BRL	0.60	BRL	0.60	BRL	0.60	BRL	0.10	BRL	0.10
Selected Groundwater Standards and Guidance												
		MA GW-2	NA		NA		NA		NA		NA	
		MA GW-3	10,000		200		20		1,000		70	
		Surface Water Benchmark	38		0.9		0.089		1		0.07	

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

Bold = Exceeds One or More Selected Standards

* = Groundwater samples were field filtered prior to analysis.

** = Groundwater sample was laboratory filtered prior to analysis.

- Surface Water Benchmark values were from MADEP's spreadworks used to derive Method 1 GW-3 Standards

Prepared By: MDW
Reviewed By: EAF
Revision Date: 11/13/2012

TABLE 1.2
SUMMARY OF GROUNDWATER ANALYTICAL DATA:
PAHs
BOOTT MILLS
130 Foot of John Street, Lowell, MA

(unit, parts per billion [ppb], ug/L)

Sample Identification	Sample Date	Analytical Method	Benzo[b]fluoranthene	RDL	Benzo[k]fluoranthene	RDL	Benzo[a]pyrene	RDL	Indeno[1,2,3-c,d]pyrene	RDL
GEC-1	06/15/2011	EPA 8270C Mod	1.3	0.10	0.50	0.10	1.1	0.10	0.90	0.10
	9/7/2011	EPA 8270C Mod	0.27	0.20	BRL	0.20	0.28	0.20	0.37	0.20
	9/7/2011 *	EPA 8270C Mod	BRL	0.20	BRL	0.20	BRL	0.20	BRL	0.20
	10/22/2012	EPA 8270D	0.29	0.050	BRL	0.20	0.23	0.10	BRL	0.20
	10/22/2012	MADEP-EPH-04-1.1	BRL	2.0	BRL	2.0	BRL	2.0	BRL	2.0
	10/22/2012 *	EPA 8270D	0.11	0.056	BRL	0.22	BRL	0.11	BRL	0.22
	10/22/2012 *	MADEP-EPH-04-1.1	BRL	2.2	BRL	2.2	BRL	2.2	BRL	2.2
GEC-2	06/15/2011	EPA 8270C Mod	0.90	0.10	0.40	0.10	0.80	0.10	0.60	0.10
	09/12/2011	EPA 8270C Mod	BRL	5	BRL	5	BRL	5	BRL	5
	9/12/2011 *	EPA 8270C Mod	BRL	5	BRL	5	BRL	5	BRL	5
	10/22/2012	EPA 8270D	0.39	0.050	BRL	0.20	0.31	0.10	0.24	0.20
	10/22/2012	MADEP-EPH-04-1.1	BRL	2.0	BRL	2.0	BRL	2.0	BRL	2.0
	10/22/2012 **	EPA 8270D	BRL	0.063	BRL	0.25	BRL	0.13	BRL	0.25
	10/22/2012 **	MADEP-EPH-04-1.1	BRL	2.5	BRL	2.5	BRL	2.5	BRL	2.5
GEC-3	06/15/2011	EPA 8270C Mod	0.30	0.10	0.20	0.10	0.30	0.10	0.20	0.10
GEC-4	06/15/2011	EPA 8270C Mod	BRL	0.10	BRL	0.10	BRL	0.10	BRL	0.10
Selected Groundwater Standards and Guidance										
		MA GW-2	NA		NA		NA		NA	
		MA GW-3	400		100		500		100	
		Surface Water Benchmark	0.42		0.14		0.5		0.14	

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

Bold = Exceeds One or More Selected Standards

Prepared By: MDW
Reviewed By: EAF
Revision Date: 11/13/2012

TABLE 1.2
SUMMARY OF GROUNDWATER ANALYTICAL DATA:
PAHs
BOOTT MILLS
130 Foot of John Street, Lowell, MA

(unit, parts per billion [ppb], ug/L)

Sample Identification	Sample Date	Analytical Method	Dibenzo[a,h]anthracene	RDL	Benzo[g,h,i]perylene	RDL
GEC-1	06/15/2011	EPA 8270C Mod	0.20	0.10	0.70	0.10
	9/7/2011	EPA 8270C Mod	BRL	0.20	0.36	0.20
	9/7/2011 *	EPA 8270C Mod	BRL	0.20	BRL	0.20
	10/22/2012	EPA 8270D	BRL	0.20	BRL	0.20
	10/22/2012	MADEP-EPH-04-1.1	BRL	2.0	BRL	2.0
	10/22/2012 *	EPA 8270D	BRL	0.22	BRL	0.56
	10/22/2012 *	MADEP-EPH-04-1.1	BRL	2.2	BRL	2.2
GEC-2	06/15/2011	EPA 8270C Mod	0.10	0.10	0.50	0.10
	09/12/2011	EPA 8270C Mod	BRL	5	BRL	5
	9/12/2011 *	EPA 8270C Mod	BRL	5	BRL	5
	10/22/2012	EPA 8270D	BRL	0.20	BRL	0.20
	10/22/2012	MADEP-EPH-04-1.1	BRL	2.0	BRL	2.0
	10/22/2012 **	EPA 8270D	BRL	0.25	BRL	0.25
	10/22/2012 **	MADEP-EPH-04-1.1	BRL	2.5	BRL	2.5
GEC-3	06/15/2011	EPA 8270C Mod	BRL	0.10	0.20	0.10
GEC-4	06/15/2011	EPA 8270C Mod	BRL	0.10	BRL	0.10
Selected Groundwater Standards and Guidance						
		MA GW-2	NA		NA	
		MA GW-3	40		20	
		Surface Water Benchmark	0.04		0.02	

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

Bold = Exceeds One or More Selected Standards

Prepared By: MDW
Reviewed By: EAF
Revision Date: 11/13/2012

TABLE 1.3
SUMMARY OF GROUNDWATER ANALYTICAL DATA:
TRACE METALS
BOOT MILLS
130 Foot of John Street, Lowell, MA

(unit, parts per billion [ppb], ug/L)

Sample Identification	Sample Date	Analytical Method	Barium, Dissolved	RDL	Lead, Dissolved	RDL	Lead, Total	RDL	Hardness (mg/l)	RDL
GEC-1	6/15/2011	EPA 6010B	100	50	**12**	5.0	NA		NA	
	9/7/2011	EPA 6010B / SM18-20 2340B	NA		BRL	10	71	10	120	0.66
GEC-2	06/15/2011	EPA 6010B	BRL	50	BRL	5.0	NA		NA	
GEC-3	06/15/2011	EPA 6010B	BRL	50	BRL	5.0	NA		NA	
GEC-4	06/15/2011	EPA 6010B	BRL	50	BRL	5.0	NA		NA	
GEC-6	09/12/2011	EPA 6010B / SM18-20 2340B	NA		BRL	10	BRL	10	230	3.0
Selected Groundwater Standards										
		MA GW-2	NS		NS		NS			
		MA GW-3	50,000		10		10			
		Surface Water Benchmark	41,000		0.5		0.5			

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

NS = No applicable Standard

Bold = Exceeds One or More Selected Standards

- On 6/15/2011 GEC-1 and GEC-2 were sampled using bailers and could not be filtered in the field. Samples were filtered by the laboratory prior to preservation. GEC-3 and GEC-4 were field filtered prior to preservation.

- The Sept. 2011 samples from GEC-1 and GEC-6 were field filtered prior to preservation.

Prepared By: MDW
Reviewed By:
Revision Date: 11/12/2012

TABLE 1.4
SUMMARY OF GROUNDWATER ANALYTICAL DATA:
POLYCHORINATED BIPHENYLS
BOOTT MILLS
130 Foot of John Street, Lowell, MA

(unit, parts per billion [ppb], ug/L)

Sample Identification	Sample Date	Analytical Method	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	RDL
GEC-1	06/15/2011	EPA 8082	3.5	0.20	1.6	0.20	**5.1**	0.20
	9/7/2011	EPA 8082	BRL	0.25	0.43	0.25	BRL	0.25
	9/7/2011 *	EPA 8082	BRL	0.25	BRL	0.25	BRL	0.25
GEC-2	06/15/2011	EPA 8082	4.5	0.20	3.3	0.20	**7.8**	0.20
	09/12/2011	EPA 8082	BRL	0.20	BRL	0.20	BRL	0.20
	9/12/2011 *	EPA 8082	BRL	0.20	BRL	0.20	BRL	0.20
GEC-3	06/15/2011	EPA 8082	BRL	0.20	BRL	0.20	BRL	0.20
GEC-4	06/15/2011	EPA 8082	BRL	0.20	BRL	0.20	BRL	0.20
GEC-6	09/12/2011	EPA 8082	BRL	0.20	BRL	0.20	BRL	0.20
GEC-7	09/12/2011	EPA 8082	BRL	0.20	BRL	0.20	BRL	0.20
Selected Groundwater Standards								
		MA GW-2	5		5		5	
		MA GW-3	10		10		10	
		Surface Water Benchmark					0.014	

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

Bold = Exceeds One or More Selected Standards

1 = Total PCBs is a combination of separte aroclor compounds

* A sample of groundwater from GEC-1 and GEC-2 was filtered prior to analysis via EPA 8082.

Prepared By: MDW
Reviewed By:
Revision Date: 11/13/2012

TABLE 1.5
SUMMARY OF GROUNDWATER ANALYTICAL DATA:
VOLATILE ORGANIC COMPOUNDS
BOOT MILLS
130 Foot of John Street, Lowell, MA

(unit, parts per billion [ppb], ug/L)

Sample Identification	Sample Date	Analytical Method	Acetone	RDL
GEC-1	9/7/2011	EPA 8260B	BRL	5
GEC-2	09/12/2011	EPA 8260B	BRL	10
GEC-4	06/15/2011	EPA 8260B	BRL	10
GEC-6	09/12/2011	EPA 8260B	BRL	10
GEC-7	09/12/2011	EPA 8260B	11	10
Selected Groundwater Standards				
MA GW-2			50,000	
MA GW-3			50,000	
Surface Water Benchmark			3,400	

Notes:

ˌ = Reported Detection Limit

.L = Below Reporting Limit

NA = Not Analyzed

ɛeds One or More Selected Standards

TABLE 2.1
SUMMARY OF SOIL ANALYTICAL DATA:
MADEP EPH, TPH AND PAHs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	n-C19 to n-C36 Aliphatic Hydrocarbons	RDL	n-C11 to n-C22 Aromatic Hydrocarbons	RDL	Total Petroleum Hydrocarbons	RDL	Phenanthrene	RDL	Acenaphthene	RDL	Fluorene	RDL	Anthracene	RDL
Exterior Courtyard Samples																
B-1 1-5'	06/06/2011	MA DEP EPH	210	20	150	20	NA		1.9	0.5	BRL	0.5	BRL	0.5	0.6	0.5
B-1 10-15'	06/06/2011	MA DEP EPH	29	25	BRL	25	NA		BRL	0.62	BRL	0.62	BRL	0.62	BRL	0.62
B-2 1-5'	06/06/2011	MA DEP EPH	160	22	200	22	NA		8.4	0.54	0.7	0.54	0.85	0.54	2.3	0.54
B-2 10-15'	06/06/2011	MA DEP EPH	69	22	38	22	NA		BRL	0.56	BRL	0.56	BRL	0.56	BRL	0.56
B-3 5-10'	06/06/2011	MA DEP EPH	30	24	BRL	24	NA		BRL	0.6	BRL	0.6	BRL	0.6	BRL	0.6
B-4 12-15'	06/06/2011	MA DEP EPH	BRL	23	BRL	23	NA		BRL	0.58	BRL	0.58	BRL	0.58	BRL	0.58
B-4 2-5'	06/06/2011	MA DEP EPH	610	23	560	110	NA		17	2.8	BRL	2.8	BRL	2.8	**4.5**	2.8
B-5 10-15'	06/06/2011	MA DEP EPH	BRL	25	BRL	25	NA		BRL	0.63	BRL	0.63	BRL	0.63	BRL	0.63
B-8 0-3'	09/01/2011	EPA 8270C	NA		NA		NA		BRL	0.22	BRL	0.30	BRL	0.38	BRL	0.22
B-8 5-10'	09/01/2011	EPA 8270C	NA		NA		NA		6.0	0.25	BRL	0.34	BRL	0.42	1.5	0.25
B-9 0-3'	09/01/2011	EPA 8270C	NA		NA		NA		3.5	0.21	BRL	0.29	BRL	0.36	0.99	0.21
B-10 0-3'	09/01/2011	EPA 8270C	NA		NA		NA		8.2	0.23	0.45	0.30	0.56	0.38	2.1	0.23
B-11 0-3'	09/01/2011	EPA 8270C	NA		NA		NA		0.43	0.21	BRL	0.28	BRL	0.35	BRL	0.21
B-12 0-3'	09/01/2011	EPA 8270C	NA		NA		NA		0.66	0.23	BRL	0.31	BRL	0.39	BRL	0.23
WC-1 (B-16 1-5')	10/05/2012	EPA 8270D / 8100M	NA		NA		1,400	190	2.0	0.38	BRL	0.38	BRL	0.38	BRL	0.38
WC-1 (B-16 1-5')	10/05/2012	EPA 8260C	NA		NA		NA		NA		NA		NA		NA	
WC-2 (B-26 2-5')	10/09/2012	EPA 8270D / 8100M	NA		NA		740	190	3.9	0.38	BRL	0.38	BRL	0.38	1.0	0.38
WC-2 (B-26 2-5')	10/09/2012	EPA 8260C	NA		NA		NA		NA		NA		NA		NA	
Selected Soil Standards																
		MA S-1/GW-2	3,000		1,000		1,000		500		1,000		1,000		1,000	
		MA S-1/GW-3	3,000		1,000		1,000		500		1,000		1,000		1,000	
		MA S-2/GW-2	5,000		3,000		3,000		1,000		3,000		3,000		3,000	
		MA S-2/GW-3	5,000		3,000		3,000		1,000		3,000		3,000		3,000	
		MA S-3/GW-2	5,000		5,000		5,000		3,000		5,000		5,000		5,000	
		MA S-3/GW-3	5,000		5,000		5,000		3,000		5,000		5,000		5,000	
		MADEP Background - Urban Fill							20		2		2		**4**	
Enclosed Courtyard Samples																
B-6 0-4'	06/06/2011	MA DEP EPH	65	21	140	21	140	21	10	0.52	1.1	0.52	1	0.52	2.2	0.52
B-7 8-10'	06/06/2011	MA DEP EPH	BRL	24	BRL	24	BRL	24	BRL	0.61	BRL	0.61	BRL	0.61	BRL	0.61
Between Building and Merrimack River																
B-13 0-3'	09/01/2011	EPA 8270C	NA		NA		NA		9.2	0.22	0.64	0.30	0.60	0.37	1.6	0.22
Selected Soil Standards																
		MA RCS-1	3,000		1,000		1,000		10		4		1,000		1,000	
		MADEP Background - Urban Fill							20		2		2		4	

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

Bold = Exceeds background concentration and S-1/GW-2 or S-1/GW-3 standard

Prepared By: MDW / EAF
Reviewed By: EAF
Revision Date: 11/01/2012

TABLE 2.1
SUMMARY OF SOIL ANALYTICAL DATA:
MADEP EPH, TPH AND PAHs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Acenaph-thylene	RDL	Naphthalene	RDL	2-Methyl-naphthalene	RDL	Fluoranthene	RDL	Pyrene	RDL	Benzo[a] anthracene	RDL	Chrysene	RDL
Exterior Courtyard Samples																
B-1 1-5'	06/06/2011	MA DEP EPH	BRL	0.5	BRL	0.5	BRL	0.5	3.2	0.5	3	0.5	1.7	0.5	2	0.5
B-1 10-15'	06/06/2011	MA DEP EPH	BRL	0.62	BRL	0.62	BRL	0.62	BRL	0.62	BRL	0.62	BRL	0.62	BRL	0.62
B-2 1-5'	06/06/2011	MA DEP EPH	BRL	0.54	BRL	0.54	BRL	0.54	**12**	0.54	11	0.54	5.9	0.54	6.6	0.54
B-2 10-15'	06/06/2011	MA DEP EPH	BRL	0.56	BRL	0.56	BRL	0.56	1	0.56	0.95	0.56	BRL	0.56	0.68	0.56
B-3 5-10'	06/06/2011	MA DEP EPH	BRL	0.6	BRL	0.6	BRL	0.6	BRL	0.6	BRL	0.6	BRL	0.6	BRL	0.6
B-4 12-15'	06/06/2011	MA DEP EPH	BRL	0.58	BRL	0.58	BRL	0.58	BRL	0.58	BRL	0.58	BRL	0.58	BRL	0.58
B-4 2-5'	06/06/2011	MA DEP EPH	BRL	2.8	BRL	2.8	BRL	2.8	**24**	2.8	19	2.8	**9.8**	2.8	**11**	2.8
B-5 10-15'	06/06/2011	MA DEP EPH	BRL	0.63	BRL	0.63	BRL	0.63	BRL	0.63	BRL	0.63	BRL	0.63	BRL	0.63
B-8 0-3'	09/01/2011	EPA 8270C	BRL	0.30	BRL	0.38	BRL	0.45	BRL	0.22	BRL	0.22	BRL	0.22	BRL	0.22
B-8 5-10'	09/01/2011	EPA 8270C	**1.1**	0.34	0.47	0.42	BRL	0.50	**14**	0.25	12	0.25	7.1	0.25	6.4	0.25
B-9 0-3'	09/01/2011	EPA 8270C	0.46	0.29	BRL	0.36	BRL	0.43	8.2	0.21	7.0	0.21	3.7	0.21	3.6	0.21
B-10 0-3'	09/01/2011	EPA 8270C	0.74	0.30	BRL	0.38	BRL	0.46	**14**	0.23	12	0.23	5.8	0.23	5.3	0.23
B-11 0-3'	09/01/2011	EPA 8270C	BRL	0.28	BRL	0.35	BRL	0.42	1.1	0.21	1.0	0.21	0.61	0.21	0.62	0.21
B-12 0-3'	09/01/2011	EPA 8270C	BRL	0.31	BRL	0.39	BRL	0.47	1.3	0.23	1.3	0.23	0.75	0.23	0.74	0.23
WC-1 (B-16 1-5')	10/05/2012	EPA 8270D / 8100M	BRL	0.38	BRL	0.38	BRL	0.38	1.9	0.38	2.0	0.38	0.97	0.38	1.1	0.38
WC-1 (B-16 1-5')	10/05/2012	EPA 8260C	NA		0.0074	0.0036	NA		NA		NA		NA		NA	
WC-2 (B-26 2-5')	10/09/2012	EPA 8270D / 8100M	BRL	0.38	BRL	0.38	BRL	0.38	6.7	0.38	7.9	0.38	4.5	0.38	4.1	0.38
WC-2 (B-26 2-5')	10/09/2012	EPA 8260C	NA		BRL	0.12	NA		NA		NA		NA		NA	
Selected Soil Standards																
		MA S-1/GW-2	600		40		80		1,000		1,000		7		70	
		MA S-1/GW-3	10		500		300		1,000		1,000		7		70	
		MA S-2/GW-2	600		40		80		3,000		3,000		40		400	
		MA S-2/GW-3	10		1,000		500		3,000		3,000		40		400	
		MA S-3/GW-2	600		40		80		5,000		5,000		300		3,000	
		MA S-3/GW-3	10		3,000		500		5,000		5,000		300		3,000	
		MADEP Background - Urban Fill	**1**		1		1		10		20		9		7	
Enclosed Courtyard Samples																
B-6 0-4'	06/06/2011	MA DEP EPH	BRL	0.52	BRL	0.52	BRL	0.52	11	0.52	9.4	0.52	4.7	0.52	5.4	0.52
B-7 8-10'	06/06/2011	MA DEP EPH	BRL	0.61	BRL	0.61	BRL	0.61	BRL	0.61	BRL	0.61	BRL	0.61	BRL	0.61
Between Building and Merrimack River																
B-13 0-3'	09/01/2011	EPA 8270C	0.33	0.30	BRL	0.37	BRL	0.45	13	0.22	11	0.22	5.6	0.22	5.9	0.22
Selected Soil Standards																
		MA RCS-1	1		4		0.7		1,000		1,000		7		70	
		MADEP Background - Urban Fill	1		1		1		10		20		9		7	

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

Prepared By: MDW / EAF
Reviewed By: EAF
Revision Date: 11/01/2012

TABLE 2.1
SUMMARY OF SOIL ANALYTICAL DATA:
MADEP EPH, TPH AND PAHs
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Benzo[b] fluoranthene	RDL	Benzo[k] fluoranthene	RDL	Benzo[a] pyrene	RDL	Indeno[1,2,3-c,d] pyrene	RDL	Dibenzo[a,h] anthracene	RDL	Benzo[g,h,i] perylene	RDL
Exterior Courtyard Samples														
B-1 1-5'	06/06/2011	MA DEP EPH	1.5	0.5	1.4	0.5	1.9	0.5	1.2	0.5	BRL	0.5	1.2	0.5
B-1 10-15'	06/06/2011	MA DEP EPH	BRL	0.62	BRL	0.62	BRL	0.62	BRL	0.62	BRL	0.62	BRL	0.62
B-2 1-5'	06/06/2011	MA DEP EPH	6.1	0.54	**4.1**	0.54	6.1	0.54	**3.9**	0.54	1.0	0.54	**3.5**	0.54
B-2 10-15'	06/06/2011	MA DEP EPH	0.59	0.56	BRL	0.56	0.64	0.56	BRL	0.56	BRL	0.56	BRL	0.56
B-3 5-10'	06/06/2011	MA DEP EPH	BRL	0.6	BRL	0.6	BRL	0.6	BRL	0.6	BRL	0.6	BRL	0.6
B-4 12-15'	06/06/2011	MA DEP EPH	BRL	0.58	BRL	0.58	BRL	0.58	BRL	0.58	BRL	0.58	BRL	0.58
B-4 2-5'	06/06/2011	MA DEP EPH	**8.7**	2.8	**8.1**	2.8	**9.8**	2.8	**6.0**	2.8	**BRL**	2.8	**5.8**	2.8
B-5 10-15'	06/06/2011	MA DEP EPH	BRL	0.63	BRL	0.63	BRL	0.63	BRL	0.63	BRL	0.63	BRL	0.63
B-8 0-3'	09/01/2011	EPA 8270C	BRL	0.22	BRL	0.22	BRL	0.30	BRL	0.30	BRL	0.22	BRL	0.30
B-8 5-10'	09/01/2011	EPA 8270C	7.8	0.25	3.3	0.25	6.5	0.34	**4.9**	0.34	**1.2**	0.25	**4.2**	0.34
B-9 0-3'	09/01/2011	EPA 8270C	4.4	0.21	1.7	0.21	3.5	0.29	2.9	0.29	0.58	0.21	2.5	0.29
B-10 0-3'	09/01/2011	EPA 8270C	6.4	0.23	2.5	0.23	5.0	0.30	4.1	0.30	1.0	0.23	**3.6**	0.30
B-11 0-3'	09/01/2011	EPA 8270C	0.74	0.21	0.30	0.21	0.63	0.28	0.51	0.28	BRL	0.21	0.43	0.28
B-12 0-3'	09/01/2011	EPA 8270C	0.84	0.23	0.32	0.23	0.65	0.31	0.53	0.31	BRL	0.23	0.46	0.31
WC-1 (B-16 1-5')	10/05/2012	EPA 8270D / 8100M	0.98	0.38	BRL	0.38	0.76	0.38	0.57	0.38	BRL	0.38	0.49	0.38
WC-1 (B-16 1-5')	10/05/2012	EPA 8260C	NA		NA		NA		NA		NA		NA	
WC-2 (B-26 2-5')	10/09/2012	EPA 8270D / 8100M	4.4	0.38	1.7	0.38	4.3	0.38	2.8	0.38	0.65	0.38	2.2	0.38
WC-2 (B-26 2-5')	10/09/2012	EPA 8260C	NA		NA		NA		NA		NA		NA	
Selected Soil Standards														
		MA S-1/GW-2	7		70		2		7		0.7		1,000	
		MA S-1/GW-3	7		70		2		7		0.7		1,000	
		MA S-2/GW-2	40		400		4		40		4		3,000	
		MA S-2/GW-3	40		400		4		40		4		3,000	
		MA S-3/GW-2	300		3,000		30		300		30		5,000	
		MA S-3/GW-3	300		3,000		30		300		30		5,000	
		MADEP Background - Urban Fill	8		4		7		3		1		3	
Enclosed Courtyard Samples														
B-6 0-4'	06/06/2011	MA DEP EPH	4.5	0.52	3.2	0.52	4.3	0.52	2.8	0.52	0.76	0.52	2.3	0.52
B-7 8-10'	06/06/2011	MA DEP EPH	BRL	0.61	BRL	0.61	BRL	0.61	BRL	0.61	BRL	0.61	BRL	0.61
Between Building and Merrimack River														
B-13 0-3'	09/01/2011	EPA 8270C	6.5	0.22	2.6	0.22	5.0	0.30	3.7	0.30	0.90	0.22	3.2	0.30
Selected Soil Standards														
		MA RCS-1	7		70		2		7		0.7		1,000	
		MADEP Background - Urban Fill	8		4		7		3		1		3	

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

Prepared By: MDW / EAF
Reviewed By: EAF
Revision Date: 11/01/2012

TABLE 2.2
SUMMARY OF SOIL ANALYTICAL DATA:
POLYCHLORINATED BIPHENYLS (PCBs)
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	RDL
Exterior Courtyard Samples								
B-1 1-5'	06/06/2011	EPA 8082	0.57	0.084	0.53	0.084	**1.1**	
B-1 10-15'	06/06/2011	EPA 8082	BRL	0.1	BRL	0.1	BRL	
B-2 1-5'	06/06/2011	EPA 8082	20	4.3	11	4.3	**31**	
B-2 10-15'	06/06/2011	EPA 8082	1.8	0.091	2.3	0.46	**4.1**	
B-3 5-10'	06/06/2011	EPA 8082	BRL	0.097	BRL	0.097	BRL	
B-4 2-5'	06/06/2011	EPA 8082	60	9	64	9	**124**	
B-4 12-15'	06/06/2011	EPA 8082	BRL	0.095	BRL	0.095	BRL	
B-5 10-15'	06/06/2011	EPA 8082	BRL	0.1	BRL	0.1	BRL	
B-8 0-1'	09/01/2011	EPA 8082	0.119	0.0342	0.149	0.0342	0.268	
B-8 1-3'	09/01/2011	EPA 8082	BRL	0.0381	BRL	0.0381	BRL	
B-8 0-3'	09/01/2011	EPA 8082	BRL	0.04	0.0699	0.04	0.0899	
B-8 5-10'	09/01/2011	EPA 8082	BRL	0.0455	BRL	0.0455	BRL	
B-9 0-1'	09/01/2011	EPA 8082	BRL	0.0364	BRL	0.0364	BRL	
B-9 1-3'	09/01/2011	EPA 8082	4.86	0.719	3.35	0.719	**8.21**	
B-10 0-3'	09/01/2011	EPA 8082	1.05	0.382	2.27	0.382	**3.32**	
B-10 3-6'	09/01/2011	EPA 8082	BRL	0.426	0.691	0.426	0.904	
B-11 0-3'	09/01/2011	EPA 8082	6.14	0.731	5.05	0.731	**11.19**	
B-11 3-6'	09/01/2011	EPA 8082	BRL	0.036	BRL	0.036	BRL	
B-12 0-3'	09/01/2011	EPA 8082	0.0649	0.0371	0.184	0.0371	0.2489	
B-12 3-6'	09/01/2011	EPA 8082	BRL	0.0368	BRL	0.0368	BRL	
B-15 0-3'	10/05/2012	EPA 8082A	5.8	1.1	4.0	1.1	**9.8**	
B-15 3-5'	10/05/2012	EPA 8082A	6.3	1.1	5.1	1.1	**11.4**	
B-15 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
WC-1 (B-16 1-5')	10/05/2012	EPA 8082A	7.4	1.1	7.6	1.1	**15**	
B-16 5-7'	10/05/2012	EPA 8082A	4.6	0.54	3.0	0.54	**7.6**	
B-16 7-9'	10/05/2012	EPA 8082A	2.5	0.52	1.7	0.52	**4.2**	
B-16 9-12'	10/05/2012	EPA 8082A	1.7	0.22	1.0	0.22	**2.7**	
B-17 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-17 3-5'	10/05/2012	EPA 8082A	BRL	0.12	BRL	0.12	BRL	
B-17 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-20 '0-3	10/05/2012	EPA 8082A	1.2	0.11	1.1	0.11	**2.3**	
B-20 3-5'	10/05/2012	EPA 8082A	0.46	0.11	0.39	0.11	0.85	
B-20 5-7'	10/05/2012	EPA 8082A	0.95	0.11	0.71	0.11	**1.66**	
B-21 0-3'	10/05/2012	EPA 8082A	3.1	0.55	3.1	0.55	**6.2**	
B-21 3-5'	10/05/2012	EPA 8082A	0.63	0.11	0.50	0.11	**1.13**	
B-22 3-5'	10/05/2012	EPA 8082A	0.90	0.22	1.9	0.22	**2.8**	
B-22 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-23 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-23 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-25 0-3'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	
B-25 3-5'	10/17/2012	EPA 8082A	BRL	0.11	0.13	0.11	0.19	
B-25 5-7'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	
WC-2 (B-26 2-5')	10/09/2012	EPA 8082A	15	2.3	17	2.3	**32**	
B-26 5-7'	10/09/2012	EPA 8082A	14	2.2	12	2.2	**26**	
B-26 7-9'	10/09/2012	EPA 8082A	1.8	0.23	1.2	0.23	**3.0**	
B-26 9-12'	10/09/2012	EPA 8082A	BRL	0.12	BRL	0.12	BRL	
B-27 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	

Prepared By: MDW
Reviewd By: EAF
Revision Date: 06/10/2013

TABLE 2.2
SUMMARY OF SOIL ANALYTICAL DATA:
POLYCHLORINATED BIPHENYLS (PCBs)
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	RDL
B-27 3-5'	10/09/2012	EPA 8082A	0.20	0.10	0.20	0.10	0.40	
B-27A 0-3'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-27A 3-5'	10/17/2012	EPA 8082A	0.18	0.10	0.20	0.10	0.38	
B-27A 5-7'	10/17/2012	EPA 8082A	0.18	0.10	0.21	0.10	0.39	
B-28 0-3'	10/17/2012	EPA 8082A	0.19	0.11	0.26	0.11	0.45	
B-29 0-3'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-29 3-5'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	
B-29 5-6'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-30 0-3'	10/17/2012	EPA 8082A	BRL	0.10	0.37	0.10	0.42	
B-30 3-4.5'	10/17/2012	EPA 8082A	BRL	0.10	0.11	0.10	0.16	
B-31 0-3'	10/09/2012	EPA 8082A	0.12	0.11	0.15	0.11	0.27	
B-31 3-5'	10/09/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	
B-32 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-32 3-5'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-34 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-35 0-3'	10/05/2012	EPA 8082A	1.6	0.21	1.4	0.21	**3.0**	
B-35 3-5'	10/05/2012	EPA 8082A	9.3	1.1	8.0	1.1	**17.3**	
B-35 5-7'	10/05/2012	EPA 8082A	18	5.7	27	5.7	**45**	
B-35 7-9'	10/05/2012	EPA 8082A	5.8	1.1	7.7	1.1	**13.5**	
B-36 0-3'	10/17/2012	EPA 8082A	BRL	0.11	0.12	0.11	0.18	
B-36 3-5'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-37 0-3'	10/05/2012	EPA 8082A	0.66	0.11	0.44	0.11	**1.1**	
B-37 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-38 0-9'	05/08/2013	EPA 8082A	BRL	5.4	37	5.4	**37**	
B-38 9-12'	05/08/2013	EPA 8082A	BRL	0.12	BRL	0.12	BRL	
B-48 0-3'	05/09/2013	EPA 8082A	0.93	0.1	0.91	0.1	**1.84**	
B-48 3-9'	05/09/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
Composite 1 0-5'	05/08/2013	EPA 8082A	4.8	1.1	2.9	1.1	**7.7**	
Composite 2 0-5'	05/08/2013	EPA 8082A	0.44	0.11	0.45	0.11	0.89	
Composite 3 0-3'	05/08/2013	EPA 8082A	0.14	0.11	0.26	0.11	0.4	
Composite 3 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
Composite 4 0-3'	05/08/2013	EPA 8082A	9.2	2.1	7.5	2.1	**16.7**	
Composite 4 3-9'	05/08/2013	EPA 8082A	0.72	0.11	0.59	0.11	**1.31**	
Composite 5 0-3'	05/09/2013	EPA 8082A	0.81	0.11	1.2	0.11	**2.01**	
Composite 5 3-9'	05/09/2013	EPA 8082A	BRL	0.12	BRL	0.12	BRL	
Composite 6 0-3'	05/09/2013	EPA 8082A	2	0.55	1.9	0.55	**3.9**	
Composite 6 3-9'	05/09/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-39 0-3'	05/08/2013	EPA 8082A	BRL	0.10	0.42	0.10	0.42	
B-39 3-9'	05/08/2013	EPA 8082A	BRL	0.11	0.25	0.11	0.25	
B-49 0-3'	05/08/2013	EPA 8082A	8.9	1.1	9.8	1.1	**18.7**	
B-49 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-50 0-3'	05/08/2013	EPA 8082A	14	2.2	22	2.2	**36**	
B-50 3-9'	05/08/2013	EPA 8082A	3.4	0.43	2.2	0.43	**5.6**	
Selected MCP Soil Standards								
		MA S-1/GW-2					2	
		MA S-1/GW-3					2	
		MA S-2/GW-2					3	
		MA S-2/GW-3					3	

Prepared By: MDW
Reviewd By: EAF
Revision Date: 06/10/2013

TABLE 2.2
SUMMARY OF SOIL ANALYTICAL DATA:
POLYCHLORINATED BIPHENYLS (PCBs)
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	RDL
		MA S-3/GW-2					3	
		MA S-3/GW-3					3	
		Upper Concentration Limits					100	
Selected TSCA Soil Standards								
		Self-Implementing High Occupancy					1	
		Self-Implementing High Occupancy beneath Cap					>1 to 10	
Enclosed Courtyard Samples								
B-6 0-4'	06/06/2011	EPA 8082	BRL	0.082	BRL	0.082	BRL	
B-7 8-10'	06/06/2011	EPA 8082	BRL	0.096	BRL	0.096	BRL	
Between Building and Merrimack River								
B-13 0-3'	09/01/2011	EPA 8082	BRL	0.0383	BRL	0.0383	BRL	
B-13 3-6'	09/01/2011	EPA 8082	BRL	0.0368	BRL	0.0368	BRL	
Selected Soil Standards								
		MA RCS-1					2	

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

Bold = Exceeds One or More Selected Standards

[1] - The result for Polychlorinated Biphenyls (PCBs) is calculated as the sum of all quantified values for all analyzed Aroclor analytes.

Composite 1- Soils collected from borings B-41, B-42, B-43 and B-54 and composited

Composite 2- Soils collected from borings B-44, B-45, B-46 and B-47 and composited

Composite 3- Soils collected from borings B-63, B-64, B-65, B-66, B-67, B-68 and B-40 and composited

Composite 4- Soils collected from borings B-39, B-50 and B-49 and composited

Composite 5- Soils collected from borings B-58, B-59, B-60 and B-61 and composited

Composite 6- Soils collected from borings B-51, B-52, B-55, B-56 and B-57 and composited

TABLE 2.3
SUMMARY OF SOIL ANALYTICAL DATA:
TOTAL TRACE METALS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Antimony, Total	RDL	Arsenic, Total	RDL	Barium, Total	RDL	Beryllium, Total	RDL	Cadmium, Total	RDL
Exterior Courtyard Samples												
B-1 1-5'	06/06/2011	EPA 6010B/7471A	2.6	1.1	5.0	3.2	**54**	5.3	BRL	0.32	0.65	0.53
B-1 10-15'	06/06/2011	EPA 6010B/7471A	BRL	1.3	BRL	3.9	28	6.5	BRL	0.39	BRL	0.65
B-2 1-5'	06/06/2011	EPA 6010B/7471A	3.4	1.1	4.2	3.3	73	5.5	BRL	0.33	BRL	0.55
B-2 10-15'	06/06/2011	EPA 6010B/7471A	4	1.1	BRL	3.4	**91**	5.7	BRL	0.34	1.3	0.57
B-3 5-10'	06/06/2011	EPA 6010B/7471A	2.8	1.2	6.2	3.6	33	5.9	BRL	0.36	0.63	0.59
B-4 2-5'	06/06/2011	EPA 6010B/7471A	3.6	1.2	6.3	3.5	**410**	5.8	BRL	0.35	0.94	0.58
B-4 12-15'	06/06/2011	EPA 6010B/7471A	BRL	1.2	BRL	3.5	25	5.8	BRL	0.35	BRL	0.58
B-5 10-15'	06/06/2011	EPA 6010B/7471A	3.8	1.3	BRL	3.9	35	6.6	BRL	0.39	BRL	0.66
B-8 0-3'	09/01/2011	EPA 6010B/7471A	BRL	2.2	5.4	0.43	**65**	0.43	0.48	0.22	BRL	0.43
B-8 5-10'	09/01/2011	EPA 6010B/7471A	BRL	2.5	2.7	0.5	32	0.5	0.51	0.25	BRL	0.5
B-9 0-3'	09/01/2011	EPA 6010B/7471A	BRL	2	6.7	0.41	37	0.41	0.27	0.2	BRL	0.41
B-10 0-3'	09/01/2011	EPA 6010B/7471A	BRL	2.3	6.6	0.46	**74**	0.46	0.48	0.23	BRL	0.46
B-11 0-3'	09/01/2011	EPA 6010B/7471A	BRL	2.1	3.6	0.41	**110**	0.41	0.4	0.21	BRL	0.41
B-12 0-3'	09/01/2011	EPA 6010B/7471A	BRL	2.2	9.1	0.45	**110**	0.45	0.48	0.22	BRL	0.45
WC-1 (B-16 1-5')	10/05/2012	EPA 6010C / 7471B / 1311	NA		BRL	2.7	**76**	2.7	NA		0.31	0.27
B-16 0-3'	10/05/2012	EPA 6010C/7196A / SM2580A /SM9045C	NA		NA		NA		NA		NA	
B-16 3-5'	10/05/2012	EPA 6010C/7196A / SM2580A /SM9045C	NA		NA		NA		NA		NA	
B-17 0-3'	10/05/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-17 3-5'	10/05/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-17 5-7'	10/05/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-21 0-3'	10/10/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-21 3-5'	10/10/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-22 0-3'	10/05/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-22 3-5'	10/05/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-23 0-3'	10/05/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-23 3-5'	10/05/2012	EPA 6010C	NA		NA		NA		NA		NA	
WC-2 (B-26 2-5')	10/09/2012	EPA 6010C / 7471B / 1311	NA		BRL	2.6	47	2.6	NA		0.35	0.26
B-30 0-3'	10/17/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-30 3-4.5'	10/17/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-31 0-3'	10/09/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-31 3-5'	10/09/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-32 0-3'	10/09/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-32 3-5'	10/09/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-33 0-3'	10/10/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-33 3-5'	10/10/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-34 0-3'	10/05/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-34 3-5'	10/05/2012	EPA 6010C	NA		NA		NA		NA		NA	
Selected Soil Standards												
		MA S-1/GW-2	20		20		1,000		100		2	
		MA S-1/GW-3	20		20		1,000		100		2	
		MA S-2/GW-2	30		20		3,000		200		30	
		MA S-2/GW-3	30		20		3,000		200		30	
		MA S-3/GW-2	30		20		5,000		200		30	
		MA S-3/GW-3	30		20		5,000		200		30	
		MADEP Background - Urban Fill	7		20		50		0.9		3	
Enclosed Courtyard Samples												
B-6 0-4'	06/06/2011	EPA 6010B/7471A	4.6	1.3	5.6	3.8	110	6.4	BRL	0.38	0.97	0.64
B-6 4-6'	6/06/2011 *	EPA 6010B	NA		NA		NA		NA		NA	
B-6A 0-2'	09/13/2011	EPA 6010B	NA		NA		NA		NA		NA	
B-6B 0-4'	09/13/2011	EPA 6010B	NA		NA		NA		NA		NA	
B-6C 0-4'	09/13/2011	EPA 6010B	NA		NA		NA		NA		NA	
B-6D 0-4'	10/09/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-6D 4-6'	10/09/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-6E 0-4'	10/09/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-6E 4-6'	10/09/2012	EPA 6010C	NA		NA		NA		NA		NA	
B-7 8-10'	06/06/2011	EPA 6010B/7471A	BRL	1.3	BRL	3.8	20	6.3	BRL	0.38	BRL	0.63
Between Building and Merrimack River												
B-13 0-3'	09/01/2011	EPA 6010B/7471A	BRL	4.4	7.8	0.87	97	0.87	0.46	0.44	BRL	0.87
Selected Soil Standards												
		MA RCS-1	20		20		1,000		100		2	
		MADEP Background - Urban Fill	7		20		50		0.9		3	

Notes:

RDL = Reported Detection Limit
BRL = Below Reporting Limit
NA = Not Analyzed
Bold = Exceeds One or More Selected Standards

* Chain of custody lists sample date as 9/14/2011. Sample was collected on 6/6/2011, and submitted to the lab on 9/14/2011.
ORP = Oxidation Reduction Potential
Standards for Total Chromium are for Cr III, because no Cr VI detected.

Prepared By: MDW
Reviewed By: EAF
Revision Date: 9/26/2011

TABLE 2.3
SUMMARY OF SOIL ANALYTICAL DATA:
TOTAL TRACE METALS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Chromium, Total	RDL	Hexavalent Chromium	RDL	ORP (mV)	pH	Lead, Total	RDL	Lead, TCLP (mg/l)	RDL
Exterior Courtyard Samples												
B-1 1-5'	06/06/2011	EPA 6010B/7471A	14	1.1	NA	5.3	NA	NA	95	5.3	NA	
B-1 10-15'	06/06/2011	EPA 6010B/7471A	12	1.3	NA	6.5	NA	NA	BRL	6.5	NA	
B-2 1-5'	06/06/2011	EPA 6010B/7471A	15	1.1	NA	5.5	NA	NA	290	5.5	NA	
B-2 10-15'	06/06/2011	EPA 6010B/7471A	38	1.1	NA	5.7	NA	NA	590	5.7	NA	
B-3 5-10'	06/06/2011	EPA 6010B/7471A	18	1.2	NA	5.9	NA	NA	17	5.9	NA	
B-4 2-5'	06/06/2011	EPA 6010B/7471A	20	1.2	NA	5.8	NA	NA	530	5.8	NA	
B-4 12-15'	06/06/2011	EPA 6010B/7471A	8.6	1.2	NA	5.8	NA	NA	BRL	5.8	NA	
B-5 10-15'	06/06/2011	EPA 6010B/7471A	13	1.3	NA	6.6	NA	NA	6.6	6.6	NA	
B-8 0-3'	09/01/2011	EPA 6010B/7471A	29	0.43	NA	2.2	NA	NA	170	2.2	NA	
B-8 5-10'	09/01/2011	EPA 6010B/7471A	10	0.5	NA	2.5	NA	NA	5.1	2.5	NA	
B-9 0-3'	09/01/2011	EPA 6010B/7471A	**48**	0.41	NA	2	NA	NA	90	2	NA	
B-10 0-3'	09/01/2011	EPA 6010B/7471A	19	0.46	NA	2.3	NA	NA	**1,400**	2.3	NA	
B-11 0-3'	09/01/2011	EPA 6010B/7471A	22	0.41	NA	2.1	NA	NA	**1,800**	2.1	NA	
B-12 0-3'	09/01/2011	EPA 6010B/7471A	34	0.45	NA	2.2	NA	NA	**620**	2.2	NA	
WC-1 (B-16 1-5')	10/05/2012	EPA 6010C / 7471B / 1311	27	0.55	NA		NA	NA	340	0.82	1.7	0.010
B-16 0-3'	10/05/2012	EPA 6010C/7196A / SM2580A /SM9045C	**78**	0.51	BRL	0.17	60	9.0	7.9	0.76	NA	
B-16 3-5'	10/05/2012	EPA 6010C/7196A / SM2580A /SM9045C	14	0.59	BRL	0.18	56	9.1	350	0.89	NA	
B-17 0-3'	10/05/2012	EPA 6010C	25	0.57	NA		NA	NA	220	0.85	NA	
B-17 3-5'	10/05/2012	EPA 6010C	11	0.55	NA		NA	NA	19	0.83	NA	
B-17 5-7'	10/05/2012	EPA 6010C	NA		NA		NA	NA	110	0.82	NA	
B-21 0-3'	10/10/2012	EPA 6010C	20	0.51	NA		NA	NA	150	0.77	NA	
B-21 3-5'	10/10/2012	EPA 6010C	28	0.54	NA		NA	NA	130	0.80	NA	
B-22 0-3'	10/05/2012	EPA 6010C	NA		NA		NA	NA	170	0.78	NA	
B-22 3-5'	10/05/2012	EPA 6010C	NA		NA		NA	NA	200	0.83	NA	
B-23 0-3'	10/05/2012	EPA 6010C	NA		NA		NA	NA	55	0.82	NA	
B-23 3-5'	10/05/2012	EPA 6010C	NA		NA		NA	NA	17	0.80	NA	
WC-2 (B-26 2-5')	10/09/2012	EPA 6010C / 7471B / 1311	**42**	0.52	NA		NA	NA	170	0.78	1.1	0.010
B-30 0-3'	10/17/2012	EPA 6010C	NA		NA		NA	NA	23	0.77	NA	
B-30 3-4.5'	10/17/2012	EPA 6010C	NA		NA		NA	NA	24	0.75	NA	
B-31 0-3'	10/09/2012	EPA 6010C	NA		NA		NA	NA	200	0.78	NA	
B-31 3-5'	10/09/2012	EPA 6010C	NA		NA		NA	NA	16	0.80	NA	
B-32 0-3'	10/09/2012	EPA 6010C	NA		NA		NA	NA	120	0.78	NA	
B-32 3-5'	10/09/2012	EPA 6010C	NA		NA		NA	NA	4.6	0.81	NA	
B-33 0-3'	10/10/2012	EPA 6010C	NA		NA		NA	NA	460	0.80	NA	
B-33 3-5'	10/10/2012	EPA 6010C	NA		NA		NA	NA	21	0.78	NA	
B-34 0-3'	10/05/2012	EPA 6010C	NA		NA		NA	NA	**860**	0.80	NA	
B-34 3-5'	10/05/2012	EPA 6010C	NA		NA		NA	NA	**800**	0.75	NA	
Selected Soil Standards												
		MA S-1/GW-2	1,000		30				300			
		MA S-1/GW-3	1,000		30				300			
		MA S-2/GW-2	3,000		200				300			
		MA S-2/GW-3	3,000		200				300			
		MA S-3/GW-2	5,000		200				300			
		MA S-3/GW-3	5,000		200				300			
		MADEP Background - Urban Fill	40		40				600			
Enclosed Courtyard Samples												
B-6 0-4'	06/06/2011	EPA 6010B/7471A	20	1.3	NA		NA	NA	**900**	6.4	NA	
B-6 4-6'	6/06/2011 *	EPA 6010B	NA		NA		NA	NA	110	1.1	NA	
B-6A 0-2'	09/13/2011	EPA 6010B	NA		NA		NA	NA	**930**	0.79	NA	
B-6B 0-4'	09/13/2011	EPA 6010B	NA		NA		NA	NA	310	0.86	NA	
B-6C 0-4'	09/13/2011	EPA 6010B	NA		NA		NA	NA	390	1.1	NA	
B-6D 0-4'	10/09/2012	EPA 6010C	NA		NA		NA	NA	170	0.85	NA	
B-6D 4-6'	10/09/2012	EPA 6010C	NA		NA		NA	NA	91	0.83	NA	
B-6E 0-4'	10/09/2012	EPA 6010C	NA		NA		NA	NA	360	0.83	NA	
B-6E 4-6'	10/09/2012	EPA 6010C	NA		NA		NA	NA	77	0.82	NA	
B-7 8-10'	06/06/2011	EPA 6010B/7471A	10	1.3	NA		NA	NA	6.9	6.3	NA	
Between Building and Merrimack River												
B-13 0-3'	09/01/2011	EPA 6010B/7471A	19	0.87	NA	4.4	NA	NA	110	4.4	NA	
Selected Soil Standards												
		MA RCS-1	1,000		30				300			
		MADEP Background - Urban Fill	40		40				600			

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

Bold = Exceeds One or More Selected Standards

Prepared By: MDW
Reviewed By: EAF
Revision Date: 9/26/2011

TABLE 2.3
SUMMARY OF SOIL ANALYTICAL DATA:
TOTAL TRACE METALS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Mercury, Total	RDL	Nickel, Total	RDL	Vanadium, Total	RDL	Zinc, Total	RDL
Exterior Courtyard Samples										
B-1 1-5'	06/06/2011	EPA 6010B/7471A	0.15	0.017	10	5.3	16	1.1	66	5.3
B-1 10-15'	06/06/2011	EPA 6010B/7471A	BRL	0.021	7.2	6.5	24	1.3	35	6.5
B-2 1-5'	06/06/2011	EPA 6010B/7471A	0.34	0.019	11	5.5	25	1.1	68	5.5
B-2 10-15'	06/06/2011	EPA 6010B/7471A	0.39	0.02	22	5.7	47	1.1	140	5.7
B-3 5-10'	06/06/2011	EPA 6010B/7471A	0.061	0.021	13	5.9	24	1.2	37	5.9
B-4 2-5'	06/06/2011	EPA 6010B/7471A	**2.5**	0.19	14	5.8	28	1.2	220	5.8
B-4 12-15'	06/06/2011	EPA 6010B/7471A	BRL	0.02	6.2	5.8	16	1.2	33	5.8
B-5 10-15'	06/06/2011	EPA 6010B/7471A	BRL	0.022	8.7	6.6	24	1.3	41	6.6
B-8 0-3'	09/01/2011	EPA 6010B/7471A	0.24	0.09	22	1.1	20	0.43	74	2.2
B-8 5-10'	09/01/2011	EPA 6010B/7471A	BRL	0.11	6.4	1.3	13	0.5	32	2.5
B-9 0-3'	09/01/2011	EPA 6010B/7471A	0.32	0.09	**48**	1	28	0.41	43	2
B-10 0-3'	09/01/2011	EPA 6010B/7471A	0.35	0.09	17	1.2	20	0.46	100	2.3
B-11 0-3'	09/01/2011	EPA 6010B/7471A	0.79	0.08	26	1	20	0.41	170	2.1
B-12 0-3'	09/01/2011	EPA 6010B/7471A	0.28	0.1	**41**	1.1	27	0.45	130	2.2
WC-1 (B-16 1-5')	10/05/2012	EPA 6010C / 7471B / 1311	0.41	0.028	NA		NA		NA	
B-16 0-3'	10/05/2012	EPA 6010C/7196A / SM2580A /SM9045C	NA		**100**	0.51	NA		NA	
B-16 3-5'	10/05/2012	EPA 6010C/7196A / SM2580A /SM9045C	NA		11	0.59	NA		NA	
B-17 0-3'	10/05/2012	EPA 6010C	NA		20	0.57	NA		NA	
B-17 3-5'	10/05/2012	EPA 6010C	NA		7.5	0.55	NA		NA	
B-17 5-7'	10/05/2012	EPA 6010C	NA		NA		NA		NA	
B-21 0-3'	10/10/2012	EPA 6010C	NA		12	0.51	NA		NA	
B-21 3-5'	10/10/2012	EPA 6010C	NA		25	0.54	NA		NA	
B-22 0-3'	10/05/2012	EPA 6010C	NA		NA		NA		NA	
B-22 3-5'	10/05/2012	EPA 6010C	NA		NA		NA		NA	
B-23 0-3'	10/05/2012	EPA 6010C	NA		NA		NA		NA	
B-23 3-5'	10/05/2012	EPA 6010C	NA		NA		NA		NA	
WC-2 (B-26 2-5')	10/09/2012	EPA 6010C / 7471B / 1311	0.61	0.055	NA		NA		NA	
B-30 0-3'	10/17/2012	EPA 6010C	NA		NA		NA		NA	
B-30 3-4.5'	10/17/2012	EPA 6010C	NA		NA		NA		NA	
B-31 0-3'	10/09/2012	EPA 6010C	NA		NA		NA		NA	
B-31 3-5'	10/09/2012	EPA 6010C	NA		NA		NA		NA	
B-32 0-3'	10/09/2012	EPA 6010C	NA		NA		NA		NA	
B-32 3-5'	10/09/2012	EPA 6010C	NA		NA		NA		NA	
B-33 0-3'	10/10/2012	EPA 6010C	NA		NA		NA		NA	
B-33 3-5'	10/10/2012	EPA 6010C	NA		NA		NA		NA	
B-34 0-3'	10/05/2012	EPA 6010C	NA		**37**	0.54	NA		NA	
B-34 3-5'	10/05/2012	EPA 6010C	NA		15	0.50	NA		NA	
Selected Soil Standards										
		MA S-1/GW-2	20		20		600		2,500	
		MA S-1/GW-3	20		20		600		2,500	
		MA S-2/GW-2	30		700		1,000		3,000	
		MA S-2/GW-3	30		700		1,000		3,000	
		MA S-3/GW-2	30		700		1,000		5,000	
		MA S-3/GW-3	30		700		1,000		5,000	
		MADEP Background - Urban Fill	1		30		30		300	
Enclosed Courtyard Samples										
B-6 0-4'	06/06/2011	EPA 6010B/7471A	0.69	0.021	13	6.4	23	1.3	220	6.4
B-6 4-6'	6/06/2011 *	EPA 6010B	NA		NA		NA		NA	
B-6A 0-2'	09/13/2011	EPA 6010B	NA		NA		NA		NA	
B-6B 0-4'	09/13/2011	EPA 6010B	NA		NA		NA		NA	
B-6C 0-4'	09/13/2011	EPA 6010B	NA		NA		NA		NA	
B-6D 0-4'	10/09/2012	EPA 6010C	NA		NA		NA		NA	
B-6D 4-6'	10/09/2012	EPA 6010C	NA		NA		NA		NA	
B-6E 0-4'	10/09/2012	EPA 6010C	NA		NA		NA		NA	
B-6E 4-6'	10/09/2012	EPA 6010C	NA		NA		NA		NA	
B-7 8-10'	06/06/2011	EPA 6010B/7471A	BRL	0.021	6.9	6.3	18	1.3	35	6.3
Between Building and Merrimack River										
B-13 0-3'	09/01/2011	EPA 6010B/7471A	0.64	0.1	20	2.2	19	0.87	95	4.4
Selected Soil Standards										
		MA RCS-1	20		20		600		2,500	
		MADEP Background - Urban Fill	1		30		30		300	

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

Bold = Exceeds One or More Selected Standards

Prepared By: MDW
Reviewed By: EAF
Revision Date: 9/26/2011

Table 3
Summary of Soil Vapor Data: Polychlorinated Biphenyls (PCBs)

Sample Location		SV-1	SV-2	FB
Analytical Method		USEPA TO-10A	USEPA TO-10A	USEPA TO-10A
Date Sampled		15-Sep-11	15-Sep-11	15-Sep-11
		Soil Vapor	Soil Vapor	Field Blank
Analyte	Units			
Aroclor-1016	µg/m^3	<0.048	<0.049	<0.040
Aroclor-1221	µg/m^3	<0.048	<0.049	<0.040
Aroclor-1232	µg/m^3	<0.048	<0.049	<0.040
Aroclor-1242	µg/m^3	<0.048	<0.049	<0.040
Aroclor-1248	µg/m^3	<0.048	<0.049	<0.040
Aroclor-1254	µg/m^3	<0.048	<0.049	<0.040
Aroclor-1260	µg/m^3	<0.048	<0.049	<0.040
Aroclor-1262	µg/m^3	<0.048	<0.049	<0.040
Aroclor-1268	µg/m^3	<0.048	<0.049	<0.040
Total PCBs		ND	ND	ND
Lowest Residential Risk-Based Number *		0.01	0.01	0.01
Soil Vapor Screening Value **		0.70	0.70	0.70

ND = None Detected

ELCR = Excess Lifetime Cancer Risk

USEPA IRIS = U.S. Environmental Protection Agency's Integrated Risk Information System

* Risk-based inhalation concentration for ELCR of 1E-06 (USEPA, IRIS)

** Residential Soil Vapor Screening Value presumes a soil vapor to indoor air attenuation factor of 70

Table 4
GROUNDWATER ELEVATION MEASUREMENTS
Boott Mills
130 Foot of John Street
Lowell, Massachusetts
(units, feet)

Well Number	Gauging Date	Screening Interval	Casing Elevation	Depth to Water	Groundwater Elevation
GEC-1	6/8/2011	7.3 - 17.3	100.40	17.30	83.10
	6/15/2011			15.66	84.74
	9/2/2011			11.54	88.86
	9/7/2011			15.10	85.30
	9/12/2011			14.20	86.20
GEC-2	6/8/2011	7.88 - 17.88	100.08	16.23	83.85
	6/15/2011			16.15	83.93
	9/2/2011			11.19	88.89
	9/7/2011			--	NA
	9/12/2011			13.93	86.15
GEC-3	6/8/2011	6.22 - 16.22	100.00	14.30	85.70
	6/15/2011			14.17	85.83
	9/2/2011			11.04	88.96
	9/7/2011			13.28	86.72
	9/12/2011			13.05	86.95
GEC-4	6/15/2011	8.78-13.78	100.02	10.07	89.95
	9/2/2011			--	NA
	9/7/2011			--	NA
	9/12/2011			--	NA
GEC-5	9/2/2011	1.8 - 11.8	100.04	11.18	88.86
	9/7/2011			--[1]	NA
	9/12/2011			--[1]	NA
GEC-6	9/2/2011	6.5 - 16.5	100.42	11.55	88.87
	9/7/2011			15.53	84.89
	9/12/2011			14.32	86.10
GEC-7	9/2/2011	3 - 13	97.73	9.15	88.58
	9/7/2011			12.97	84.76
	9/12/2011			11.73	86.00

Notes:
1 - Well Dry
- Benchmark (BM)= Southern corner of the catch basin rim located within the stormwater system 20ft northwest of GEC-3 . Assumed 100 ft elevation at BM.

Prepared by : MDW
Reviewed by: BTB
Revised: 3/7/2014

APPENDIX A

GEC's Response to EPA's Comments

Goldman
Environmental
Consultants, Inc.

60 Brooks Drive
Braintree, MA 02184

781-356-9140
Fax 781-356-9147
www.goldmanenvironmental.com

December 20, 2013

Kimberly N. Tisa
PCB Coordinator
Office of Site Remediation & Restoration
EPA New England, Region 1,
5 Post Office Square - Suite 100
Boston, MA 02109-3912

RE: Response to EPA's Comment Letter dated October 22, 2013, Regarding Request for Risk-Based PCB Cleanup Under 40 CFR § 761.61(c)
Boott Mills, 130 Foot of John Street
Lowell, MA 01852
MADEP RTN: 3-26688

Dear Ms. Tisa:

Goldman Environmental Consultants, Inc. (GEC) on behalf of Boott Properties, LLC, the current owner of the 130 Foot of John Street property, provides the following responses to your Comment Letter dated October 22, 2013, regarding Request for Risk-Based PCB Cleanup Under 40 CFR § 761.61(c). We appreciate your feedback and hope that the following responses help to clarify and answer any uncertainties you had on our initial submittal and complete our Notification.

Our responses are as follows.

1. *What was the construction date(s) of the existing buildings on the property?*

   Based on Sanborn Fire Insurance Maps, the buildings located on the property were constructed prior to 1892.

2. *The Notification indicates that previous removal work occurred in March 2007 under a December 2007 RAM Plan. If available, a figure should be provided showing the area where soil excavation work occurred and the location of the post-excavation soil sampling.*

   Attached, please find Figure 1, prepared by Environmental Compliance Services, Inc. (ECS) and included in the Release Abatement Measure (RAM) Completion Report prepared by ECS, dated January 28, 2008. Figure 1 depicts the area where approximately 210 tons of soils were excavated from the exterior courtyard in March 2007 under ECS's direction. Confirmatory soil samples, collected and identified by ECS as 1A-N, 2A-N, 3A-N, 4A-N, 5A-N, 1B-E, 1C-E, 1D-E and 2D-S, are also depicted on Figure 1. Based on the RAM Completion Report, attached as Attachment 1, the confirmatory soil samples were collected from a depth of 24 to 36 inches below the ground surface along the sidewalls within the open excavation. Based on a comparison of exterior courtyard dimensions to the excavation dimensions shown on Figure 1 Excavation Area Plan, provided in the RAM Completion Report, ECS excavated shallow soils from approximately 50% of the exterior courtyard. Information on the excavation depths was not explicitly provided although side wall samples were collected two to three feet below ground surface and approximately 210 tons of excavated soils were transported to Turnkey Landfill in Rochester, New Hampshire. According to the RAM Completion Report, clean backfill and gravel were placed in the courtyard to return it to grade.

3. *Please note that Table 2.2 in the Notification indicates a revision date of November 1, 2012. Given that there is 2013 PCB data contained in this table, it would appear that the revision date, as shown, is incorrect.*

   Attached, please find Table 2.2 with the correct revision date.

4. *It is not clear where the wall-mounted transformers were located as these locations are not readily apparent on the figures. What is known about these transformers and when were they removed from the property?*

   Although a vast amount of research was conducted in an effort to determine the locations, types and ages of the transformer(s), no information was found. The research into the transformer(s) consisted of the following:

   1. Review of the National Park Service HABS Plans from 1984 (these are existing-conditions architectural plans of the buildings in the Boott Cotton Mills complex). The plans do not indicate the existence of any wall-mounted transformers, however, that is likely because the plans wouldn't have noted them in the first place. This is not definitive evidence that there were no transformers at the time the plans were produced.

   2. Review of HAER photos at the Library of Congress. This collection of photos was taken in the 1970's and early 1980's in conjunction with the plans referenced above. There are no clear photos of the façade in question (the southern façade of Mill No. 5).

   3. Discussion with the administrator of the Lowell Historic Board, Steven Stowell, and employees of the National Park Service (the Lowell National Historical Park), Peter Aucella and Charles Parrott. None of them had knowledge of the transformers, although they were helpful in our review of items 1 and 2 above.

   It was reported by ECS in the January 28, 2008 RAM Completion Report that "information provided by the general contractor indicates that a "wall-mounted transformer" may have been located in the courtyard where PCBs subsequently were detected in soil." Based on this information, it is speculated that PCB contamination in the exterior courtyard originated from a release from a historic wall-mounted transformer.

5. *PCBs were identified in groundwater at greater than (>) 0.5 parts per billion (ppb), which is not discussed per se in the Notification. However, it is indicated that PCBs were not present in the dissolved state, which was a consideration in the risk evaluation. As shown in the groundwater analytical table data, the footnotes indicate that GEC-1 and GEC-2 were filtered prior to PCB analysis.*

   a. *How were the samples filtered?*

      The samples collected for dissolved PCB analyses from monitoring wells GEC-1 and GEC-2 on September 7, 2011 and September 12, 2011, respectively, were collected via bladder pumps and filtered in the field using a 0.45 µm in-line filter. Refer to Attachment 2 for the filter specification sheet.

   b. *EPA notes that for the filtered samples, the total PCB results for the associated unfiltered samples were reported as BRL. Thus, it does not appear that sufficient data exists that would indicate that PCBs are associated only with the soil particulates.*

      During the June 15, 2011 groundwater sampling event, four monitoring wells, GEC-1, GEC-2, GEC-3 and GEC-4 were sampled for PCBs. PCBs (Aroclor 1248 and 1254)

were detected above its reportable detection limit (RDL) in two (GEC-1 and GEC-2) out of the four samples. Total PCB concentrations in GEC-1 and GEC-2 during the June 2011 sampling round were 5.1 and 7.8 µg/l, respectively. However, due to a low water table in GEC-1 and GEC-2 low flow groundwater sampling via bladder pumps could not be conducted as planned, and therefore, GEC-1 and GEC-2 were sampled via bailers. Samples from GEC-3 and GEC-4 were collected via low flow techniques utilizing bladder pumps.

During the September 2011 groundwater sampling events conducted on September 7, 2011 and September 12, 2011, four monitoring wells, GEC-1, GEC-2, GEC-6 and GEC-7 were sampled for PCBs. Samples were collected by low-flow technique via bladder pumps from GEC-1 and GEC-2 for analysis of total and dissolved PCBs. Samples were collected from GEC-6 and GEC-7 for total PCBs via a bladder pump and bailer, respectively. Total Aroclor 1254 was detected in GEC-2 at a concentration of 0.43 ug/l. No other PCBs were detected in groundwater of GEC-2 and no dissolved PCBs were detected in groundwater of either GEC-1 or GEC-2. In addition, groundwater samples collected from GEC-6 and GEC-7 contained no detectable total PCB.

The presence of PCBs in unfiltered groundwater samples collected from GEC-1 and GEC-2 in June 2011 via bailers is likely associated with suspended soil particulates in the groundwater samples attributable to the sampling technique. The reduced total PCB concentrations detected in September 2011, and lack of detectable PCBs in filtered groundwater samples was observed during low flow sampling via bladder pumps when little to no suspended soil particulates would have been present in the sample due to the sampling technique. These results/findings indicate that dissolved-phase PCBs are not present in groundwater.

c. *Please be aware that EPA generally does not look at "dissolved" PCBs, and thus the Notification should include a discussion of how the total PCB concentration for the unfiltered samples could affect the remedial plan.*

As discussed above, the total PCB concentrations detected in GEC-1 and GEC-2 during the June 15, 2011 groundwater sampling event were the results of samples collected with bailers and, therefore, contained a high suspended soil particulate count. The total PCB concentrations detected in GEC-1 and GEC-2 during the September 2011 sampling events were the results of samples collected via a low flow sampling technique using bladder pumps and, therefore, the suspended soil particulate count was reduced in comparison to the June 2011 samples. GEC believes samples collected from GEC-1 and GEC-2 during September 2011 are more representative of actual dissolved-phase PCBs in groundwater. The highest total PCB concentration detected in September 2011 was 0.43µg/l in monitoring well GEC-1. This does not exceed 0.5 µg/l, the decontamination standard specified for unrestricted use under 40 CFR § 761.79(b)(1)(iii). Therefore, total PCB concentrations in groundwater do not need to be removed from groundwater and do not affect the remedial plan.

In addition, the planned depth of soil excavation is unlikely to intercept the groundwater table. Therefore, de-watering of the excavation pit from infiltrating groundwater is unlikely to be an issue during remediation.

d. As Aroclor PCBs were reported, a determination on the "accuracy" of the reported number should be discussed. That is, how did the raw data compare to the standard? This likely will need to be discussed with the lab.

The laboratory could not provide any insight regarding the accuracy of the reported number. Based on GEC's interpretation, the accuracy of the reported number could be affected through the use of surrogate values to evaluate percent recovery. In addition, the analytical data were evaluated relative to MADEP's Compendium of Analytical Methods. For each sample / analysis, no laboratory control sample and / or laboratory control sample duplicate recoveries were less than CAM's recommended criteria for gross failure. None of the OHM detected in any sample met the laboratory control sample criterion for "gross failure" rejection.

Surrogate recovery for the following samples was not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences (analytes and samples qualified: Decachlorobiphenyl, Decachlorobiphenyl[2C], Tetrachloro-m-xylene, Tetrachloro-m-xylene[2C]): Comment: Each of the B-# and WC-# samples are located in areas of planned excavation. Some of the boring intervals comprising the Composite # samples were analyzed separately and some are planned for excavation. See the bottom of this answer for more details.

- B-38 (0-9')
- B-49 (0-3')
- B-50 (0-3')
- Composite 1 (0-5')
- Composite 4 (0-3')
- Composite 6 (0-3')
- WC-2
- WC-1
- B-35 (5-7')
- B-35 (7-9')
- B-16 (5-7')
- B-16 (7-9')
- B-15 (0-3')
- B-15 (3-5')
- B-35 (3-5')
- B-26 (5-7')

Sample fingerprints did not match standard exactly. The following samples were quantitated against the closest matching standard (analyte and samples qualified: Aroclor-1248, Aroclor-1248[2C]):

- Composite 1 (0-5')
- Composite 4 (3-9')

Sample fingerprints did not match standard exactly. The following samples were quantitated against the closest matching standard (analyte and samples qualified: Aroclor-1248, Aroclor-1248[2C], Aroclor-1254[2C]): Comment: B-35 is located within hot spot #1 and excavation is planned to 9 feet below grade. The remaining samples are located in areas not currently planned to be excavated.

- B-35 (3-5')
- B-37 (0-3')

- B-35 (0-3')
- B-20 (3-5')
- B-20 (5-7')
- B-21 (0-3')
- B-21 (3-5')
- B-22 (3-5')
- B-31 (0-3')
- B-27 (0-3')

Sample contains two incompletely resolved Aroclors. Aroclor with the closest matching pattern is reported for the following samples (analyte and sample qualified: Aroclor-1254, Aroclor-1254[2C]): Comment: B-39 is located within hot spot #1 and excavation is planned to 9 feet below grade.

- B-39 (0-3')
- B-39 (3-9')

For the following samples, laboratory fortified blank duplicate RPD is outside of control limits. Reduced precision is anticipated for any reported value for this compound. (analyte and sample qualified: Aroclor-1016, Aroclor-1016[2C], Arooclor-1260, Aroclor-1260[2C]). Comment: The lab reports identified below report results for one sample each, i.e., WC-1 and WC-2. These samples were collected from borings B-17 and B-26, respectively, which are located in areas of planned excavation.

- WC-2
- B061065-BLK1 (Contest 12J0624 & Contest 12J0625)
- B061065-BS1 (Contest 12J0624 & Contest 12J0625)
- B061065-BSD1 (Contest 12J0625)
- WC-1

Result was confirmed using a dissimilar column. Relative percent difference between the two results was >40%. The higher result was reported for the following samples (analyte and samples qualified: Aroclor-1248[2C]). Comment: This sample was collected from hot spot #1, which will be excavated to 9 feet below grade.

- B-35 (7-9')

Continuing calibration did not meet method specifications and was biased on the high side for this compound. Increased uncertainty is associated with the reported value which is likely to be biased on the high side. (analyte and samples qualified: Aroclor-1016[2C]). Comment: For samples, detected value may be higher than actually present in sample. This lab report included the samples collected from boring B-17.

- B060508-BS1 (Contest 12J0289)
- B060508-BSD1 (Contest 12J0289)

Due to continuing calibration non-conformance on the confirmatory detector, the lower of two results was reported. (analyte and samples qualified: Aroclor-1254). Comment: Boring B-35 is located within hot spot #1, which is planned to be excavated to 9 feet below grade.

- B-35 (5-7')
- B-35 (7-9')

Matrix spike and/or spike duplicate recovery bias high due to contribution of other Aroclors present in the source sample. (analyte and samples qualified: Aroclor-1016, Aroclor-1016[2C], Aroclor-1260, Aroclor-1260[2C]). Comment: Presence of PCBs in source sample resulted in elevated spike recovery. As a result, introduces uncertainty in the affected data set. Lab report 12J0290 included the samples of borings B-15 and B-16. Both borings are located in areas of planned excavation.

- B073035-MS1 (Contest 13E0387)
- B073035-MSD1 (Contest 13E0387)
- B060565-MS1 (Contest 12J0290)
- B060565-MSD1 (Contest 12J0290)

Samples contain elevated detection limits due to the dilution required by the elevated concentrations of target compounds in the sample. As a result, one or more of the target analytes did not achieve requested CAM reporting limits and surrogate recoveries were below the acceptance criteria. Comment: B-9 (1-3) is located within planned excavation area 3. Because PCBs were detected in these samples, the detection limit issue is not significant.

- B-9 (1-3')
- B-10 (0-3')
- B-10 (3-6')
- B-11 (0-3')

For the following samples, reported results for selected analyte exceeded the high standard of the associated calibration curve. Results are estimated. Sample was re-analyzed and reported with all analytes within calibration. Comment: This result is acceptable. Also, B-2 (1-5') and B-4 (2-5') were collected in locations and at depth intervals where remedial excavation is planned.

- B-2 (1-5')
- B-2 (10-15')
- B-4 (2-5')

The following samples were diluted prior to analysis. Dilution was required to keep all target analytes within calibration. Elevated reporting limits are above the recommended CAM reporting limits for the target analytes. Comment: Elevated level of PCBs detected in this sample; therefore, dilution was required.

- B-2 (10-15')

A five-time dilution was performed as part of the standard analytical procedure for the following samples. Comment: Requested CAM reporting limits were achieved for all samples, except for those that required dilution due to elevated levels of PCBs.

- B-29 (0-3')
- B-29 (3-5')
- B-29 (5-6')
- B-36 (3-5')
- B-25 (0-3')
- B-25 (5-7')
- B-27A (0-3')
- B-37 (3-5')
- B-26 (9-12')

- B-15 (5-7')
- B-17 (0-3')
- B-17 (3-5')
- B-17 (5-7')
- B-34 (3-5')
- B-22 (5-7')
- B-23 (0-3')
- B-23 (3-5')
- B-32 (0-3')
- B-31 (3-5')
- B-32 (3-5')

Quality control issues can affect the precision and accuracy of the reported results. Issues with quality control often exist in samples where elevated levels of PCBs exist and dilution is required to keep all analytes within calibration range. Most of the samples identified were collected in areas of planned excavation, which would reduce the uncertainty in the data set. Samples B-38 0-9', B-39 0-3' and 3-9', WC-2, B-35 0-3', 3-5', 5-7' and 7-9', B-26 5-7' and B-4 2-5' are located within planned Excavation 1 (hot spot #1). Samples B-49 0-3', B-50 0-3' and B-15 0-3' and 3-5' are located within planned Excavation 2 (hot spot #2). Samples WC-1, B-9 1-3' and B-2 1-5' are located in planned Excavation 3.

Composite 4 0-3' is comprised of the 0-3' interval soils of borings B-39, B-49 and B-50, and are slated for excavation. Composite 4 3-9' is comprised of the 3-9' interval soils of borings B-39, B-49 and B-50. Upon obtaining the analytical results of Composite 4 3-9', the 3-9' soil samples from B-39, B-49 and B-50 were analyzed separately. B-39 3-9' soils are slated for excavation. The B-49 and B-50 3-9' interval soils are partly below the bottom of the planned Excavation 2; these two samples did not have quality control issues.

Composite 1 is comprised of soils from borings B-41 and 42, which are outside of planned excavation areas, and borings B-43 and B-54, which are within planned excavation areas. The borings of Composite 6 is located outside of any planned excavation area. Because most of the affected soil samples were collected in areas of planned excavation, the quality control issues are not significant, except potentially for the ones (e.g., B-49 and B-50) located in planned Excavation 2, from where excavated soils are planned to be disposed at Turnkey Landfill as <50 ppm PCB soils. Additional test boring and soil sampling are planned at B-38, B-39, B-49 and B-50 to address data gaps. Additional test boring for Composite 1 will be repeated, but will include only borings B-41 and B-42. Additional test boring for Composite 6 will include all prior test boring locations. Refer to Table 2 for supplemental soil sampling plan. In addition to addressing data gaps, this additional test boring program will also address quality control issues identified above.

6. *The sampling intervals with reported PCB concentrations are insufficient to support disposal of PCB soils as a <50 ppm waste. Initial sampling intervals appear to generally be collected over a 0-3' range. Some intervals within the soil borings were collected over 6 feet. Given that the source of PCB is indicated to be associated with releases form wall-mounted [PCB] transformers, the intervals are too big to confirm current PCB concentrations for either cleanup or disposal.*

   Although it is speculated that the initial release was from a wall-mounted [PCB] transformer, since the time of the initial release, soil excavation activities, subsurface utility installations and re-grading activities have occurred within the courtyard and soils have been disturbed and moved around vertically and horizontally. For example, during the initial RAM excavation by ECS in 2007, approximately the top two to three feet of soils were removed from a large portion of the exterior courtyard, live-loaded onto dump trucks and transported to Turnkey Landfill in Rochester, New Hampshire. The excavated area was reportedly subsequently backfilled with clean soils and gravel. However, during GEC's subsequent investigations this area was found to be re-contaminated, probably by mixing of soils during installation of the stormwater system, utility lines and re-grading prior to paving. As a result of commingling of soils, the top few inches of soils are likely not significantly more contaminated with PCBs than the deeper soils. Attached as Table 1, please find the results of previously collected PCB soil samples. This table also provides an evaluation of each data point, relative to the following:

   i. Excavation 1: All soil excavated from this area will be shipped as soil containing PCBs at concentrations >50 ppm (mg/kg). Therefore, no additional soil sampling is required. Following the completion of excavation, confirmatory soil samples will be collected at and outside the sidewalls and bottom of Excavation 1 to ensure PCB concentrations are <10 ppm.

   ii. Excavations 2 and 3: All soils excavated from these areas are slated to be shipped as soil containing PCBs at concentrations <50 ppm. To determine if there is a potential for any of these soils to contain more than 50 ppm PCBs in any one-foot interval, the existing PCB data were evaluated, by assigning the entire mass of PCB detected in a given sample to a one-foot interval of the sample, as documented in Table 1. This conservative approach would mean that no PCBs existed in the remaining two to four feet of soils comprising the original soil sample. For any given sample, within the two excavation areas, if there is a potential for the maximum PCB concentration in a one-foot interval sample to exceed 50 ppm, additional soil sampling and analysis was recommended for location where the original sample was collected. In which case, one-foot sampling intervals were recommended for the entire sampling interval of the original sample. For example, if the original sample was collected from the 0-3 foot interval, the recommended sampling intervals are 0-1, 1-2 and 2-3 feet below grade. Based on this evaluation, for Excavation 2, additional sampling is recommended for the 0-1, 1-2 and 2-3 foot intervals of test borings B-49 and B-50. For Excavation 3, additional sampling is recommended for the 0-1, 1-2, 2-3, 3-4 and 4-5 foot intervals of test borings B-2 and B-16. The supplementary soil sampling plan is provided in Table 2. Following the completion of excavation, confirmatory soil samples will be collected at and outside the sidewalls and bottom of Excavation 1 to ensure PCB concentrations are <10 ppm.

   iii. Beneath Excavations 1, 2 and 3: The recommended excavation depths for Excavations 1, 2 and 3 are 9, 5 and 5 feet, respectively. For each excavation, the

PCB data beneath the maximum planned depth of excavation were evaluated to determine if there was a potential for more than 10 ppm PCBs to be present in any two-foot interval soil below the bottom of the excavation, as documented in Table 1. An assumption was made that the entire mass of PCBs present in a given soil sample originated from only a two-foot interval of the test boring. Based on this evaluation, the existing soil data for beneath Excavations 1 and 3 indicated that PCB levels are likely less than or equal to 10 ppm. For Excavation 2, one sampling point B-50 3-9 foot interval requires additional investigation. This sample includes soils from the 3-5 foot interval, which will be excavated. Therefore, soils from the 5-7 and 7-9 foot intervals at the B-50 test boring location will be collected and analyzed for PCBs, as described in Table 2.

iv. Remainder of the Courtyard: It must be demonstrated throughout the remainder of the courtyard, that the soil being left in place is soil containing PCBs at concentrations <10 ppm. To demonstrate that soils being left in place have PCB concentrations <10 ppm, GEC evaluated previously collected data to determine if additional samples were needed to verify PCB concentrations in soils to be left in place are <10 ppm. This evaluation is provided in Table 1, and was conducted separately for the 0-3 foot interval and the 3-15 foot interval.

i. 0-3 Foot Interval: To evaluate data, GEC took the concentration of PCB detected in each sample collected from the 0-3 foot interval and multiplied it by the number of 6-inch intervals the sample was collected over. If the calculated concentration was >10 ppm, GEC reasoned additional sampling was required. If the calculated concentration was <10 ppm, GEC reasoned that additional sampling was not warranted, existing data demonstrates PCB concentrations of <10 ppm. For example, a concentration of 0.27 ppm PCBs was detected in the sample collected from B-31 0-3 feet. Because the sample was collected over six 6-inch spans, 0.27 ppm was multiplied by 6 to get 1.62 ppm. Because 1.62 ppm is < 10 ppm it was reasoned that additional sampling at this grid area was not warranted. Based on this evaluation, additional sampling was recommended for the 0-0.5, 0.5-1, 1-2 and 2-3 foot intervals for test boring locations B-10, B-11, B-20, B-21 and B-48, as well as those comprising Composite 5 and Composite 6. Also, additional sampling was recommended for the 0-0.5, 0.5-1, 1-2, 2-3, 3-4 and 4-5 foot intervals for the test borings comprising Composite 1. Composite 4 was not included in this evaluation because the 0-3 foot interval samples from the borings comprising Composite 4 were evaluated separately, and three out of five of the borings are in areas of planned excavation. The sampling plan is provided in Table 2.

ii. 3-15 Foot Interval: To evaluate data for this interval, GEC took the concentration of PCB detected in each sample collected from each grid and multiplied it by the number of feet the sample was collected over. If the calculated concentration was >10 ppm GEC reasoned additional sampling was required. If the calculated concentration was <10 ppm GEC reasoned that additional sampling was not warranted at this location, because existing data demonstrates PCB concentrations are <10 ppm within the grid area. Based on this evaluation, for the 3-15 foot interval, no soil sample was predicted to have a PCB concentration >10 ppm within any of its one-foot intervals. Based on the foregoing, no additional investigation is recommended for the 3-15 foot interval outside the excavation areas.

7. *Page 8. The Notification indicates that a site-specific cleanup standard of 10 ppm was calculated for PCBs. Based on previous reviews by EPA's risk assessor, the shallow sampling intervals that were used in this risk determination would be considered too large for the RA. EPA's RA guidance indicates that the initial interval should be within top 1 inch.*

   As discussed above under question 6, the source of the release is unknown and is speculated initially by ECS that it might be from a wall-mounted [PCB] transformer. Regardless of the origin of release, it is likely quite old, given that PCB contamination was detected throughout the courtyard and to depth intervals as much as 10-15 feet below ground surface. Since the time of the initial release, soils were disturbed, likely repeatedly, as a result of installing or repairing utilities or re-grading prior to paving. As recently as 2007, ECS conducted a RAM during which excavation of nearly 50% of the exterior courtyard (i.e., 260 square yards out of the 550 square yard courtyard) was conducted and reportedly backfilled with clean soil and gravel. Subsequent to the RAM, a storm water system was installed. Currently, utility lines (i.e., sewer, water, storm water and gas) are located throughout the courtyard, including on all four sides of the storm water system. Likely utility lines were installed or moved to accommodate the storm water system and / or during conversion of the mill complex for residential use. The exterior courtyard was subsequently paved or re-paved, which also likely required re-grading of soils. During GEC's investigations, PCBs were detected in shallow soils within the RAM excavation area, where clean soils were expected. These results support GEC's opinion that soils have been disturbed and commingled since the initial PCB release and even since the RAM excavation. Given the age of the release and Site history, collecting soils in one-inch intervals would be excessively expensive and is unlikely to show that the top one-inch interval soils are any more contaminated than the top one-foot or three-foot interval soils. As discussed above in comment 6, GEC will conduct additional sampling at shallow sampling intervals, where data suggests levels might exceed proposed clean up criteria or in grids where 0-3 foot interval data is limited. Additional soil samples will be collected from 0-6 inches, 6-12 inches, 1-2 feet, 2-3 feet and 3-5 feet. Refer to Table 2 for the proposed soil sampling plan.

8. *Justification is not adequate to support a deviation from the cap requirements under § 761.61(a)(7). It is indicated that the subsurface utilities present "potential" difficulty in installing a TSCA-compliant cap. However, the "potential" difficulty is not fully vetted and thus additional justification/information is required to support the proposed deviation. Information on the location (both laterally and vertically) of the utilities and other subsurface structures should be included in the Notification.*

   Based on site's current building and ground elevations, a 4-inch cap is the thickest cap that could currently be installed at the Site without removing soil across the entire area slated to be capped. There is currently one main entrance to the building and five entry doors into individual condo units that are at grade level. If a cap greater than 4-inches in thickness is installed as the Site currently is, it will not be possible to grade runoff water flow and water will flow directly into the building and individual condo units. To install a TSCA compliant cap with 6-inches of asphalt, 2-inches of soil would have to be scraped off the entire area to be capped. This would entail scraping 2-inches of soil off an approximately 150 ft x 40 ft area, and disposing of approximately 37 cubic yards of soil as PCB contaminated soil. Additionally, a stormwater infiltration system is located within the area to be capped. Although there is no as-built for the stormwater infiltration system, based on conversation with the on-site contractor overseeing site renovations, the stormwater system is installed such that it would not be possible to decrease it's elevation by 2-inches. In addition to the stormwater infiltration system there are multiple utility lines running all over the courtyard at

various depths. Based on these factors, GEC is proposing to install a 4-inch asphalt cap in place of the TSCA 6-inch asphalt cap.

9. *Verification sampling is not proposed following soil removal. Given the sampling conducted to-date, the sampling is not adequate or consistent with the procedural requirements under Subpart O. Therefore, verification sampling would be required to determine PCB concentrations remaining following remedial work.*

   Verification sampling will be conducted following the remedial work in accordance with Subpart O of 40 CFR § 761. After we conduct this proposed sampling and prior to conducting the verification sampling, a sampling plan will be presented to EPA for approval.

10. *Page 11. 1st paragraph. The Notification refers the reader to Attachment 3 for details pertaining to cap construction. Attachment 3 to the Notification is the Conceptual Site Model and Risk Assessment for the Site, not the cap design. However, a discussion of the cap was found in Section 5.0 of Attachment 3.*

    The justification and details of the cap design are provided in the response to comment 8, above.

11. *Attachment 3. Conceptual Site Model and Risk Assessment. Please note that at this time EPA has not had sufficient time to conduct a comprehensive review of the human health risk assessment (HHRA). However, for purposes of providing some feedback, EPA is providing the following comments:*

    a. *For purposes of developing the risk assessment, EPA generally would follow the HHRA guidance provided in the EPA RA Guidance for Superfund, Volume 1 Part A. While EPA understands that the HHRA was provided in part, to satisfy the MassDEP requirements, it was also provided to support the 10 ppm PCB cleanup standard under 40 CFR Part 761. Please clarify the differences, if any, between EPA's RA guidance and the MassDEP guidance that could/would affect the risk evaluation.*

       MADEP's risk assessment guidance is similar to EPA's RAG Volume I Part A guidance. As pertains to the risk assessment contained in the RAM Plan Modification, some key differences between the two guidance documents are described below:

       i. MADEP requires an appropriately conservative estimate of mean concentration for use as the exposure point concentration. Depending on the data set, the exposure point concentration may be a mean concentration, maximum concentration or 95% upper confidence limit (UCL) of the mean. EPA's guidance requires the use of the 95% UCL of the Mean. For this risk assessment, the 95% UCL of the mean was used for PCBs, lead and nickel. For the remaining contaminants of concern, the mean concentration was used. These remaining contaminants of concern were detected at relatively low concentrations and their presence, even at 95% UCL of the mean, would not significantly change the outcome of the risk assessment.

       ii. The risk assessment used cancer and non-cancer dose response values required by MADEP. Usually, MADEP adopts EPA's dose response values provided in the Integrated Risk Information System (IRIS). When they do not adopt EPA's dose response values, they usually derive or identify one that is more conservative than EPA's. When EPA does not provide a dose response value, MADEP derives its own, which is more conservative than eliminating a contaminant from an exposure pathway in the quantitative risk assessment.

iii. The effect of differences in exposure assumptions are described below in bullet 11b.

b. *Exposure Factors. EPA recognizes that most (if not all) the references for these factors are to the MassDEP guidance. For purposes of the HHRA EPA would generally consider values representing the upper bound or Reasonable Maximum Exposure (RME). The RME refers to people who are at the high end of the exposure distribution. This scenario is intended to assess exposures that are higher than average, but are still within the realistic range of exposure. For example, the RME for exposed skin for all adults is 5700 cm^2/day. This value was not considered in the RA.*

The Exposure Factors Handbook (2011 version available on-line) provides most of the EPA exposure factors. The link to the highlights (and the handbook) is provided below.

http://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=221023

Please review and consider what differences exist between the factors used in this HHRA and those specified in the EPA exposure factors and if the risk evaluation would change as a result of these differences.

Please note, the above link to the EPA's *Exposure Factors Handbook: 2011 Edition* does not work. It was located at the following link:

http://www.epa.gov/ncea/efh/pdfs/efh-complete.pdf

In Table 3, the exposure factors used in the risk assessment provided in the RAM are compared to those in EPA's *Exposure Factors Handbook* and EPA's *Risk Assessment Guidance for Superfund: Volume I Human Health Evaluation Manual (Volumes A, E and F)* (RAGS). Regarding EPA's example comparison above, the RME for exposed skin of 5700 cm^2/day is for all adult residents (RAGS Part E, page 3-10). The risk assessment provided in the RAM assumed that the soils remain covered by a protective cover / cap, and that residential exposure occurs only during a single six-month period when the protective cover / cap is removed. As such, a conservative assumption was made that the most sensitive receptor (a very young child) would be exposed to the soils during this period. Therefore, the adult surface RME for exposed skin of an adult resident does not apply.

The risk assessment provided in the RAM Plan Modification assumed the exposure period for each receptor would be limited to a six-month period during which a construction project was occurring. However, a six-month exposure period is unlikely to occur because a cap will be installed over the exterior courtyard and the cap can be removed or partially removed only long enough to repair or install utility lines or the storm-water recharge system, during which these activities would be conducted under a Soil Management Plan. The cap and requirements for maintenance and activities pertaining to the cap would be memorialized via an institutional control (i.e., a Notice of Activity and Use Limitation). Therefore, the risk assessment contained site-specific exposure factors for exposure period, exposure duration, non-cancer averaging period and, for resident, exposure frequency. These site-specific exposure factors are consistent with the requirements of the Notice of Activity and Use Limitation.

The following MADEP and EPA exposure factors were compared for each receptor: (1) resident; (2) commercial office worker; and (3) construction worker. These receptors are the ones identified in the RAM Plan Modification. EPA provides default exposure factors for residents and commercial/industrial workers. When there are no restrictions on exposure, both MADEP's and EPA's defaults are that a resident resides at the same

location for 30 years, from age 1 to 31 years. For this risk assessment, because exposure is presumed to occur only during a 6-month period, the residential receptor was conservatively assumed to be aged 1 to 2 years old during the period of exposure. This assumption would tend to result in a higher exposure and risk estimate than if the resident was assumed to be older.

MADEP requires calculating risks for commercial office worker and construction worker separately. EPA assumes the commercial/industrial worker could be a groundskeeper, landscaper, construction worker, etc. Because of the cap, the 6-month exposure period would be the same for both EPA's commercial/industrial worker and MADEP's construction worker. Under this scenario, EPA's commercial/industrial worker has exposure more in line with MADEP's construction worker than with MADEP's commercial office worker.

Given the use of the cap and Notice of Activity and Use Limitation, the comparison of MADEP's and EPA's exposure factors is most significant for skin surface area (SA), soil adherence factor (AF), soil ingestion rate (IR), body weight (BW), dust inhalation rate (Inh) and chemical-specific oral and dermal absorption factors. These comparisons are documented in Table 3 for all except the absorption factors, which is documented in Table 4.

Resident: The EPA documents provided guidance on a resident, aged 1 to 6 years old, who has a BW of 15 kg, an IR of 100 mg/day (or 200 mg/day, if aged 3 to 6 years old), a SA of 2800 cm^2/day and AF of 0.2. Because a cap would be in place and exposure would be limited to a single six-month project, GEC assumed the resident would be aged 1-2 years at the time of exposure. This child resident has a BW of 10.7 kg, an IR of 100 mg/day, a SA of 1670 cm^2/day and an AF of 0.35. GEC's use of the lower SA is consistent with that of a younger and smaller child, with a lower BW. Based on the ratio of SA/BW, GEC's approach would result in a 15.6% lower risk estimate for dermal contact exposure than if EPA's BW and SA values were used. However, this decrease is offset by the use MADEP's higher AF value, which would result in a 17.5% higher risk estimate for dermal exposure. The IR/BW suggests a 40% higher risk estimate for ingestion of soils from using MADEP's assumptions. For this receptor, the direct contact soil exposure frequency (EF) was assumed to be 2 days per week rather than 5-days per week, because a soil management plan would be used to limit residential exposure to soils via direct contact. The EF for exposure to dusts was assumed to be 24 hours per day, 7 days per week during the 26-month construction project. Although dust suppression or monitoring activities will be conducted during the RAM, it was not used to limit the assumed residential child exposure to dusts. The net result of these differences is an appropriately conservative estimate of exposure, given the planned installation and maintenance of the cap and the planned implementation of a Notice of Activity and Use Limitation and use of a soil management plan during any period of soil disturbance.

Commercial Office Worker: MADEP's Commercial Office Worker is not directly comparable to a EPA's Commercial/Industrial Worker, because EPA assumes the Commercial/Industrial Worker includes groundskeepers, landscapers, etc. For this Site, a cap would be placed over the exterior courtyard, which means that there would be no exposures to an outdoor Commercial/Industrial Worker. Because the exposure is limited to a six-month construction project, EPA's Commercial/Industrial Worker is directly comparable to MADEP's Construction Worker. See below.

Construction Worker: MADEP's Construction Worker is assumed to be an 18-25 year old female, who has BW of 58 kg, SA of 3473 cm^2/day, AF of 0.29, IR of 100 mg/day and Ihl of 60 L/min. EPA's Commercial/Industrial Worker is assumed to be an adult of either sex, with a BW of 70 kg, SA of 3300 cm^2/day, AF of 0.2, IR of 50 mg/day and, if applicable, an Ihl of 50 L/min. In each case, the use of MADEP's assumptions would result in higher risk estimates than if EPA's assumptions were used: 5.2% higher for SA for dermal contact, 45% higher for AF for dermal contact, 100% higher for ingestion, 17.1% higher for BW for all exposures, and 10% higher for Inh for inhalation. The differences in exposure frequencies for MADEP and EPA would result in 4.2% higher non-cancer risk estimates for MADEP. The exposure frequencies for cancer risk would result in higher risk estimate for EPA than for EPA, but this is only because EPA's assumption does not reflect the shorter exposure period of 0.6 months, due to the cap. Given the planned use of the cap and implementation of a Notice of Activity and Use Limitation, MADEP's default assumptions would result in a significantly higher estimate of exposure (thus risk) than if EPA's default assumptions were used.

Soil Dermal Absorption Factors: The MADEP's and EPA's soil absorption factors were compared for the dermal contact exposure routes. MADEP provides soil absorption factors for all contaminants of concern for this Site. EPA provides a soil absorption factor for only one contaminant of concern (PCB-1254/1242). MADEP's higher absorption factor (0.16) would result in a 14.3% higher risk estimate for dermal exposure than would EPA's absorption factor (0.14). MADEP also provides a recommended default absorption factor for semi-volatile organic compounds that have no dedicated absorption factor of their own. For C19-C36 aliphatic hydrocarbons and C11-C22 aromatic hydrocarbons, MADEP's dermal absorption factors are 0.1 and 0.18, respectively. For C11-C22 aromatic hydrocarbons, the use of MADEP's higher absorption factor would result in an 80% higher estimate of dermal exposure than if EPA's default absorption factor was used. When no dedicated or default exposure factor exists for a contaminant, EPA recommends qualitatively evaluating the contaminant for dermal exposure in the uncertainty section of the risk assessment in lieu of including it in the quantitative risk assessment. MADEP provides dermal soil absorption factors and requires evaluating them in the quantitative risk assessment. Excluding them from the quantitative risk assessment would decrease the risk estimate, potentially significantly. EPA does not provide soil dermal absorption factors for the metals. For the Construction Worker, if metals were excluded from the dermal contact portion of the risk assessment, it would lower the non-cancer risk estimate by approximately 0.1 (or 10% of the risk limit).

Soil Ingestion (Gastrointestinal (GI)) Absorption Factors: The MADEP provides soil oral absorption factors for each contaminant of concern. EPA does not provide specific soil oral absorption factors, but does provide GI absorption factors for most of the contaminants of concern. For most contaminants with absorption factors, MADEP's soil absorption factors are higher than EPA's GI absorption factors, which indicate that the use of MADEP's soil absorption factors would result in higher estimates of exposure (thus risk) by the ingestion pathway. For PCBs, which is the primary risk driver, MADEP's soil absorption factor (0.85) lies between the values provided by EPA (ranging from 0.80 to 1.0).

Results: Based on these comparisons, the risk assessment used to support the RAM Plan Modification provides an appropriately conservative estimate of exposure, comparable to or more conservative than if EPA's exposure assumptions were used. This finding takes into account the site-specific decision to place and maintain a cap over the soils and to

allow occasional access to the soils in order to repair, maintain or install subsurface utilities as institutionally controlled by an Activity and Use Limitation.

c. *Table 6.2.1. The treatment of samples reported as BRL in combination with a detectable PCB concentration does not appear to be consistent from sample to sample. For example, Sample B-30 0-3', the total PCB concentration was reported as 0.42 ppm (i.e., ½ RDL (0.05 ppm 1248) + (0.37 ppm 1254). However, for B-39 0-3', the total PCBs were reported as 0.42 ppm 1254 with no contribution from 1248 considered. The treatment of the BRL-reported results should be consistent for purposes of the risk evaluation.*

Understood. This is an inconsequential oversight, in that it had and will have no effect on the outcome of the risk assessment. However, going forward, where no PCBs are detected, a surrogate value of ½ RDL will be used consistently.

d. ***No samples in the 0 to 2 cm depth horizon.*** *This horizon is the most realistic to use for on-site workers and/or residents. It also provides more realistic information for inhalation of fugitive emissions based on particulate emission factors. Some sample should be collected from the top 2 cm of soil for the HHRA. For the purpose of the number of samples to collect, please refer to the User's Guide, section 2.3.2 of the EPA soil screening guidance (EPA540/R-96/018, July 1996).*

http://www.epa.gov/superfund/health/conmedia/soil/

As discussed previously, the existing analytical data were compared to the clean-up criteria (Table 1), to determine where the greatest uncertainty exists regarding whether PCBs levels in 0-0.5 to 0.5 to 1 foot intervals exceed clean up objectives. The sampling plan (Table 2) was created, in part, to address this uncertainty. During the next risk assessment, for the sampling locations where re-sampling and analysis will not occur, an assumption will be made for all existing 0-3 foot interval samples that the entire mass of the PCBs is located in the 0-0.5 foot interval sample (where no excavation planned) or in the 0-1 foot interval sample (where excavation is planned). This approach is overly conservative in that soils have been commingled due to prior soil excavation and re-grading activities and PCB contamination exists within the 1-3 foot interval soil samples.

e. ***The way that the soil data was handled may underestimate the Exposure Point Concentration (EPC).*** *For the 0 to 3 foot horizon, the Massachusetts Department of Environmental Protection (MassDEP) does not want to see dilution of the EPC by the mixing in of uncontaminated soils. This means that the highest sample for a given location in the 0 to 3 foot horizon should be used to calculate the EPC. This approach assumes that the highest concentration is on the surface. Should you have any questions regarding this MassDEP policy, please contact Nancy Bettinger at MassDEP.*

In addition to the average calculated in this way, EPA requires risk calculations of an EPC based on the 95% Upper Confidence Limit (UCL) of the Mean which we will use for site decisions. Please use the soil samples from the 0 to 2 cm soil horizon for the surface soil calculations. If BMD is not planning to collect more soil, calculate the 95% UCL from the maximum concentration from each location (or core) in the 0 to 3 foot interval to represent the EPC for surface soils.

For the 95% UCL of the mean guidance see the link at the bottom of the following webpage:

http://www.epa.gov/osp/hstl/tsc/tsc.htm

Additional guidance's (some of which discuss the 95% UCL) may be found at the following:

http://www.epa.gov/osp/hstl/tsc/issue.htm.

All exposure point concentrations (0-3, 0-6 and 0-15 foot intervals) for PCBs were calculated as the 95% UCL of the Mean, with one exception. For Hot Spot 2, the exposure point concentration was the maximum concentration detected. For the other contaminants of concern, only lead and nickel were found to be present at elevated concentrations relative to their toxicity. Therefore, the 95% UCL of the Mean was calculated and used as the exposure point concentrations for lead (0-3, 0-6 and 0-15 foot intervals) and for nickel (0-3 foot interval). All remaining contaminants of concern were either the mean or maximum concentration detected for each exposure point and soil interval. Refer to Tables 6.1.1 to 6.3.3 of the RAM Plan Modification for the justification of method to derive exposure point concentration and the derivation of exposure point concentrations.

Following receipt of the results of the planned additional investigation, 95% UCL of the Mean will be re-calculated for PCBs, lead and nickel using EPA's tool. The remaining contaminants of concern do not significantly affect the outcome of the risk assessment, and their exposure point concentrations will remain the same.

f. ***Include the risks from the dioxin-like PCBs for the PCB contaminated soils that will remain on site.*** *In the best situation, EPA would expect some sampling for dioxin-line PCB congeners to predict the risks from these chemicals. If this is not an option, please discuss the impact of dioxin like PCBs on risk in the uncertainty section. If possible, include quantitative or semi-quantitative estimates for those Exposure Point Concentrations that will remain on site and which are above the MassDEP residential soil standard of 2 ppm.*

Additional test boring will be conducted prior to excavation, to address EPA's data gaps in the existing data set. Currently, the additional investigation includes the collection of fifty-four soil samples, plus five duplicates, for analysis of PCB Aroclors. A sub-set of samples (seven plus one duplicate) will be analyzed for both PCB Aroclors and the dioxin-like PCB congeners. The soil sampling program is provided in Table 2, which also includes a list of the dioxin-like congeners targeted for analysis.

g. Please note that given that the PCB-contaminated soils will be covered with a solid barrier, EPA has opted not to review the ecological risk assessment at this time. However, EPA is reserving its rights to consider the ERA if site conditions change or new information is presented indicating ecological issues on the property.

Understood.

12. Attachment 5. A review of the laboratory analytical reports identified the following:

a. Groundwater Analytical (GA) Reports: Sample extraction method for PCBs was identified as Method 3545 on various reports. This method is not specifically approved under either Subpart N or Subpart O of 40 CFR Part 761. A comparison study conducted in accordance with Subpart Q would be required for this method. Data generated with the method without a Subpart Q comparison study should be identified.

Alternative extraction methods were conducted as allowed by MADEP CAM and the data will be used. All ongoing, proposed sampling will be extracted and analyzed via TSCA approved methods.

b. *Alpha Analytical (Alpha) Reports: Sample extraction method for PCBs was identified as Method 3546 on various reports. This method is not specifically approved under either Subpart N or Subpart O of 40 CFR Part 761. A comparison study conducted in accordance with Subpart Q would be required for this method. Data generated with the method without a Subpart Q comparison study should be identified.*

   Alternative extraction methods were conducted as allowed by MADEP CAM and the data will be used. All ongoing, proposed sampling will be extracted and analyzed via TSCA approved methods.

b. *Contest (Contest) Reports: Sample extraction method for PCBs was identified as Method 3546 on various reports. This method is not specifically approved under either Subpart N or Subpart O of 40 CFR Part 761. A comparison study conducted in accordance with Subpart Q would be required for this method. Data generated with the method without a Subpart Q comparison study should be identified.*

   Alternative extraction methods were conducted as allowed by MADEP CAM and the data will be used. All ongoing, proposed sampling will be extracted and analyzed via TSCA approved methods.

13. Attachment 6. Data Usability and Representativeness Evaluation

a. *It is indicated that for all TO-10A analysis (soil vapor) only the quartz filter was extracted and analyzed. Please explain the rational for this decision.*

   We do not know why the lab limited analyses to the quartz filters. However, because the detection limits were acceptably low and no PCBs were detected on the quartz filters, not analyzing the other filters is not a significant data gap.

b. *With respect to the evaluation of the data, during its review of the lab quality control samples, some samples were identified to have elevated recoveries of PCBs not previously identified in the samples. For example, for Project Number 911JR-2110 (Laboratory Work Order Number 12J0290) samples collected October 5, 2012, elevated recoveries of Aroclors 1016 and 1260 were identified in sample B-16 (5-7'). However, these PCBs were not identified in the source sample, which was reported to contain Aroclors 1248 and 1254. Other samples may have had similar issues. However, there was no discussion per se of what effect, if any, this would have on the proposed remedial plan.*

   PCB Aroclors are mixtures of PCB congeners. PCB Aroclors contain overlapping mixtures of congeners, so when Aroclors 1248 and 1254 are present in the sample, they add to the recovery of the two spiked Aroclors (1016 and 1260). The elevated recoveries of Aroclors 1016 and 1260 should be expected if elevated levels of Aroclors 1248 and 1254 are present in the source sample.

14. Attachment 7. Soil Management Plan.

a. *Page 3 of 5. It is unclear how the pavement located in Excavation Areas 1, 2, and/or 3 will be managed. Please be aware that if the pavement is in contact with PCB-contaminated soil, the pavement must be managed as a PCB waste unless it can be demonstrated otherwise.*

   Based on observations made during drilling activities, it appears that there is not a layer of gravel beneath the asphalt, and that the asphalt is in contact with the PCB-contaminated soil. Therefore, the asphalt will be managed as PCB waste. Asphalt removed from Excavation #1 will be disposed with soils excavated from Excavation #1,

asphalt removed from Excavation #2 will be disposed with soils excavated from Excavation #2, and asphalt removed from Excavation #3 will be disposed with soils excavated from Excavation #3.

b. *Page 4 of 5. Please be aware that there are equipment decontamination provisions under 40 CFR § 761.79(c) which must be followed. Alternatively, surface wipe sampling of decontaminated surfaces could be conducted to verify the adequacy of the decontamination.*

Attached as Attachment 3, please find the Equipment Decontamination Procedure.

c. *Page 5 of 5. Given the location of the contamination, EPA will require total dust monitoring during excavation activities. Please provide a dust monitoring plan with proposed action levels.*

Attached as Attachment 4, please find the Dust Monitoring Plan.

15. *Attachment 9. Feasibility Evaluation of PCB Remedial Alternatives.*

a. *Page 1. It is indicted that the findings of the risk characterization indicate that the cap does not need to meet the TSCA requirements as it only needs to limit direct contact to soils. Please be aware that a cap may help minimize infiltration of surface water into PCB-contaminated soils. Also see previous comment 8.*

As indicated in the response to comment 8, a stormwater infiltration system is located in the area to be capped. The purposed of the stormwater infiltration system is to allow water to infiltrate through the soils in the area to prevent flooding of the courtyard area. As documented in the RAM Plan Modification Report and Application for Risk-based Cleanup of PCBs, Eastern Exterior Courtyard, dated August 27, 2013, no PCBs were detected in any of the groundwater samples collected for dissolved PCB analysis. In addition, little or no volatile petroleum hydrocarbons (VPH) or volatile organic compounds (VOCs) were detected in the groundwater samples, which, if present, could result in co-solution of the PCBs in groundwater. In addition, groundwater samples collected via low-flow technique had little to no detectable levels of total PCBs. Where detected following low-flow sample collection, the total PCB level was below the applicable TSCA standard. Based on these results, PCBs in groundwater is not a significant issue. Based on this information, PCBs detected in soil have not leached into groundwater and, especially given the age of the release, are not expected to leach into groundwater in the future. Therefore, the primary intent of capping the area is to limit direct contact to soils.

b. *Page 4. There is reference to a "conservative average concentration" of less than 10 ppm for Site soils. Based on a conversation with Mr. Butler on October 18, 2013, it was indicated that the goal of the remedial project was to achieve a <10 ppm PCB cleanup standards for all soils, not just an "average concentration". Please confirm.*

Based on available date, where ever a sample contains >10 ppm PCB, soil will be remediated through excavation, with the exception of one location, B-11 where soil will remain in place. With regards to B-11, several soil borings were advanced in the immediate proximity of B-11. All soil samples collected from these borings had levels of PCBs between <0.07 and 0.5 ppm. The B-11 soil sample collected from the 0-3 foot interval contained 11.19 ppm total PCBs. Another test boring will be advanced in this same location and soil samples from the 0-0.5, 0.5-1, 1-2 and 2-3 foot intervals will be collected for PCB analysis. Based on the results of this additional investigation, the decision not to excavate at B-11 may be revisited.

c. *In this attachment, it is indicated that a 4-inch asphalt cover is proposed to be installed following removal of PCB-contaminated soils within the 3 excavation areas. This information was not identified readily in any other section of the Notification. Accordingly, please confirm that this is in fact the proposed construction for the cap. Also see previous comment 8.*

Yes, following the completion of the remedial activities, a 4-inch asphalt cap will be installed across the entire courtyard. Please refer to our response to comment 8 for the reasoning why the installation of a 6-inch asphalt cap is not feasible.

Respectfully Submitted,
Goldman Environmental Consultants, Inc.

Prepared By:

Lauren M. McKinlay
Project Manager, Geologist

Prepared By:

Eileen Furlong
Senior Vice President, Operations

Approved By:

Brian T. Butler, LSP
Senior Vice President, Operations

Cc:
Jon Rudzinski

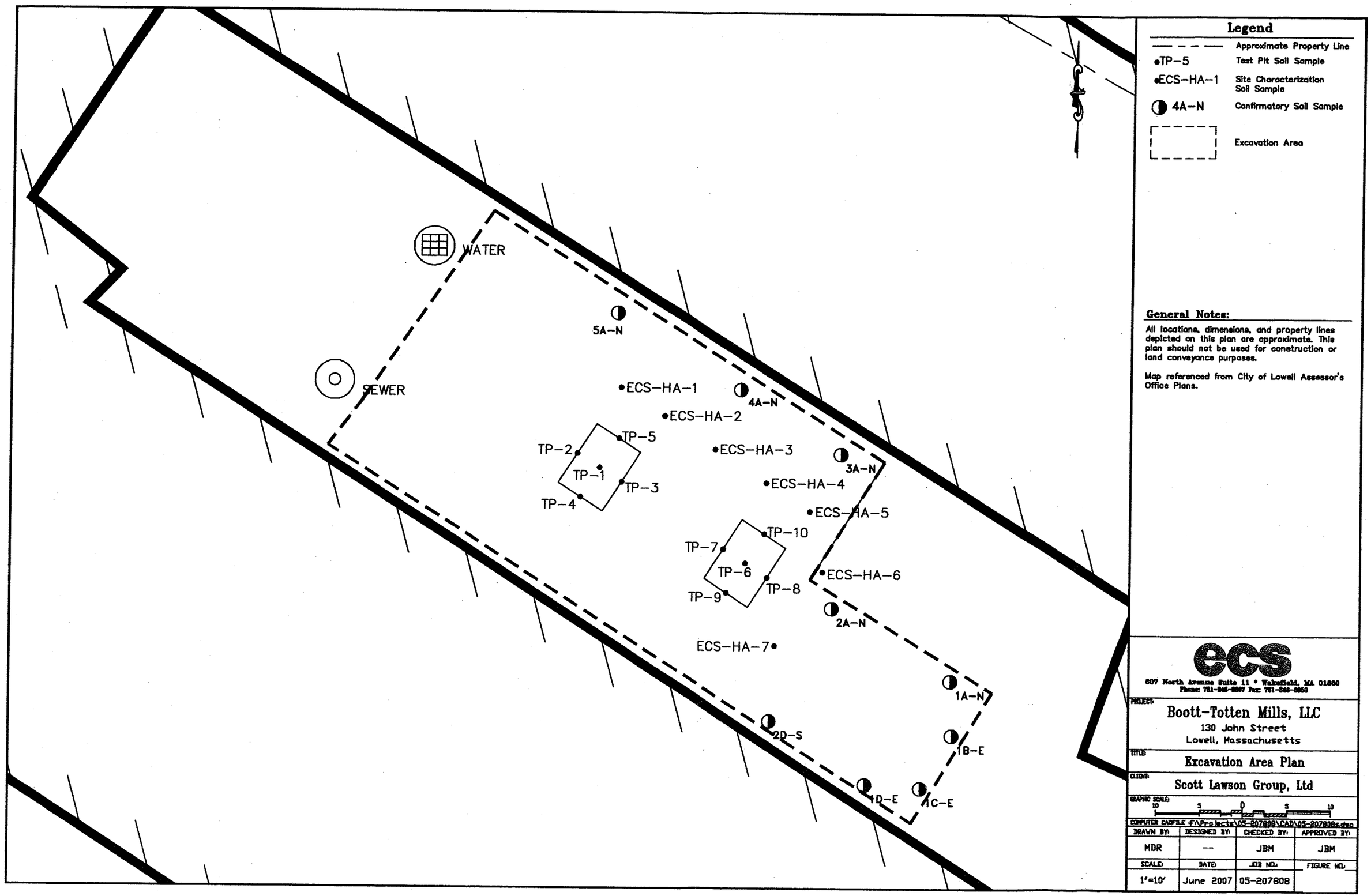
Figures
1 – ECS RAM Completion Report Excavation Area Plan

Tables
1 – Results of Previously Collected PCB Soil Samples
2 – Supplemental Soil Sampling Plan
2.2 – Summary of Soil Analytical Data: PCBs
3 – Exposure Factors
4 – Absorption Factors

Attachments:
1 – ECS RAM Completion Report
2 – Filter Specification Sheet
3 – Equipment Decontamination Procedure
4 – Dust Monitoring Plan

FIGURES

Figure 1



Legend

- Approximate Property Line
- •TP–5 — Test Pit Soil Sample
- •ECS–HA–1 — Site Characterization Soil Sample
- 4A–N — Confirmatory Soil Sample
- Excavation Area

General Notes:

All locations, dimensions, and property lines depicted on this plan are approximate. This plan should not be used for construction or land conveyance purposes.

Map referenced from City of Lowell Assessor's Office Plans.

ecs
607 North Avenue Suite 11 • Wakefield, MA 01880
Phone: 781-246-9007 Fax: 781-246-9850

PROJECT:
Boott–Totten Mills, LLC
130 John Street
Lowell, Massachusetts

TITLE:
Excavation Area Plan

CLIENT:
Scott Lawson Group, Ltd

GRAPHIC SCALE: 10 5 0 5 10

COMPUTER CADFILE: F:\Projects\05-207808\CAD\05-207808e.dwg

DRAWN BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:
MDR	--	JBM	JBM
SCALE:	DATE:	JOB NO.:	FIGURE NO.:
1"=10'	June 2007	05-207808	

TABLES

TABLE 1
EVALUATION OF SOIL ANALYTICAL DATA:
POLYCHLORINATED BIPHENYLS (PCBs)
Boott Mills
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	RDL	Potential Maximum PCB Conc. in each 6-Inch, 1-Foot or 2-Foot Interval *	Interpretation of Evaluation
Excavation Area 1 (Excavate to 9 feet below grade; transport to Waste Management Model City, NY; > 50 ppm PCB)										
B-4 2-5'	06/06/2011	EPA 8082	60	9	64	9	**124**		Not needed	All of these soils will be transported to Waste Management Model City, NY for disposal of soils containing more than 50 mg/kg PCBs.
B-8 0-1'	09/01/2011	EPA 8082	0.119	0.0342	0.149	0.0342	0.268		Not needed	
B-8 1-3'	09/01/2011	EPA 8082	BRL	0.0381	BRL	0.0381	BRL		Not needed	
B-8 0-3'	09/01/2011	EPA 8082	BRL	0.04	0.0699	0.04	0.0899		Not needed	
B-8 5-10'	09/01/2011	EPA 8082	BRL	0.0455	BRL	0.0455	BRL		Not needed	
WC-2 (B-26 2-5')	10/09/2012	EPA 8082A	15	2.3	17	2.3	32		Not needed	
B-26 5-7'	10/09/2012	EPA 8082A	14	2.2	12	2.2	26		Not needed	
B-26 7-9'	10/09/2012	EPA 8082A	1.8	0.23	1.2	0.23	3.0		Not needed	
B-35 0-3'	10/05/2012	EPA 8082A	1.6	0.21	1.4	0.21	3.0		Not needed	
B-35 3-5'	10/05/2012	EPA 8082A	9.3	1.1	8.0	1.1	17.3		Not needed	
B-35 5-7'	10/05/2012	EPA 8082A	18	5.7	27	5.7	45		Not needed	
B-35 7-9'	10/05/2012	EPA 8082A	5.8	1.1	7.7	1.1	13.5		Not needed	
B-38 0-9'	05/08/2013	EPA 8082A	BRL	5.4	37	5.4	37		Not needed	
B-39 0-3'	05/08/2013	EPA 8082A	BRL	0.10	0.42	0.10	0.42		Not needed	
B-39 3-9'	05/08/2013	EPA 8082A	BRL	0.11	0.25	0.11	0.25		Not needed	
Excavation Area 1 (Beneath Excavation) (evaluated in two-foot intervals)										
B-4 12-15'	06/06/2011	EPA 8082	BRL	0.095	BRL	0.095	BRL	0.19	0.14	Based on available data, all data are below 1 mg/kg, acceptable to leave behind.
B-26 9-12'	10/09/2012	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.24	0.18	
B-38 9-12'	05/08/2013	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.24	0.18	
Excavation Area 2 (Excavate to 5 feet below grade; transport to Turnkey Landfill, Rochester, NY; < 50 ppm PCB) (evaluated in one-foot intervals)										
										Additional investigation needed to determine if these soils are suitable for disposal at Turnkey Landfill.
B-1 1-5'	06/06/2011	EPA 8082	0.57	0.084	0.53	0.084	1.1		4.4	
B-49 0-3'	05/08/2013	EPA 8082A	8.9	1.1	9.8	1.1	18.7		**56.1**	> 50 mg/kg; Obtain PCB data from 0-1, 1-2 and 2-3 foot intervals, to determine if any one-foot interval is >50 mg/kg; determine appropriate disposal location.
B-50 0-3'	05/08/2013	EPA 8082A	14	2.2	22	2.2	36		**108**	> 50 mg/kg; Obtain PCB data from 0-1, 1-2 and 2-3 foot intervals, to determine if any one-foot interval is >50 mg/kg; determine appropriate disposal location.
B-15 0-3'	10/05/2012	EPA 8082A	5.8	1.1	4.0	1.1	9.8		29.4	
B-15 3-5'	10/05/2012	EPA 8082A	6.3	1.1	5.1	1.1	11.4		22.8	
B-49 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.22	0.66	
B-50 3-9'	05/08/2013	EPA 8082A	3.4	0.43	2.2	0.43	5.6		33.6	
Excavation Area 2 (Beneath Excavation) (evaluated in two-foot intervals)										
										Additional investigation needed to determine if these soils are suitable to remain at Site.
B-49 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.22	0.33	
B-50 3-9'	05/08/2013	EPA 8082A	3.4	0.43	2.2	0.43	5.6		**16.8**	Obtain PCB data from 5-7 and 7-9 foot intervals, to determine if any two-foot interval is >10 mg/kg; 3-5 foot interval will be excavated
B-1 10-15'	06/06/2011	EPA 8082	BRL	0.1	BRL	0.1	BRL	0.2	BRL	

TABLE 1
EVALUATION OF SOIL ANALYTICAL DATA:
POLYCHLORINATED BIPHENYLS (PCBs)
Boott Mills
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	RDL	Potential Maximum PCB Conc. in each 6-Inch, 1-Foot or 2-Foot Interval *	Interpretation of Evaluation
Excavation Area 3 (Excavate to 5 feet below grade; transport to Turnkey Landfill, Rochester, NY; < 50 ppm PCB) (evaluated in one-foot intervals)										
										Additional investigation needed to determine if these soils are suitable for disposal at Turnkey Landfill.
B-2 1-5'	06/06/2011	EPA 8082	20	4.3	11	4.3	31		**124**	Obtain PCB data from 0-1, 1-2, 2-3, 3-4 and 4-5 foot intervals, to determine if any one-foot interval is >50 mg/kg
B-9 0-1'	09/01/2011	EPA 8082	BRL	0.0364	BRL	0.0364	BRL	0.07	0.0364	
B-9 1-3'	09/01/2011	EPA 8082	4.86	0.719	3.35	0.719	8.21		16.42	
WC-1 (B-16 1-5')	10/05/2012	EPA 8082A	7.4	1.1	7.6	1.1	15		**60**	Obtain PCB data from 0-1, 1-2, 2-3, 3-4 and 4-5 foot intervals, to determine if any one-foot interval is >50 mg/kg
Excavation Area 3 (Beneath Excavation) (evaluated in two-foot intervals)										
B-15 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.22	0.11	Based on available data, these soils are acceptable to remain behind, beneath cap.
B-16 5-7'	10/05/2012	EPA 8082A	4.6	0.54	3.0	0.54	7.6		7.6	
B-16 7-9'	10/05/2012	EPA 8082A	2.5	0.52	1.7	0.52	4.2		4.2	
B-16 9-12'	10/05/2012	EPA 8082A	1.7	0.22	1.0	0.22	2.7		4.05	
B-2 10-15'	06/06/2011	EPA 8082	1.8	0.091	2.3	0.46	4.1		10.25	

TABLE 1
EVALUATION OF SOIL ANALYTICAL DATA:
POLYCHLORINATED BIPHENYLS (PCBs)
Boott Mills
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	RDL	Potential Maximum PCB Conc. in each 6-Inch, 1-Foot or 2-Foot Interval *	Interpretation of Evaluation
Remainder of Site - 0 to 3 foot interval (evaluated in six-inch intervals)										Additional investigation needed to determine if these soils are suitable to remain at Site, beneath cap.
B-10 0-3'	09/01/2011	EPA 8082	1.05	0.382	2.27	0.382	3.32		**19.92**	Obtain PCB data from 0-0.5, 0.5-1, 1-2 and 2-3 foot intervals, to determine if any 6-inch or one-foot interval is >10 mg/kg
B-11 0-3'	09/01/2011	EPA 8082	6.14	0.731	5.05	0.731	11.19		**67.14**	Obtain PCB data from 0-0.5, 0.5-1, 1-2 and 2-3 foot intervals, to determine if any 6-inch or one-foot interval is >10 mg/kg
B-12 0-3'	09/01/2011	EPA 8082	0.0649	0.0371	0.184	0.0371	0.2489		1.4934	
B-17 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.22	0.66	
B-20 '0-3	10/05/2012	EPA 8082A	1.2	0.11	1.1	0.11	2.3		**13.8**	Obtain PCB data from 0-0.5, 0.5-1, 1-2 and 2-3 foot intervals, to determine if any 6-inch or one-foot interval is >10 mg/kg
B-21 0-3'	10/05/2012	EPA 8082A	3.1	0.55	3.1	0.55	6.2		**37.2**	Obtain PCB data from 0-0.5, 0.5-1, 1-2 and 2-3 foot intervals, to determine if any 6-inch or one-foot interval is >10 mg/kg
B-23 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.22	0.66	
B-25 0-3'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.2	0.6	
B-27 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.22	0.66	
B-27A 0-3'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.22	0.66	
B-28 0-3'	10/17/2012	EPA 8082A	0.19	0.11	0.26	0.11	0.45		2.7	
B-29 0-3'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.22	0.66	
B-30 0-3'	10/17/2012	EPA 8082A	BRL	0.10	0.37	0.10	0.42		2.52	
B-31 0-3'	10/09/2012	EPA 8082A	0.12	0.11	0.15	0.11	0.27		1.62	
B-32 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.22	0.66	
B-36 0-3'	10/17/2012	EPA 8082A	BRL	0.11	0.12	0.11	0.18		1.05	
B-37 0-3'	10/05/2012	EPA 8082A	0.66	0.11	0.44	0.11	1.1		6.6	
B-48 0-3'	05/09/2013	EPA 8082A	0.93	0.1	0.91	0.1	1.84		**11.04**	Obtain PCB data from 0-0.5, 0.5-1, 1-2 and 2-3 foot intervals, to determine if any 6-inch or one-foot interval is >10 mg/kg
Composite 1 0-5'	05/08/2013	EPA 8082A	4.8	1.1	2.9	1.1	7.7		**77**	Obtain PCB data from 0-0.5, 0.5-1, 1-2, 2-3, 3-4 and 4-5 foot intervals, to determine if any 6-inch or one-foot interval is >10 mg/kg (exclude B-43 and B-54, which will be excavated)
Composite 2 0-5'	05/08/2013	EPA 8082A	0.44	0.11	0.45	0.11	0.89		8.9	Obtain PCB data from 0-0.5 and 0.5-1 foot intervals, to determine if either of these two intervals would have less than 8.9 mg/kg PCBs
Composite 3 0-3'	05/08/2013	EPA 8082A	0.14	0.11	0.26	0.11	0.4		2.4	
Composite 4 0-3'	05/08/2013	EPA 8082A	9.2	2.1	7.5	2.1	16.7		**100.2**	This composite is comprised of B-39, B-49 and B-50, which were also evaluated separately, and are included in areas to be excavated.
Composite 5 0-3'	05/09/2013	EPA 8082A	0.81	0.11	1.2	0.11	2.01		**12.06**	Obtain PCB data from 0-0.5, 0.5-1, 1-2 and 2-3 foot intervals, to determine if any 6-inch or one-foot interval is >10 mg/kg
Composite 6 0-3'	05/09/2013	EPA 8082A	2	0.55	1.9	0.55	3.9		**23.4**	Obtain PCB data from 0-0.5, 0.5-1, 1-2 and 2-3 foot intervals, to determine if any 6-inch or one-foot interval is >10 mg/kg

TABLE 1
EVALUATION OF SOIL ANALYTICAL DATA:
POLYCHLORINATED BIPHENYLS (PCBs)
Boott Mills
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	RDL	Potential Maximum PCB Conc. in each 6-Inch, 1-Foot or 2-Foot Interval *	Interpretation of Evaluation
Remainder of Site - 3 to 15 foot interval (evaluated in one-foot intervals)										
B-3 5-10'	06/06/2011	EPA 8082	BRL	0.097	BRL	0.097	BRL	0.19	0.485	Based on available data, these soils are acceptable to remain behind, except for Composite 4, which is located within areas slated for excavation
B-5 10-15'	06/06/2011	EPA 8082	BRL	0.1	BRL	0.1	BRL	0.2	0.5	
B-10 3-6'	09/01/2011	EPA 8082	BRL	0.426	0.691	0.426	0.904		2.712	
B-11 3-6'	09/01/2011	EPA 8082	BRL	0.036	BRL	0.036	BRL	0.07	0.108	
B-12 3-6'	09/01/2011	EPA 8082	BRL	0.0368	BRL	0.0368	BRL	0.07	0.1104	
B-17 3-5'	10/05/2012	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.24	0.24	
B-17 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.22	0.22	
B-20 3-5'	10/05/2012	EPA 8082A	0.46	0.11	0.39	0.11	0.85		1.7	
B-20 5-7'	10/05/2012	EPA 8082A	0.95	0.11	0.71	0.11	1.66		3.32	
B-21 3-5'	10/05/2012	EPA 8082A	0.63	0.11	0.50	0.11	1.13		2.26	
B-22 3-5'	10/05/2012	EPA 8082A	0.90	0.22	1.9	0.22	2.8		5.6	
B-22 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.22	0.22	
B-23 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.22	0.22	
B-25 3-5'	10/17/2012	EPA 8082A	BRL	0.11	0.13	0.11	0.19		0.37	
B-25 5-7'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.2	0.2	
B-27 3-5'	10/09/2012	EPA 8082A	0.20	0.10	0.20	0.10	0.40		0.80	
B-27A 3-5'	10/17/2012	EPA 8082A	0.18	0.10	0.20	0.10	0.38		0.76	
B-27A 5-7'	10/17/2012	EPA 8082A	0.18	0.10	0.21	0.10	0.39		0.78	
B-29 3-5'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.2	0.2	
B-29 5-6'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.22	0.11	
B-30 3-4.5'	10/17/2012	EPA 8082A	BRL	0.10	0.11	0.10	0.16		0.32	
B-31 3-5'	10/09/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.2	0.2	
B-32 3-5'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.22	0.22	
B-34 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.22	0.22	
B-36 3-5'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.22	0.22	
B-37 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.22	0.22	
B-48 3-9'	05/09/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.22	0.22	
Composite 3 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.22	0.66	
Composite 4 3-9'	05/08/2013	EPA 8082A	0.72	0.11	0.59	0.11	1.31		7.86	This composite is comprised of B-39, B-49 and B-50, which were also analyzed separately. B-39 3-9' is slated for excavation (Excavation 1). B-49 and B-50 are partially below the depth slated for excavation (Excavation 2).
Composite 5 3-9'	05/09/2013	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.24	0.72	
Composite 6 3-9'	05/09/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.22	0.66	

Notes:

RDL = Reported Detection Limit

BRL = Below Reported Detection Limit

[1] - The result for Polychlorinated Biphenyls (PCBs) is calculated as the sum of all quantified values for all analyzed Aroclor analytes.

Composite 1- Soils collected from borings B-41, B-42, B-43 and B-54 and composited

Composite 2- Soils collected from borings B-44, B-45, B-46 and B-47 and composited

Composite 3- Soils collected from borings B-63, B-64, B-65, B-66, B-67, B-68 and B-40 and composited

Composite 4- Soils collected from borings B-39, B-50 and B-49 and composited

Composite 5- Soils collected from borings B-58, B-59, B-60 and B-61 and composited

Composite 6- Soils collected from borings B-51, B-52, B-55, B-56 and B-57 and composited

* For a given soil sample, all PCBs are conservatively assumed to be present in one of the 1-foot or 2-foot intervals. Potential Maximum Concentration detected by multiplying the Total PCB concentration by the number of intervals in the sample. When a sample had no detection of both Aroclor congeners associated with this Site, one-half the reported detection limit for both congeners combined was used to calculate the Potential Maximum Concentration. For Total PCBs, when one congener was not detected, one-half its reported detection limit was used to calculate the Total PCB concentration.

Table 2
Additional Pre-Excavation Soil Sampling and Analysis

Boring	Soil Interval (feet)	Aroclor PCB Analysis	PCB Congener Analysis ^
Within and Beneath Excavation 2			
B-49A	0-1	X	X
	1-2	X	
	2-3	X	
B-50A	0-1	X	X
	1-2	X	
	2-3	X X **	
	5-7	X	
	7-9	X	
Within Excavation 3			
B-2A	0-1	X	X
	1-2	X	
	2-3	X	
	3-4	X X **	
	4-5	X	
B-16A	0-1	X	X
	1-2	X	
	2-3	X	
	3-4	X	
	4-5	X	
Remainder of Site			
B-10A	0-0.5	X	
	0.5-1	X	
	1-2	X	
	2-3	X X **	
B-11A	0-0.5	X	X X *
	0.5-1	X	
	1-2	X	
	2-3	X	
B-20A	0-0.5	X	
	0.5-1	X	
	1-2	X X **	
	2-3	X	
B-21A	0-0.5	X	X
	0.5-1	X	
	1-2	X	
	2-3	X	
B-48A	0-0.5	X X **	
	0.5-1	X	
	1-2	X	
	2-3	X	
Composite 1A (B-41A + B-42A)	0-0.5	X	
	0.5-1	X	
	1-2	X	
	2-3	X	
	3-4	X	
	4-5	X	
Composite 2A (B-44A to B-47A)	0-0.5	X	
	0.5-1	X	
Composite 5A (B-58A, B-59A, B-60A + B-61A)	0-0.5	X	
	0.5-1	X	
	1-2	X	
	2-3	X	
Composite 6A (B-51A, B-52A, B-55A, B-56A + B-57A)	0-0.5	X	X
	0.5-1	X	
	1-2	X	
	2-3	X	
	TOTAL ANALYSES	59 **	8 *

* Includes one duplicate sample
** Includes five duplicate samples

^ Analysis will be conducted for the following PCB congeners:

3,3',4,4'-TCB (77)	3,3',4,4',5,5'-HxCB (169)	2,3',4,4',5-PeCB (118)	2,3,3',4,4',5'-HxCB (157)
3,4,4',5-TCB (81)	2,3,3',4,4'-PeCB (105)	2',3,4,4',5-PeCB (123)	2,3',4,4',5,5'-HxCB (167)
3,3',4,4',5-PeCB (126)	2,3,4,4',5-PeCB (114)	2,3,3',4,4', 5 -HXCB (156)	2,3,3',4,4',5,5'-HpCB (189)

Source: USEPA, *Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-p-dioxin and Dioxin-Like Compounds* , EPA/100/R 10/005, www.epa.gov/osa

Use extraction and analytical methods approved under either Subpart N or Subpart O of 40 CFR Part 761.

TABLE 2.2
SUMMARY OF SOIL ANALYTICAL DATA:
POLYCHLORINATED BIPHENYLS (PCBs)
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	RDL
Exterior Courtyard Samples								
B-1 1-5'	06/06/2011	EPA 8082	0.57	0.084	0.53	0.084	**1.1**	
B-1 10-15'	06/06/2011	EPA 8082	BRL	0.1	BRL	0.1	BRL	
B-2 1-5'	06/06/2011	EPA 8082	20	4.3	11	4.3	**31**	
B-2 10-15'	06/06/2011	EPA 8082	1.8	0.091	2.3	0.46	**4.1**	
B-3 5-10'	06/06/2011	EPA 8082	BRL	0.097	BRL	0.097	BRL	
B-4 2-5'	06/06/2011	EPA 8082	60	9	64	9	**124**	
B-4 12-15'	06/06/2011	EPA 8082	BRL	0.095	BRL	0.095	BRL	
B-5 10-15'	06/06/2011	EPA 8082	BRL	0.1	BRL	0.1	BRL	
B-8 0-1'	09/01/2011	EPA 8082	0.119	0.0342	0.149	0.0342	0.268	
B-8 1-3'	09/01/2011	EPA 8082	BRL	0.0381	BRL	0.0381	BRL	
B-8 0-3'	09/01/2011	EPA 8082	BRL	0.04	0.0699	0.04	0.0899	
B-8 5-10'	09/01/2011	EPA 8082	BRL	0.0455	BRL	0.0455	BRL	
B-9 0-1'	09/01/2011	EPA 8082	BRL	0.0364	BRL	0.0364	BRL	
B-9 1-3'	09/01/2011	EPA 8082	4.86	0.719	3.35	0.719	**8.21**	
B-10 0-3'	09/01/2011	EPA 8082	1.05	0.382	2.27	0.382	**3.32**	
B-10 3-6'	09/01/2011	EPA 8082	BRL	0.426	0.691	0.426	0.904	
B-11 0-3'	09/01/2011	EPA 8082	6.14	0.731	5.05	0.731	**11.19**	
B-11 3-6'	09/01/2011	EPA 8082	BRL	0.036	BRL	0.036	BRL	
B-12 0-3'	09/01/2011	EPA 8082	0.0649	0.0371	0.184	0.0371	0.2489	
B-12 3-6'	09/01/2011	EPA 8082	BRL	0.0368	BRL	0.0368	BRL	
B-15 0-3'	10/05/2012	EPA 8082A	5.8	1.1	4.0	1.1	**9.8**	
B-15 3-5'	10/05/2012	EPA 8082A	6.3	1.1	5.1	1.1	**11.4**	
B-15 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
WC-1 (B-16 1-5')	10/05/2012	EPA 8082A	7.4	1.1	7.6	1.1	**15**	
B-16 5-7'	10/05/2012	EPA 8082A	4.6	0.54	3.0	0.54	**7.6**	
B-16 7-9'	10/05/2012	EPA 8082A	2.5	0.52	1.7	0.52	**4.2**	
B-16 9-12'	10/05/2012	EPA 8082A	1.7	0.22	1.0	0.22	**2.7**	
B-17 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-17 3-5'	10/05/2012	EPA 8082A	BRL	0.12	BRL	0.12	BRL	
B-17 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-20 '0-3	10/05/2012	EPA 8082A	1.2	0.11	1.1	0.11	**2.3**	
B-20 3-5'	10/05/2012	EPA 8082A	0.46	0.11	0.39	0.11	0.85	
B-20 5-7'	10/05/2012	EPA 8082A	0.95	0.11	0.71	0.11	**1.66**	
B-21 0-3'	10/05/2012	EPA 8082A	3.1	0.55	3.1	0.55	**6.2**	
B-21 3-5'	10/05/2012	EPA 8082A	0.63	0.11	0.50	0.11	**1.13**	
B-22 3-5'	10/05/2012	EPA 8082A	0.90	0.22	1.9	0.22	**2.8**	
B-22 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-23 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-23 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-25 0-3'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	
B-25 3-5'	10/17/2012	EPA 8082A	BRL	0.11	0.13	0.11	0.19	
B-25 5-7'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	
WC-2 (B-26 2-5')	10/09/2012	EPA 8082A	15	2.3	17	2.3	**32**	
B-26 5-7'	10/09/2012	EPA 8082A	14	2.2	12	2.2	**26**	
B-26 7-9'	10/09/2012	EPA 8082A	1.8	0.23	1.2	0.23	**3.0**	
B-26 9-12'	10/09/2012	EPA 8082A	BRL	0.12	BRL	0.12	BRL	
B-27 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	

Prepared By: MDW
Reviewd By: EAF
Revision Date: 06/10/2013

TABLE 2.2
SUMMARY OF SOIL ANALYTICAL DATA:
POLYCHLORINATED BIPHENYLS (PCBs)
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	RDL
B-27 3-5'	10/09/2012	EPA 8082A	0.20	0.10	0.20	0.10	0.40	
B-27A 0-3'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-27A 3-5'	10/17/2012	EPA 8082A	0.18	0.10	0.20	0.10	0.38	
B-27A 5-7'	10/17/2012	EPA 8082A	0.18	0.10	0.21	0.10	0.39	
B-28 0-3'	10/17/2012	EPA 8082A	0.19	0.11	0.26	0.11	0.45	
B-29 0-3'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-29 3-5'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	
B-29 5-6'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-30 0-3'	10/17/2012	EPA 8082A	BRL	0.10	0.37	0.10	0.42	
B-30 3-4.5'	10/17/2012	EPA 8082A	BRL	0.10	0.11	0.10	0.16	
B-31 0-3'	10/09/2012	EPA 8082A	0.12	0.11	0.15	0.11	0.27	
B-31 3-5'	10/09/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	
B-32 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-32 3-5'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-34 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-35 0-3'	10/05/2012	EPA 8082A	1.6	0.21	1.4	0.21	**3.0**	
B-35 3-5'	10/05/2012	EPA 8082A	9.3	1.1	8.0	1.1	**17.3**	
B-35 5-7'	10/05/2012	EPA 8082A	18	5.7	27	5.7	**45**	
B-35 7-9'	10/05/2012	EPA 8082A	5.8	1.1	7.7	1.1	**13.5**	
B-36 0-3'	10/17/2012	EPA 8082A	BRL	0.11	0.12	0.11	0.18	
B-36 3-5'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-37 0-3'	10/05/2012	EPA 8082A	0.66	0.11	0.44	0.11	**1.1**	
B-37 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-38 0-9'	05/08/2013	EPA 8082A	BRL	5.4	37	5.4	**37**	
B-38 9-12'	05/08/2013	EPA 8082A	BRL	0.12	BRL	0.12	BRL	
B-48 0-3'	05/09/2013	EPA 8082A	0.93	0.1	0.91	0.1	**1.84**	
B-48 3-9'	05/09/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
Composite 1 0-5'	05/08/2013	EPA 8082A	4.8	1.1	2.9	1.1	**7.7**	
Composite 2 0-5'	05/08/2013	EPA 8082A	0.44	0.11	0.45	0.11	0.89	
Composite 3 0-3'	05/08/2013	EPA 8082A	0.14	0.11	0.26	0.11	0.4	
Composite 3 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
Composite 4 0-3'	05/08/2013	EPA 8082A	9.2	2.1	7.5	2.1	**16.7**	
Composite 4 3-9'	05/08/2013	EPA 8082A	0.72	0.11	0.59	0.11	**1.31**	
Composite 5 0-3'	05/09/2013	EPA 8082A	0.81	0.11	1.2	0.11	**2.01**	
Composite 5 3-9'	05/09/2013	EPA 8082A	BRL	0.12	BRL	0.12	BRL	
Composite 6 0-3'	05/09/2013	EPA 8082A	2	0.55	1.9	0.55	**3.9**	
Composite 6 3-9'	05/09/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-39 0-3'	05/08/2013	EPA 8082A	BRL	0.10	0.42	0.10	0.42	
B-39 3-9'	05/08/2013	EPA 8082A	BRL	0.11	0.25	0.11	0.25	
B-49 0-3'	05/08/2013	EPA 8082A	8.9	1.1	9.8	1.1	**18.7**	
B-49 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	
B-50 0-3'	05/08/2013	EPA 8082A	14	2.2	22	2.2	**36**	
B-50 3-9'	05/08/2013	EPA 8082A	3.4	0.43	2.2	0.43	**5.6**	
Selected MCP Soil Standards								
		MA S-1/GW-2					2	
		MA S-1/GW-3					2	
		MA S-2/GW-2					3	
		MA S-2/GW-3					3	

Prepared By: MDW
Reviewd By: EAF
Revision Date: 06/10/2013

TABLE 2.2
SUMMARY OF SOIL ANALYTICAL DATA:
POLYCHLORINATED BIPHENYLS (PCBs)
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	RDL
		MA S-3/GW-2					3	
		MA S-3/GW-3					3	
		Upper Concentration Limits					100	
Selected TSCA Soil Standards								
		Self-Implementing High Occupancy					1	
		Self-Implementing High Occupancy beneath Cap					>1 to 10	
Enclosed Courtyard Samples								
B-6 0-4'	06/06/2011	EPA 8082	BRL	0.082	BRL	0.082	BRL	
B-7 8-10'	06/06/2011	EPA 8082	BRL	0.096	BRL	0.096	BRL	
Between Building and Merrimack River								
B-13 0-3'	09/01/2011	EPA 8082	BRL	0.0383	BRL	0.0383	BRL	
B-13 3-6'	09/01/2011	EPA 8082	BRL	0.0368	BRL	0.0368	BRL	
Selected Soil Standards								
		MA RCS-1					2	

Notes:

RDL = Reported Detection Limit

BRL = Below Reporting Limit

NA = Not Analyzed

Bold = Exceeds One or More Selected Standards

[1] - The result for Polychlorinated Biphenyls (PCBs) is calculated as the sum of all quantified values for all analyzed Aroclor analytes.

Composite 1- Soils collected from borings B-41, B-42, B-43 and B-54 and composited

Composite 2- Soils collected from borings B-44, B-45, B-46 and B-47 and composited

Composite 3- Soils collected from borings B-63, B-64, B-65, B-66, B-67, B-68 and B-40 and composited

Composite 4- Soils collected from borings B-39, B-50 and B-49 and composited

Composite 5- Soils collected from borings B-58, B-59, B-60 and B-61 and composited

Composite 6- Soils collected from borings B-51, B-52, B-55, B-56 and B-57 and composited

Table 3

Comparison of MADEP and USEPA Exposure Factors

Receptor / Media	Exposure Factor	Unit	USEPA	Notes	MADEP *	Notes	Interpretation
Resident, aged 1-<2 years							
Soils	Surface Area (SA)	cm^2/d	2800	1a	1670	1b	MADEP: SA/BW would result in 15.6% lower risk estimate for dermal contact than if USEPA assumption used.
Soils	Mass of soil adhered per unit exposed skin (AF)	mg/cm^2	0.2	2b	0.35	2b	MADEP: 17.5% higher risk estimate for dermal contact than if used USEPA's AF.
Soils	Ingestion Rate (IR)	mg/d	100	3a	100	3b	No effect re. IR alone. MADEP: IR/BW would result in 40% higher risk estimate for incidental ingestion than if USEPA assumption used.
Soils	Body Weight (BW)	kg	15	4a	10.7	4b	See SA and IR
Soils	Exposure Frequency (EF)	d/yr	350	5a	52	5b	MADEP: 85% lower risk estimate than if used USEPA's EF default; however, this receptor assumed to be exposed to soils only during 6-month construction period and access to soils limited by implementation of Soil Management Plan, otherwise soils are covered with cap.
Dusts	Exposure Frequency (EF)	d/yr	365	6a	182	6b	MADEP: Assume EF shortened via maintenance of cap and Notice of Activity and Use Limitation; otherwise, cancer risk estimates would be higher.
Both	Exposure Period (EP)	year	30	7a	1	7b	MADEP: Assume EP shortened via maintenance of cap and Notice of Activity and Use Limitation; otherwise, cancer risk estimates would be higher.
Both	Averaging Period (AP) (Non-cancer)	year	30	8	1	8	No effect, because EP = AP
Both	Averaging Period (AP) (Cancer)	year	70	9a	70	9b	No effect.
Both	Exposure Duration (ED)	d/event	1	10a	1	10b	No effect.

Table 3
Comparison of MADEP and USEPA Exposure Factors

Notes for Resident, aged 1 to 2 years old:

* Exposure factors used by GEC in risk assessments in RAM Plan Modification

1a. Page 3-11 of Risk Assessment Guidance for Superfund (RAGS): Volume I Part E. Assumed exposure to head, forearms, hands, lower legs and feet; 50th percentile value for children aged <1 to <6 of both sexes. For children younger than 2, aged two values were used in this calculation.

1b. Face, hands, forearms, lower legs and feet for age 1-2 year old, default value used by MADEP in their risk assessments. From Table B-2 of *Guidance for Disposal Site Risk Characterization* , MADEP, 1995. 50th percentile of face (1/3 head), forearms, hands, lower legs and feet for females.

2a. Page 3-14 of Risk Assessment Guidance for Superfund (RAGS): Volume I Part E. 95th percentile weighted AF for children playing at a daycare

2b. Value used by MADEP for children up to age 8 years, for deriving Method 1 S-1 standards and in Risk Assessment Short Forms. Value was derived according to procedure provided in MADEP's Technical Update: Weighted Skin-Soil Adherence Factors, April 2002.

3a. Table 5-1 in Exposure Factors Handbook. Value provided is general central population tendency for a child aged 1 to <6 years old. General population upper tendency for a 3 to <6 year old child is 200 mg/kg. (Values provide for both dust and soil ingestion)

3b. Soil ingestion rate used by MADEP for children up to 8 years, in Risk Assessment Short Form. From, MADEP (2002), Technical Update: Calculation of an Enhanced Soil Ingestion Rate.

4a. Page 3-19 of Risk Assessment Guidance for Superfund (RAGS): Volume I Part E. Average body weight, ages 1 to 6 years.

4b. Body weight for age 1-2 year old female, default value used by MADEP in Risk Assessment Short Form.

5a. Page 3-20 of RAGS: Volume I Part E. RME for Resident is 350 days per year

5b. 2 days per week during a single six-month construction project

6a. Presume daily exposure to dusts by resident

6b. 7 days per week during a single six-month construction project

7a. Page 3-20 of RAGS: Volume I Part E. RME for Resident is 30 years.

7b. Exposure period is during year when construction project is occurring, otherwise cap maintained per Notice of Activity and Use Limitation.

8. Non-cancer averaging period is the same as the exposure period.

9a. Value used by USEPA for cancer averaging period

9b. Value used by MADEP for cancer averaging period

10a. Page 3-20 of RAGS: Volume I Part E. RME for event frequency is 1 day per event.

10b. Assume that exposure duration for both dust inhalation and soil contact is 1 day (24-hours) per event

Table 3

Comparison of MADEP and USEPA Exposure Factors

Receptor / Media	Exposure Factor	Unit	USEPA	Notes	MADEP *	Notes	Interpretation
On-Site Commercial Office Worker, aged 18-25 year old female							
Soils	Surface Area (SA)	cm^2/d	3300	1a	3473	1b	MADEP: 5.2% higher risk estimate for dermal contact than if used USEPA's SA default.
Soils	Mass of soil adhered per unit exposed skin (AF)	mg/cm^2	0.2	2a	0.03	2b	MADEP: 85% lower risk estimate for dermal contact than if used USEPA's AF default; however, this receptor assumed to be office worker exposed to soils only during 6-month construction period. No routine or long-term landscaping or groundskeeping will be conducted because of cap. Construction worker would have the higher exposure.
Soils	Ingestion Rate (IR)	mg/d	50	3a	50	3b	No effect
Soils	Body Weight (BW)	kg	70		57.1	4b	MADEP: 18.4% higher risk estimate than if used USEPA's BW default
Soils	Exposure Frequency (EF)	d/yr	250	5a	130	5b	MADEP: 4.2% higher non-cancer risk estimate and 48% lower cancer risk estimate than if used USEPA's EF default.
Soils	Exposure Period (EP)	year	25	6a	0.5	6b	MADEP: Assume EP shortened via maintenance of cap and Notice of Activity and Use Limitation; otherwise, non-cancer risk estimates would be higher.
Soils	Averaging Period (AP) (Non-cancer)	year	25	7	0.5	7	No effect, because EP = AP
Soils	Averaging Period (AP) (Cancer)	year	70	8a	70	8b	No effect.
Soils	Exposure Duration (ED)	d/event	1	9a	1	9b	No effect.

Table 3
Comparison of MADEP and USEPA Exposure Factors

Notes for Commercial Office Worker, aged 18-25 year old female:

* Exposure factors used by GEC in risk assessments in RAM Plan Modification

1a. Page 3-11 of Risk Assessment Guidance for Superfund (RAGS): Volume I Part E. Assumed exposure to head, forearms and hands; 50th percentile value for adults of both sexes, greater than 18 years of age.

1b. Table B-2 in Guidance for Disposal Site Risk Characterization, MADEP (1995). 50th percentile value for adult females for Face (1/3 head), forearms, hands and feet. Value used by MADEP to derive Method 1 S-2 soil standards and in MADEP's Risk Assessment Short Forms.

2a. Page 3-17 of Risk Assessment Guidance for Superfund (RAGS): Volume I Part E. 50th percentile weighted AF, assuming high-end soil activity, such as construction worker, utility worker, groundskeeper, landscaper, gardener, irrigation installer.

2b. Adherence factor is the same as used by MADEP for office workers to derive Method 1 S-2 soil standards. Value was derived according to procedure provided in MADEP's Technical Update: Weighted Skin-Soil Adherence Factors, April 2002.

3a. Table 5-1 in Exposure Factors Handbook. Value provided is general central population tendency for an adult, for both soils and dust ingestion.

3b. Soil ingestion rate is the same as used by MADEP for office workers to derive Method 1 S-2 soil standards.

4a. Page 3-19 of Risk Assessment Guidance for Superfund (RAGS): Volume I Part E. Average body weight, ages 7 to 31 years.

4b. 50th percentile body weight for age 18 to <25 year old female, in Table B-1 of Guidance for Disposal Site Risk Characterization, MADEP (1995). Recently, MADEP has started to use 58 kg for 18 to <25 year old female, when calculation Method 1 soil standards or in Short Forms.

5a. Page 3-20 of RAGS: Volume I Part E. RME for Industrial Worker is 250 days per year for an EF of 0.685 events/yr

5b. 5 days per week (total 130 days) during a single six-month construction project; otherwise soils are covered by cap.

6a. Page 3-20 of RAGS: Volume I Part E. RME for Industrial Worker is 25 years.

6b. Exposure period is the term of the construction project (0.5 years); otherwise exposure limited by cap and Notice of Activity and Use Limitation.

7. Non-cancer averaging period is the same as the exposure period.

8a. Value used by USEPA for cancer averaging period

8b. Value used by MADEP for cancer averaging period

9a. Page 3-20 of RAGS: Volume I Part E. RME for event frequency is 1 day per event.

9b. Assume that exposure duration for soil contact is 1 day (24-hours) per event

Table 3

Comparison of MADEP and USEPA Exposure Factors

Receptor / Media	Exposure Factor	Unit	USEPA	Notes	MADEP *	Notes	Interpretation
Construction Worker, aged 18-25 year old female							
Soils	Surface Area (SA)	cm^2/d	3300	1a	3473	1b	MADEP: 5.2% higher risk estimate for dermal contact than if used USEPA's SA default.
Soils	Mass of soil adhered per unit exposed skin (AF)	mg/cm^2	0.2	2a	0.29	2b	MADEP: 45% higher risk estimate for dermal contact than if used USEPA's AF default.
Soils	Ingestion Rate (IR)	mg/d	50	3a	100	3b	MADEP: 100% higher risk estimate for risk estimates for incid. Ingestion than if used USEPA's IR default.
Soils	Body Weight (BW)	kg	70	4a	58	4b	MADEP: 17.1% higher risk estimate than if used USEPA's BW default.
Both	Exposure Frequency (EF)	event/d	0.685 (250 d/yr)	5a	0.714 (130 d/6-mo)	5b	MADEP: 4.2% higher non-cancer risk estimate and 48% lower cancer risk estimate than if used USEPA's EF default.
Both	Exposure Period (EP)	year	25	6a	0.5	6b	MADEP: Assume EP shortened via maintenance of cap and Notice of Activity and Use Limitation; otherwise, non-cancer risk estimates would be higher.
Both	Averaging Period (AP) (Non-cancer)	year	25	7	0.5	7	No effect, because EP = AP
Both	Averaging Period (AP) (Cancer)	year	70	8a	70	8b	No change
Soils	Exposure Duration (USEPA - Event Frequency) (ED)	d/event	1	9a	1	9b	No change
Dusts	Exposure Duration (ED)	d/event	0.333	9a	0.333	9b	No change
Dusts	Concentration of PM-10 dust (PM-10)	$\mu g/m^3$	not found		60	10b	
Dusts	Inhalation Rate during work (Inh)	L/min	50	11a	60	11b	MADEP: 10% higher risk estimates than if used USEPA's InH value.

Table 3
Comparison of MADEP and USEPA Exposure Factors

Notes for Construction Worker, aged 18-25 year old female:

* Exposure factors used by GEC in risk assessments in RAM Plan Modification

1a. Page 3-11 of Risk Assessment Guidance for Superfund (RAGS): Volume I Part E. Assumed exposure to head, forearms and hands; 50th percentile value for adults of both sexes, greater than 18 years of age. (no values provided for construction worker in guidance; therefore, presumed value for commercial/industrial is appropriate)

1b. Table B-2 in Guidance for Disposal Site Risk Characterization, MADEP (1995). 50th percentile value for adult females for Face (1/3 head), forearms, hands and feet. Value used by MADEP to derive Method 1 S-2 soil standards and in MADEP's Risk Assessment Short Forms.

2a. Page 3-17 of RAGS: Volume I Part E. 50th percentile weighted AF, assuming high-end soil activity, such as construction worker, utility worker, groundskeeper, landscaper, gardener, irrigation installer.

2b. Adherence factor is the same as used by MADEP for office workers to derive Method 1 S-2 soil standards. Value was derived according to procedure provided in MADEP's Technical Update: Weighted Skin-Soil Adherence Factors, April 2002.

3a. Table 5-1 in Exposure Factors Handbook. Value provided is general central population tendency for an adult, for both soils and dust ingestion.

3b. Soil ingestion rate is the same as used by MADEP for construction workers to derive Method 1 S-2 and S-3 soil standards and in Risk Assessment Short Forms for Construction Worker. From MADEP's Technical Update: Calculation of an Enhanced Soil Ingestion Rate (2002).

4a. Page 3-19 of RAGS: Volume I Part E. Average body weight, ages 7 to 31 years.

4b. Valued used for 18 to <25 year old female, when calculating Method 1 soil standards and in Risk Assessment Short Forms.

5a. Page 3-20 of RAGS: Volume I Part E. RME for Industrial Worker is 250 days per year for an EF of 0.685 events/yr

5b. 5 days per week or 0.714 of a day (or for 6 month project 5*26 = 130 days)

6a. Page 3-20 of RAGS: Volume I Part E. RME for Industrial Worker is 25 years.

6b. Exposure period is the term of the construction project (0.5 years)

7. Non-cancer averaging period is the same as the exposure period.

8a. Value used by USEPA for cancer averaging period

8b. Value used by MADEP for cancer averaging period

9a. Page 3-20 of RAGS: Volume I Part E. RME for event frequency for soil contact is 1 day per event. Section 6.3 of RAGS: Volume I Part F: Inhalation of dust by construction worker - 8 hours per day, 5 days per week.

9b. Assume that exposure duration for dust inhalation is 8 hours per event and for soil contact is 24-hours per event

10a. USEPA default values for PM-10 dust concentration was not found.

10b. MADEP 1995 Guidance for Disposal Site Risk Characterization, pg B-11

11a. Table 6-2 in Exposure Factors Handbook. Value provided is mean concentration for heavy exertion by an adult (both sexes), aged 21 to <31 years. This approach is no longer recommended by USEPA. However, it was included here because MADEP uses this approach to evaluate risks from both inhalation of dusts and subsequent swallowing of a portion of inhaled dusts.

11b. Table B-4 MADEP 1995 Guidance for Disposal Site Risk Characterization (for heavy exertion)

Table 4
Comparison of MADEP and USEPA Soil Absorption Factors

Contaminant of Concern	Pathway	USEPA	Notes	MADEP *	Notes	Interpretation
Barium	Dermal Contact	none available	1a	0.05	2	MADEP: Higher risk because dermal exposure to barium in soils is not excluded from quantitative risk assessment
Chromium (III)	Dermal Contact	none available	1a	0.04	2	MADEP: Higher risk because dermal exposure to chromium in soils is not excluded from quantitative risk assessment
Lead	Dermal Contact	none available	1a	0.006	2	MADEP: Higher risk because dermal exposure to lead in soils is not excluded from quantitative risk assessment
Mercury	Dermal Contact	none available	1a	0.05	2	MADEP: Higher risk because dermal exposure to mercury in soils is not excluded from quantitative risk assessment
Nickel	Dermal Contact	none available	1a	0.35	2	MADEP: Higher risk because dermal exposure to nickel in soils is not excluded from quantitative risk assessment
Total PCBs (PCB 1248 and PCB 1254)	Dermal Contact	0.14	1b	0.16	2	MADEP: 14.3% higher risk estimate for dermal absorption for PCBs than if used USEPA's value.
Vanadium	Dermal Contact	none available	1a	0.03	2	MADEP: Higher risk because dermal exposure to vanadium in soils is not excluded from quantitative risk assessment
C19-C36 Aliphatic Hydrocarbons	Dermal Contact	0.1	1c	0.1	2	No effect.
C11-C22 Aromatic Hydrocarbons	Dermal Contact	0.1	1c	0.18	2	MADEP: 80% higher risk estimate for dermal absorption for C11-C22 aromatic hydrocarbons than if used USEPA's default value for

Notes for Soil Dermal Absorption Factors:

1a. Section 3.2.2.4 and Exhibit 3-4 of RAGS: Volume I Part E. No soil dermal absorption factors available for most contaminants. For these contaminants, USEPA recommends evaluating risks qualitatively in the uncertainty section of the risk assessment, rather than quantitatively.

1b. Exhibit 3-4 of Risk Assessment Guidance for Superfund (RAGS): Volume I Part E. Provides available soil dermal absorption factors, of which only one contaminant of concern (Aroclors 1254/1242) has a soil dermal absorption factor.

1c. Exhibit 3-4 of RAGS: Volume I Part E. Default value for semi-volatile organic compounds.

2. MADEP values used to derive Method 1 S-1, S-2 and S-3 soil standards and in the Risk Assessment Short Forms.

Table 4
Comparison of MADEP and USEPA Soil Absorption Factors

Contaminant of Concern	Pathway	USEPA	Notes	MADEP *	Notes	Interpretation
Barium	Ingestion	0.07	1b	1	2	MADEP: 13.3% higher risk estimate for gi absorption of barium than if used USEPA's value.
Chromium (III)	Ingestion	0.013	1b	1	2	MADEP: 75.9% higher risk estimate for gi absorption of chromium than if used USEPA's value.
Lead	Ingestion	not provided	1a	0.5	2	
Mercury	Ingestion	0.07	1b	1	2	MADEP: 13.3% higher risk estimate for gi absorption of mercury than if used USEPA's value.
Nickel	Ingestion	0.04	1b	1	2	MADEP: 24% higher risk estimate for gi absorption of nickel than if used USEPA's value.
Total PCBs (PCB 1242 and PCB 1254)	Ingestion	0.80 to 1.0	1c	0.85	2	MADEP: Little effect on risk estimate. MADEP's oral absorption factor is within the range provided by USEPA.
Vanadium	Ingestion	0.026	1b	1	2	MADEP: 37.5% higher risk estimate for gi absorption of vanadium than if used USEPA's value.
C19-C36 Aliphatic Hydrocarbons	Ingestion	not provided	1a	1	2	
C11-C22 Aromatic Hydrocarbons	Ingestion	not provided	1a	0.36	2	

Notes for Soil Ingestion Absorption Factors:

1a. Exhibit 4-1 of Risk Assessment Guidance for Superfund (RAGS): Volume I Part E. No soil oral absorption factors provided.

1b. Exhibit 4-1 of RAGS: Volume I Part E. Soil oral (GI) absorption factors based on studies where delivery vehicle was water, diet or (for vanadium) gavage (vehicle not specified). No soil GI absorption factors are provided.

1c. Exhibit 4-1 of RAGS: Volume I Part E. Soil oral (GI) absorption factor based on studies where delivery vehicles were squalene, "emulsion" and corn oil. No soil GI absorption factors are provided.

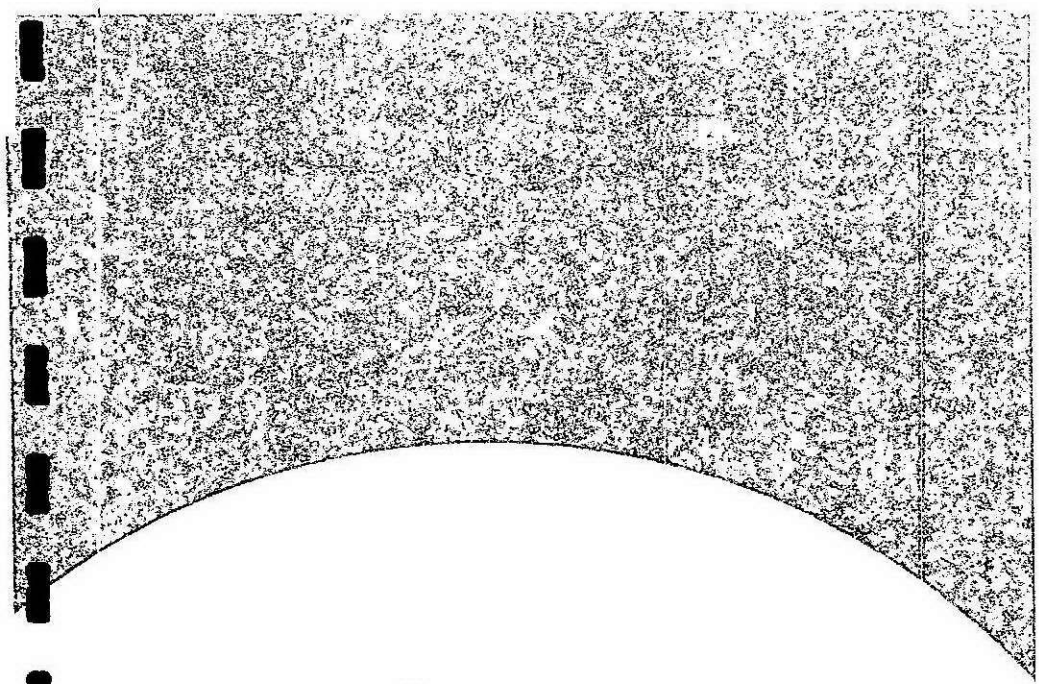
2. MADEP values used to derive Method 1 S-1, S-2 and S-3 soil standards and in the Risk Assessment Short Forms.

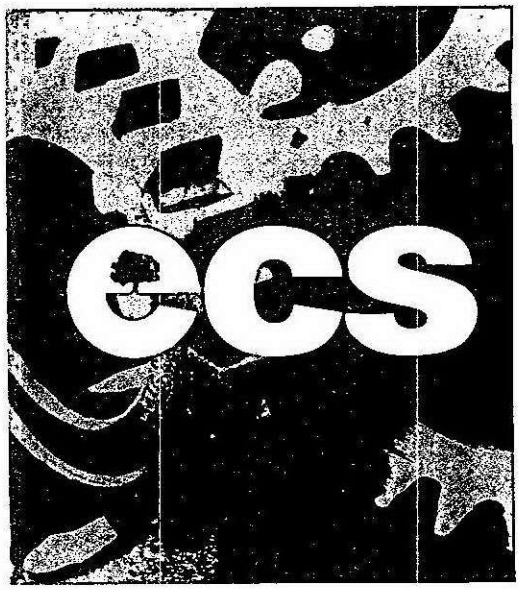
ATTACHMENT 1:

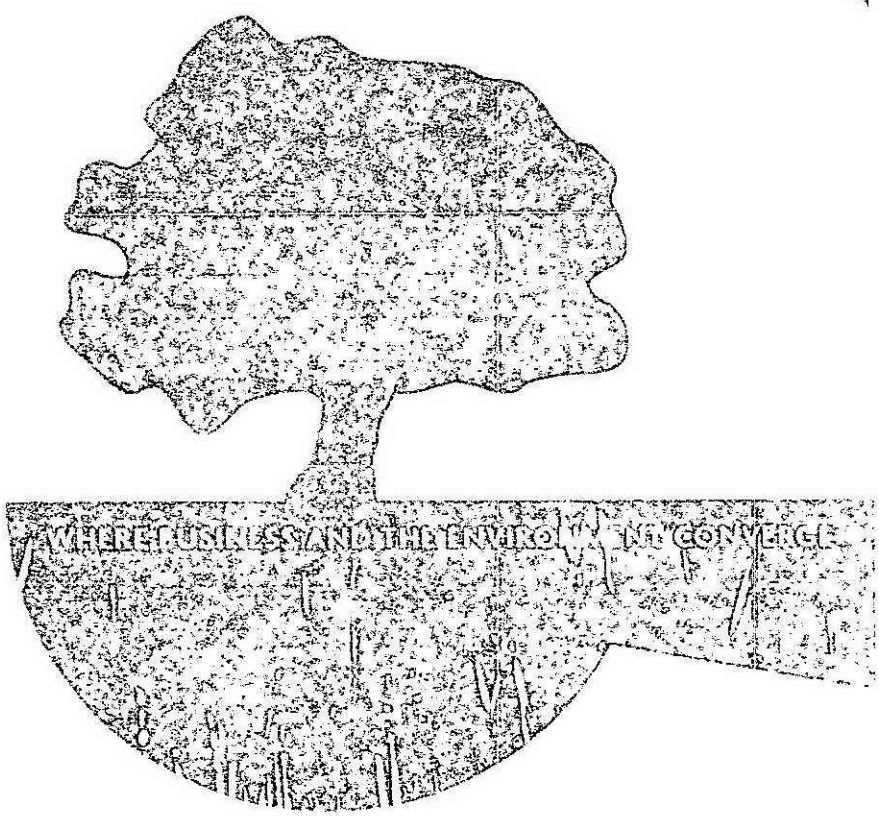
ECS RAM Completion Report

SCANNED

Lowell 3-266
130 John St.





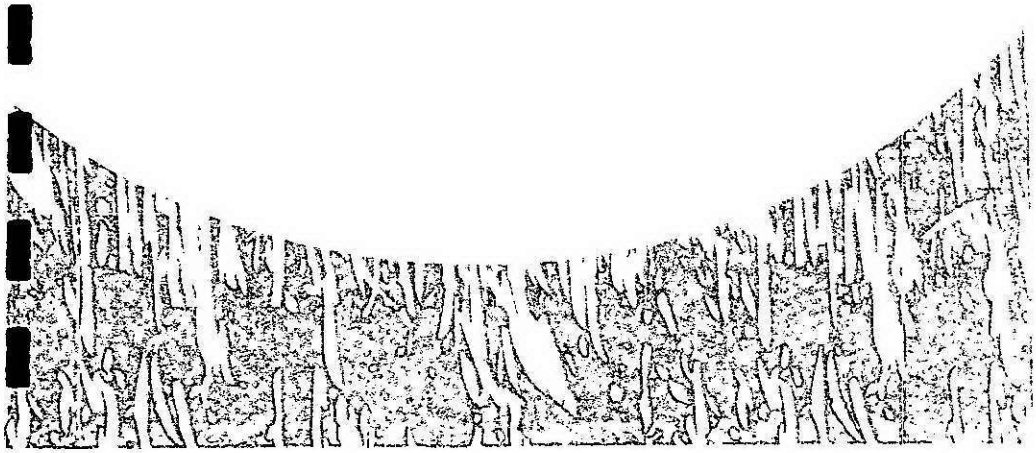


RELEASE ABATEMENT MEASURE COMPLETION REPORT
RTN 3-26688
130 John St.

BOOTS MILLS DEVELOPMENT
LOWELL, MASSACHUSETTS

Prepared for:
Massachusetts Department of Environmental Protection

Project No. 05-207808
January 29th, 2008



Prepared by:
607 North Avenue, Suite 11
Wakefield, MA 01880
tel 781.246.8897 fax 781.246.8950
www.ecsconsult.com

TABLE OF CONTENTS

SECTION		PAGE
1.0	**INTRODUCTION**	**1**
2.0	**BACKGROUND**	**2**
2.1	SITE LOCATION AND DESCRIPTION	2
2.2	DESCRIPTION OF RELEASE, SITE CONDITIONS & SURROUNDING RECEPTORS [40.0446(4)(**a**)]	2
2.2.1	Description of Release & Site Conditions	2
2.2.2	Sensitive Receptors	2
3.0	**RELEASE ABATEMENT MEASURE [40.0446(4)(b)]**	**4**
3.1	SUMMARY OF INVESTIGATORY AND MONITORING DATA [40.0446(4)(**c**)]	4
3.2	FINDINGS AND CONCLUSIONS [40.0446(4)(**d**)]	5
3.3	DESCRIPTION OF REMEDIATION WASTE AND WASTE MANAGEMENT [40.0446(4)(**e**)]	5
3.4	DESCRIPTION OF ONGOING ACTIVITIES [40.0446(4)(**f**)]	6
3.5	LICENSED SITE PROFESSIONAL OPINION [40.0446(5)(**a**)]	6

FIGURES:

Figure 1	Site Location Map
Figure 2	Site Plan
Figure 3	Soil Sampling Locations

TABLES:

Table 1	Soil Pile Disposal Characterization Analytical Results for PCBs
Table 2	Soil Pile Disposal Characterization Analytical Results for VOCs & SVOCs
Table 3	Soil Pile Disposal Characterization Analytical Results for Metals
Table 4	Confirmatory Soil Sampling Analytical Results

APPENDICES:

Appendix A	BWSC Transmittal Form
Appendix B	Laboratory Analytical Reports - Soil
Appendix C	Bill of Lading

1.0 INTRODUCTION

On behalf of the Boott Mill Development Corporation, Environmental Compliance Services, Inc., (ECS) has prepared the following Release Abatement Measure (RAM) Completion Report for the removal and disposal of soil contaminated with polychlorinated biphenyls (PCBs) and metals located on a portion of the property at 130 John Street in Lowell, Massachusetts and tracked by the Massachusetts Department of Environmental Protection (MassDEP) under Release Tracking Number (RTN) 3-26688 (herein referred to as "the Site"). The purpose of the RAM was to characterize and manage the excavation and off-site disposal of PCB impacted soil.

Refer to Figure 1 (Site Location Map) for the location of the Site in relation to surrounding topography and drainage. Refer to Figure 2 (Site Plan) for the approximate location of the excavation activities and Figure 3 sample locations. Appendix A includes a copy of MassDEP BWSC Transmittal Form BWSC 106 submitted with this report.

As listed in 40.0446 (1), a RAM Completion Report shall be submitted to the DEP no later than 60 days following the completion of those remedial actions proposed in the RAM Plan. The last RAM activities at the Site were completed on April 30, 2007. There was an expected delay for financial reasons in retaining ECS to prepare and submit this RAM Completion Report.

This report was prepared to comply with the requirements of 310 CMR 40.0446, RAM Completion reporting, and includes the following information:

- A description of the release, site conditions, and surrounding receptors;
- A description of the RAM completed at the Site;
- All investigatory and monitoring data obtained during the implementation of the RAM;
- A statement of findings and conclusions resulting from implementation of the RAM;
- Details of and documentation on the management of any remediation waste, remedial wastewater and/or remedial additives managed at the Site as part of the RAM;
- A description of any ongoing activities related to the RAM that will be conducted at the Site (not applicable); and
- LSP Opinion as to whether the Release Abatement Measure was conducted in conformance with 310 CMR 40.0440, the Release Abatement Measure Plan, and any conditions of approval established by the MassDEP.

2.0 BACKGROUND

2.1 SITE LOCATION AND DESCRIPTION

The Site consists of an approximately 2.1-acre parcel of land located at 130 John Street in Lowell, Massachusetts. UTM coordinates for the Site are 19 0310776 east and 47 23997 north. A Site Locus and Site Plan are attached as Figures 1 and 2, respectively. The site is occupied by the former Boott Cotton Mill facility. The Merrimack River abuts the property to the north and small, man-made canals are located to the west and south of the site. Commercial properties are located to the east of the site.

2.2 DESCRIPTION OF RELEASE, SITE CONDITIONS & SURROUNDING RECEPTORS [40.0446(4)(a)]

2.2.1 Description of Release & Site Conditions

A complete release history for the site is not known at this time. Information provided by the general contractor indicates that a "wall-mounted transformer" may have been located in the courtyard where PCBs subsequently were subsequently detected in soil. Excavation was being undertaken in the court yard on November 2006 when the general contractor Consigli Construction noted what they believed to be a "petroleum odor." Consigli retained TRC Environmental of Lowell, MA to conduct test pits of the court yard on November 20, 2006. Collected "grab" sidewall and pit bottom soil samples were analyzed for volatile organic compounds (VOCs) using EPA Method 8260. Composite soil samples were submitted for laboratory analysis of: PCBs, RCRA 5 metals, extractable petroleum hydrocarbons (EPH), and semi-volatile organic compounds (SVOCs).

The laboratory analytical results are attached in Appendix B. As shown in the attached reports, PCBs were detected in two of the test pits designated as TP-1 and TP-2 at concentrations exceeding the Massachusetts Contingency Plan (MCP) reportable concentration (RC) category RCS-1 threshold for PCBs of 2 parts per million (ppm). RCS-1 is applicable to this Site per 310 CMR 40.0361 (1), (a) because residences and/or a public park are located within 500 feet of the Site. PCB concentrations ranged from 2 to 15 ppm in these two test pits. It should also be noted that benzo(a)pyrene (6.23 ppm) was detected in two of the analyzed soil samples at concentrations exceeding the RCS-1 of 2.0 ppm. Approximate locations of the two test pits are shown on Figure 3.

2.2.2 Sensitive Receptors

The site is located in an area zoned for mixed use. The site is surrounded by primarily commercial buildings. There are no institutions within a 500-foot radius of the Site.

The Merrimack River abuts the property to the north. Small man-made canals are located to the west and south of the property. According to the MassDEP Priority resource map for the site, the site is located within 500 feet of an area designated as an NHESP Wetlands Habitat. According to the Mass Geographic Information System (MassGIS) database, there are no areas designated as Areas of Critical Environmental Concern, Protected Open

Space, or Vernal Pools located within 500 feet of the Site. In addition, the Site is not mapped within the boundaries of a Potentially Productive Aquifer, Zone II Area, Interim Wellhead Protection or Zone A area. Based on this analysis, as described in the MCP (310 CMR 40.0362 and 40.0932), groundwater beneath the Site can be categorized as MCP Method 1 GW-2/GW-3. However, based on pit bottom soil quality analytical data (see Section 3.1) no release to groundwater was observed at the Site.

The Site is located within 20 ft of a building. Children's and adult's frequency of use at the Site is considered "high" because they are present as visitors and residents. Intensity of usage for child and adult is expected to be low as it relates to the surficial release because there are no activities planned which would disturb Site soil in the area of the release. Therefore, based on this analysis soil cleanup categories for this Site are selected as S-2. However, in order to evaluate the potential need to place an Activity and Use Limitation (AUL) and in order to maintain a Response Action Outcome (RAO), ECS also compared residual contaminant concentrations to S-1 standards.

3.0 RELEASE ABATEMENT MEASURE [40.0446(4)(b)]

The objective(s) of the RAM was to document the excavation of contaminated soil and off-site transport to an appropriate recycling facility. In addition, on behalf of Boott Mill Development Corporation, ECS conducted confirmatory soil sampling to verify that the contaminated soil had been removed.

Soil was removed from the court yard and loaded directly onto trucks on March 29 and March 30, 2007. The soil was compacted, indicating that it had been present at the Site for a long period of time, which as discussed above gave no indication as to the period of time for rlease of PCBs to soil. As discussed in further detail below in Section 3.3, approximately 210 tons of soil was removed. On April 30, 2007 clean backfill and gravel were placed within the courtyard and compacted to grade in order to complete site restoration. ECS personnel were on site prior to the start of excavation activities each morning on March 29 and March 30. Additional oversight of construction activities was conducted by ECS on April 2, April 3, and April 4, 2007.

3.1 SUMMARY OF INVESTIGATORY AND MONITORING DATA [40.0446(4)(c)]

ECS met with Consigli Construction on March 26, 2007, to discuss the extent of soil to be disposed and disposal activities. Based on this meeting, ECS personnel returned to the Site on March 27, 2007, and collected eight additional soil samples (ECS-HA-1 through ECS-HA-7 and ECS-C-1) from the courtyard for characterization analysis to obtain approvals into selected disposal facilities. The soil samples were analyzed for PCBs by EPA Method 8082. Soil sample ECS-C-1 was also analyzed for RCRA 5 Metals by EPA Method 6000/7000, volatile organic compounds (VOCs) by EPA Method 8260 and semi-volatile organic compounds (SVOCs) by EPA Method 8270. It should be noted that the sample locations ECS-HA-1 through ECS-HA-7 were located within the excavation. Elevated levels of PCBs were detected within these samples and concentrations ranged from 3.7 mg/kg to 36.09 mg/kg. The soil from within this area has been removed from the Site.

Turnkey Landfill in Rochester, New Hampshire approved the receipt of the soil. Soil disposal characterization analytical results are presented in Tables 1 through 3. All parameters detected were below Turnkey's disposal requirements. All soil removed from the excavation was sent to Turnkey Landfill due to the concentrations of PCBs detected in the samples collected by ECS on March 27, 2007. Lead was detected at a concentration of 433 mg/kg, above the 300 mg/kg S-2/S-3 soil standards, within the composite soil sample (ECS-C-1) collected from the courtyard.

On April 5, 2007, nine (9) confirmatory soil samples (labeled as samples 5A-N, 4A-N, 3A-N, 2A-N, 1A-N, 1B-E, 1C-E, 1D-E and 2D-S) were collected from the soils within the courtyard. Sample locations are shown on Figure 3. The soil samples were collected from a depth of 24 to 36 inches below the ground surface along the sidewalls within the open excavation using a hand auger and sent for laboratory analysis of PCBs by EPA Method 8082, polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270 and Lead by EPA Method 6000/7000.

PCB concentrations were below laboratory detection limits in samples 1A-N, 3A-N, 1B-E, 1C-E and 2D-S. PCBs were detected in the samples collected from 2A-N and 1D-S at concentrations of 0.110 mg/kg and 0.0476 mg/kg, respectively. These concentrations are below the MCP Method 1 Soil Standard of 2 mg/kg for S-1 soils. PCBs were detected in the samples collected from 4A-N and 5A-N at concentrations of 6.150 mg/kg and 2.272 mg/kg, respectively. These concentrations are above the MCP Method 1 Soil Standard of 2 mg/kg. Lead and PAHs were detected above MCP Method 1 Soil Standards within the sample collected at location 2D-S.

Laboratory analytical reports are included in Appendix B.

During the excavation activities the courtyard area remained inundated with water due to repeated precipitation events and inadequate drainage which prevented dust and particulates from entering the atmosphere. Air sampling was deemed unnecessary and visual inspections for dust were conducted during the excavation activities.

3.2 FINDINGS AND CONCLUSIONS [40.0446(4)(d)]

Soil samples were collected by the previous consultant from two test pits in November 2006. Laboratory analytical results indicated that detected concentrations of PCBs in soil samples ranged from 3.7 mg/kg to 36.09 mg/kg. The soil was excavated in March 2007 to facilitate a drainage improvement project and transported off site to Turnkey in Rochester, NH. Approximately 210 tons of soil was removed from the site.

Confirmatory soil samples were collected from the soils within the footprint of the excavation. PCBs were not detected above laboratory detection limits in five of the nine confirmatory samples. PCB concentrations detected in two of the remaining four confirmatory soil samples were below the MCP Method 1 S-2/S-3 soil standard of 2 mg/kg. The soil samples collected at locations 4A-N and 5A-N contained levels of PCBs above the MCP Method 1 S-1 soil standards. Comparison of the nine confirmatory samples along with the two test pit bottom sample locations (TP-1 and TP-6) and one side wall location (TP-2), collected by a previous consultant, show an average exposure point concentration (EPC) for PCBs across the site of 0.78 mg/kg, which is below the MCP Method 1 Soil Standard of 2 mg/kg (Table 4). The sample collected from location 2D-S contained elevated levels of lead and PAH compounds above applicable MCP Method 1 Soil Standards.

Pursuant to 310 CMR 40.0950, an Imminent Hazard does not exist at the Site because conditions were not present that would pose a significant risk to human health over a short time period. No PCBs were detected above 10 ppm within six inches of grade, during Site restoration activities gravel and clean backfill were compacted to grade. No Critical Exposure Pathways (CEP) as defined in 310 CMR 40.0006 have been identified at the Site because there was no release to groundwater and the Site is not located within a GW-1 area and therefore ingestion of groundwater is not anticipated. The PCB-contaminated soil has been removed from the site and disposed off site at a licensed recycling facility. The excavation was then filled with clean fill and gravel and compacted to grade, therefore, direct contact, dermal adsorption or ingestion of soil particulate is not anticipated.

Additional investigations are needed within this area to determine the nature and extent of the elevated levels of PAHs and lead detected in sample 2D-S prior to concluding if a condition of No Significant Risk exists at the Site.

3.3 DESCRIPTION OF REMEDIATION WASTE AND WASTE MANAGEMENT [40.0446(4)(e)]

The following table summarizes the quantity of soil removed and date removed from the Site.

Date Soil Removed	Truck Loads	Total Quantity (tons)
March 29, 2007	4	74.33
March 30, 2007	8	134.84
Total Soil Removed	12	209.17

Soil was transported from the Site by JM Environmental Corporation under a Bill of Lading (BOL) to Turnkey in Rochester, New Hampshire. The BOL is included in Appendix C.

3.4 DESCRIPTION OF ONGOING ACTIVITIES [40.0446(4)(f)]

The RAM is now complete at this Site and no further activities related to the Plan are anticipated for the Site. Additional investigations are needed within this area to determine the nature and extent of the elevated levels of PAHs and lead detected in sample 2D-S prior to concluding if a condition of No Significant Risk exists at the Site.

3.5 LICENSED SITE PROFESSIONAL OPINION [40.0446(5)(a)]

Mr. James Matz (LSP #5323) of ECS has been contracted by Lawson as the Licensed Site Professional (LSP) of record for this RAM. The required seal and signature are included on the attached MassDEP transmittal form, BWSC-106 included in Appendix A.

FIGURES

ecs

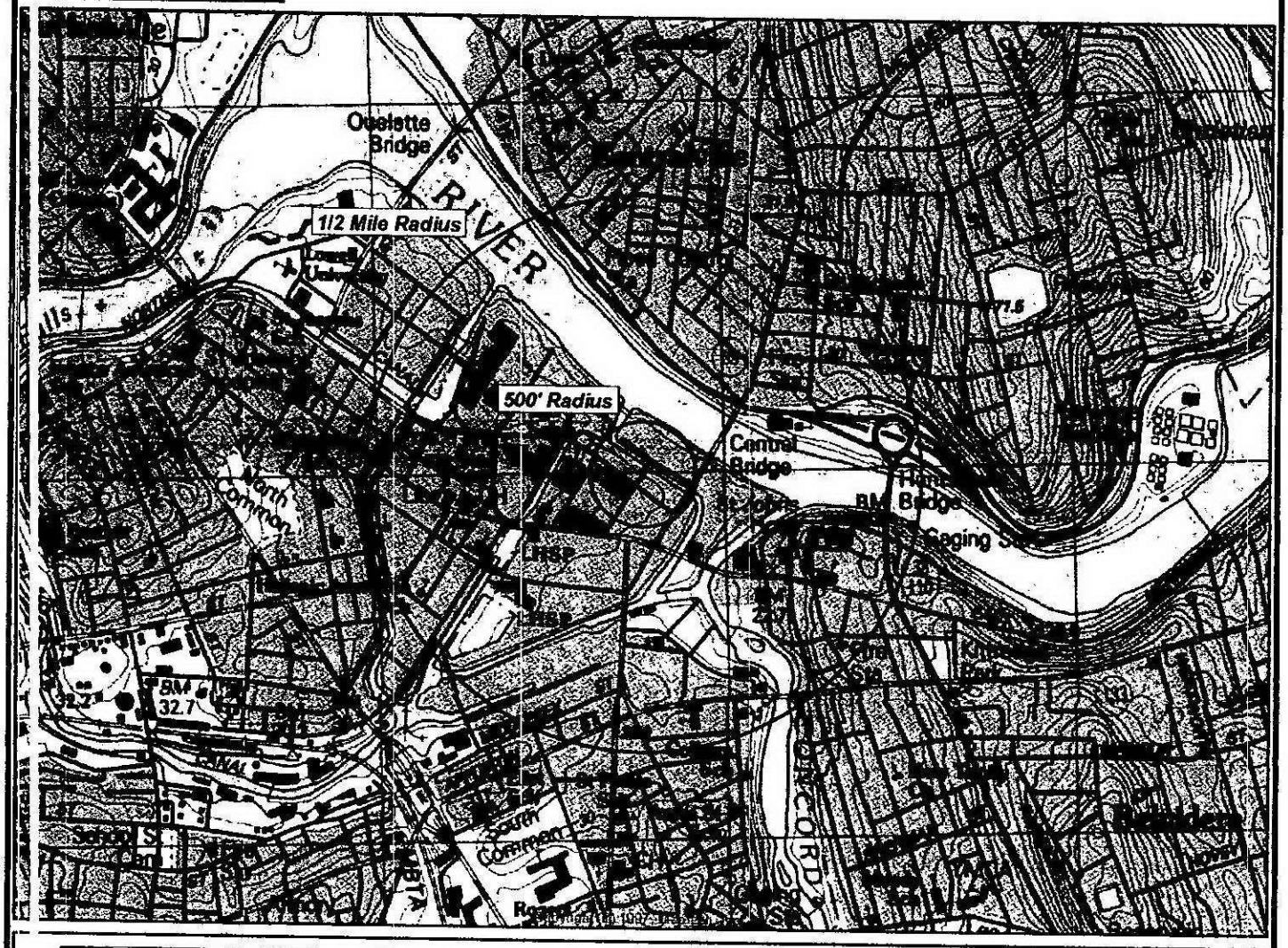
Environmental Compliance Services, Inc.
607 North Avenue, Wakefield, MA 01880
Phone (781)-246-8897 Fax (781)-246-8950
www.ecsconsult.com

SITE LOCUS

Figure: 1

Boott-Totten Mills
130 John Street
Lowell, MA
01852

Job Number: 05-207808



1 1/2 0 1 Mile

1 inch = 1500 feet

Contour Interval: 3 Meters

North

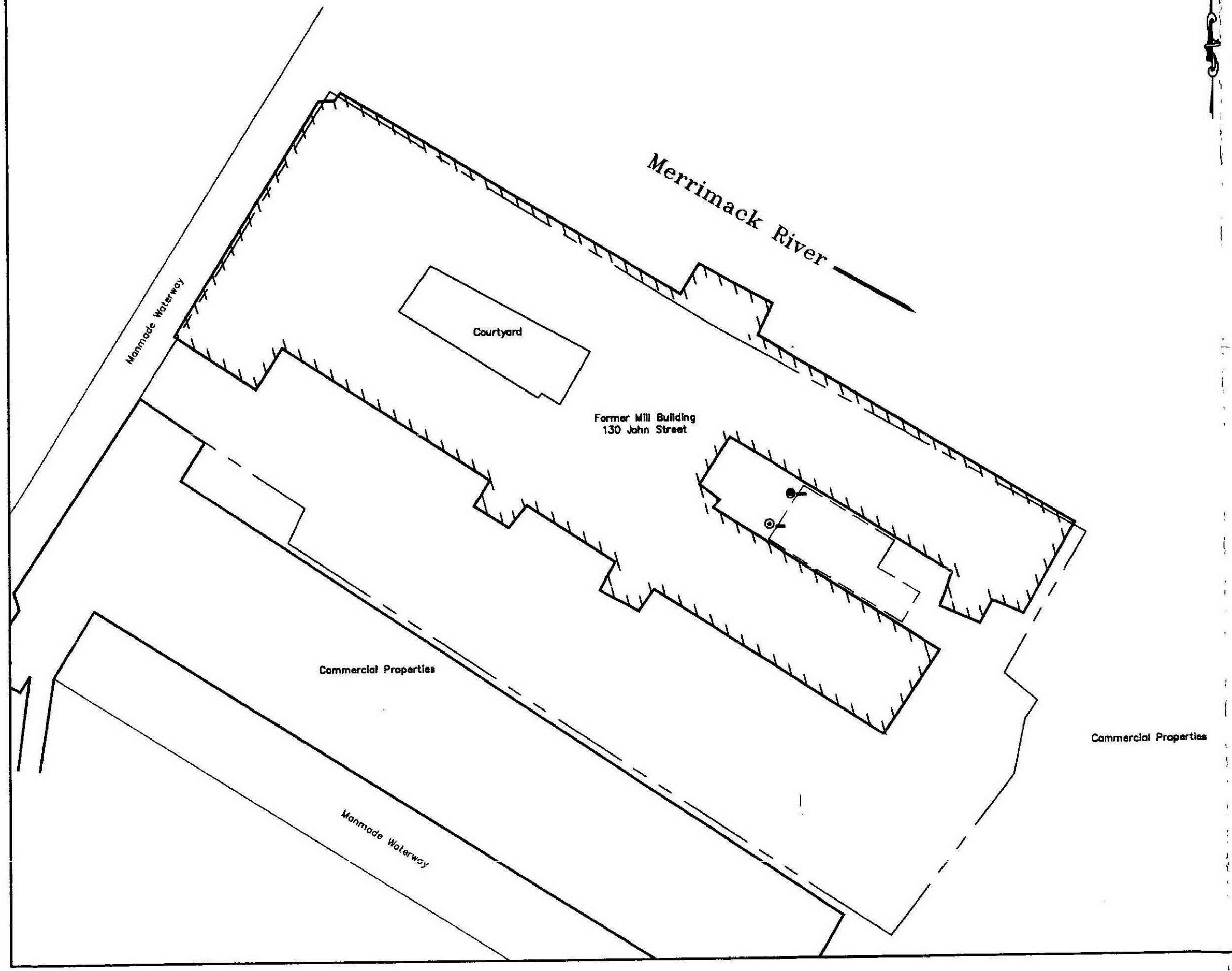
Base Map: U.S. Geological Survey; Quadrangle Location: Lowell, MA

UTM Coordinates: 19 0310776 East / 47 23997 North

Map Edited: 1987

Map Revised: None

Generated By: MDR



Legend

Approximate Property Line

Excavation Area

General Notes:

All locations, dimensions, and property lines depicted on this plan are approximate. This plan should not be used for construction or land conveyance purposes.

Map referenced from City of Lowell Assessor's Office Plans.

ecs
607 North Avenue Suite 11 • Wakefield, MA 01880
Phone: 781-246-2697 Fax: 781-246-2460

PROJECT:
Boott-Totten Mills, LLC
130 John Street
Lowell, Massachusetts

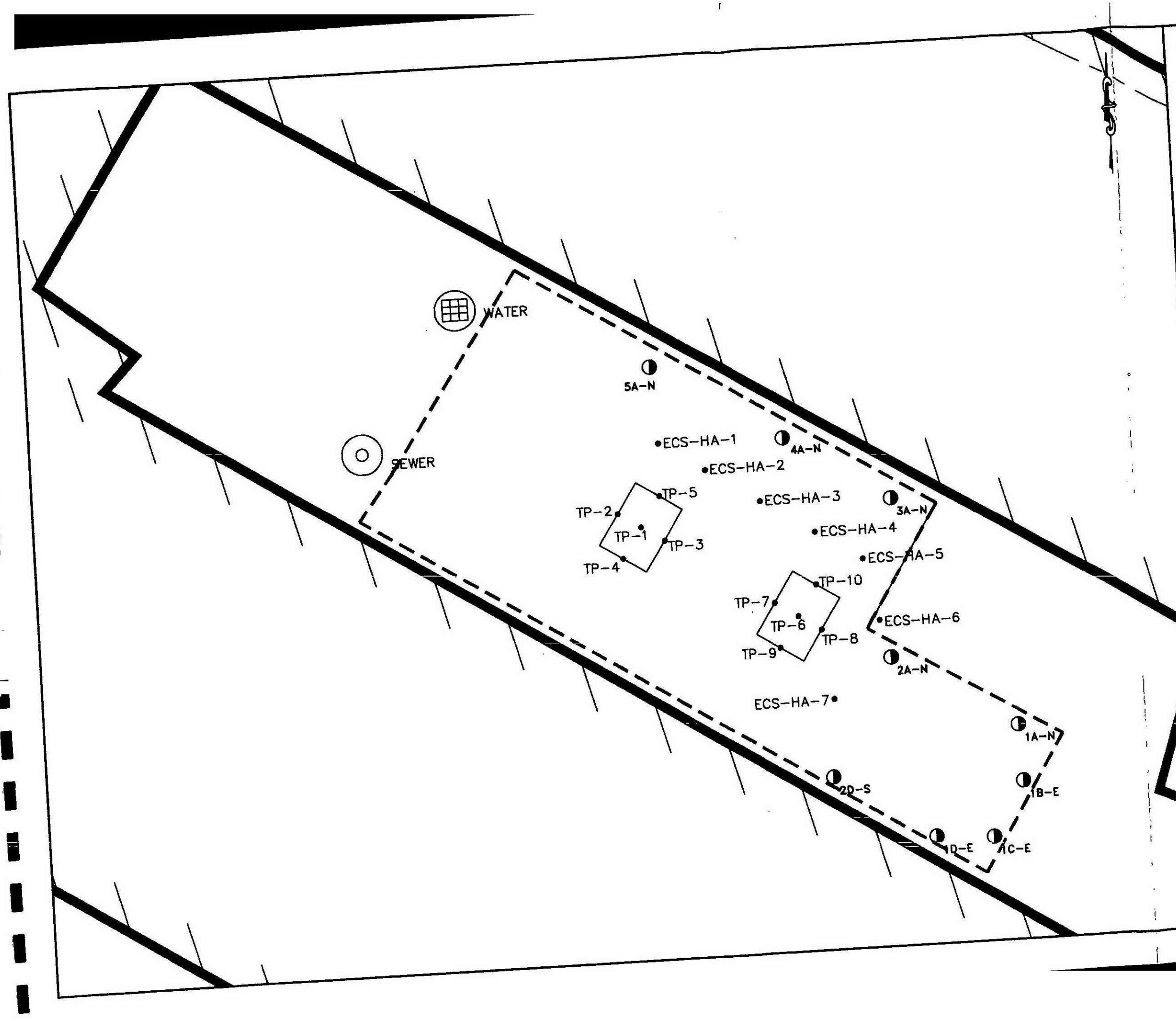
TITLE:
Site Plan

CLIENT:
Scott Lawson Group, Ltd

GRAPHIC SCALE: 50 25 0 25 50

COMPUTER CADFILE: F:\Projects\05-207808\CAD\05-207808site.dwg

DRAWN BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:
MDR	--	JBM	JBM
SCALE:	DATE:	JOB NO.:	FIGURE NO.
1"=50'	June 2007	05-207808	2



Legend

- Approximate Property Line
- •TP-5 — Test Pit Soil Sample
- •ECS-HA-1 — Site Characterization Soil Sample
- 4A-N — Confirmatory Soil Sample
- Excavation Area

General Notes:

All locations, dimensions, and property lines depicted on this plan are approximate. This plan should not be used for construction or land conveyance purposes.

Map referenced from City of Lowell Assessor's Office Plans.

ecs
607 North Avenue Suite 11 • Wakefield, MA 01880
Phone: 781-246-0007 Fax: 781-246-0660

PROJECT: **Boott-Totten Mills, LLC**
130 John Street
Lowell, Massachusetts

TITLE: **Excavation Area Plan**

CLIENT: **Scott Lawson Group, Ltd**

GRAPHIC SCALE: 10 5 0 5 10

COMPUTER CADFILE: F:\Projects\05-207808\CAD\05-207808.dwg

DRAWN BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:
MDR	---	JBM	JBM
SCALE:	DATE:	JOB NO.:	FIGURE NO.:
1"=10'	June 2007	05-207808	3

VN

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC106

Release Tracking Number
3 - 26688

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

A. SITE LOCATION:

1. Site Name/Location Aid: Former Boott Cotton Mill

2. Street Address: 130 John Street

3. City/Town: Lowell 4. ZIP Code: 01852

5. UTM Coordinates: a. UTM N: 47 23997 b. UTM E: 19 0310776

☐ 6. Check here if a Tier Classification Submittal has been provided to DEP for this disposal site.
☐ a. Tier IA ☐ b. Tier IB ☐ c. Tier IC ☐ d. Tier II

7. If a Tier I Permit has been issued, provide Permit Number: _____

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

1. List Submittal Date of Initial RAM Plan (if previously submitted): 12/08/2006 (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. 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.

RECEIVED
FEB - 5 2008
DEP
NORTHEAST REGIONAL OFFICE

☑ 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. ☐ - _____ ☐ - _____

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

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC106

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

Release Tracking Number
3 - 26685

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

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

☐ a. Air ☐ b. Basement ☐ c. Critical Exposure Pathway ☐ d. Groundwater ☐ e. Residence
☐ f. Paved Surface ☐ g. Private Well ☐ h. Public Water Supply ☐ i. School ☐ j. Sediments
☑ k. Soil ☐ l. Storm Drain ☐ m. Surface Water ☐ n. Unknown ☐ o. Wetland ☐ p. Zone 2
☐ q. Others Specify: _____

2. Identify all sources of the Release or Threat of Release, if known: (check all that apply)

☐ a. Above-ground Storage Tank (AST) ☐ b. Boat/Vessel ☐ c. Drums ☐ d. Fuel Tank
☐ e. Pipe/Hose/Line ☐ f. Tanker Truck ☐ g. Transformer ☐ h. Under-ground Storage Tank (UST)
☐ i. Vehicle ☑ j. Others Specify: Historic use

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

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

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
☐ 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. Bioremediation
☐ 12. Air Sparging

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC106

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM

Release Tracking Number
3 - 26688

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

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

☑ 13. 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 _____

iia. Receiving Facility: _____ Town: _____ State: _____

iib. Receiving Facility: _____ Town: _____ State: _____

iii. Describe: _____

☐ 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 250

Receiving Facility: Turnkey Town: Rochester State: NH

☐ 14. Removal of Drums, Tanks or Containers:

a. Describe Quantity and Amount: _____

b. Receiving Facility: _____ Town: _____ State: _____

c. Receiving Facility: _____ Town: _____ State: _____

☐ 15. Removal of Other Contaminated Media:

a. Specify Type and Volume: _____

b. Receiving Facility: _____ Town: _____ State: _____

c. Receiving Facility: _____ Town: _____ State: _____

☐ 16. Other Response Actions:

Describe: _____

☐ 17. Use of Innovative Technologies:

Describe: _____

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC106

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM

Release Tracking Number
3 - 26688

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

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 #: 5323

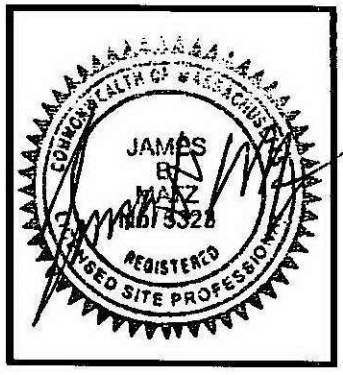
2. First Name: James B. 3. Last Name: Matz

4. Telephone: 781-246-8897 5. Ext.: 288 6. FAX: 781-246-8950

7. Signature:

8. Date: 1-28-08
(mm/dd/yyyy)

9. LSP Stamp:



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC106

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

Release Tracking Number

3 - 26688

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: Bootts Mill Development Corporation

3. Contact First Name: Edward F. 4. Last Name: Barry

5. Street: 130 John Street 6. Title:

7. City/Town: Lowell 8. State: MA 9. ZIP Code: 01852

10. Telephone: (978) 454-9053 11. Ext.: 12. FAX:

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

☑ 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 the DEP Regional Office.

☑ 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.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC106

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM

Release Tracking Number
☐ - ☐

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

I. CERTIFICATION OF PERSON UNDERTAKING RAM:

1. I, Edward F. Barry, 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: Edward F. Barry, Jr. (Signature) 3. Title: President

4. For: Boott Mill Development Corporation (Name of person or entity recorded in Section F) 5. Date: 7/10/07 (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. FAX:

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:)

05-207808.00
Scott Lawson Group, Ltd.
Boott Mill
130 John Street
Lowell, MA

Table 1
Concentrations of
Polychlorinated Biphenyls by SW846 8082
Detected in Soil Samples

Sample Location	ECS-HA-1	ECS-HA-2	ECS-HA-3	ECS-HA-4	ECS-HA-5	ECS-HA-6	ECS-HA-7	ECS-C-1	Reportable Concentrations		MCP Method 1 Soil Standards					
Sampling Date	3/27/2007	3/27/2007	3/27/2007	3/27/2007	3/27/2007	3/27/2007	3/27/2007	3/27/2007								
Sample Depth (ft)									RCS-1	RCS-2	S-1/GW-2	S-1/GW-3	S-2/GW-2	S-2/GW-3	S-3/GW-2	S-3/GW-3
Laboratory Analytical Results (mg/kg)	Results/Method Detection Limits															
PCB 1016	ND/0.0386	ND/0.0395	ND/0.0433	ND/0.0411	ND/0.0385	ND/0.0355	ND/0.0342	ND/0.0358								
PCB 1221	ND/0.0386	ND/0.0395	ND/0.0433	ND/0.0411	ND/0.0385	ND/0.0355	ND/0.0342	ND/0.0358								
PCB 1232	ND/0.0386	ND/0.0395	ND/0.0433	ND/0.0411	ND/0.0385	ND/0.0355	ND/0.0342	ND/0.0358								
PCB 1242	ND/0.0386	ND/0.0395	ND/0.0433	ND/0.0411	ND/0.0385	ND/0.0355	ND/0.0342	ND/0.0358								
PCB 1248	**29.70**	**16.00**	**3.79**	**2.23**	**9.27**	**5.36**	**15.30**	**7.35**	2	2	2	2	2	2	2	2
PCB 1254	**6.39**	**5.30**	**2.66**	**1.47**	**3.98**	**4.06**	**6.45**	**4.12**								
PCB 1260	ND/0.0386	ND/0.0395	ND/0.0433	ND/0.0411	ND/0.0385	ND/0.0355	ND/0.0342	ND/0.0358								
PCB 1262	ND/0.0386	ND/0.0395	ND/0.0433	ND/0.0411	ND/0.0385	ND/0.0355	ND/0.0342	ND/0.0358								
PCB 1268	ND/0.0386	ND/0.0395	ND/0.0433	ND/0.0411	ND/0.0385	ND/0.0355	ND/0.0342	ND/0.0358								

NOTES:

NA = target analyte Not Analyzed.

ND/5.0 = target analyte Not Detected above the noted detection limit.

NS = No Standard.

Bold indicates target analyte exceeds the MCP Method 1 Risk Based Standards.

Reportable Concentrations are excerpted from 310 CMR 40.1600 Table 1.

MCP Method 1 Risk Standards are excerpted from 310 CMR 40.0975(6)(a) Table 2 and 310 CMR 40.0975(6)(b) Table 3

05-207808.00 Scott Lawson Group, Ltd. Boott Mill 130 John Street Lowell, MA	Table 2 Concentrations of Volatile Organic Compounds (VOCs) Detected in Soil Samples (USEPA Method 8260B)								
Sample Location	ECS-C-1	**Reportable Concentrations**		**MCP Method 1 Soil Standards**					
Sampling Date	3/27/07								
Sample Depth		RCS-1	RCS-2	S-1/GW-2	S-1/GW-3	S-2/GW-2	S-2/GW-3	S-3/GW-2	S-3/GW-3
Volatile Organic Compounds (ug/kg)	**Results/Method Detection Limits**								
Toluene	239	30,000	300,000	300,000	500,000	300,000	1,000,000	300,000	1,000,000
Semivolatile Organic Compounds (ug/kg)	**Results/Method Detection Limits**								
Acenaphthene	ND/1440	20,000	2,500,000	1,000,000	1,000,000	2,500,000	2,500,000	5,000,000	4,000,000
Acenaphthylene	ND/1440	100,000	1,000,000	100,000	100,000	2,500,000	1,000,000	2,500,000	1,000,000
Anthracene	3,560	1,000,000	2,500,000	1,000,000	1,000,000	2,500,000	2,500,000	5,000,000	5,000,000
Benzo (a) anthracene	6,250	7,000	40,000	7,000	7,000	40,000	40,000	300,000	300,000
Benzo (b) fluoranthene	5,420	7,000	40,000	7,000	7,000	40,000	40,000	300,000	300,000
Benzo (k) fluoranthene	5,020	70,000	400,000	70,000	70,000	400,000	400,000	3,000,000	3,000,000
Benzo (a) pyrene	**6,230**	2,000	4,000	2,000	2,000	4,000	4,000	30,000	30,000
Benzo (g,h,i) perylene	2,920	1,000,000	2,500,000	1,000,000	1,000,000	2,500,000	2,500,000	2,500,000	2,500,000
Chrysene	6,750	7,000	10,000	7,000	7,000	10,000	10,000	40,000	40,000
Dibenzo (a,h) anthracene	ND/1440	700	4,000	700	700	4,000	4,000	30,000	30,000
Fluoranthene	13,800	1,000,000	3,000,000	1,000,000	1,000,000	3,000,000	3,000,000	5,000,000	5,000,000
Fluorene	ND/1440	400,000	2,000,000	1,000,000	1,000,000	2,000,000	2,000,000	5,000,000	4,000,000
Indeno (1,2,3-cd) pyrene	2,910	7,000	40,000	7,000	7,000	40,000	40,000	300,000	300,000
2-Methylnaphthalene	ND/1440	4,000	1,000,000	500,000	500,000	1,000,000	1,000,000	2,000,000	1,000,000
Naphthalene	ND/1440	4,000	40,000	40,000	500,000	40,000	1,000,000	40,000	3,000,000
Phenanthrene	5,620	100,000	100,000	1,000,000	100,000	2,500,000	100,000	2,500,000	100,000
Pyrene	14,100	1,000,000	3,000,000	1,000,000	1,000,000	3,000,000	3,000,000	5,000,000	5,000,000

NOTES:

NA = target analyte Not Analyzed.

ND/5.0 = target analyte Not Detected above the noted detection limit.

NS = No Standard.

Bold indicates target analyte exceeds the MCP Method 1 Risk Based Standards.

Reportable Concentrations are excerpted from 310 CMR 40.1600 Table 1.

MCP Method 1 Risk Standards are excerpted from 310 CMR 40.0975(6)(a) Table 2 and 310 CMR 40.0975(6)(b) Table 3.

05-207808.00 Scott Lawson Group, Ltd. Boott Mill 130 John Street Lowell, MA	**Table 3** **Concentrations of** **Priority Pollutant 13 Metals** **Detected in Soil Samples** **(USEPA Methods 6000/7000 Series)**

Sample Location	**ECS-C-1**	**Reportable Concentrations**		**MCP Method 1 Soil Standards**					
Sampling Date	**3/27/2007**								
Sample Depth (ft)		**RCS-1**	**RCS-2**	**S-1/GW-2**	**S-1/GW-3**	**S-2/GW-2**	**S-2/GW-3**	**S-3/GW-2**	**S-3/GW-3**
Laboratory Analytical Results (mg/kg)	**Results/Method Detection Limits**								
Silver	NA	100	200	100	100	200	200	200	200
Arsenic	5.6	20	20	20	20	20	20	20	20
Cadmium	0.3	2	30	2	2	30	30	30	30
Chromium	11.3	30	200	30	30	200	200	200	200
Mercury	0.9	20	30	20	20	30	30	30	30
Lead	**433**	300	300	300	300	300	300	300	300
Selenium	NA	400	800	400	400	800	800	800	800
Beryllium	NA	0.7	0.8	0.7	0.7	0.8	0.8	3	3
Copper	NA	NS	NS	NS	NS	NS	NS	NS	NS
Nickel	NA	20	700	20	20	700	700	700	700
Antimony	NA	20	30	20	20	30	30	30	30
Zinc	NA	2500	3000	2,500	2,500	3,000	3,000	5,000	5,000
Thallium	NA	8	60	8	8	60	60	80	80

NOTES:

NA = target analyte Not Analyzed.

ND/5.0 = target analyte Not Detected above the noted detection limit.

NS = No Standard.

Bold indicates target analyte exceeds the MCP Method 1 Risk Based Standards.

Reportable Concentrations are excerpted from 310 CMR 40.1600 Table 1.

MCP Method 1 Risk Standards are excerpted from 310 CMR 40.0975(6)(a) Table 2 and 310 CMR 40.0975(6)(b) Table 3.

05-207808.00
Scott Lawson Group, Ltd.
Boott Mill
130 John Street
Lowell, MA

Table 4
Confirmatory Soil Samples

Sample Location	1A-N	2A-N	3A-N	4A-N	5A-N	1B-E	1C-E	1D-S	2D-S	TP-1	TP-2	TP-6	MCP Method 1 Soil Standards			
Sampling Date	5/5/2007	5/5/2007	5/5/2007	5/5/2007	5/5/2007	5/5/2007	5/5/2007	5/5/2007	5/5/2007	11/20/2006	11/20/2006	11/20/2006				
Sample Depth (ft)													S-1/GW-2	S-1/GW-3	S-2/GW-2	S-2/GW-3
Laboratory Analytical Results (mg/kg)	Results/Method Detection Limits															
PCB 1016	ND/0.0383	ND/0.0468	ND/0.0383	ND/0.0365	ND/0.0387	ND/0.0350	ND/0.0365	ND/0.0367	ND/0.0387	ND/0.116	ND/0.111	ND/0.111				
PCB 1221	ND/0.0383	ND/0.0468	ND/0.0383	ND/0.0365	ND/0.0387	ND/0.0350	ND/0.0365	ND/0.0367	ND/0.0387	ND/0.116	ND/0.111	ND/0.111				
PCB 1232	ND/0.0383	ND/0.0468	ND/0.0383	ND/0.0365	ND/0.0387	ND/0.0350	ND/0.0365	ND/0.0367	ND/0.0387	ND/0.116	ND/0.111	ND/0.111				
PCB 1242	ND/0.0383	ND/0.0468	ND/0.0383	ND/0.0365	ND/0.0387	ND/0.0350	ND/0.0365	ND/0.0367	ND/0.0387	ND/0.116	0.242	ND/0.111				
PCB 1248	ND/0.0383	0.110	ND/0.0383	**4.780**	**1.560**	ND/0.0350	ND/0.0365	0.0476	ND/0.0387	ND/0.116	ND/0.111	ND/0.111	2	2	2	2
PCB 1254	ND/0.0383	ND/0.0468	ND/0.0383	**1.370**	**0.712**	ND/0.0350	ND/0.0365	ND/0.0367	ND/0.0387	ND/0.116	0.143	ND/0.111				
PCB 1260	ND/0.0383	ND/0.0468	ND/0.0383	ND/0.0365	ND/0.0387	ND/0.0350	ND/0.0365	ND/0.0367	ND/0.0387	ND/0.116	ND/0.111	ND/0.111				
PCB 1262	ND/0.0383	ND/0.0468	ND/0.0383	ND/0.0365	ND/0.0387	ND/0.0350	ND/0.0365	ND/0.0367	ND/0.0387	ND/0.116	ND/0.111	ND/0.111				
PCB 1268	ND/0.0383	ND/0.0468	ND/0.0383	ND/0.0365	ND/0.0387	ND/0.0350	ND/0.0365	ND/0.0367	ND/0.0387	ND/0.116	ND/0.111	ND/0.111				
PAHs																
Laboratory Analytical Results (ug/kg)	Results/Method Detection Limits															
Acenaphthene	ND/160	NA	ND/179	NA	451	NA	ND/159	NA	474	NA	NA	NA	1,000,000	1,000,000	2,500,000	2,500,000
Acenaphthylene	ND/160	NA	ND/179	NA	439	NA	ND/159	NA	676	NA	NA	NA	100,000	100,000	2,500,000	1,000,000
Anthracene	ND/160	NA	ND/179	NA	2,350	NA	ND/159	NA	2,950	NA	NA	NA	1,000,000	1,000,000	2,500,000	2,500,000
Benzo (a) anthracene	ND/160	NA	ND/179	NA	4,550	NA	ND/159	NA	**11,000**	NA	NA	NA	7,000	7,000	40,000	40,000
Benzo (a) pyrene	ND/160	NA	ND/179	NA	3,830	NA	ND/159	NA	**10,200**	NA	NA	NA	2,000	2,000	4,000	4,000
Benzo (b) fluoranthene	ND/160	NA	ND/179	NA	4,020	NA	ND/159	NA	**9,070**	NA	NA	NA	7,000	7,000	40,000	40,000
Benzo (g,h,i) perylene	ND/160	NA	ND/179	NA	2,000	NA	ND/159	NA	**4,280**	NA	NA	NA	7,000	7,000	40,000	40,000
Benzo (k) fluoranthene	ND/160	NA	ND/179	NA	2,890	NA	ND/159	NA	8,640	NA	NA	NA	70,000	70,000	400,000	400,000
Chrysene	ND/160	NA	ND/179	NA	4,230	NA	ND/159	NA	**9,480**	NA	NA	NA	7,000	7,000	10,000	10,000
Dibenzo (a,h) anthracene	ND/160	NA	ND/179	NA	502	NA	ND/159	NA	**1,030**	NA	NA	NA	700	700	4,000	4,000
Fluoranthene	ND/160	NA	ND/179	NA	9,320	NA	ND/159	NA	20,100	NA	NA	NA	1,000,000	1,000,000	3,000,000	3,000,000
Fluorene	ND/160	NA	ND/179	NA	790	NA	ND/159	NA	529	NA	NA	NA	1,000,000	1,000,000	2,000,000	2,000,000
Indeno (1,2,3-cd) pyrene	ND/160	NA	ND/179	NA	1,900	NA	ND/159	NA	4,380	NA	NA	NA	7,000	7,000	40,000	40,000
1-Methylnaphthalene	ND/160	NA	ND/179	NA	ND/179	NA	ND/159	NA	213	NA	NA	NA	NS	NS	NS	NS
2-Methylnaphthalene	ND/160	NA	ND/179	NA	ND/179	NA	ND/159	NA	185	NA	NA	NA	500,000	500,000	1,000,000	1,000,000
Naphthalene	ND/160	NA	ND/179	NA	ND/179	NA	ND/159	NA	887	NA	NA	NA	40,000	500,000	40,000	1,000,000
Phenanthrene	ND/160	NA	ND/179	NA	6,310	NA	ND/159	NA	8,430	NA	NA	NA	1,000,000	100,000	2,500,000	100,000
Pyrene	ND/160	NA	ND/179	NA	8,820	NA	ND/159	NA	21,100	NA	NA	NA	1,000,000	1,000,000	3,000,000	3,000,000
Metals																
Laboratory Analytical Results (mg/kg)	Results/Method Detection Limits															
Lead	55.3	NA	6.34	NA	162	NA	6.64	NA	**929**	NA	NA	NA	300	300	300	300

NOTES:

NA = target analyte Not Analyzed.

ND/5.0 = target analyte Not Detected above the noted detection limit.

NS = No Standard.

Bold indicates target analyte exceeds the MCP Method 1 Risk Based Standards.

Reportable Concentrations are excerpted from 310 CMR 40.1600 Table 1.

MCP Method 1 Risk Standards are excerpted from 310 CMR 40.0975(6)(a) Table 2 and 310 CMR 40.0975(6)(b) Table 3.

APPENDIX A

BWSC TRANSMITTAL FORM

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC106

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

Release Tracking Number
3 - 26688

A. SITE LOCATION:

1. Site Name/Location Aid: Former Boott Cotton Mill
2. Street Address: 130 John Street
3. City/Town: Lowell 4. ZIP Code: 01852
5. UTM Coordinates: a. UTM N: 47 23997 b. UTM E: 19 0310776

RECEIVED
FEB 05 2008
DEP
NORTHEAST REGIONAL OFFICE

☐ 6. Check here if a Tier Classification Submittal has been provided to DEP for this disposal site.
☐ a. Tier IA ☐ b. Tier IB ☐ c. Tier IC ☐ d. Tier II

7. If a Tier I Permit has been issued, provide Permit Number: _____

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

1. List Submittal Date of Initial RAM Plan (if previously submitted): 12/08/2006 (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. 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. ☐ - ☐ ☐ - ☐

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

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC106

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM

Release Tracking Number
3 - 26688

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

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

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

☐ a. Air ☐ b. Basement ☐ c. Critical Exposure Pathway ☐ d. Groundwater ☐ e. Residence
☐ f. Paved Surface ☐ g. Private Well ☐ h. Public Water Supply ☐ i. School ☐ j. Sediments
☑ k. Soil ☐ l. Storm Drain ☐ m. Surface Water ☐ n. Unknown ☐ o. Wetland ☐ p. Zone 2
☐ q. Others Specify: _____

2. Identify all sources of the Release or Threat of Release, if known: (check all that apply)

☐ a. Above-ground Storage Tank (AST) ☐ b. Boat/Vessel ☐ c. Drums ☐ d. Fuel Tank
☐ e. Pipe/Hose/Line ☐ f. Tanker Truck ☐ g. Transformer ☐ h. Under-ground Storage Tank (UST)
☐ i. Vehicle ☑ j. Others Specify: Historic use

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

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

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
☐ 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. Bioremediation
☐ 12. Air Sparging

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC106

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM

Release Tracking Number
3 - 26688

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

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

☑ 13. 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 _____

iia. Receiving Facility: _____ Town: _____ State: _____

iib. Receiving Facility: _____ Town: _____ State: _____

iii. Describe: _____

☐ 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 250

Receiving Facility: Turnkey Town: Rochester State: NH

☐ 14. Removal of Drums, Tanks or Containers:

a. Describe Quantity and Amount: _____

b. Receiving Facility: _____ Town: _____ State: _____

c. Receiving Facility: _____ Town: _____ State: _____

☐ 15. Removal of Other Contaminated Media:

a. Specify Type and Volume: _____

b. Receiving Facility: _____ Town: _____ State: _____

c. Receiving Facility: _____ Town: _____ State: _____

☐ 16. Other Response Actions:

Describe: _____

☐ 17. Use of Innovative Technologies:

Describe: _____

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC106

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

Release Tracking Number
3 - 26688

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 #: 5323

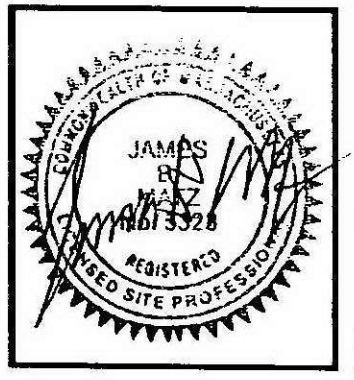
2. First Name: James B. 3. Last Name: Matz

4. Telephone: 781-246-8897 5. Ext.: 288 6. FAX: 781-246-8950

7. Signature:

8. Date: 1-28-08
(mm/dd/yyyy)

9. LSP Stamp:



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC106

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

Release Tracking Number
3 - 2668

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: Bootts Mill Development Corporation
3. Contact First Name: Edward F. 4. Last Name: Barry
5. Street: 130 John Street 6. Title:
7. City/Town: Lowell 8. State: MA 9. ZIP Code: 01852
10. Telephone: (978) 454-9053 11. Ext.: 12. FAX:

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

☑ 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 the DEP Regional Office.

☑ 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.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC106

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM

Release Tracking Number
☐ - ☐

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

I. CERTIFICATION OF PERSON UNDERTAKING RAM:

1. I, Edward F. Barry, 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: Edward F. Barry, Jr. (Signature) 3. Title: President

4. For: Boott Mill Development Corporation (Name of person or entity recorded in Section F) 5. Date: 7/10/07 (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. FAX: _____

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 B

LABORATORY ANALYTICAL REPORTS - SOIL

Report Date:
05-Apr-07 15:07

☑ Final Report
☐ Re-Issued Report
☐ Revised Report

SPECTRUM ANALYTICAL, INC.
Featuring
HANIBAL TECHNOLOGY

Laboratory Report

Environmental Compliance Services
607 North Avenue; Suite 11
Wakefield, MA 01880
Attn: James Matz

Project: Boott Mill - Lowell, MA
Project 05-207808.00

Laboratory ID	Client Sample ID	Matrix	Date Sampled	Date Received
SA59771-01	ECS-HA-1	Soil	27-Mar-07 08:15	27-Mar-07 16:34
SA59771-02	ECS-HA-2	Soil	27-Mar-07 08:30	27-Mar-07 16:34
SA59771-03	ECS-HA-3	Soil	27-Mar-07 08:35	27-Mar-07 16:34
SA59771-04	ECS-HA-4	Soil	27-Mar-07 08:50	27-Mar-07 16:34
SA59771-05	ECS-HA-5	Soil	27-Mar-07 09:05	27-Mar-07 16:34
SA59771-06	ECS-HA-6	Soil	27-Mar-07 09:20	27-Mar-07 16:34
SA59771-07	ECS-HA-7	Soil	27-Mar-07 09:35	27-Mar-07 16:34
SA59771-08	ECS-C-1	Soil	27-Mar-07 10:00	27-Mar-07 16:34

I attest that the information contained within the report has been reviewed for accuracy and checked against the quality control requirements for each method. These results relate only to the sample(s) as received.
All applicable NELAC requirements have been met.
Please note that this report contains 31 pages of analytical data plus Chain of Custody document(s).
This report may not be reproduced, except in full, without written approval from Spectrum Analytical, Inc.

Massachusetts Certification # M-MA138/MA1110
Connecticut # PH-0777
Florida # E87600/E87936
Maine # MA138
New Hampshire # 2538/2972
New Jersey # MA011/MA012
New York # 11393/11840
Rhode Island # 98
USDA # S-51435
Vermont # VT-11393

ACCREDITED IN ACCORDANCE WITH nelac

Authorized by:

Hanibal C. Tayeh, Ph.D.
President/Laboratory Director

Technical Reviewer's Initial:

Spectrum Analytical, Inc. is a NELAC accredited laboratory organization and meets NELAC testing standards. Use of the NELAC logo however does not insure that Spectrum is currently accredited for the specific method or analyte indicated. Please refer to our "Quality" web page at www.spectrum-analytical.com for a full listing of our current certifications and fields of accreditation. States in which Spectrum Analytical, Inc. holds NELAC certification are New York, New Hampshire, New Jersey and Florida. All analytical work for Volatile Organic and Air analysis are transferred to and conducted at our 830 Silver Street location (NH-2972, NY-11840, FL-E87936 and NJ-MA012).

CASE NARRATIVE:

The data set for work order SA59771 complies with internal QC criteria for the methods performed. The samples were received @ 9.9 degrees Celsius. An infrared thermometer with a tolerance of +/- 2.0 degrees Celsius was used immediately upon receipt of the samples.

MADEP has published a list of analytical methods (CAM) which provides a series of recommended protocols for the acquisition, analysis and reporting of analytical data in support of MCP decisions. "Presumptive Certainty" can be established only for those methods published by the MADEP in the MCP CAM. The compounds and/or elements reported were specifically requested by the client on the Chain of Custody and in some cases may not include the full analyte list as defined in the method.

According to WSC-CAM 5/2004 Rev.4, Table 11 A-1, recovery for some VOC analytes have been deemed potentially difficult. Although they may still be within the recommended 70%-130% recovery range, a range has been set based on historical control limits.

Please refer to "Notes and Definitions" for all sample/analyte qualifiers. Qualifiers will narrate any non-conformances and issues relating to quality control samples and/or sample analysis/matrix.

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
ECS-HA-1 SA59771-01	05-207808.00	Soil	27-Mar-07 08:15	27-Mar-07

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	Dilution	Method Ref.	Prepared	Analyzed	Batch	Analyst
Semivolatile Organic Compounds by GC											
Polychlorinated Biphenyls by SW846 8082											
Prepared by method SW846 3545A											
12674-11-2	PCB 1016	BRL		µg/kg dry	38.6	1	SW846 8082	27-Mar-07	28-Mar-07	7031604	SM
11104-28-2	PCB 1221	BRL		µg/kg dry	38.6	1	"	"	"	"	"
11141-16-5	PCB 1232	BRL		µg/kg dry	38.6	1	"	"	"	"	"
53469-21-9	PCB 1242	BRL		µg/kg dry	38.6	1	"	"	"	"	"
12672-29-6	PCB 1248	24,100	E	µg/kg dry	38.6	1	"	"	"	"	"
11097-69-1	PCB 1254	5,450		µg/kg dry	38.6	1	"	"	"	"	"
11096-82-5	PCB 1260	BRL		µg/kg dry	38.6	1	"	"	"	"	"
37324-23-5	PCB 1262	BRL		µg/kg dry	38.6	1	"	"	"	"	"
11100-14-4	PCB 1268	BRL		µg/kg dry	38.6	1	"	"	"	"	"
Surrogate recoveries:											
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*45*		*30-150 %*			"	"	"	"	"
2051-24-3	*Decachlorobiphenyl (Sr)*	*65*		*30-150 %*			"	"	"	"	"
Polychlorinated Biphenyls by SW846 8082									SA59771-01RE1		
Prepared by method SW846 3545A											
12674-11-2	PCB 1016	BRL		µg/kg dry	386	10	SW846 8082	27-Mar-07	28-Mar-07	7031604	SM
11104-28-2	PCB 1221	BRL		µg/kg dry	386	10	"	"	"	"	"
11141-16-5	PCB 1232	BRL		µg/kg dry	386	10	"	"	"	"	"
53469-21-9	PCB 1242	BRL		µg/kg dry	386	10	"	"	"	"	"
12672-29-6	PCB 1248	29,700		µg/kg dry	386	10	"	"	"	"	"
11097-69-1	PCB 1254	6,390		µg/kg dry	386	10	"	"	"	"	"
11096-82-5	PCB 1260	BRL		µg/kg dry	386	10	"	"	"	"	"
37324-23-5	PCB 1262	BRL		µg/kg dry	386	10	"	"	"	"	"
11100-14-4	PCB 1268	BRL		µg/kg dry	386	10	"	"	"	"	"
Surrogate recoveries:											
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*50*		*30-150 %*			"	"	"	"	"
2051-24-3	*Decachlorobiphenyl (Sr)*	*100*		*30-150 %*			"	"	"	"	"
General Chemistry Parameters											
	% Solids	84.6		%		1	SM2540 G Mod.	27-Mar-07	27-Mar-07	7031667	BD

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
ECS-HA-2 SA59771-02	05-207808.00	Soil	27-Mar-07 08:30	27-Mar-07

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	Dilution	Method Ref.	Prepared	Analyzed	Batch	Analyst
Semivolatile Organic Compounds by GC											
Polychlorinated Biphenyls by SW846 8082											
Prepared by method SW846 3545A											
12674-11-2	PCB 1016	BRL		µg/kg dry	39.5	1	SW846 8082	27-Mar-07	28-Mar-07	7031604	SM
11104-28-2	PCB 1221	BRL		µg/kg dry	39.5	1	"	"	"	"	"
11141-16-5	PCB 1232	BRL		µg/kg dry	39.5	1	"	"	"	"	"
53469-21-9	PCB 1242	BRL		µg/kg dry	39.5	1	"	"	"	"	"
12672-29-6	PCB 1248	14,100	E	µg/kg dry	39.5	1	"	"	"	"	"
11097-69-1	PCB 1254	4,240		µg/kg dry	39.5	1	"	"	"	"	"
11096-82-5	PCB 1260	BRL		µg/kg dry	39.5	1	"	"	"	"	"
37324-23-5	PCB 1262	BRL		µg/kg dry	39.5	1	"	"	"	"	"
11100-14-4	PCB 1268	BRL		µg/kg dry	39.5	1	"	"	"	"	"
Surrogate recoveries:											
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*45*		*30-150 %*			"	"	"	"	"
2051-24-3	*Decachlorobiphenyl (Sr)*	*70*		*30-150 %*			"	"	"	"	"
Polychlorinated Biphenyls by SW846 8082									**SA59771-02RE1**		
Prepared by method SW846 3545A											
12674-11-2	PCB 1016	BRL		µg/kg dry	395	10	SW846 8082	27-Mar-07	28-Mar-07	7031604	SM
11104-28-2	PCB 1221	BRL		µg/kg dry	395	10	"	"	"	"	"
11141-16-5	PCB 1232	BRL		µg/kg dry	395	10	"	"	"	"	"
53469-21-9	PCB 1242	BRL		µg/kg dry	395	10	"	"	"	"	"
12672-29-6	PCB 1248	16,000		µg/kg dry	395	10	"	"	"	"	"
11097-69-1	PCB 1254	5,300		µg/kg dry	395	10	"	"	"	"	"
11096-82-5	PCB 1260	BRL		µg/kg dry	395	10	"	"	"	"	"
37324-23-5	PCB 1262	BRL		µg/kg dry	395	10	"	"	"	"	"
11100-14-4	PCB 1268	BRL		µg/kg dry	395	10	"	"	"	"	"
Surrogate recoveries:											
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*50*		*30-150 %*			"	"	"	"	"
2051-24-3	*Decachlorobiphenyl (Sr)*	*100*		*30-150 %*			"	"	"	"	"
General Chemistry Parameters											
	% Solids	82.7		%		1	SM2540 G Mod.	27-Mar-07	27-Mar-07	7031667	BD

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
ECS-HA-3	05-207808.00	Soil	27-Mar-07 08:35	27-Mar-07
SA59771-03				

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	Dilution	Method Ref.	Prepared	Analyzed	Batch	Analyst
Semivolatile Organic Compounds by GC											
Polychlorinated Biphenyls by SW846 8082											
Prepared by method SW846 3545A											
12674-11-2	PCB 1016	BRL		µg/kg dry	43.3	1	SW846 8082	27-Mar-07	28-Mar-07	7031604	SM
11104-28-2	PCB 1221	BRL		µg/kg dry	43.3	1	"	"	"	"	"
11141-16-5	PCB 1232	BRL		µg/kg dry	43.3	1	"	"	"	"	"
53469-21-9	PCB 1242	BRL		µg/kg dry	43.3	1	"	"	"	"	"
12672-29-6	PCB 1248	3,790		µg/kg dry	43.3	1	"	"	"	"	"
11097-69-1	PCB 1254	2,660		µg/kg dry	43.3	1	"	"	"	"	"
11096-82-5	PCB 1260	BRL		µg/kg dry	43.3	1	"	"	"	"	"
37324-23-5	PCB 1262	BRL		µg/kg dry	43.3	1	"	"	"	"	"
11100-14-4	PCB 1268	BRL		µg/kg dry	43.3	1	"	"	"	"	"
Surrogate recoveries:											
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*45*		*30-150 %*			"	"	"	"	"
2051-24-3	*Decachlorobiphenyl (Sr)*	*75*		*30-150 %*			"	"	"	"	"
General Chemistry Parameters											
	% Solids	82.1		%		1	SM2540 G Mod.	27-Mar-07	27-Mar-07	7031667	BD

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
ECS-HA-4 SA59771-04	05-207808.00	Soil	27-Mar-07 08:50	27-Mar-07

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	Dilution	Method Ref.	Prepared	Analyzed	Batch	Analyst
Semivolatile Organic Compounds by GC											
Polychlorinated Biphenyls by SW846 8082											
Prepared by method SW846 3545A											
12674-11-2	PCB 1016	BRL		µg/kg dry	41.1	1	SW846 8082	27-Mar-07	28-Mar-07	7031604	SM
11104-28-2	PCB 1221	BRL		µg/kg dry	41.1	1	"	"	"	"	"
11141-16-5	PCB 1232	BRL		µg/kg dry	41.1	1	"	"	"	"	"
53469-21-9	PCB 1242	BRL		µg/kg dry	41.1	1	"	"	"	"	"
12672-29-6	PCB 1248	2,230		µg/kg dry	41.1	1	"	"	"	"	"
11097-69-1	PCB 1254	1,470		µg/kg dry	41.1	1	"	"	"	"	"
11096-82-5	PCB 1260	BRL		µg/kg dry	41.1	1	"	"	"	"	"
37324-23-5	PCB 1262	BRL		µg/kg dry	41.1	1	"	"	"	"	"
11100-14-4	PCB 1268	BRL		µg/kg dry	41.1	1	"	"	"	"	"
Surrogate recoveries:											
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	62		30-150 %			"	"	"	"	"
2051-24-3	*Decachlorobiphenyl (Sr)*	62		30-150 %			"	"	"	"	"
General Chemistry Parameters											
	% Solids	81.1		%		1	SM2540 G Mod.	27-Mar-07	27-Mar-07	7031667	BD

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
ECS-HA-5 SA59771-05	05-207808.00	Soil	27-Mar-07 09:05	27-Mar-07

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	Dilution	Method Ref.	Prepared	Analyzed	Batch	Analyst
Semivolatile Organic Compounds by GC											
Polychlorinated Biphenyls by SW846 8082											
Prepared by method SW846 3545A											
12674-11-2	PCB 1016	BRL		µg/kg dry	38.5	1	SW846 8082	27-Mar-07	28-Mar-07	7031604	SM
11104-28-2	PCB 1221	BRL		µg/kg dry	38.5	1	"	"	"	"	"
11141-16-5	PCB 1232	BRL		µg/kg dry	38.5	1	"	"	"	"	"
53469-21-9	PCB 1242	BRL		µg/kg dry	38.5	1	"	"	"	"	"
12672-29-6	PCB 1248	9,270		µg/kg dry	38.5	1	"	"	"	"	"
11097-69-1	PCB 1254	3,980		µg/kg dry	38.5	1	"	"	"	"	"
11096-82-5	PCB 1260	BRL		µg/kg dry	38.5	1	"	"	"	"	"
37324-23-5	PCB 1262	BRL		µg/kg dry	38.5	1	"	"	"	"	"
11100-14-4	PCB 1268	BRL		µg/kg dry	38.5	1	"	"	"	"	"
Surrogate recoveries:											
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*45*		*30-150 %*			"	"	"	"	"
2051-24-3	*Decachlorobiphenyl (Sr)*	*70*		*30-150 %*			"	"	"	"	"
General Chemistry Parameters											
	% Solids	84.7		%		1	SM2540 G Mod.	27-Mar-07	27-Mar-07	7031667	BD

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
ECS-HA-6 SA59771-06	05-207808.00	Soil	27-Mar-07 09:20	27-Mar-07

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	Dilution	Method Ref.	Prepared	Analyzed	Batch	Analyst
Semivolatile Organic Compounds by GC											
Polychlorinated Biphenyls by SW846 8082											
Prepared by method SW846 3545A											
12674-11-2	PCB 1016	BRL		µg/kg dry	35.5	1	SW846 8082	27-Mar-07	28-Mar-07	7031604	SM
11104-28-2	PCB 1221	BRL		µg/kg dry	35.5	1	"	"	"	"	"
11141-16-5	PCB 1232	BRL		µg/kg dry	35.5	1	"	"	"	"	"
53469-21-9	PCB 1242	BRL		µg/kg dry	35.5	1	"	"	"	"	"
12672-29-6	PCB 1248	5,360		µg/kg dry	35.5	1	"	"	"	"	"
11097-69-1	PCB 1254	4,060		µg/kg dry	35.5	1	"	"	"	"	"
11096-82-5	PCB 1260	BRL		µg/kg dry	35.5	1	"	"	"	"	"
37324-23-5	PCB 1262	BRL		µg/kg dry	35.5	1	"	"	"	"	"
11100-14-4	PCB 1268	BRL		µg/kg dry	35.5	1	"	"	"	"	"
Surrogate recoveries:											
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*40*		*30-150 %*			"	"	"	"	"
2051-24-3	*Decachlorobiphenyl (Sr)*	*65*		*30-150 %*			"	"	"	"	"
General Chemistry Parameters											
	% Solids	84.7		%		1	SM2540 G Mod.	27-Mar-07	27-Mar-07	7031667	BD

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
ECS-HA-7 SA59771-07	05-207808.00	Soil	27-Mar-07 09:35	27-Mar-07

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	Dilution	Method Ref.	Prepared	Analyzed	Batch	Analyst
Semivolatile Organic Compounds by GC											
Polychlorinated Biphenyls by SW846 8082											
Prepared by method SW846 3545A											
12674-11-2	PCB 1016	BRL		µg/kg dry	34.2	1	SW846 8082	27-Mar-07	28-Mar-07	7031604	SM
11104-28-2	PCB 1221	BRL		µg/kg dry	34.2	1	"	"	"	"	"
11141-16-5	PCB 1232	BRL		µg/kg dry	34.2	1	"	"	"	"	"
53469-21-9	PCB 1242	BRL		µg/kg dry	34.2	1	"	"	"	"	"
12672-29-6	PCB 1248	12,200	E	µg/kg dry	34.2	1	"	"	"	"	"
11097-69-1	PCB 1254	5,560		µg/kg dry	34.2	1	"	"	"	"	"
11096-82-5	PCB 1260	BRL		µg/kg dry	34.2	1	"	"	"	"	"
37324-23-5	PCB 1262	BRL		µg/kg dry	34.2	1	"	"	"	"	"
11100-14-4	PCB 1268	BRL		µg/kg dry	34.2	1	"	"	"	"	"
Surrogate recoveries:											
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*50*		*30-150 %*			"	"	"	"	"
2051-24-3	*Decachlorobiphenyl (Sr)*	*80*		*30-150 %*			"	"	"	"	"
Polychlorinated Biphenyls by SW846 8082									SA59771-07RE1		
Prepared by method SW846 3545A											
12674-11-2	PCB 1016	BRL		µg/kg dry	342	10	SW846 8082	27-Mar-07	28-Mar-07	7031604	SM
11104-28-2	PCB 1221	BRL		µg/kg dry	342	10	"	"	"	"	"
11141-16-5	PCB 1232	BRL		µg/kg dry	342	10	"	"	"	"	"
53469-21-9	PCB 1242	BRL		µg/kg dry	342	10	"	"	"	"	"
12672-29-6	PCB 1248	15,300		µg/kg dry	342	10	"	"	"	"	"
11097-69-1	PCB 1254	6,450		µg/kg dry	342	10	"	"	"	"	"
11096-82-5	PCB 1260	BRL		µg/kg dry	342	10	"	"	"	"	"
37324-23-5	PCB 1262	BRL		µg/kg dry	342	10	"	"	"	"	"
11100-14-4	PCB 1268	BRL		µg/kg dry	342	10	"	"	"	"	"
Surrogate recoveries:											
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*50*		*30-150 %*			"	"	"	"	"
2051-24-3	*Decachlorobiphenyl (Sr)*	*100*		*30-150 %*			"	"	"	"	"
General Chemistry Parameters											
	% Solids	86.6		%		1	SM2540 G Mod.	27-Mar-07	27-Mar-07	7031667	BD

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
ECS-C-1 SA59771-08	05-207808.00	Soil	27-Mar-07 10:00	27-Mar-07

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	Dilution	Method Ref.	Prepared	Analyzed	Batch	Analyst
Volatile Organic Compounds											
	VOC Extraction	Field extracted		N/A		1	VOC	27-Mar-07	27-Mar-07	7031675	BD
Volatile Organic Compounds											
Prepared by method SW846 5030 Soil (high level)											
76-13-1	1,1,2-Trichlorotrifluoroethane (Freon	BRL		µg/kg dry	39.4	50	SW 846 8260B	28-Mar-07	28-Mar-07	7031697	mar
67-64-1	Acetone	BRL		µg/kg dry	787	50	"	"	"	"	"
107-13-1	Acrylonitrile	BRL		µg/kg dry	39.4	50	"	"	"	"	"
71-43-2	Benzene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
108-86-1	Bromobenzene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
74-97-5	Bromochloromethane	BRL		µg/kg dry	39.4	50	"	"	"	"	"
75-27-4	Bromodichloromethane	BRL		µg/kg dry	39.4	50	"	"	"	"	"
75-25-2	Bromoform	BRL		µg/kg dry	39.4	50	"	"	"	"	"
74-83-9	Bromomethane	BRL		µg/kg dry	78.7	50	"	"	"	"	"
78-93-3	2-Butanone (MEK)	BRL		µg/kg dry	394	50	"	"	"	"	"
104-51-8	n-Butylbenzene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
135-98-8	sec-Butylbenzene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
98-06-6	tert-Butylbenzene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
75-15-0	Carbon disulfide	BRL		µg/kg dry	197	50	"	"	"	"	"
56-23-5	Carbon tetrachloride	BRL		µg/kg dry	39.4	50	"	"	"	"	"
108-90-7	Chlorobenzene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
75-00-3	Chloroethane	BRL		µg/kg dry	78.7	50	"	"	"	"	"
67-66-3	Chloroform	BRL		µg/kg dry	39.4	50	"	"	"	"	"
74-87-3	Chloromethane	BRL		µg/kg dry	78.7	50	"	"	"	"	"
95-49-8	2-Chlorotoluene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
106-43-4	4-Chlorotoluene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
96-12-8	1,2-Dibromo-3-chloropropane	BRL		µg/kg dry	78.7	50	"	"	"	"	"
124-48-1	Dibromochloromethane	BRL		µg/kg dry	39.4	50	"	"	"	"	"
106-93-4	1,2-Dibromoethane (EDB)	BRL		µg/kg dry	39.4	50	"	"	"	"	"
74-95-3	Dibromomethane	BRL		µg/kg dry	39.4	50	"	"	"	"	"
95-50-1	1,2-Dichlorobenzene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
541-73-1	1,3-Dichlorobenzene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
106-46-7	1,4-Dichlorobenzene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
75-71-8	Dichlorodifluoromethane (Freon12)	BRL		µg/kg dry	78.7	50	"	"	"	"	"
75-34-3	1,1-Dichloroethane	BRL		µg/kg dry	39.4	50	"	"	"	"	"
107-06-2	1,2-Dichloroethane	BRL		µg/kg dry	39.4	50	"	"	"	"	"
75-35-4	1,1-Dichloroethene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
156-59-2	cis-1,2-Dichloroethene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
156-60-5	trans-1,2-Dichloroethene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
78-87-5	1,2-Dichloropropane	BRL		µg/kg dry	39.4	50	"	"	"	"	"
142-28-9	1,3-Dichloropropane	BRL		µg/kg dry	39.4	50	"	"	"	"	"
594-20-7	2,2-Dichloropropane	BRL		µg/kg dry	39.4	50	"	"	"	"	"
563-58-6	1,1-Dichloropropene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
10061-01-5	cis-1,3-Dichloropropene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
10061-02-6	trans-1,3-Dichloropropene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
100-41-4	Ethylbenzene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
87-68-3	Hexachlorobutadiene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
591-78-6	2-Hexanone (MBK)	BRL		µg/kg dry	394	50	"	"	"	"	"
98-82-8	Isopropylbenzene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
99-87-6	4-Isopropyltoluene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
1634-04-4	Methyl tert-butyl ether	BRL		µg/kg dry	39.4	50	"	"	"	"	"
108-10-1	4-Methyl-2-pentanone (MIBK)	BRL		µg/kg dry	394	50	"	"	"	"	"
75-09-2	Methylene chloride	BRL		µg/kg dry	394	50	"	"	"	"	"
91-20-3	Naphthalene	BRL		µg/kg dry	39.4	50	"	"	"	"	"

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
ECS-C-1 SA59771-08	05-207808.00	Soil	27-Mar-07 10:00	27-Mar-07

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	Dilution	Method Ref.	Prepared	Analyzed	Batch	Analyst
Volatile Organic Compounds											
Volatile Organic Compounds											
Prepared by method SW846 5030 Soil (high level)											
103-65-1	n-Propylbenzene	BRL		µg/kg dry	39.4	50	SW 846 8260B	28-Mar-07	28-Mar-07	7031697	mar
100-42-5	Styrene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
630-20-6	1,1,1,2-Tetrachloroethane	BRL		µg/kg dry	39.4	50	"	"	"	"	"
79-34-5	1,1,2,2-Tetrachloroethane	BRL		µg/kg dry	39.4	50	"	"	"	"	"
127-18-4	Tetrachloroethene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
108-88-3	Toluene	239		µg/kg dry	39.4	50	"	"	"	"	"
87-61-6	1,2,3-Trichlorobenzene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
120-82-1	1,2,4-Trichlorobenzene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
71-55-6	1,1,1-Trichloroethane	BRL		µg/kg dry	39.4	50	"	"	"	"	"
79-00-5	1,1,2-Trichloroethane	BRL		µg/kg dry	39.4	50	"	"	"	"	"
79-01-6	Trichloroethene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
75-69-4	Trichlorofluoromethane (Freon 11)	BRL		µg/kg dry	39.4	50	"	"	"	"	"
96-18-4	1,2,3-Trichloropropane	BRL		µg/kg dry	39.4	50	"	"	"	"	"
95-63-6	1,2,4-Trimethylbenzene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
108-67-8	1,3,5-Trimethylbenzene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
75-01-4	Vinyl chloride	BRL		µg/kg dry	39.4	50	"	"	"	"	"
1330-20-7	m,p-Xylene	BRL		µg/kg dry	78.7	50	"	"	"	"	"
95-47-6	o-Xylene	BRL		µg/kg dry	39.4	50	"	"	"	"	"
109-99-9	Tetrahydrofuran	BRL		µg/kg dry	394	50	"	"	"	"	"
60-29-7	Ethyl ether	BRL		µg/kg dry	39.4	50	"	"	"	"	"
994-05-8	Tert-amyl methyl ether	BRL		µg/kg dry	39.4	50	"	"	"	"	"
637-92-3	Ethyl tert-butyl ether	BRL		µg/kg dry	39.4	50	"	"	"	"	"
108-20-3	Di-isopropyl ether	BRL		µg/kg dry	39.4	50	"	"	"	"	"
75-65-0	Tert-Butanol / butyl alcohol	BRL		µg/kg dry	394	50	"	"	"	"	"
123-91-1	1,4-Dioxane	BRL		µg/kg dry	787	50	"	"	"	"	"
Surrogate recoveries:											
460-00-4	*4-Bromofluorobenzene*	*100*		*70-130 %*			"	"	"	"	"
2037-26-5	*Toluene-d8*	*110*		*70-130 %*			"	"	"	"	"
17060-07-0	*1,2-Dichloroethane-d4*	*96*		*70-130 %*			"	"	"	"	"
1868-53-7	*Dibromofluoromethane*	*100*		*70-130 %*			"	"	"	"	"
Semivolatile Organic Compounds by GC											
Polychlorinated Biphenyls by SW846 8082											
Prepared by method SW846 3545A											
12674-11-2	PCB 1016	BRL		µg/kg dry	35.8	1	SW846 8082	27-Mar-07	28-Mar-07	7031604	SM
11104-28-2	PCB 1221	BRL		µg/kg dry	35.8	1	"	"	"	"	"
11141-16-5	PCB 1232	BRL		µg/kg dry	35.8	1	"	"	"	"	"
53469-21-9	PCB 1242	BRL		µg/kg dry	35.8	1	"	"	"	"	"
12672-29-6	PCB 1248	7,350		µg/kg dry	35.8	1	"	"	"	"	"
11097-69-1	PCB 1254	4,120		µg/kg dry	35.8	1	"	"	"	"	"
11096-82-5	PCB 1260	BRL		µg/kg dry	35.8	1	"	"	"	"	"
37324-23-5	PCB 1262	BRL		µg/kg dry	35.8	1	"	"	"	"	"
11100-14-4	PCB 1268	BRL		µg/kg dry	35.8	1	"	"	"	"	"
Surrogate recoveries:											
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*45*		*30-150 %*			"	"	"	"	"
2051-24-3	*Decachlorobiphenyl (Sr)*	*80*		*30-150 %*			"	"	"	"	"
Semivolatile Organic Compounds by GCMS											
Semivolatile Organic Compounds by SW846 8270C											
Prepared by method SW846 3545A											
83-32-9	Acenaphthene	BRL		µg/kg dry	1440	1	SW846 8270C	28-Mar-07	28-Mar-07	7031683	M.B

This laboratory report is not valid without an authorized signature on the cover page.

* Reportable Detection Limit BRL = Below Reporting Limit

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
ECS-C-1	05-207808.00	Soil	27-Mar-07 10:00	27-Mar-07
SA59771-08				

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	Dilution	Method Ref.	Prepared	Analyzed	Batch	Analyst
Semivolatile Organic Compounds by GCMS											
Semivolatile Organic Compounds by SW846 8270C											
Prepared by method SW846 3545A											
208-96-8	Acenaphthylene	BRL		µg/kg dry	1440	1	SW846 8270C	28-Mar-07	28-Mar-07	7031683	M.B
62-53-3	Aniline	BRL		µg/kg dry	1440	1	"	"	"	"	"
120-12-7	Anthracene	3,560		µg/kg dry	1440	1	"	"	"	"	"
1912-24-9	Atrazine	BRL		µg/kg dry	1440	1	"	"	"	"	"
103-33-3	Azobenzene/Diphenyldiazine	BRL		µg/kg dry	1440	1	"	"	"	"	"
92-87-5	Benzidine	BRL		µg/kg dry	1440	1	"	"	"	"	"
56-55-3	Benzo (a) anthracene	6,250		µg/kg dry	1440	1	"	"	"	"	"
50-32-8	Benzo (a) pyrene	6,230		µg/kg dry	1440	1	"	"	"	"	"
205-99-2	Benzo (b) fluoranthene	5,420		µg/kg dry	1440	1	"	"	"	"	"
191-24-2	Benzo (g,h,i) perylene	2,920		µg/kg dry	1440	1	"	"	"	"	"
207-08-9	Benzo (k) fluoranthene	5,020		µg/kg dry	1440	1	"	"	"	"	"
65-85-0	Benzoic acid	BRL		µg/kg dry	1440	1	"	"	"	"	"
100-51-6	Benzyl alcohol	BRL		µg/kg dry	1440	1	"	"	"	"	"
111-91-1	Bis(2-chloroethoxy)methane	BRL		µg/kg dry	1440	1	"	"	"	"	"
111-44-4	Bis(2-chloroethyl)ether	BRL		µg/kg dry	1440	1	"	"	"	"	"
39638-32-9	Bis(2-chloroisopropyl)ether	BRL		µg/kg dry	1440	1	"	"	"	"	"
117-81-7	Bis(2-ethylhexyl)phthalate	BRL		µg/kg dry	1440	1	"	"	"	"	"
101-55-3	4-Bromophenyl phenyl ether	BRL		µg/kg dry	1440	1	"	"	"	"	"
85-68-7	Butyl benzyl phthalate	BRL		µg/kg dry	1440	1	"	"	"	"	"
86-74-8	Carbazole	BRL		µg/kg dry	1440	1	"	"	"	"	"
59-50-7	4-Chloro-3-methylphenol	BRL		µg/kg dry	1440	1	"	"	"	"	"
106-47-8	4-Chloroaniline	BRL		µg/kg dry	1440	1	"	"	"	"	"
91-58-7	2-Chloronaphthalene	BRL		µg/kg dry	1440	1	"	"	"	"	"
95-57-8	2-Chlorophenol	BRL		µg/kg dry	1440	1	"	"	"	"	"
7005-72-3	4-Chlorophenyl phenyl ether	BRL		µg/kg dry	1440	1	"	"	"	"	"
218-01-9	Chrysene	6,750		µg/kg dry	1440	1	"	"	"	"	"
53-70-3	Dibenzo (a,h) anthracene	BRL		µg/kg dry	1440	1	"	"	"	"	"
132-64-9	Dibenzofuran	BRL		µg/kg dry	1440	1	"	"	"	"	"
95-50-1	1,2-Dichlorobenzene	BRL		µg/kg dry	1440	1	"	"	"	"	"
541-73-1	1,3-Dichlorobenzene	BRL		µg/kg dry	1440	1	"	"	"	"	"
106-46-7	1,4-Dichlorobenzene	BRL		µg/kg dry	1440	1	"	"	"	"	"
91-94-1	3,3'-Dichlorobenzidine	BRL		µg/kg dry	1440	1	"	"	"	"	"
120-83-2	2,4-Dichlorophenol	BRL		µg/kg dry	1440	1	"	"	"	"	"
84-66-2	Diethyl phthalate	BRL		µg/kg dry	1440	1	"	"	"	"	"
131-11-3	Dimethyl phthalate	BRL		µg/kg dry	1440	1	"	"	"	"	"
105-67-9	2,4-Dimethylphenol	BRL		µg/kg dry	1440	1	"	"	"	"	"
84-74-2	Di-n-butyl phthalate	BRL		µg/kg dry	1440	1	"	"	"	"	"
534-52-1	4,6-Dinitro-2-methylphenol	BRL		µg/kg dry	1440	1	"	"	"	"	"
51-28-5	2,4-Dinitrophenol	BRL		µg/kg dry	1440	1	"	"	"	"	"
121-14-2	2,4-Dinitrotoluene	BRL		µg/kg dry	1440	1	"	"	"	"	"
606-20-2	2,6-Dinitrotoluene	BRL		µg/kg dry	1440	1	"	"	"	"	"
117-84-0	Di-n-octyl phthalate	BRL		µg/kg dry	1440	1	"	"	"	"	"
206-44-0	Fluoranthene	13,800		µg/kg dry	1440	1	"	"	"	"	"
86-73-7	Fluorene	BRL		µg/kg dry	1440	1	"	"	"	"	"
118-74-1	Hexachlorobenzene	BRL		µg/kg dry	1440	1	"	"	"	"	"
87-68-3	Hexachlorobutadiene	BRL		µg/kg dry	1440	1	"	"	"	"	"
77-47-4	Hexachlorocyclopentadiene	BRL		µg/kg dry	1440	1	"	"	"	"	"
67-72-1	Hexachloroethane	BRL		µg/kg dry	1440	1	"	"	"	"	"
193-39-5	Indeno (1,2,3-cd) pyrene	2,910		µg/kg dry	1440	1	"	"	"	"	"
90-12-0	1-Methylnaphthalene	BRL		µg/kg dry	1440	1	"	"	"	"	"

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
ECS-C-1 SA59771-08	05-207808.00	Soil	27-Mar-07 10:00	27-Mar-07

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	Dilution	Method Ref.	Prepared	Analyzed	Batch	Analyst
Semivolatile Organic Compounds by GCMS											
Semivolatile Organic Compounds by SW846 8270C											
Prepared by method SW846 3545A											
78-59-1	Isophorone	BRL		µg/kg dry	1440	1	SW846 8270C	28-Mar-07	28-Mar-07	7031683	M.B
91-57-6	2-Methylnaphthalene	BRL		µg/kg dry	1440	1	"	"	"	"	"
95-48-7	2-Methylphenol	BRL		µg/kg dry	1440	1	"	"	"	"	"
108-39-4, 106-44-5	3,4-Methylphenol	BRL		µg/kg dry	1440	1	"	"	"	"	"
91-20-3	Naphthalene	BRL		µg/kg dry	1440	1	"	"	"	"	"
88-74-4	2-Nitroaniline	BRL		µg/kg dry	1440	1	"	"	"	"	"
99-09-2	3-Nitroaniline	BRL		µg/kg dry	1440	1	"	"	"	"	"
100-01-6	4-Nitroaniline	BRL		µg/kg dry	5760	1	"	"	"	"	"
98-95-3	Nitrobenzene	BRL		µg/kg dry	1440	1	"	"	"	"	"
88-75-5	2-Nitrophenol	BRL		µg/kg dry	1440	1	"	"	"	"	"
100-02-7	4-Nitrophenol	BRL		µg/kg dry	5760	1	"	"	"	"	"
62-75-9	N-Nitrosodimethylamine	BRL		µg/kg dry	1440	1	"	"	"	"	"
621-64-7	N-Nitrosodi-n-propylamine	BRL		µg/kg dry	1440	1	"	"	"	"	"
86-30-6	N-Nitrosodiphenylamine	BRL		µg/kg dry	1440	1	"	"	"	"	"
87-86-5	Pentachlorophenol	BRL		µg/kg dry	1440	1	"	"	"	"	"
85-01-8	Phenanthrene	5,620		µg/kg dry	1440	1	"	"	"	"	"
108-95-2	Phenol	BRL		µg/kg dry	1440	1	"	"	"	"	"
129-00-0	Pyrene	14,100		µg/kg dry	1440	1	"	"	"	"	"
110-86-1	Pyridine	BRL		µg/kg dry	1440	1	"	"	"	"	"
120-82-1	1,2,4-Trichlorobenzene	BRL		µg/kg dry	1440	1	"	"	"	"	"
95-95-4	2,4,5-Trichlorophenol	BRL		µg/kg dry	1440	1	"	"	"	"	"
88-06-2	2,4,6-Trichlorophenol	BRL		µg/kg dry	1440	1	"	"	"	"	"
Surrogate recoveries:											
321-60-8	*2-Fluorobiphenyl*	*83*		*30-130 %*			"	"	"	"	"
367-12-4	*2-Fluorophenol*	*63*		*15-110 %*			"	"	"	"	"
4165-60-0	*Nitrobenzene-d5*	*73*		*30-130 %*			"	"	"	"	"
4165-62-2	*Phenol-d5*	*66*		*15-110 %*			"	"	"	"	"
1718-51-0	*Terphenyl-dl4*	*96*		*30-130 %*			"	"	"	"	"
118-79-6	*2,4,6-Tribromophenol*	*67*		*15-110 %*			"	"	"	"	"
Total Metals by EPA 6000/7000 Series Methods											
7440-38-2	Arsenic	5.55		mg/kg dry	1.73	1	SW846 6010B	27-Mar-07	28-Mar-07	7031665	LR
7440-43-9	Cadmium	0.288		mg/kg dry	0.288	1	"	"	"	"	"
7440-47-3	Chromium	11.3		mg/kg dry	0.576	1	"	"	"	"	"
7439-97-6	Mercury	0.907		mg/kg dry	0.0354	1	SW846 7471A	"	28-Mar-07	7031666	YP
7439-92-1	Lead	433		mg/kg dry	0.864	1	SW846 6010B	"	28-Mar-07	7031665	LR
TCLP Metals by EPA 1311 & 6000/7000 Series Methods											
	TCLP Extraction	Completed		N/A		1	SW846 1311	03-Apr-07	03-Apr-07	7040172	BD
7439-92-1	Lead	3.00		mg/l	0.0075	1	SW846 1311/6010B	04-Apr-07	04-Apr-07	7040200	HB
General Chemistry Parameters											
	% Solids	83.7		%		1	SM2540 G Mod.	27-Mar-07	27-Mar-07	7031667	BD
	Specific Conductance (EC)	145		uS/cm		1	SM2510B	28-Mar-07	28-Mar-07	7031704	YM

Volatile Organic Compounds - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 7031697 - SW846 5030 Soil (high level)										
Blank (7031697-BLK1)										
Prepared & Analyzed: 28-Mar-07										
1,1,2-Trichlorotrifluoroethane (Freon 113)	BRL		µg/kg wet	1.0						
Acetone	BRL		µg/kg wet	20.0						
Acrylonitrile	BRL		µg/kg wet	1.0						
Benzene	BRL		µg/kg wet	1.0						
Bromobenzene	BRL		µg/kg wet	1.0						
Bromochloromethane	BRL		µg/kg wet	1.0						
Bromodichloromethane	BRL		µg/kg wet	1.0						
Bromoform	BRL		µg/kg wet	1.0						
Bromomethane	BRL		µg/kg wet	2.0						
2-Butanone (MEK)	BRL		µg/kg wet	10.0						
n-Butylbenzene	BRL		µg/kg wet	1.0						
sec-Butylbenzene	BRL		µg/kg wet	1.0						
tert-Butylbenzene	BRL		µg/kg wet	1.0						
Carbon disulfide	BRL		µg/kg wet	5.0						
Carbon tetrachloride	BRL		µg/kg wet	1.0						
Chlorobenzene	BRL		µg/kg wet	1.0						
Chloroethane	BRL		µg/kg wet	2.0						
Chloroform	BRL		µg/kg wet	1.0						
Chloromethane	BRL		µg/kg wet	2.0						
2-Chlorotoluene	BRL		µg/kg wet	1.0						
4-Chlorotoluene	BRL		µg/kg wet	1.0						
1,2-Dibromo-3-chloropropane	BRL		µg/kg wet	2.0						
Dibromochloromethane	BRL		µg/kg wet	1.0						
1,2-Dibromoethane (EDB)	BRL		µg/kg wet	1.0						
Dibromomethane	BRL		µg/kg wet	1.0						
1,2-Dichlorobenzene	BRL		µg/kg wet	1.0						
1,3-Dichlorobenzene	BRL		µg/kg wet	1.0						
1,4-Dichlorobenzene	BRL		µg/kg wet	1.0						
Dichlorodifluoromethane (Freon12)	BRL		µg/kg wet	2.0						
1,1-Dichloroethane	BRL		µg/kg wet	1.0						
1,2-Dichloroethane	BRL		µg/kg wet	1.0						
1,1-Dichloroethene	BRL		µg/kg wet	1.0						
cis-1,2-Dichloroethene	BRL		µg/kg wet	1.0						
trans-1,2-Dichloroethene	BRL		µg/kg wet	1.0						
1,2-Dichloropropane	BRL		µg/kg wet	1.0						
1,3-Dichloropropane	BRL		µg/kg wet	1.0						
2,2-Dichloropropane	BRL		µg/kg wet	1.0						
1,1-Dichloropropene	BRL		µg/kg wet	1.0						
cis-1,3-Dichloropropene	BRL		µg/kg wet	1.0						
trans-1,3-Dichloropropene	BRL		µg/kg wet	1.0						
Ethylbenzene	BRL		µg/kg wet	1.0						
Hexachlorobutadiene	BRL		µg/kg wet	1.0						
2-Hexanone (MBK)	BRL		µg/kg wet	10.0						
Isopropylbenzene	BRL		µg/kg wet	1.0						
4-Isopropyltoluene	BRL		µg/kg wet	1.0						
Methyl tert-butyl ether	BRL		µg/kg wet	1.0						
4-Methyl-2-pentanone (MIBK)	BRL		µg/kg wet	10.0						
Methylene chloride	BRL		µg/kg wet	10.0						
Naphthalene	BRL		µg/kg wet	1.0						
n-Propylbenzene	BRL		µg/kg wet	1.0						
Styrene	BRL		µg/kg wet	1.0						

Volatile Organic Compounds - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 7031697 - SW846 5030 Soil (high level)										
Blank (7031697-BLK1)										
Prepared & Analyzed: 28-Mar-07										
1,1,1,2-Tetrachloroethane	BRL		µg/kg wet	1.0						
1,1,2,2-Tetrachloroethane	BRL		µg/kg wet	1.0						
Tetrachloroethene	BRL		µg/kg wet	1.0						
Toluene	BRL		µg/kg wet	1.0						
1,2,3-Trichlorobenzene	BRL		µg/kg wet	1.0						
1,2,4-Trichlorobenzene	BRL		µg/kg wet	1.0						
1,1,1-Trichloroethane	BRL		µg/kg wet	1.0						
1,1,2-Trichloroethane	BRL		µg/kg wet	1.0						
Trichloroethene	BRL		µg/kg wet	1.0						
Trichlorofluoromethane (Freon 11)	BRL		µg/kg wet	1.0						
1,2,3-Trichloropropane	BRL		µg/kg wet	1.0						
1,2,4-Trimethylbenzene	BRL		µg/kg wet	1.0						
1,3,5-Trimethylbenzene	BRL		µg/kg wet	1.0						
Vinyl chloride	BRL		µg/kg wet	1.0						
m,p-Xylene	BRL		µg/kg wet	2.0						
o-Xylene	BRL		µg/kg wet	1.0						
Tetrahydrofuran	BRL		µg/kg wet	10.0						
Ethyl ether	BRL		µg/kg wet	1.0						
Tert-amyl methyl ether	BRL		µg/kg wet	1.0						
Ethyl tert-butyl ether	BRL		µg/kg wet	1.0						
Di-isopropyl ether	BRL		µg/kg wet	1.0						
Tert-Butanol / butyl alcohol	BRL		µg/kg wet	10.0						
1,4-Dioxane	BRL		µg/kg wet	20.0						
Surrogate: 4-Bromofluorobenzene	*30.2*		µg/kg wet		*30.0*		*101*	*70-130*		
Surrogate: Toluene-d8	*30.1*		µg/kg wet		*30.0*		*100*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4	*27.8*		µg/kg wet		*30.0*		*93*	*70-130*		
Surrogate: Dibromofluoromethane	*28.9*		µg/kg wet		*30.0*		*96*	*70-130*		
LCS (7031697-BS1)										
Prepared & Analyzed: 28-Mar-07										
1,1,2-Trichlorotrifluoroethane (Freon 113)	19.9		µg/kg wet		20.0		100	70-130		
Acetone	15.5		µg/kg wet		20.0		78	1.77-175		
Acrylonitrile	19.2		µg/kg wet		20.0		96	70-130		
Benzene	21.0		µg/kg wet		20.0		105	70-130		
Bromobenzene	21.5		µg/kg wet		20.0		108	70-130		
Bromochloromethane	19.7		µg/kg wet		20.0		98	70-130		
Bromodichloromethane	21.5		µg/kg wet		20.0		108	70-130		
Bromoform	21.6		µg/kg wet		20.0		108	70-130		
Bromomethane	21.4		µg/kg wet		20.0		107	55.3-136		
2-Butanone (MEK)	15.5		µg/kg wet		20.0		78	38.8-142		
n-Butylbenzene	17.4		µg/kg wet		20.0		87	70-130		
sec-Butylbenzene	19.4		µg/kg wet		20.0		97	70-130		
tert-Butylbenzene	20.4		µg/kg wet		20.0		102	70-130		
Carbon disulfide	17.8		µg/kg wet		20.0		89	70-130		
Carbon tetrachloride	17.5		µg/kg wet		20.0		88	70-130		
Chlorobenzene	20.9		µg/kg wet		20.0		104	70-130		
Chloroethane	18.5		µg/kg wet		20.0		92	55.3-130		
Chloroform	19.8		µg/kg wet		20.0		99	70-130		
Chloromethane	19.6		µg/kg wet		20.0		98	70-130		
2-Chlorotoluene	21.1		µg/kg wet		20.0		106	70-130		
4-Chlorotoluene	20.4		µg/kg wet		20.0		102	70-130		
1,2-Dibromo-3-chloropropane	19.5		µg/kg wet		20.0		98	70-130		

Volatile Organic Compounds - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 7031697 - SW846 5030 Soil (high level)										
LCS (7031697-BS1)										
Prepared & Analyzed: 28-Mar-07										
Dibromochloromethane	21.7		µg/kg wet		20.0		108	64.7-139		
1,2-Dibromoethane (EDB)	22.0		µg/kg wet		20.0		110	70-130		
Dibromomethane	20.3		µg/kg wet		20.0		102	70-130		
1,2-Dichlorobenzene	21.2		µg/kg wet		20.0		106	70-130		
1,3-Dichlorobenzene	21.2		µg/kg wet		20.0		106	70-130		
1,4-Dichlorobenzene	20.6		µg/kg wet		20.0		103	70-130		
Dichlorodifluoromethane (Freon12)	21.8		µg/kg wet		20.0		109	34.4-167		
1,1-Dichloroethane	19.2		µg/kg wet		20.0		96	70-130		
1,2-Dichloroethane	18.9		µg/kg wet		20.0		94	70-130		
1,1-Dichloroethene	18.6		µg/kg wet		20.0		93	70-130		
cis-1,2-Dichloroethene	20.2		µg/kg wet		20.0		101	70-130		
trans-1,2-Dichloroethene	18.8		µg/kg wet		20.0		94	70-130		
1,2-Dichloropropane	20.4		µg/kg wet		20.0		102	70-130		
1,3-Dichloropropane	21.0		µg/kg wet		20.0		105	70-130		
2,2-Dichloropropane	16.2		µg/kg wet		20.0		81	70-130		
1,1-Dichloropropene	20.6		µg/kg wet		20.0		103	70-130		
cis-1,3-Dichloropropene	19.4		µg/kg wet		20.0		97	70-130		
trans-1,3-Dichloropropene	20.2		µg/kg wet		20.0		101	70-130		
Ethylbenzene	20.4		µg/kg wet		20.0		102	70-130		
Hexachlorobutadiene	19.4		µg/kg wet		20.0		97	60.7-140		
2-Hexanone (MBK)	14.3		µg/kg wet		20.0		72	70-130		
Isopropylbenzene	19.5		µg/kg wet		20.0		98	70-130		
4-Isopropyltoluene	19.7		µg/kg wet		20.0		98	70-130		
Methyl tert-butyl ether	20.0		µg/kg wet		20.0		100	70-130		
4-Methyl-2-pentanone (MIBK)	18.5		µg/kg wet		20.0		92	46.1-145		
Methylene chloride	17.6		µg/kg wet		20.0		88	70-130		
Naphthalene	19.8		µg/kg wet		20.0		99	70-130		
n-Propylbenzene	17.2		µg/kg wet		20.0		86	70-130		
Styrene	22.4		µg/kg wet		20.0		112	70-130		
1,1,1,2-Tetrachloroethane	21.1		µg/kg wet		20.0		106	70-130		
1,1,2,2-Tetrachloroethane	20.3		µg/kg wet		20.0		102	70-130		
Tetrachloroethene	19.0		µg/kg wet		20.0		95	70-130		
Toluene	19.5		µg/kg wet		20.0		98	70-130		
1,2,3-Trichlorobenzene	20.2		µg/kg wet		20.0		101	70-130		
1,2,4-Trichlorobenzene	19.4		µg/kg wet		20.0		97	70-130		
1,1,1-Trichloroethane	18.0		µg/kg wet		20.0		90	70-130		
1,1,2-Trichloroethane	22.1		µg/kg wet		20.0		110	70-130		
Trichloroethene	20.9		µg/kg wet		20.0		104	70-130		
Trichlorofluoromethane (Freon 11)	18.6		µg/kg wet		20.0		93	56.8-140		
1,2,3-Trichloropropane	23.5		µg/kg wet		20.0		118	70-130		
1,2,4-Trimethylbenzene	20.2		µg/kg wet		20.0		101	70-130		
1,3,5-Trimethylbenzene	20.9		µg/kg wet		20.0		104	70-130		
Vinyl chloride	18.6		µg/kg wet		20.0		93	70-130		
m,p-Xylene	41.4		µg/kg wet		40.0		104	70-130		
o-Xylene	21.4		µg/kg wet		20.0		107	70-130		
Tetrahydrofuran	18.5		µg/kg wet		20.0		92	70-130		
Ethyl ether	19.8		µg/kg wet		20.0		99	65.3-130		
Tert-amyl methyl ether	19.6		µg/kg wet		20.0		98	70-130		
Ethyl tert-butyl ether	19.8		µg/kg wet		20.0		99	70-130		
Di-isopropyl ether	18.3		µg/kg wet		20.0		92	70-130		
Tert-Butanol / butyl alcohol	193		µg/kg wet		200		96	70-130		

Volatile Organic Compounds - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 7031697 - SW846 5030 Soil (high level)										
LCS (7031697-BS1)										
Prepared & Analyzed: 28-Mar-07										
1,4-Dioxane	183		µg/kg wet		200		92	34-155		
Surrogate: 4-Bromofluorobenzene	*30.4*		µg/kg wet		*30.0*		*101*	*70-130*		
Surrogate: Toluene-d8	*30.4*		µg/kg wet		*30.0*		*101*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4	*26.9*		µg/kg wet		*30.0*		*90*	*70-130*		
Surrogate: Dibromofluoromethane	*28.2*		µg/kg wet		*30.0*		*94*	*70-130*		
LCS Dup (7031697-BSD1)										
Prepared & Analyzed: 28-Mar-07										
1,1,2-Trichlorotrifluoroethane (Freon 113)	18.7		µg/kg wet		20.0		94	70-130	6	25
Acetone	12.6		µg/kg wet		20.0		63	1.77-175	21	50
Acrylonitrile	19.8		µg/kg wet		20.0		99	70-130	3	25
Benzene	20.4		µg/kg wet		20.0		102	70-130	3	25
Bromobenzene	21.2		µg/kg wet		20.0		106	70-130	2	25
Bromochloromethane	20.2		µg/kg wet		20.0		101	70-130	3	25
Bromodichloromethane	21.2		µg/kg wet		20.0		106	70-130	2	25
Bromoform	21.8		µg/kg wet		20.0		109	70-130	0.9	25
Bromomethane	20.4		µg/kg wet		20.0		102	55.3-136	5	50
2-Butanone (MEK)	16.1		µg/kg wet		20.0		80	38.8-142	3	50
n-Butylbenzene	16.7		µg/kg wet		20.0		84	70-130	4	25
sec-Butylbenzene	18.6		µg/kg wet		20.0		93	70-130	4	25
tert-Butylbenzene	19.9		µg/kg wet		20.0		100	70-130	2	25
Carbon disulfide	17.3		µg/kg wet		20.0		86	70-130	3	25
Carbon tetrachloride	16.8		µg/kg wet		20.0		84	70-130	5	25
Chlorobenzene	20.6		µg/kg wet		20.0		103	70-130	1	25
Chloroethane	17.7		µg/kg wet		20.0		88	55.3-130	4	50
Chloroform	19.4		µg/kg wet		20.0		97	70-130	2	25
Chloromethane	18.9		µg/kg wet		20.0		94	70-130	4	25
2-Chlorotoluene	20.6		µg/kg wet		20.0		103	70-130	3	25
4-Chlorotoluene	20.2		µg/kg wet		20.0		101	70-130	1	25
1,2-Dibromo-3-chloropropane	20.8		µg/kg wet		20.0		104	70-130	6	25
Dibromochloromethane	21.5		µg/kg wet		20.0		108	64.7-139	0	50
1,2-Dibromoethane (EDB)	21.8		µg/kg wet		20.0		109	70-130	0.9	25
Dibromomethane	20.4		µg/kg wet		20.0		102	70-130	0	25
1,2-Dichlorobenzene	20.9		µg/kg wet		20.0		104	70-130	2	25
1,3-Dichlorobenzene	20.8		µg/kg wet		20.0		104	70-130	2	25
1,4-Dichlorobenzene	20.5		µg/kg wet		20.0		102	70-130	1	25
Dichlorodifluoromethane (Freon12)	20.8		µg/kg wet		20.0		104	34.4-167	5	50
1,1-Dichloroethane	18.7		µg/kg wet		20.0		94	70-130	2	25
1,2-Dichloroethane	19.2		µg/kg wet		20.0		96	70-130	2	25
1,1-Dichloroethene	17.5		µg/kg wet		20.0		88	70-130	6	25
cis-1,2-Dichloroethene	19.4		µg/kg wet		20.0		97	70-130	4	25
trans-1,2-Dichloroethene	18.2		µg/kg wet		20.0		91	70-130	3	25
1,2-Dichloropropane	20.4		µg/kg wet		20.0		102	70-130	0	25
1,3-Dichloropropane	21.3		µg/kg wet		20.0		106	70-130	0.9	25
2,2-Dichloropropane	15.5		µg/kg wet		20.0		78	70-130	4	25
1,1-Dichloropropene	20.1		µg/kg wet		20.0		100	70-130	3	25
cis-1,3-Dichloropropene	19.6		µg/kg wet		20.0		98	70-130	1	25
trans-1,3-Dichloropropene	20.0		µg/kg wet		20.0		100	70-130	1	25
Ethylbenzene	19.9		µg/kg wet		20.0		100	70-130	2	25
Hexachlorobutadiene	18.5		µg/kg wet		20.0		92	60.7-140	5	50
2-Hexanone (MBK)	14.5		µg/kg wet		20.0		72	70-130	0	25
Isopropylbenzene	18.9		µg/kg wet		20.0		94	70-130	4	25

Volatile Organic Compounds - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 7031697 - SW846 5030 Soil (high level)										
LCS Dup (7031697-BSD1)										
Prepared & Analyzed: 28-Mar-07										
4-Isopropyltoluene	19.0		µg/kg wet		20.0		95	70-130	3	25
Methyl tert-butyl ether	20.2		µg/kg wet		20.0		101	70-130	1	25
4-Methyl-2-pentanone (MIBK)	18.6		µg/kg wet		20.0		93	46.1-145	1	50
Methylene chloride	17.9		µg/kg wet		20.0		90	70-130	2	25
Naphthalene	19.6		µg/kg wet		20.0		98	70-130	1	25
n-Propylbenzene	16.9		µg/kg wet		20.0		84	70-130	2	25
Styrene	22.0		µg/kg wet		20.0		110	70-130	2	25
1,1,1,2-Tetrachloroethane	20.9		µg/kg wet		20.0		104	70-130	2	25
1,1,2,2-Tetrachloroethane	20.8		µg/kg wet		20.0		104	70-130	2	25
Tetrachloroethene	18.1		µg/kg wet		20.0		90	70-130	5	25
Toluene	18.8		µg/kg wet		20.0		94	70-130	4	25
1,2,3-Trichlorobenzene	19.4		µg/kg wet		20.0		97	70-130	4	25
1,2,4-Trichlorobenzene	19.1		µg/kg wet		20.0		96	70-130	1	25
1,1,1-Trichloroethane	17.6		µg/kg wet		20.0		88	70-130	2	25
1,1,2-Trichloroethane	21.9		µg/kg wet		20.0		110	70-130	0	25
Trichloroethene	20.4		µg/kg wet		20.0		102	70-130	2	25
Trichlorofluoromethane (Freon 11)	17.9		µg/kg wet		20.0		90	56.8-140	3	50
1,2,3-Trichloropropane	23.6		µg/kg wet		20.0		118	70-130	0	25
1,2,4-Trimethylbenzene	20.0		µg/kg wet		20.0		100	70-130	1	25
1,3,5-Trimethylbenzene	20.4		µg/kg wet		20.0		102	70-130	2	25
Vinyl chloride	18.4		µg/kg wet		20.0		92	70-130	1	25
m,p-Xylene	40.9		µg/kg wet		40.0		102	70-130	2	25
o-Xylene	21.2		µg/kg wet		20.0		106	70-130	0.9	25
Tetrahydrofuran	18.4		µg/kg wet		20.0		92	70-130	0	25
Ethyl ether	20.3		µg/kg wet		20.0		102	65.3-130	3	50
Tert-amyl methyl ether	19.1		µg/kg wet		20.0		96	70-130	2	25
Ethyl tert-butyl ether	19.9		µg/kg wet		20.0		100	70-130	1	25
Di-isopropyl ether	18.0		µg/kg wet		20.0		90	70-130	2	25
Tert-Butanol / butyl alcohol	195		µg/kg wet		200		98	70-130	2	25
1,4-Dioxane	193		µg/kg wet		200		96	34-155	4	25
Surrogate: 4-Bromofluorobenzene	*30.3*		µg/kg wet		*30.0*		*101*	*70-130*		
Surrogate: Toluene-d8	*30.1*		µg/kg wet		*30.0*		*100*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4	*27.6*		µg/kg wet		*30.0*		*92*	*70-130*		
Surrogate: Dibromofluoromethane	*28.8*		µg/kg wet		*30.0*		*96*	*70-130*		
Matrix Spike (7031697-MS1) **Source: SA59708-01**										
Prepared & Analyzed: 28-Mar-07										
Benzene	19.4		µg/kg dry		20.0	BRL	97	70-130		
Chlorobenzene	19.6		µg/kg dry		20.0	BRL	98	70-130		
1,1-Dichloroethene	18.5		µg/kg dry		20.0	BRL	92	70-130		
Toluene	18.5		µg/kg dry		20.0	BRL	92	70-130		
Trichloroethene	20.0		µg/kg dry		20.0	BRL	100	70-130		
Surrogate: 4-Bromofluorobenzene	*30.6*		µg/kg dry		*30.0*		*102*	*70-130*		
Surrogate: Toluene-d8	*30.6*		µg/kg dry		*30.0*		*102*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4	*27.0*		µg/kg dry		*30.0*		*90*	*70-130*		
Surrogate: Dibromofluoromethane	*27.9*		µg/kg dry		*30.0*		*93*	*70-130*		
Matrix Spike Dup (7031697-MSD1) **Source: SA59708-01**										
Prepared & Analyzed: 28-Mar-07										
Benzene	20.4		µg/kg dry		20.0	BRL	102	70-130	5	30
Chlorobenzene	20.9		µg/kg dry		20.0	BRL	104	70-130	6	30
1,1-Dichloroethene	19.3		µg/kg dry		20.0	BRL	96	70-130	4	30
Toluene	21.0		µg/kg dry		20.0	BRL	105	70-130	13	30

Volatile Organic Compounds - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 7031697 - SW846 5030 Soil (high level)										
Matrix Spike Dup (7031697-MSD1) Source: SA59708-01										
Prepared & Analyzed: 28-Mar-07										
Trichloroethene	21.3		µg/kg dry		20.0	BRL	106	70-130	6	30
Surrogate: 4-Bromofluorobenzene	*30.6*		µg/kg dry		*30.0*		*102*	*70-130*		
Surrogate: Toluene-d8	*32.4*		µg/kg dry		*30.0*		*108*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4	*28.0*		µg/kg dry		*30.0*		*93*	*70-130*		
Surrogate: Dibromofluoromethane	*29.8*		µg/kg dry		*30.0*		*99*	*70-130*		

Semivolatile Organic Compounds by GC - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 7031604 - SW846 3545A										
Blank (7031604-BLK1)										
Prepared & Analyzed: 27-Mar-07										
PCB 1016	BRL		µg/kg wet	28.6						
PCB 1221	BRL		µg/kg wet	28.6						
PCB 1232	BRL		µg/kg wet	28.6						
PCB 1242	BRL		µg/kg wet	28.6						
PCB 1248	BRL		µg/kg wet	28.6						
PCB 1254	BRL		µg/kg wet	28.6						
PCB 1260	BRL		µg/kg wet	28.6						
PCB 1262	BRL		µg/kg wet	28.6						
PCB 1268	BRL		µg/kg wet	28.6						
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*20.0*		µg/kg wet		*28.6*		*70*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*30.0*		µg/kg wet		*28.6*		*105*	*30-150*		
LCS (7031604-BS1)										
Prepared & Analyzed: 27-Mar-07										
PCB 1016	400		µg/kg wet	28.6	357		112	40-140		
PCB 1260	431		µg/kg wet	28.6	357		121	40-140		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*20.0*		µg/kg wet		*28.6*		*70*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*30.0*		µg/kg wet		*28.6*		*105*	*30-150*		
LCS Dup (7031604-BSD1)										
Prepared & Analyzed: 27-Mar-07										
PCB 1016	406		µg/kg wet	28.6	357		114	40-140	2	30
PCB 1260	463		µg/kg wet	28.6	357		130	40-140	7	30
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*20.0*		µg/kg wet		*28.6*		*70*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*31.4*		µg/kg wet		*28.6*		*110*	*30-150*		
Duplicate (7031604-DUP1) **Source: SA59728-01**										
Prepared & Analyzed: 27-Mar-07										
PCB 1016	BRL		µg/kg dry	40.2		BRL				40
PCB 1221	BRL		µg/kg dry	40.2		BRL				40
PCB 1232	BRL		µg/kg dry	40.2		BRL				40
PCB 1242	BRL		µg/kg dry	40.2		BRL				40
PCB 1248	BRL		µg/kg dry	40.2		BRL				40
PCB 1254	BRL		µg/kg dry	40.2		BRL				40
PCB 1260	BRL		µg/kg dry	40.2		BRL				40
PCB 1262	BRL		µg/kg dry	40.2		BRL				40
PCB 1268	BRL		µg/kg dry	40.2		BRL				40
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*28.1*		µg/kg dry		*40.1*		*70*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*46.2*		µg/kg dry		*40.1*		*115*	*30-150*		
Matrix Spike (7031604-MS1) **Source: SA59728-01**										
Prepared & Analyzed: 27-Mar-07										
PCB 1016	596		µg/kg dry	40.3	503	BRL	118	40-140		
PCB 1260	642		µg/kg dry	40.3	503	BRL	128	40-140		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*28.2*		µg/kg dry		*40.2*		*70*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*46.3*		µg/kg dry		*40.2*		*115*	*30-150*		
Matrix Spike Dup (7031604-MSD1) **Source: SA59728-01**										
Prepared & Analyzed: 27-Mar-07										
PCB 1016	600		µg/kg dry	40.2	502	BRL	120	40-140	2	50
PCB 1260	644		µg/kg dry	40.2	502	BRL	128	40-140	0	50
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*30.1*		µg/kg dry		*40.1*		*75*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*48.1*		µg/kg dry		*40.1*		*120*	*30-150*		

Semivolatile Organic Compounds by GCMS - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 7031683 - SW846 3545A										
Blank (7031683-BLK1)										
Prepared & Analyzed: 28-Mar-07										
Acenaphthene	BRL		µg/kg wet	330						
Acenaphthylene	BRL		µg/kg wet	330						
Aniline	BRL		µg/kg wet	330						
Anthracene	BRL		µg/kg wet	330						
Atrazine	BRL		µg/kg wet	330						
Azobenzene/Diphenyldiazine	BRL		µg/kg wet	330						
Benzidine	BRL		µg/kg wet	330						
Benzo (a) anthracene	BRL		µg/kg wet	330						
Benzo (a) pyrene	BRL		µg/kg wet	330						
Benzo (b) fluoranthene	BRL		µg/kg wet	330						
Benzo (g,h,i) perylene	BRL		µg/kg wet	330						
Benzo (k) fluoranthene	BRL		µg/kg wet	330						
Benzoic acid	BRL		µg/kg wet	330						
Benzyl alcohol	BRL		µg/kg wet	330						
Bis(2-chloroethoxy)methane	BRL		µg/kg wet	330						
Bis(2-chloroethyl)ether	BRL		µg/kg wet	330						
Bis(2-chloroisopropyl)ether	BRL		µg/kg wet	330						
Bis(2-ethylhexyl)phthalate	BRL		µg/kg wet	330						
4-Bromophenyl phenyl ether	BRL		µg/kg wet	330						
Butyl benzyl phthalate	BRL		µg/kg wet	330						
Carbazole	BRL		µg/kg wet	330						
4-Chloro-3-methylphenol	BRL		µg/kg wet	330						
4-Chloroaniline	BRL		µg/kg wet	330						
2-Chloronaphthalene	BRL		µg/kg wet	330						
2-Chlorophenol	BRL		µg/kg wet	330						
4-Chlorophenyl phenyl ether	BRL		µg/kg wet	330						
Chrysene	BRL		µg/kg wet	330						
Dibenzo (a,h) anthracene	BRL		µg/kg wet	330						
Dibenzofuran	BRL		µg/kg wet	330						
1,2-Dichlorobenzene	BRL		µg/kg wet	330						
1,3-Dichlorobenzene	BRL		µg/kg wet	330						
1,4-Dichlorobenzene	BRL		µg/kg wet	330						
3,3'-Dichlorobenzidine	BRL		µg/kg wet	330						
2,4-Dichlorophenol	BRL		µg/kg wet	330						
Diethyl phthalate	BRL		µg/kg wet	330						
Dimethyl phthalate	BRL		µg/kg wet	330						
2,4-Dimethylphenol	BRL		µg/kg wet	330						
Di-n-butyl phthalate	BRL		µg/kg wet	330						
4,6-Dinitro-2-methylphenol	BRL		µg/kg wet	330						
2,4-Dinitrophenol	BRL		µg/kg wet	330						
2,4-Dinitrotoluene	BRL		µg/kg wet	330						
2,6-Dinitrotoluene	BRL		µg/kg wet	330						
Di-n-octyl phthalate	BRL		µg/kg wet	330						
Fluoranthene	BRL		µg/kg wet	330						
Fluorene	BRL		µg/kg wet	330						
Hexachlorobenzene	BRL		µg/kg wet	330						
Hexachlorobutadiene	BRL		µg/kg wet	330						
Hexachlorocyclopentadiene	BRL		µg/kg wet	330						
Hexachloroethane	BRL		µg/kg wet	330						
Indeno (1,2,3-cd) pyrene	BRL		µg/kg wet	330						
Isophorone	BRL		µg/kg wet	330						

Semivolatile Organic Compounds by GCMS - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 7031683 - SW846 3545A										
Blank (7031683-BLK1)										
Prepared & Analyzed: 28-Mar-07										
1-Methylnaphthalene	BRL		µg/kg wet	330						
2-Methylnaphthalene	BRL		µg/kg wet	330						
2-Methylphenol	BRL		µg/kg wet	330						
3,4-Methylphenol	BRL		µg/kg wet	330						
Naphthalene	BRL		µg/kg wet	330						
2-Nitroaniline	BRL		µg/kg wet	330						
3-Nitroaniline	BRL		µg/kg wet	330						
4-Nitroaniline	BRL		µg/kg wet	1320						
Nitrobenzene	BRL		µg/kg wet	330						
2-Nitrophenol	BRL		µg/kg wet	330						
4-Nitrophenol	BRL		µg/kg wet	1320						
N-Nitrosodimethylamine	BRL		µg/kg wet	330						
N-Nitrosodi-n-propylamine	BRL		µg/kg wet	330						
N-Nitrosodiphenylamine	BRL		µg/kg wet	330						
Pentachlorophenol	BRL		µg/kg wet	330						
Phenanthrene	BRL		µg/kg wet	330						
Phenol	BRL		µg/kg wet	330						
Pyrene	BRL		µg/kg wet	330						
Pyridine	BRL		µg/kg wet	330						
1,2,4-Trichlorobenzene	BRL		µg/kg wet	330						
2,4,5-Trichlorophenol	BRL		µg/kg wet	330						
2,4,6-Trichlorophenol	BRL		µg/kg wet	330						
Surrogate: 2-Fluorobiphenyl	*6720*		µg/kg wet		*6670*		*101*	*30-130*		
Surrogate: 2-Fluorophenol	*5430*		µg/kg wet		*6670*		*81*	*15-110*		
Surrogate: Nitrobenzene-d5	*6450*		µg/kg wet		*6670*		*97*	*30-130*		
Surrogate: Phenol-d5	*5310*		µg/kg wet		*6670*		*80*	*15-110*		
Surrogate: Terphenyl-dl4	*7450*		µg/kg wet		*6670*		*112*	*30-130*		
Surrogate: 2,4,6-Tribromophenol	*6810*		µg/kg wet		*6670*		*102*	*15-110*		
LCS (7031683-BS1)										
Prepared & Analyzed: 28-Mar-07										
Acenaphthene	5470		µg/kg wet	330	6670		82	40-130		
Acenaphthylene	5180		µg/kg wet	330	6670		78	40-130		
Aniline	3100		µg/kg wet	330	6670		46	40-130		
Anthracene	5940		µg/kg wet	330	6670		89	40-130		
Atrazine	6850		µg/kg wet	330	6670		103	40-130		
Azobenzene/Diphenyldiazine	4550		µg/kg wet	330	6670		68	40-130		
Benzidine	1910		µg/kg wet	330	6670		29	0-130		
Benzo (a) anthracene	5140		µg/kg wet	330	6670		77	40-130		
Benzo (a) pyrene	5810		µg/kg wet	330	6670		87	40-130		
Benzo (b) fluoranthene	5380		µg/kg wet	330	6670		81	40-130		
Benzo (g,h,i) perylene	6150		µg/kg wet	330	6670		92	40-130		
Benzo (k) fluoranthene	6060		µg/kg wet	330	6670		91	40-130		
Benzoic acid	3530		µg/kg wet	330	6670		53	0-130		
Benzyl alcohol	3760		µg/kg wet	330	6670		56	40-130		
Bis(2-chloroethoxy)methane	3390		µg/kg wet	330	6670		51	40-130		
Bis(2-chloroethyl)ether	5000		µg/kg wet	330	6670		75	40-130		
Bis(2-chloroisopropyl)ether	3530		µg/kg wet	330	6670		53	40-130		
Bis(2-ethylhexyl)phthalate	4770		µg/kg wet	330	6670		72	40-130		
4-Bromophenyl phenyl ether	5270		µg/kg wet	330	6670		79	40-130		
Butyl benzyl phthalate	4800		µg/kg wet	330	6670		72	40-130		
Carbazole	8800	QC1	µg/kg wet	330	6670		132	40-130		

Semivolatile Organic Compounds by GCMS - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 7031683 - SW846 3545A										
LCS (7031683-BS1)										
Prepared & Analyzed: 28-Mar-07										
4-Chloro-3-methylphenol	3510		µg/kg wet	330	6670		53	40-130		
4-Chloroaniline	3460		µg/kg wet	330	6670		52	40-130		
2-Chloronaphthalene	4880		µg/kg wet	330	6670		73	40-130		
2-Chlorophenol	3990		µg/kg wet	330	6670		60	40-130		
4-Chlorophenyl phenyl ether	6020		µg/kg wet	330	6670		90	40-130		
Chrysene	6050		µg/kg wet	330	6670		91	40-130		
Dibenzo (a,h) anthracene	5940		µg/kg wet	330	6670		89	40-130		
Dibenzofuran	5240		µg/kg wet	330	6670		79	40-130		
1,2-Dichlorobenzene	5230		µg/kg wet	330	6670		78	40-130		
1,3-Dichlorobenzene	3800		µg/kg wet	330	6670		57	40-130		
1,4-Dichlorobenzene	5620		µg/kg wet	330	6670		84	40-130		
3,3'-Dichlorobenzidine	6200		µg/kg wet	330	6670		93	40-130		
2,4-Dichlorophenol	3370		µg/kg wet	330	6670		51	40-130		
Diethyl phthalate	5030		µg/kg wet	330	6670		75	40-130		
Dimethyl phthalate	4990		µg/kg wet	330	6670		75	40-130		
2,4-Dimethylphenol	3200		µg/kg wet	330	6670		48	40-130		
Di-n-butyl phthalate	5200		µg/kg wet	330	6670		78	40-130		
4,6-Dinitro-2-methylphenol	4740		µg/kg wet	330	6670		71	40-130		
2,4-Dinitrophenol	4220		µg/kg wet	330	6670		63	40-130		
2,4-Dinitrotoluene	5300		µg/kg wet	330	6670		79	40-130		
2,6-Dinitrotoluene	6130		µg/kg wet	330	6670		92	40-130		
Di-n-octyl phthalate	5070		µg/kg wet	330	6670		76	40-130		
Fluoranthene	5250		µg/kg wet	330	6670		79	40-130		
Fluorene	5350		µg/kg wet	330	6670		80	40-130		
Hexachlorobenzene	5630		µg/kg wet	330	6670		84	40-130		
Hexachlorobutadiene	4650		µg/kg wet	330	6670		70	40-130		
Hexachlorocyclopentadiene	4440		µg/kg wet	330	6670		67	40-130		
Hexachloroethane	4290		µg/kg wet	330	6670		64	40-130		
Indeno (1,2,3-cd) pyrene	5850		µg/kg wet	330	6670		88	40-130		
1-Methylnaphthalene	5310		µg/kg wet	330	6670		80	40-140		
Isophorone	3660		µg/kg wet	330	6670		55	40-130		
2-Methylnaphthalene	3740		µg/kg wet	330	6670		56	40-130		
2-Methylphenol	4120		µg/kg wet	330	6670		62	40-130		
3,4-Methylphenol	4250		µg/kg wet	330	6670		64	40-130		
Naphthalene	3860		µg/kg wet	330	6670		58	40-130		
2-Nitroaniline	5220		µg/kg wet	330	6670		78	40-130		
3-Nitroaniline	6400		µg/kg wet	330	6670		96	40-130		
4-Nitroaniline	5970		µg/kg wet	1320	6670		90	40-130		
Nitrobenzene	4240		µg/kg wet	330	6670		64	40-130		
2-Nitrophenol	3600		µg/kg wet	330	6670		54	40-130		
4-Nitrophenol	5280		µg/kg wet	1320	6670		79	40-130		
N-Nitrosodimethylamine	4960		µg/kg wet	330	6670		74	40-130		
N-Nitrosodi-n-propylamine	3630		µg/kg wet	330	6670		54	40-130		
N-Nitrosodiphenylamine	5700		µg/kg wet	330	6670		85	40-130		
Pentachlorophenol	5440		µg/kg wet	330	6670		82	40-130		
Phenanthrene	5140		µg/kg wet	330	6670		77	40-130		
Phenol	3860		µg/kg wet	330	6670		58	40-130		
Pyrene	5170		µg/kg wet	330	6670		78	40-130		
Pyridine	3920		µg/kg wet	330	6670		59	40-130		
1,2,4-Trichlorobenzene	4220		µg/kg wet	330	6670		63	40-130		
2,4,5-Trichlorophenol	5350		µg/kg wet	330	6670		80	40-130		

Semivolatile Organic Compounds by GCMS - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 7031683 - SW846 3545A										
LCS (7031683-BS1)										
Prepared & Analyzed: 28-Mar-07										
2,4,6-Trichlorophenol	3710		µg/kg wet	330	6670		56	40-130		
Surrogate: 2-Fluorobiphenyl	*6280*		µg/kg wet		*6670*		*94*	*30-130*		
Surrogate: 2-Fluorophenol	*4310*		µg/kg wet		*6670*		*65*	*15-110*		
Surrogate: Nitrobenzene-d5	*4460*		µg/kg wet		*6670*		*67*	*30-130*		
Surrogate: Phenol-d5	*3640*		µg/kg wet		*6670*		*55*	*15-110*		
Surrogate: Terphenyl-dl4	*6520*		µg/kg wet		*6670*		*98*	*30-130*		
Surrogate: 2,4,6-Tribromophenol	*6600*		µg/kg wet		*6670*		*99*	*15-110*		
Duplicate (7031683-DUP1)	**Source: SA59748-03**									
Prepared & Analyzed: 28-Mar-07										
Acenaphthene	BRL		µg/kg dry	263		BRL				50
Acenaphthylene	BRL		µg/kg dry	263		BRL				50
Aniline	BRL		µg/kg dry	263		BRL				50
Anthracene	BRL		µg/kg dry	263		BRL				50
Atrazine	BRL		µg/kg dry	263		BRL				50
Azobenzene/Diphenyldiazine	BRL		µg/kg dry	263		BRL				50
Benzidine	BRL		µg/kg dry	263		BRL				50
Benzo (a) anthracene	36.7	J	µg/kg dry	263		BRL				50
Benzo (a) pyrene	37.2	J	µg/kg dry	263		BRL				50
Benzo (b) fluoranthene	46.8	J	µg/kg dry	263		BRL				50
Benzo (g,h,i) perylene	BRL		µg/kg dry	263		BRL				50
Benzo (k) fluoranthene	40.4	J	µg/kg dry	263		BRL				50
Benzoic acid	BRL		µg/kg dry	263		BRL				50
Benzyl alcohol	BRL		µg/kg dry	263		BRL				50
Bis(2-chloroethoxy)methane	BRL		µg/kg dry	263		BRL				50
Bis(2-chloroethyl)ether	BRL		µg/kg dry	263		BRL				50
Bis(2-chloroisopropyl)ether	BRL		µg/kg dry	263		BRL				50
Bis(2-ethylhexyl)phthalate	BRL		µg/kg dry	263		BRL				50
4-Bromophenyl phenyl ether	BRL		µg/kg dry	263		BRL				50
Butyl benzyl phthalate	BRL		µg/kg dry	263		BRL				50
Carbazole	BRL		µg/kg dry	263		BRL				50
4-Chloro-3-methylphenol	BRL		µg/kg dry	263		BRL				50
4-Chloroaniline	BRL		µg/kg dry	263		BRL				50
2-Chloronaphthalene	BRL		µg/kg dry	263		BRL				50
2-Chlorophenol	BRL		µg/kg dry	263		BRL				50
4-Chlorophenyl phenyl ether	BRL		µg/kg dry	263		BRL				50
Chrysene	44.1	J	µg/kg dry	263		BRL				50
Dibenzo (a,h) anthracene	BRL		µg/kg dry	263		BRL				50
Dibenzofuran	BRL		µg/kg dry	263		BRL				50
1,2-Dichlorobenzene	BRL		µg/kg dry	263		BRL				50
1,3-Dichlorobenzene	BRL		µg/kg dry	263		BRL				50
1,4-Dichlorobenzene	BRL		µg/kg dry	263		BRL				50
3,3'-Dichlorobenzidine	BRL		µg/kg dry	263		BRL				50
2,4-Dichlorophenol	BRL		µg/kg dry	263		BRL				50
Diethyl phthalate	BRL		µg/kg dry	263		BRL				50
Dimethyl phthalate	BRL		µg/kg dry	263		BRL				50
2,4-Dimethylphenol	BRL		µg/kg dry	263		BRL				50
Di-n-butyl phthalate	BRL		µg/kg dry	263		BRL				50
4,6-Dinitro-2-methylphenol	BRL		µg/kg dry	263		BRL				50
2,4-Dinitrophenol	BRL		µg/kg dry	263		BRL				50
2,4-Dinitrotoluene	BRL		µg/kg dry	263		BRL				50
2,6-Dinitrotoluene	BRL		µg/kg dry	263		BRL				50

Semivolatile Organic Compounds by GCMS - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 7031683 - SW846 3545A										
Duplicate (7031683-DUP1) **Source: SA59748-03**										
Prepared & Analyzed: 28-Mar-07										
Di-n-octyl phthalate	BRL		µg/kg dry	263		BRL				50
Fluoranthene	92.0	J	µg/kg dry	263		BRL				50
Fluorene	BRL		µg/kg dry	263		BRL				50
Hexachlorobenzene	BRL		µg/kg dry	263		BRL				50
Hexachlorobutadiene	BRL		µg/kg dry	263		BRL				50
Hexachlorocyclopentadiene	BRL		µg/kg dry	263		BRL				50
Hexachloroethane	BRL		µg/kg dry	263		BRL				50
Indeno (1,2,3-cd) pyrene	BRL		µg/kg dry	263		BRL				50
1-Methylnaphthalene	BRL		µg/kg dry	263		BRL				50
Isophorone	BRL		µg/kg dry	263		BRL				50
2-Methylnaphthalene	BRL		µg/kg dry	263		BRL				50
2-Methylphenol	BRL		µg/kg dry	263		BRL				50
3,4-Methylphenol	BRL		µg/kg dry	263		BRL				50
Naphthalene	BRL		µg/kg dry	263		BRL				50
2-Nitroaniline	BRL		µg/kg dry	263		BRL				50
3-Nitroaniline	BRL		µg/kg dry	263		BRL				50
4-Nitroaniline	BRL		µg/kg dry	1050		BRL				50
Nitrobenzene	BRL		µg/kg dry	263		BRL				50
2-Nitrophenol	BRL		µg/kg dry	263		BRL				50
4-Nitrophenol	BRL		µg/kg dry	1050		BRL				50
N-Nitrosodimethylamine	BRL		µg/kg dry	263		BRL				50
N-Nitrosodi-n-propylamine	BRL		µg/kg dry	263		BRL				50
N-Nitrosodiphenylamine	BRL		µg/kg dry	263		BRL				50
Pentachlorophenol	BRL		µg/kg dry	263		BRL				50
Phenanthrene	BRL		µg/kg dry	263		BRL				50
Phenol	BRL		µg/kg dry	263		BRL				50
Pyrene	96.2	J	µg/kg dry	263		BRL				50
Pyridine	BRL		µg/kg dry	263		BRL				50
1,2,4-Trichlorobenzene	BRL		µg/kg dry	263		BRL				50
2,4,5-Trichlorophenol	BRL		µg/kg dry	263		BRL				50
2,4,6-Trichlorophenol	BRL		µg/kg dry	263		BRL				50
Surrogate: 2-Fluorobiphenyl	*2000*		µg/kg dry		*2660*		*75*	*30-130*		
Surrogate: 2-Fluorophenol	*1270*		µg/kg dry		*2660*		*48*	*15-110*		
Surrogate: Nitrobenzene-d5	*2100*		µg/kg dry		*2660*		*79*	*30-130*		
Surrogate: Phenol-d5	*1550*		µg/kg dry		*2660*		*58*	*15-110*		
Surrogate: Terphenyl-d14	*2160*		µg/kg dry		*2660*		*81*	*30-130*		
Surrogate: 2,4,6-Tribromophenol	*1900*		µg/kg dry		*2660*		*71*	*15-110*		
Matrix Spike (7031683-MS1) **Source: SA59748-03**										
Prepared & Analyzed: 28-Mar-07										
Acenaphthene	4090		µg/kg dry	286	5770	BRL	71	40-140		
4-Chloro-3-methylphenol	2550		µg/kg dry	286	5770	BRL	44	30-130		
2-Chlorophenol	2950		µg/kg dry	286	5770	BRL	51	30-130		
1,4-Dichlorobenzene	4040		µg/kg dry	286	5770	BRL	70	40-140		
2,4-Dinitrotoluene	3850		µg/kg dry	286	5770	BRL	67	40-140		
4-Nitrophenol	3290		µg/kg dry	1140	5770	BRL	57	30-130		
N-Nitrosodi-n-propylamine	2790		µg/kg dry	286	5770	BRL	48	40-140		
Pentachlorophenol	3660		µg/kg dry	286	5770	BRL	63	30-130		
Phenol	2790		µg/kg dry	286	5770	BRL	48	30-130		
Pyrene	3840		µg/kg dry	286	5770	BRL	67	40-140		
1,2,4-Trichlorobenzene	3180		µg/kg dry	286	5770	BRL	55	40-140		
Surrogate: 2-Fluorobiphenyl	*4800*		µg/kg dry		*5770*		*83*	*30-130*		
Surrogate: 2-Fluorophenol	*2980*		µg/kg dry		*5770*		*52*	*15-110*		

Semivolatile Organic Compounds by GCMS - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 7031683 - SW846 3545A										
Matrix Spike (7031683-MS1) **Source: SA59748-03**										
Prepared & Analyzed: 28-Mar-07										
Surrogate: Nitrobenzene-d5	*3220*		µg/kg dry		*5770*		*56*	*30-130*		
Surrogate: Phenol-d5	*2520*		µg/kg dry		*5770*		*44*	*15-110*		
Surrogate: Terphenyl-dl4	*4630*		µg/kg dry		*5770*		*80*	*30-130*		
Surrogate: 2,4,6-Tribromophenol	*4700*		µg/kg dry		*5770*		*81*	*15-110*		
Matrix Spike Dup (7031683-MSD1) **Source: SA59748-03**										
Prepared & Analyzed: 28-Mar-07										
Acenaphthene	4010		µg/kg dry	287	5790	BRL	69	40-140	3	30
4-Chloro-3-methylphenol	2790		µg/kg dry	287	5790	BRL	48	30-130	9	30
2-Chlorophenol	2940		µg/kg dry	287	5790	BRL	51	30-130	0	30
1,4-Dichlorobenzene	4040		µg/kg dry	287	5790	BRL	70	40-140	0	30
2,4-Dinitrotoluene	3830		µg/kg dry	287	5790	BRL	66	40-140	2	30
4-Nitrophenol	3900		µg/kg dry	1150	5790	BRL	67	30-130	16	30
N-Nitrosodi-n-propylamine	2900		µg/kg dry	287	5790	BRL	50	40-140	4	30
Pentachlorophenol	3960		µg/kg dry	287	5790	BRL	68	30-130	8	30
Phenol	2910		µg/kg dry	287	5790	BRL	50	30-130	4	30
Pyrene	3720		µg/kg dry	287	5790	BRL	64	40-140	5	30
1,2,4-Trichlorobenzene	3050		µg/kg dry	287	5790	BRL	53	40-140	4	30
Surrogate: 2-Fluorobiphenyl	*4360*		µg/kg dry		*5790*		*75*	*30-130*		
Surrogate: 2-Fluorophenol	*2830*		µg/kg dry		*5790*		*49*	*15-110*		
Surrogate: Nitrobenzene-d5	*3070*		µg/kg dry		*5790*		*53*	*30-130*		
Surrogate: Phenol-d5	*2630*		µg/kg dry		*5790*		*45*	*15-110*		
Surrogate: Terphenyl-dl4	*4420*		µg/kg dry		*5790*		*76*	*30-130*		
Surrogate: 2,4,6-Tribromophenol	*4630*		µg/kg dry		*5790*		*80*	*15-110*		

Total Metals by EPA 6000/7000 Series Methods - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 7031665 - SW846 3050B										
Blank (7031665-BLK1)										
Prepared: 27-Mar-07 Analyzed: 28-Mar-07										
Lead	BRL		mg/kg wet	0.703						
Cadmium	BRL		mg/kg wet	0.234						
Arsenic	BRL		mg/kg wet	1.41						
Chromium	BRL		mg/kg wet	0.468						
Duplicate (7031665-DUP1) **Source: SA59771-08**										
Prepared: 27-Mar-07 Analyzed: 28-Mar-07										
Lead	337	QR6	mg/kg dry	0.792		433			25	20
Arsenic	5.54		mg/kg dry	1.58		5.55			0.2	20
Cadmium	0.322		mg/kg dry	0.264		0.288			11	20
Chromium	12.2		mg/kg dry	0.528		11.3			8	20
Matrix Spike (7031665-MS1) **Source: SA59771-08**										
Prepared: 27-Mar-07 Analyzed: 28-Mar-07										
Lead	405	QM7	mg/kg dry	0.825	138	433	NR	75-125		
Chromium	138		mg/kg dry	0.550	138	11.3	92	75-125		
Arsenic	129		mg/kg dry	1.65	138	5.55	89	75-125		
Cadmium	126		mg/kg dry	0.275	138	0.288	91	75-125		
Matrix Spike Dup (7031665-MSD1) **Source: SA59771-08**										
Prepared: 27-Mar-07 Analyzed: 28-Mar-07										
Lead	433	QM7	mg/kg dry	0.878	146	433	0	75-125	7	20
Chromium	153		mg/kg dry	0.585	146	11.3	97	75-125	10	20
Arsenic	137		mg/kg dry	1.76	146	5.55	90	75-125	6	20
Cadmium	133		mg/kg dry	0.293	146	0.288	91	75-125	5	20
Post Spike (7031665-PS1) **Source: SA59771-08**										
Prepared: 27-Mar-07 Analyzed: 28-Mar-07										
Arsenic	129		mg/kg dry	1.63	136	5.55	91	80-120		
Cadmium	125		mg/kg dry	0.271	136	0.288	92	80-120		
Chromium	139		mg/kg dry	0.543	136	11.3	94	80-120		
Reference (7031665-SRM1)										
Prepared: 27-Mar-07 Analyzed: 28-Mar-07										
Lead	43.9		mg/kg wet	0.750	45.1		97	81.8-118.1		
Chromium	46.7		mg/kg wet	0.500	49.6		94	78.9-120.5		
Cadmium	31.4		mg/kg wet	0.250	31.9		98	82.1-117.9		
Arsenic	44.2		mg/kg wet	1.50	45.0		98	80.8-119.4		
Reference (7031665-SRM2)										
Prepared: 27-Mar-07 Analyzed: 28-Mar-07										
Lead	43.0		mg/kg wet	0.750	44.6		96	81.8-118.1		
Chromium	46.3		mg/kg wet	0.500	49.1		94	78.9-120.5		
Cadmium	30.9		mg/kg wet	0.250	31.6		98	82.1-117.9		
Arsenic	43.1		mg/kg wet	1.50	44.6		97	80.8-119.4		
Batch 7031666 - EPA200/SW7000 Series										
Blank (7031666-BLK1)										
Prepared: 27-Mar-07 Analyzed: 28-Mar-07										
Mercury	BRL		mg/kg wet	0.0292						
Duplicate (7031666-DUP1) **Source: SA59771-08**										
Prepared: 27-Mar-07 Analyzed: 28-Mar-07										
Mercury	0.806		mg/kg dry	0.0347		0.907			12	20

This laboratory report is not valid without an authorized signature on the cover page.

* Reportable Detection Limit BRL = Below Reporting Limit

Total Metals by EPA 6000/7000 Series Methods - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 7031666 - EPA200/SW7000 Series										
Matrix Spike (7031666-MS1) **Source: SA59771-08**										
Prepared: 27-Mar-07 Analyzed: 28-Mar-07										
Mercury	1.05	QM7	mg/kg dry	0.0347	0.483	0.907	30	75-125		
Matrix Spike Dup (7031666-MSD1) **Source: SA59771-08**										
Prepared: 27-Mar-07 Analyzed: 28-Mar-07										
Mercury	1.19	QM7	mg/kg dry	0.0358	0.497	0.907	57	75-125	13	20
Reference (7031666-SRM1)										
Prepared: 27-Mar-07 Analyzed: 28-Mar-07										
Mercury	1.27		mg/kg wet	0.0300	1.12		113	65.9-132.6		

TCLP Metals by EPA 1311 & 6000/7000 Series Methods - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 7040200 - SW846 3010A										
Blank (7040200-BLK1)										
Prepared & Analyzed: 04-Apr-07										
Lead	BRL		mg/l	0.0075						
LCS (7040200-BS1)										
Prepared & Analyzed: 04-Apr-07										
Lead	1.17		mg/l	0.0075	1.25		94	76.9-104		
LCS Dup (7040200-BSD1)										
Prepared & Analyzed: 04-Apr-07										
Lead	1.16		mg/l	0.0075	1.25		93	76.9-104	0.9	20
Duplicate (7040200-DUP1) **Source: SA60057-01**										
Prepared & Analyzed: 04-Apr-07										
Lead	0.540	QR6	mg/l	0.0075		1.58			98	20
Matrix Spike (7040200-MS1) **Source: SA60060-01**										
Prepared & Analyzed: 04-Apr-07										
Lead	1.16		mg/l	0.0075	1.25	0.0270	91	70-107		
Matrix Spike Dup (7040200-MSD1) **Source: SA60060-01**										
Prepared & Analyzed: 04-Apr-07										
Lead	1.19		mg/l	0.0075	1.25	0.0270	93	70-107	3	20
Post Spike (7040200-PS1) **Source: SA60060-01**										
Prepared & Analyzed: 04-Apr-07										
Lead	1.20		mg/l	0.0075	1.25	0.0270	94	64.4-111		

General Chemistry Parameters - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 7031667 - General Preparation										
Duplicate (7031667-DUP1)	**Source: SA59757-01**									
Prepared & Analyzed: 27-Mar-07										
% Solids	96.9		%			96.8			0.1	20
Duplicate (7031667-DUP2)	**Source: SA59771-08**									
Prepared & Analyzed: 27-Mar-07										
% Solids	85.8		%			83.7			2	20
Batch 7031704 - General Preparation										
LCS (7031704-BS1)										
Prepared & Analyzed: 28-Mar-07										
Specific Conductance (EC)	146		uS/cm		147		99	95-105		
Duplicate (7031704-DUP1)	**Source: SA59771-08**									
Prepared & Analyzed: 28-Mar-07										
Specific Conductance (EC)	142		uS/cm			145			2	5
Reference (7031704-SRM1)										
Prepared & Analyzed: 28-Mar-07										
Specific Conductance (EC)	209		uS/cm		200		104	80-120		

Notes and Definitions

__RE	Reanalysis for data confirmation.
Comp	Completed
E	The concentration indicated for this analyte is an estimated value. This value is considered an estimate (CLP E-flag).
QC1	Analyte out of acceptance range.
QM7	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
QR6	The RPD exceeded the QC control limits; however precision is demonstrated with acceptable RPD values for MS/MSD.
vex2	Field extracted
BRL	Below Reporting Limit - Analyte NOT DETECTED at or above the reporting limit
dry	Sample results reported on a dry weight basis
NR	Not Reported
RPD	Relative Percent Difference
J	Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).

A plus sign (+) in the Method Reference column indicates the method is not accredited by NELAC.

Laboratory Control Sample (LCS): A known matrix spiked with compound(s) representative of the target analytes, which is used to document laboratory performance.

Matrix Duplicate: An intra-laboratory split sample which is used to document the precision of a method in a given sample matrix.

Matrix Spike: An aliquot of a sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

Method Blank: An analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. The method blank is used to document contamination resulting from the analytical process.

Method Detection Limit (MDL): The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.

Reportable Detection Limit (RDL): The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes the RDL analyte concentration is selected as the lowest non-zero standard in the calibration curve. While the RDL is approximately 5 to 10 times the MDL, the RDL for each sample takes into account the sample volume/weight, extract/digestate volume, cleanup procedures and, if applicable, dry weight correction. Sample RDLs are highly matrix-dependent.

Surrogate: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. These compounds are spiked into all blanks, standards, and samples prior to analysis. Percent recoveries are calculated for each surrogate.

Validated by:
Hanibal C. Tayeh, Ph.D.
Nicole Brown

MADEP MCP ANALYTICAL METHOD REPORT CERTIFICATION FORM

Laboratory Name: Spectrum Analytical, Inc. - Agawam, MA	Project #: 05-207808.00
Project Location: Boott Mill - Lowell, MA	MADEP RTN [1]:

This form provides certifications for the following data set:
SA59771-01 through SA59771-08

Sample matrices:	Soil				
MCP SW-846 Methods Used	☑ 8260B	☐ 8151A	☐ 8330	☑ 6010B	☑ 7470A/1A
	☑ 8270C	☐ 8081A	☐ VPH	☐ 6020	☐ 9014M [2]
	☑ 8082	☐ 8021B	☐ EPH	☐ 7000S [3]	☐ 7196A

1 List Release Tracking Number (RTN), if known
2 M - SW-846 Method 9014 or MADEP Physiologically Available Cyanide (PAC) Method
3 S - SW-846 Methods 7000 Series List individual method and analyte

An affirmative response to questions A, B, C and D is required for "Presumptive Certainty" status

A	Were all samples received by the laboratory in a condition consistent with that described on the Chain of Custody documentation for the data set?	☑ Yes ☐ No
B	Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines?	☑ Yes ☐ No
C	Does the data included in this report meet all the analytical requirements for "Presumptive Certainty", as described in Section 2.0 (a), (b), (c) and (d) of the MADEP document CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	☑ Yes ☐ No
D	***VPH and EPH methods only***: Was the VPH or EPH method conducted without significant modifications (see Section 11.3 of respective methods)?	☐ Yes ☐ No

A response to questions E and F below is required for "Presumptive Certainty" status

E	Were all analytical QC performance standards and recommendations for the specified methods achieved?	☑ Yes ☐ No
F	Were results for all analyte-list compounds/elements for the specified method(s) reported?	☐ Yes ☑ No

All negative responses are addressed in a case narrative on the cover page of this report.

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.

Hanibal C. Tayeh, Ph.D.
President/Laboratory Director

Date: 4/5/2007

SA 59771 v EM

SPECTRUM ANALYTICAL, INC.
Featuring
HANDBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

Page 1 of 1

Special Handling:
☐ Standard TAT - 7 to 10 business days
☒ Rush TAT - Date Needed: 3/28/07
All TATs subject to laboratory approval. Min. 24-hour notification needed for rushes. Samples disposed of after 60 days unless otherwise instructed.

Report To: ECS Wakefield
607 North Ave, Suite 11
Wakefield, MA 01880

Project Mgr.: James Matz

Invoice To: ECS Agawam
"Special Pricing"

P.O. No.: RON: 00002

Project No: 05-207805.00
Site Name: Boott [redacted] Mill
Location: Lowell State: MA
Sampler(s): Jessica Pfeifer

1=$Na_2S_2O_3$ 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid
7=CH_3OH 8=$NaHSO_4$ 9=Unpreserved 10=

DW=Drinking Water GW=Groundwater WW=Wastewater
O=Oil SW=Surface Water SO=Soil SL=Sludge A=Air
X1= X2= X3=

G=Grab C=Composite

Containers: Analyses:

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Preservative	# of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	8082	Total Arsenic	Total Cadmium	Total Chromium	Total Lead	Total Mercury	Total SVOCs	Total VOCs	Conductivity	Dry Weight	QA Reporting Notes: (check if needed)
S9771-01	ECS-HA-1	3/27/07	815	G	SO	9		1			X									X	Project allows for
02	ECS-HA-2		830	G				1												X	full 25% Surcharge.
03	ECS-HA-3		835	G				1												X	
04	ECS-HA-4		850	G				1												X	
05	ECS-HA-5		905	G				1												X	
06	ECS-HA-6		920	G				1												X	
07	ECS-HA-7		935	G				1												X	
08	ECS-C-1		1000	C		9	2	1				X	X	X	X	X	X	X	X		

QA Reporting Notes:
☒ Provide MA DEP MCP CAM Report
☐ Provide CT DPH RCP Report
QA/QC Reporting Level
☒ Standard ☐ No QC
☐ Other
State specific reporting standards:

☐ Fax results when available to ( )
☒ E-mail to: JMatz@ECSconsult.com
EDD Format

Condition upon receipt: ☐ Iced ☐ Ambient: ☒ 9.9

Relinquished by:	Received by:	Date:	Time:
Jessica L Pfeifer	[signature]	3-27-07	1320
[signature]	[signature]	3/27/07	1634

11 Almgren Drive • Agawam, Massachusetts 01001 • 413-789-9018 • Fax 413-789-4076 • www.spectrum-analytical.com

Headquarters: 11 Almgren Drive & 830 Silver Street • Agawam, MA 01001 • 1-800-789-9115 • 413-789-9018 • FAX 413-789-4076
FL Division: 8180 Woodland Center Boulevard • Tampa, FL 33614 • 1-888-497-5270 • 813-888-9507 • FAX 800-480-6435
www.spectrum-analytical.com

SA 9771 ✓ EM P

SPECTRUM ANALYTICAL, INC.
Fostering
HANDICAP TECHNOLOGY

CHAIN OF CUSTODY RECORD

Page 1 of 1

Special Handling:
- ☐ Standard TAT - 7 to 10 business days
- ☒ Rush TAT - Date Needed: 3/29/07
- All TATs subject to laboratory approval.
- Min. 24-hour notification needed for rushes.
- Samples disposed of after 60 days unless otherwise instructed.

Report To: ECS (Wakefield
607 North Ave, Suite 11
Wakefield, MA 01880

Project Mgr.: James Matz

Invoice To: ECS Agawam
"Special Pricing"
P.O. No.: RQN: 30002

Project No.: 05-207008.00
Site Name: Boott [redacted] Mill
Location: Lowell State: MA
Sampler(s): Jessica Pfeifer

1=$Na_2S_2O_3$ 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid
7=CH_3OH 8=$NaHSO_4$ 9=Unpreserved 10=_____

DW=Drinking Water GW=Groundwater WW=Wastewater
O=Oil SW=Surface Water SO=Soil SL=Sludge A=Air
X1=_____ X2=_____ X3=_____

G=Grab C=Composite

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Preservative	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Analyses: 8082	Total Arsenic	Total Cadmium	Total Chromium	Total Lead	Total Mercury	Total SVOCs	Total VOCs	Conductivity	Dry Weight	QA Reporting Notes: (check if needed)
S9771-01	ECS-HA-1	3/27/07	815	G	SO	9		1			X									X	Project allows for full 25% Surcharge
02	ECS-HA-2		830	G				1												X	
03	ECS-HA-3		835	G				1												X	
04	ECS-HA-4		850	G				1												X	
05	ECS-HA-5		905	G				1												X	
06	ECS-HA-6		920	G				1												X	
07	ECS-HA-7		935	G		↓		1												X	
✓ 08	ECS-C-1		1000	C	↓	9	2	1			↓	X	X	X	X	X	X	X	X	X	ADDED ANALYSIS Per Client Fax 4/3/07

☐ Fax results when available to (____) _____
☒ E-mail to JMatz@ECSconsult.com
EDD Format _____

Condition upon receipt: ☐ Iced ☐ Ambient ☒ 9.9

Relinquished by:	Received by:	Date:	Time:
Jessica L Pfeifer		3/27/07	1320
		3/27/07	1634

14 Alingeen Drive • Agawam, Massachusetts 01001 • 413-789-9018 • Fax 413-789-4076 • www.spectrum-analytical.com

Report Date:
17-Apr-07 17:30

☑ Final Report
☐ Re-Issued Report
☐ Revised Report

SPECTRUM ANALYTICAL, INC.
Featuring
HANIBAL TECHNOLOGY

Laboratory Report

Environmental Compliance Services
607 North Avenue; Suite 11
Wakefield, MA 01880
Attn: James Matz

Project: Boott Mill - Lowell, MA
Project 05-207808

Laboratory ID	Client Sample ID	Matrix	Date Sampled	Date Received
SA60393-01	1A-N	Soil	05-Apr-07 10:45	06-Apr-07 16:45
SA60393-02	2A-N	Soil	05-Apr-07 14:00	06-Apr-07 16:45
SA60393-03	3A-N	Soil	05-Apr-07 10:00	06-Apr-07 16:45
SA60393-04	4A-N	Soil	05-Apr-07 13:00	06-Apr-07 16:45
SA60393-05	5A-N	Soil	05-Apr-07 09:00	06-Apr-07 16:45
SA60393-06	1B-E	Soil	05-Apr-07 11:15	06-Apr-07 16:45
SA60393-07	1C-E	Soil	05-Apr-07 11:30	06-Apr-07 16:45
SA60393-08	1D-S	Soil	05-Apr-07 13:30	06-Apr-07 16:45
SA60393-09	2D-S	Soil	05-Apr-07 11:45	06-Apr-07 16:45

I attest that the information contained within the report has been reviewed for accuracy and checked against the quality control requirements for each method. These results relate only to the sample(s) as received.
All applicable NELAC requirements have been met.
Please note that this report contains 18 pages of analytical data plus Chain of Custody document(s).
This report may not be reproduced, except in full, without written approval from Spectrum Analytical, Inc.

Massachusetts Certification # M-MA138/MA1110
Connecticut # PH-0777
Florida # E87600/E87936
Maine # MA138
New Hampshire # 2538/2972
New Jersey # MA011/MA012
New York # 11393/11840
Rhode Island # 98
USDA # S-51435
Vermont # VT-11393

Authorized by:

Hanibal C. Tayeh, Ph.D.
President/Laboratory Director

Technical Reviewer's Initial:

Spectrum Analytical, Inc. is a NELAC accredited laboratory organization and meets NELAC testing standards. Use of the NELAC logo however does not insure that Spectrum is currently accredited for the specific method or analyte indicated. Please refer to our "Quality" web page at www.spectrum-analytical.com for a full listing of our current certifications and fields of accreditation. States in which Spectrum Analytical, Inc. holds NELAC certification are New York, New Hampshire, New Jersey and Florida. All analytical work for Volatile Organic and Air analysis are transferred to and conducted at our 830 Silver Street location (NH-2972, NY-11840, FL-E87936 and NJ-MA012).

CASE NARRATIVE:

The data set for work order SA60393 complies with internal QC criteria for the methods performed. The samples were received @ 4.5 degrees Celsius. An infrared thermometer with a tolerance of +/- 2.0 degrees Celsius was used immediately upon receipt of the samples.

MADEP has published a list of analytical methods (CAM), which provides a series of recommended protocols for the acquisition, analysis and reporting of analytical data in support of MCP decisions. "Presumptive Certainty" can be established only for those methods published by the MADEP in the MCP CAM. The compounds and/or elements reported were specifically requested by the client on the Chain of Custody and in some cases may not include the full analyte list as defined in the method.

According to WSC-CAM 5/2004 Rev.4, Table 11 A-1, recovery for some VOC analytes have been deemed potentially difficult. Although they may still be within the recommended 70%-130% recovery range, a range has been set based on historical control limits.

Please refer to "Notes and Definitions" for all sample/analyte qualifiers. Qualifiers will narrate any non-conformances and issues relating to quality control samples and/or sample analysis/matrix.

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
1A-N SA60393-01	05-207808	Soil	05-Apr-07 10:45	06-Apr-07

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	Dilution	Method Ref.	Prepared	Analyzed	Batch	Analyst
Semivolatile Organic Compounds by GC											
Polychlorinated Biphenyls by SW846 8082											
Prepared by method SW846 3545A											
12674-11-2	PCB 1016	BRL		µg/kg dry	38.3	1	SW846 8082	11-Apr-07	17-Apr-07	7040708	SM
11104-28-2	PCB 1221	BRL		µg/kg dry	38.3	1	"	"	"	"	"
11141-16-5	PCB 1232	BRL		µg/kg dry	38.3	1	"	"	"	"	"
53469-21-9	PCB 1242	BRL		µg/kg dry	38.3	1	"	"	"	"	"
12672-29-6	PCB 1248	BRL		µg/kg dry	38.3	1	"	"	"	"	"
11097-69-1	PCB 1254	BRL		µg/kg dry	38.3	1	"	"	"	"	"
11096-82-5	PCB 1260	BRL		µg/kg dry	38.3	1	"	"	"	"	"
37324-23-5	PCB 1262	BRL		µg/kg dry	38.3	1	"	"	"	"	"
11100-14-4	PCB 1268	BRL		µg/kg dry	38.3	1	"	"	"	"	"
Surrogate recoveries:											
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*35*		*30-150 %*			"	"	"	"	"
2051-24-3	*Decachlorobiphenyl (Sr)*	*60*		*30-150 %*			"	"	"	"	"
Semivolatile Organic Compounds by GCMS											
PAHs by SW846 8270C											
Prepared by method SW846 3545A											
83-32-9	Acenaphthene	BRL		µg/kg dry	160	1	SW846 8270C	11-Apr-07	12-Apr-07	7040654	M.B
208-96-8	Acenaphthylene	BRL		µg/kg dry	160	1	"	"	"	"	"
120-12-7	Anthracene	BRL		µg/kg dry	160	1	"	"	"	"	"
56-55-3	Benzo (a) anthracene	BRL		µg/kg dry	160	1	"	"	"	"	"
50-32-8	Benzo (a) pyrene	BRL		µg/kg dry	160	1	"	"	"	"	"
205-99-2	Benzo (b) fluoranthene	BRL		µg/kg dry	160	1	"	"	"	"	"
191-24-2	Benzo (g,h,i) perylene	BRL		µg/kg dry	160	1	"	"	"	"	"
207-08-9	Benzo (k) fluoranthene	BRL		µg/kg dry	160	1	"	"	"	"	"
218-01-9	Chrysene	BRL		µg/kg dry	160	1	"	"	"	"	"
53-70-3	Dibenzo (a,h) anthracene	BRL		µg/kg dry	160	1	"	"	"	"	"
206-44-0	Fluoranthene	BRL		µg/kg dry	160	1	"	"	"	"	"
86-73-7	Fluorene	BRL		µg/kg dry	160	1	"	"	"	"	"
193-39-5	Indeno (1,2,3-cd) pyrene	BRL		µg/kg dry	160	1	"	"	"	"	"
90-12-0	1-Methylnaphthalene	BRL		µg/kg dry	160	1	"	"	"	"	"
91-57-6	2-Methylnaphthalene	BRL		µg/kg dry	160	1	"	"	"	"	"
91-20-3	Naphthalene	BRL		µg/kg dry	160	1	"	"	"	"	"
85-01-8	Phenanthrene	BRL		µg/kg dry	160	1	"	"	"	"	"
129-00-0	Pyrene	BRL		µg/kg dry	160	1	"	"	"	"	"
Surrogate recoveries:											
321-60-8	*2-Fluorobiphenyl*	*76*		*30-130 %*			"	"	"	"	"
1718-51-0	*Terphenyl-dl4*	*88*		*30-130 %*			"	"	"	"	"
Total Metals by EPA 6000/7000 Series Methods											
7439-92-1	Lead	55.3		mg/kg dry	0.872	1	SW846 6010B	12-Apr-07	13-Apr-07	7040782	HB
General Chemistry Parameters											
	% Solids	84.3		%		1	SM2540 G Mod.	12-Apr-07	12-Apr-07	7040820	YM

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
2A-N	05-207808	Soil	05-Apr-07 14:00	06-Apr-07
SA60393-02				

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	Dilution	Method Ref.	Prepared	Analyzed	Batch	Analyst
Semivolatile Organic Compounds by GC											
Polychlorinated Biphenyls by SW846 8082											
Prepared by method SW846 3545A											
12674-11-2	PCB 1016	BRL		µg/kg dry	46.8	1	SW846 8082	11-Apr-07	17-Apr-07	7040708	SM
11104-28-2	PCB 1221	BRL		µg/kg dry	46.8	1	"	"	"	"	"
11141-16-5	PCB 1232	BRL		µg/kg dry	46.8	1	"	"	"	"	"
53469-21-9	PCB 1242	BRL		µg/kg dry	46.8	1	"	"	"	"	"
12672-29-6	PCB 1248	110		µg/kg dry	46.8	1	"	"	"	"	"
11097-69-1	PCB 1254	BRL		µg/kg dry	46.8	1	"	"	"	"	"
11096-82-5	PCB 1260	BRL		µg/kg dry	46.8	1	"	"	"	"	"
37324-23-5	PCB 1262	BRL		µg/kg dry	46.8	1	"	"	"	"	"
11100-14-4	PCB 1268	BRL		µg/kg dry	46.8	1	"	"	"	"	"
Surrogate recoveries:											
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*35*		*30-150 %*			"	"	"	"	"
2051-24-3	*Decachlorobiphenyl (Sr)*	*50*		*30-150 %*			"	"	"	"	"
General Chemistry Parameters											
	% Solids	82.7		%		1	SM2540 G Mod.	12-Apr-07	12-Apr-07	7040820	YM

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
3A-N	05-207808	Soil	05-Apr-07 10:00	06-Apr-07
SA60393-03				

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	Dilution	Method Ref.	Prepared	Analyzed	Batch	Analyst
Semivolatile Organic Compounds by GC											
Polychlorinated Biphenyls by SW846 8082											
Prepared by method SW846 3545A											
12674-11-2	PCB 1016	BRL		µg/kg dry	38.8	1	SW846 8082	11-Apr-07	17-Apr-07	7040708	SM
11104-28-2	PCB 1221	BRL		µg/kg dry	38.8	1	"	"	"	"	"
11141-16-5	PCB 1232	BRL		µg/kg dry	38.8	1	"	"	"	"	"
53469-21-9	PCB 1242	BRL		µg/kg dry	38.8	1	"	"	"	"	"
12672-29-6	PCB 1248	BRL		µg/kg dry	38.8	1	"	"	"	"	"
11097-69-1	PCB 1254	BRL		µg/kg dry	38.8	1	"	"	"	"	"
11096-82-5	PCB 1260	BRL		µg/kg dry	38.8	1	"	"	"	"	"
37324-23-5	PCB 1262	BRL		µg/kg dry	38.8	1	"	"	"	"	"
11100-14-4	PCB 1268	BRL		µg/kg dry	38.8	1	"	"	"	"	"
Surrogate recoveries:											
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*35*		*30-150 %*			"	"	"	"	"
2051-24-3	*Decachlorobiphenyl (Sr)*	*60*		*30-150 %*			"	"	"	"	"
Semivolatile Organic Compounds by GCMS											
PAHs by SW846 8270C											
Prepared by method SW846 3545A											
83-32-9	Acenaphthene	BRL		µg/kg dry	179	1	SW846 8270C	11-Apr-07	12-Apr-07	7040654	M.B
208-96-8	Acenaphthylene	BRL		µg/kg dry	179	1	"	"	"	"	"
120-12-7	Anthracene	BRL		µg/kg dry	179	1	"	"	"	"	"
56-55-3	Benzo (a) anthracene	BRL		µg/kg dry	179	1	"	"	"	"	"
50-32-8	Benzo (a) pyrene	BRL		µg/kg dry	179	1	"	"	"	"	"
205-99-2	Benzo (b) fluoranthene	BRL		µg/kg dry	179	1	"	"	"	"	"
191-24-2	Benzo (g,h,i) perylene	BRL		µg/kg dry	179	1	"	"	"	"	"
207-08-9	Benzo (k) fluoranthene	BRL		µg/kg dry	179	1	"	"	"	"	"
218-01-9	Chrysene	BRL		µg/kg dry	179	1	"	"	"	"	"
53-70-3	Dibenzo (a,h) anthracene	BRL		µg/kg dry	179	1	"	"	"	"	"
206-44-0	Fluoranthene	BRL		µg/kg dry	179	1	"	"	"	"	"
86-73-7	Fluorene	BRL		µg/kg dry	179	1	"	"	"	"	"
193-39-5	Indeno (1,2,3-cd) pyrene	BRL		µg/kg dry	179	1	"	"	"	"	"
90-12-0	1-Methylnaphthalene	BRL		µg/kg dry	179	1	"	"	"	"	"
91-57-6	2-Methylnaphthalene	BRL		µg/kg dry	179	1	"	"	"	"	"
91-20-3	Naphthalene	BRL		µg/kg dry	179	1	"	"	"	"	"
85-01-8	Phenanthrene	BRL		µg/kg dry	179	1	"	"	"	"	"
129-00-0	Pyrene	BRL		µg/kg dry	179	1	"	"	"	"	"
Surrogate recoveries:											
321-60-8	*2-Fluorobiphenyl*	*83*		*30-130 %*			"	"	"	"	"
1718-51-0	*Terphenyl-dl4*	*95*		*30-130 %*			"	"	"	"	"
Total Metals by EPA 6000/7000 Series Methods											
7439-92-1	Lead	6.34		mg/kg dry	0.887	1	SW846 6010B	12-Apr-07	13-Apr-07	7040782	HB
General Chemistry Parameters											
	% Solids	82.6		%		1	SM2540 G Mod.	12-Apr-07	12-Apr-07	7040820	YM

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
4A-N SA60393-04	05-207808	Soil	05-Apr-07 13:00	06-Apr-07

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	Dilution	Method Ref.	Prepared	Analyzed	Batch	Analyst
Semivolatile Organic Compounds by GC											
Polychlorinated Biphenyls by SW846 8082											
Prepared by method SW846 3545A											
12674-11-2	PCB 1016	BRL		µg/kg dry	36.5	1	SW846 8082	11-Apr-07	17-Apr-07	7040708	SM
11104-28-2	PCB 1221	BRL		µg/kg dry	36.5	1	"	"	"	"	"
11141-16-5	PCB 1232	BRL		µg/kg dry	36.5	1	"	"	"	"	"
53469-21-9	PCB 1242	BRL		µg/kg dry	36.5	1	"	"	"	"	"
12672-29-6	PCB 1248	4,780		µg/kg dry	36.5	1	"	"	"	"	"
11097-69-1	PCB 1254	1,370		µg/kg dry	36.5	1	"	"	"	"	"
11096-82-5	PCB 1260	BRL		µg/kg dry	36.5	1	"	"	"	"	"
37324-23-5	PCB 1262	BRL		µg/kg dry	36.5	1	"	"	"	"	"
11100-14-4	PCB 1268	BRL		µg/kg dry	36.5	1	"	"	"	"	"
Surrogate recoveries:											
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*50*		*30-150 %*			"	"	"	"	"
2051-24-3	*Decachlorobiphenyl (Sr)*	*80*		*30-150 %*			"	"	"	"	"
General Chemistry Parameters											
	% Solids	83.5		%		1	SM2540 G Mod.	12-Apr-07	12-Apr-07	7040820	YM

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
5A-N SA60393-05	05-207808	Soil	05-Apr-07 09:00	06-Apr-07

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	Dilution	Method Ref.	Prepared	Analyzed	Batch	Analyst
Semivolatile Organic Compounds by GC											
Polychlorinated Biphenyls by SW846 8082											
Prepared by method SW846 3545A											
12674-11-2	PCB 1016	BRL		µg/kg dry	38.7	1	SW846 8082	12-Apr-07	12-Apr-07	7040743	SM
11104-28-2	PCB 1221	BRL		µg/kg dry	38.7	1	"	"	"	"	"
11141-16-5	PCB 1232	BRL		µg/kg dry	38.7	1	"	"	"	"	"
53469-21-9	PCB 1242	BRL		µg/kg dry	38.7	1	"	"	"	"	"
12672-29-6	PCB 1248	1,560		µg/kg dry	38.7	1	"	"	"	"	"
11097-69-1	PCB 1254	712		µg/kg dry	38.7	1	"	"	"	"	"
11096-82-5	PCB 1260	BRL		µg/kg dry	38.7	1	"	"	"	"	"
37324-23-5	PCB 1262	BRL		µg/kg dry	38.7	1	"	"	"	"	"
11100-14-4	PCB 1268	BRL		µg/kg dry	38.7	1	"	"	"	"	"
Surrogate recoveries:											
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*30*		*30-150 %*			"	"	"	"	"
2051-24-3	*Decachlorobiphenyl (Sr)*	*50*		*30-150 %*			"	"	"	"	"
Semivolatile Organic Compounds by GCMS											
PAHs by SW846 8270C											
Prepared by method SW846 3545A											
83-32-9	Acenaphthene	451		µg/kg dry	179	1	SW846 8270C	11-Apr-07	12-Apr-07	7040654	M.B
208-96-8	Acenaphthylene	439		µg/kg dry	179	1	"	"	"	"	"
120-12-7	Anthracene	2,350		µg/kg dry	179	1	"	"	"	"	"
56-55-3	Benzo (a) anthracene	4,550		µg/kg dry	179	1	"	"	"	"	"
50-32-8	Benzo (a) pyrene	3,830		µg/kg dry	179	1	"	"	"	"	"
205-99-2	Benzo (b) fluoranthene	4,020		µg/kg dry	179	1	"	"	"	"	"
191-24-2	Benzo (g,h,i) perylene	2,000		µg/kg dry	179	1	"	"	"	"	"
207-08-9	Benzo (k) fluoranthene	2,890		µg/kg dry	179	1	"	"	"	"	"
218-01-9	Chrysene	4,230		µg/kg dry	179	1	"	"	"	"	"
53-70-3	Dibenzo (a,h) anthracene	502		µg/kg dry	179	1	"	"	"	"	"
206-44-0	Fluoranthene	9,320		µg/kg dry	179	1	"	"	"	"	"
86-73-7	Fluorene	790		µg/kg dry	179	1	"	"	"	"	"
193-39-5	Indeno (1,2,3-cd) pyrene	1,900		µg/kg dry	179	1	"	"	"	"	"
90-12-0	1-Methylnaphthalene	BRL		µg/kg dry	179	1	"	"	"	"	"
91-57-6	2-Methylnaphthalene	BRL		µg/kg dry	179	1	"	"	"	"	"
91-20-3	Naphthalene	BRL		µg/kg dry	179	1	"	"	"	"	"
85-01-8	Phenanthrene	6,310		µg/kg dry	179	1	"	"	"	"	"
129-00-0	Pyrene	8,820		µg/kg dry	179	1	"	"	"	"	"
Surrogate recoveries:											
321-60-8	*2-Fluorobiphenyl*	*70*		*30-130 %*			"	"	"	"	"
1718-51-0	*Terphenyl-dl4*	*85*		*30-130 %*			"	"	"	"	"
Total Metals by EPA 6000/7000 Series Methods											
7439-92-1	Lead	162		mg/kg dry	0.769	1	SW846 6010B	12-Apr-07	13-Apr-07	7040782	HB
General Chemistry Parameters											
	% Solids	85.0		%		1	SM2540 G Mod.	12-Apr-07	12-Apr-07	7040820	YM

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
1B-E SA60393-06	05-207808	Soil	05-Apr-07 11:15	06-Apr-07

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	Dilution	Method Ref.	Prepared	Analyzed	Batch	Analyst
Semivolatile Organic Compounds by GC											
Polychlorinated Biphenyls by SW846 8082											
Prepared by method SW846 3545A											
12674-11-2	PCB 1016	BRL		µg/kg dry	35.0	1	SW846 8082	12-Apr-07	12-Apr-07	7040743	SM
11104-28-2	PCB 1221	BRL		µg/kg dry	35.0	1	"	"	"	"	"
11141-16-5	PCB 1232	BRL		µg/kg dry	35.0	1	"	"	"	"	"
53469-21-9	PCB 1242	BRL		µg/kg dry	35.0	1	"	"	"	"	"
12672-29-6	PCB 1248	BRL		µg/kg dry	35.0	1	"	"	"	"	"
11097-69-1	PCB 1254	BRL		µg/kg dry	35.0	1	"	"	"	"	"
11096-82-5	PCB 1260	BRL		µg/kg dry	35.0	1	"	"	"	"	"
37324-23-5	PCB 1262	BRL		µg/kg dry	35.0	1	"	"	"	"	"
11100-14-4	PCB 1268	BRL		µg/kg dry	35.0	1	"	"	"	"	"
Surrogate recoveries:											
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*40*		*30-150 %*			"	"	"	"	"
2051-24-3	*Decachlorobiphenyl (Sr)*	*65*		*30-150 %*			"	"	"	"	"
General Chemistry Parameters											
	% Solids	87.0		%		1	SM2540 G Mod.	12-Apr-07	12-Apr-07	7040820	YM

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
1C-E SA60393-07	05-207808	Soil	05-Apr-07 11:30	06-Apr-07

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	Dilution	Method Ref.	Prepared	Analyzed	Batch	Analyst
Semivolatile Organic Compounds by GC											
Polychlorinated Biphenyls by SW846 8082											
Prepared by method SW846 3545A											
12674-11-2	PCB 1016	BRL		µg/kg dry	36.5	1	SW846 8082	12-Apr-07	12-Apr-07	7040743	SM
11104-28-2	PCB 1221	BRL		µg/kg dry	36.5	1	"	"	"	"	"
11141-16-5	PCB 1232	BRL		µg/kg dry	36.5	1	"	"	"	"	"
53469-21-9	PCB 1242	BRL		µg/kg dry	36.5	1	"	"	"	"	"
12672-29-6	PCB 1248	BRL		µg/kg dry	36.5	1	"	"	"	"	"
11097-69-1	PCB 1254	BRL		µg/kg dry	36.5	1	"	"	"	"	"
11096-82-5	PCB 1260	BRL		µg/kg dry	36.5	1	"	"	"	"	"
37324-23-5	PCB 1262	BRL		µg/kg dry	36.5	1	"	"	"	"	"
11100-14-4	PCB 1268	BRL		µg/kg dry	36.5	1	"	"	"	"	"
Surrogate recoveries:											
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*35*		*30-150 %*			"	"	"	"	"
2051-24-3	*Decachlorobiphenyl (Sr)*	*50*		*30-150 %*			"	"	"	"	"
Semivolatile Organic Compounds by GCMS											
PAHs by SW846 8270C											
Prepared by method SW846 3545A											
83-32-9	Acenaphthene	BRL		µg/kg dry	159	1	SW846 8270C	11-Apr-07	12-Apr-07	7040654	M.B
208-96-8	Acenaphthylene	BRL		µg/kg dry	159	1	"	"	"	"	"
120-12-7	Anthracene	BRL		µg/kg dry	159	1	"	"	"	"	"
56-55-3	Benzo (a) anthracene	BRL		µg/kg dry	159	1	"	"	"	"	"
50-32-8	Benzo (a) pyrene	BRL		µg/kg dry	159	1	"	"	"	"	"
205-99-2	Benzo (b) fluoranthene	BRL		µg/kg dry	159	1	"	"	"	"	"
191-24-2	Benzo (g,h,i) perylene	BRL		µg/kg dry	159	1	"	"	"	"	"
207-08-9	Benzo (k) fluoranthene	BRL		µg/kg dry	159	1	"	"	"	"	"
218-01-9	Chrysene	BRL		µg/kg dry	159	1	"	"	"	"	"
53-70-3	Dibenzo (a,h) anthracene	BRL		µg/kg dry	159	1	"	"	"	"	"
206-44-0	Fluoranthene	BRL		µg/kg dry	159	1	"	"	"	"	"
86-73-7	Fluorene	BRL		µg/kg dry	159	1	"	"	"	"	"
193-39-5	Indeno (1,2,3-cd) pyrene	BRL		µg/kg dry	159	1	"	"	"	"	"
90-12-0	1-Methylnaphthalene	BRL		µg/kg dry	159	1	"	"	"	"	"
91-57-6	2-Methylnaphthalene	BRL		µg/kg dry	159	1	"	"	"	"	"
91-20-3	Naphthalene	BRL		µg/kg dry	159	1	"	"	"	"	"
85-01-8	Phenanthrene	BRL		µg/kg dry	159	1	"	"	"	"	"
129-00-0	Pyrene	BRL		µg/kg dry	159	1	"	"	"	"	"
Surrogate recoveries:											
321-60-8	*2-Fluorobiphenyl*	*62*		*30-130 %*			"	"	"	"	"
1718-51-0	*Terphenyl-dl4*	*91*		*30-130 %*			"	"	"	"	"
Total Metals by EPA 6000/7000 Series Methods											
7439-92-1	Lead	6.64		mg/kg dry	0.841	1	SW846 6010B	12-Apr-07	13-Apr-07	7040782	HB
General Chemistry Parameters											
	% Solids	86.9		%		1	SM2540 G Mod.	12-Apr-07	12-Apr-07	7040820	YM

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
ID-S	05-207808	Soil	05-Apr-07 13:30	06-Apr-07
SA60393-08				

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	Dilution	Method Ref.	Prepared	Analyzed	Batch	Analyst
Semivolatile Organic Compounds by GC											
Polychlorinated Biphenyls by SW846 8082											
Prepared by method SW846 3545A											
12674-11-2	PCB 1016	BRL		µg/kg dry	36.7	1	SW846 8082	12-Apr-07	12-Apr-07	7040743	SM
11104-28-2	PCB 1221	BRL		µg/kg dry	36.7	1	"	"	"	"	"
11141-16-5	PCB 1232	BRL		µg/kg dry	36.7	1	"	"	"	"	"
53469-21-9	PCB 1242	BRL		µg/kg dry	36.7	1	"	"	"	"	"
12672-29-6	PCB 1248	47.6		µg/kg dry	36.7	1	"	"	"	"	"
11097-69-1	PCB 1254	BRL		µg/kg dry	36.7	1	"	"	"	"	"
11096-82-5	PCB 1260	BRL		µg/kg dry	36.7	1	"	"	"	"	"
37324-23-5	PCB 1262	BRL		µg/kg dry	36.7	1	"	"	"	"	"
11100-14-4	PCB 1268	BRL		µg/kg dry	36.7	1	"	"	"	"	"
Surrogate recoveries:											
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*35*		*30-150 %*			"	"	"	"	"
2051-24-3	*Decachlorobiphenyl (Sr)*	*55*		*30-150 %*			"	"	"	"	"
General Chemistry Parameters											
	% Solids	87.8		%		1	SM2540 G Mod.	12-Apr-07	12-Apr-07	7040820	YM

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
2D-S SA60393-09	05-207808	Soil	05-Apr-07 11:45	06-Apr-07

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	Dilution	Method Ref.	Prepared	Analyzed	Batch	Analyst
Semivolatile Organic Compounds by GC											
Polychlorinated Biphenyls by SW846 8082											
Prepared by method SW846 3545A											
12674-11-2	PCB 1016	BRL		µg/kg dry	38.7	1	SW846 8082	12-Apr-07	13-Apr-07	7040743	SM
11104-28-2	PCB 1221	BRL		µg/kg dry	38.7	1	"	"	"	"	"
11141-16-5	PCB 1232	BRL		µg/kg dry	38.7	1	"	"	"	"	"
53469-21-9	PCB 1242	BRL		µg/kg dry	38.7	1	"	"	"	"	"
12672-29-6	PCB 1248	BRL		µg/kg dry	38.7	1	"	"	"	"	"
11097-69-1	PCB 1254	BRL		µg/kg dry	38.7	1	"	"	"	"	"
11096-82-5	PCB 1260	BRL		µg/kg dry	38.7	1	"	"	"	"	"
37324-23-5	PCB 1262	BRL		µg/kg dry	38.7	1	"	"	"	"	"
11100-14-4	PCB 1268	BRL		µg/kg dry	38.7	1	"	"	"	"	"
Surrogate recoveries:											
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*35*		*30-150 %*			"	"	"	"	"
2051-24-3	*Decachlorobiphenyl (Sr)*	*65*		*30-150 %*			"	"	"	"	"
Semivolatile Organic Compounds by GCMS											
PAHs by SW846 8270C											
Prepared by method SW846 3545A											
83-32-9	Acenaphthene	474		µg/kg dry	166	1	SW846 8270C	11-Apr-07	12-Apr-07	7040654	M.B
208-96-8	Acenaphthylene	676		µg/kg dry	166	1	"	"	"	"	"
120-12-7	Anthracene	2,950		µg/kg dry	166	1	"	"	"	"	"
56-55-3	Benzo (a) anthracene	11,000		µg/kg dry	166	1	"	"	"	"	"
50-32-8	Benzo (a) pyrene	10,200		µg/kg dry	166	1	"	"	"	"	"
205-99-2	Benzo (b) fluoranthene	9,070		µg/kg dry	166	1	"	"	"	"	"
191-24-2	Benzo (g,h,i) perylene	4,280		µg/kg dry	166	1	"	"	"	"	"
207-08-9	Benzo (k) fluoranthene	8,640		µg/kg dry	166	1	"	"	"	"	"
218-01-9	Chrysene	9,480		µg/kg dry	166	1	"	"	"	"	"
53-70-3	Dibenzo (a,h) anthracene	1,030		µg/kg dry	166	1	"	"	"	"	"
206-44-0	Fluoranthene	20,100		µg/kg dry	166	1	"	"	"	"	"
86-73-7	Fluorene	529		µg/kg dry	166	1	"	"	"	"	"
193-39-5	Indeno (1,2,3-cd) pyrene	4,380		µg/kg dry	166	1	"	"	"	"	"
90-12-0	1-Methylnaphthalene	213		µg/kg dry	166	1	"	"	"	"	"
91-57-6	2-Methylnaphthalene	185		µg/kg dry	166	1	"	"	"	"	"
91-20-3	Naphthalene	887		µg/kg dry	166	1	"	"	"	"	"
85-01-8	Phenanthrene	8,430		µg/kg dry	166	1	"	"	"	"	"
129-00-0	Pyrene	21,100		µg/kg dry	166	1	"	"	"	"	"
Surrogate recoveries:											
321-60-8	*2-Fluorobiphenyl*	*85*		*30-130 %*			"	"	"	"	"
1718-51-0	*Terphenyl-dl4*	*96*		*30-130 %*			"	"	"	"	"
Total Metals by EPA 6000/7000 Series Methods											
7439-92-1	Lead	929		mg/kg dry	0.843	1	SW846 6010B	12-Apr-07	13-Apr-07	7040782	HB
General Chemistry Parameters											
	% Solids	81.6		%		1	SM2540 G Mod.	12-Apr-07	12-Apr-07	7040820	YM

Semivolatile Organic Compounds by GC - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 7040708 - SW846 3545A										
Blank (7040708-BLK1)										
Prepared: 11-Apr-07 Analyzed: 17-Apr-07										
PCB 1016	BRL		µg/kg wet	28.6						
PCB 1221	BRL		µg/kg wet	28.6						
PCB 1232	BRL		µg/kg wet	28.6						
PCB 1242	BRL		µg/kg wet	28.6						
PCB 1248	BRL		µg/kg wet	28.6						
PCB 1254	BRL		µg/kg wet	28.6						
PCB 1260	BRL		µg/kg wet	28.6						
PCB 1262	BRL		µg/kg wet	28.6						
PCB 1268	BRL		µg/kg wet	28.6						
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*15.7*		µg/kg wet		*28.6*		*55*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*25.7*		µg/kg wet		*28.6*		*90*	*30-150*		
LCS (7040708-BS1)										
Prepared: 11-Apr-07 Analyzed: 17-Apr-07										
PCB 1016	273		µg/kg wet	28.6	357		76	40-140		
PCB 1260	344		µg/kg wet	28.6	357		96	40-140		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*14.3*		µg/kg wet		*28.6*		*50*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*25.7*		µg/kg wet		*28.6*		*90*	*30-150*		
LCS Dup (7040708-BSD1)										
Prepared: 11-Apr-07 Analyzed: 17-Apr-07										
PCB 1016	293		µg/kg wet	28.6	357		82	40-140	8	30
PCB 1260	329		µg/kg wet	28.6	357		92	40-140	4	30
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*14.3*		µg/kg wet		*28.6*		*50*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*22.9*		µg/kg wet		*28.6*		*80*	*30-150*		
Duplicate (7040708-DUP1) **Source: SA60393-02**										
Prepared: 11-Apr-07 Analyzed: 17-Apr-07										
PCB 1016	BRL		µg/kg dry	46.5		BRL				40
PCB 1221	BRL		µg/kg dry	46.5		BRL				40
PCB 1232	BRL		µg/kg dry	46.5		BRL				40
PCB 1242	BRL		µg/kg dry	46.5		BRL				40
PCB 1248	60.4	QM4	µg/kg dry	46.5		110			58	40
PCB 1254	32.5	J	µg/kg dry	46.5		37.4			14	40
PCB 1260	BRL		µg/kg dry	46.5		BRL				40
PCB 1262	BRL		µg/kg dry	46.5		BRL				40
PCB 1268	BRL		µg/kg dry	46.5		BRL				40
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*13.9*		µg/kg dry		*46.5*		*30*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*16.3*		µg/kg dry		*46.5*		*35*	*30-150*		
Matrix Spike (7040708-MS1) **Source: SA60393-02**										
Prepared: 11-Apr-07 Analyzed: 17-Apr-07										
PCB 1016	649		µg/kg dry	92.2	576	BRL	113	40-140		
PCB 1260	672		µg/kg dry	92.2	576	BRL	117	40-140		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*18.4*		µg/kg dry		*23.0*		*80*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*32.2*		µg/kg dry		*23.0*		*140*	*30-150*		
Matrix Spike Dup (7040708-MSD1) **Source: SA60393-02**										
Prepared: 11-Apr-07 Analyzed: 17-Apr-07										
PCB 1016	621		µg/kg dry	92.8	580	BRL	107	40-140	5	50
PCB 1260	682		µg/kg dry	92.8	580	BRL	118	40-140	0.9	50
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*27.8*		µg/kg dry		*46.4*		*60*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*46.4*		µg/kg dry		*46.4*		*100*	*30-150*		
Batch 7040743 - SW846 3545A										

Semivolatile Organic Compounds by GC - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 7040743 - SW846 3545A										
Blank (7040743-BLK1)										
Prepared & Analyzed: 12-Apr-07										
PCB 1016	BRL		µg/kg wet	28.6						
PCB 1221	BRL		µg/kg wet	28.6						
PCB 1232	BRL		µg/kg wet	28.6						
PCB 1242	BRL		µg/kg wet	28.6						
PCB 1248	BRL		µg/kg wet	28.6						
PCB 1254	BRL		µg/kg wet	28.6						
PCB 1260	BRL		µg/kg wet	28.6						
PCB 1262	BRL		µg/kg wet	28.6						
PCB 1268	BRL		µg/kg wet	28.6						
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*15.7*		µg/kg wet		*28.6*		*55*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*25.7*		µg/kg wet		*28.6*		*90*	*30-150*		
LCS (7040743-BS1)										
Prepared & Analyzed: 12-Apr-07										
PCB 1016	279		µg/kg wet	28.6	357		78	40-140		
PCB 1260	314		µg/kg wet	28.6	357		88	40-140		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*14.3*		µg/kg wet		*28.6*		*50*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*24.3*		µg/kg wet		*28.6*		*85*	*30-150*		
LCS Dup (7040743-BSD1)										
Prepared & Analyzed: 12-Apr-07										
PCB 1016	276		µg/kg wet	28.6	357		77	40-140	1	30
PCB 1260	310		µg/kg wet	28.6	357		87	40-140	1	30
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*14.3*		µg/kg wet		*28.6*		*50*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*24.3*		µg/kg wet		*28.6*		*85*	*30-150*		
Duplicate (7040743-DUP1) **Source: SA60484-02**										
Prepared & Analyzed: 12-Apr-07										
PCB 1016	BRL		µg/kg dry	38.9		BRL				40
PCB 1221	BRL		µg/kg dry	38.9		BRL				40
PCB 1232	BRL		µg/kg dry	38.9		BRL				40
PCB 1242	BRL		µg/kg dry	38.9		BRL				40
PCB 1248	BRL		µg/kg dry	38.9		BRL				40
PCB 1254	BRL		µg/kg dry	38.9		BRL				40
PCB 1260	BRL		µg/kg dry	38.9		BRL				40
PCB 1262	BRL		µg/kg dry	38.9		BRL				40
PCB 1268	BRL		µg/kg dry	38.9		BRL				40
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*19.4*		µg/kg dry		*38.8*		*50*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*34.9*		µg/kg dry		*38.8*		*90*	*30-150*		
Matrix Spike (7040743-MS1) **Source: SA60484-02**										
Prepared & Analyzed: 12-Apr-07										
PCB 1016	373		µg/kg dry	38.9	485	BRL	77	40-140		
PCB 1260	427		µg/kg dry	38.9	485	BRL	88	40-140		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*19.4*		µg/kg dry		*38.8*		*50*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*35.0*		µg/kg dry		*38.8*		*90*	*30-150*		
Matrix Spike Dup (7040743-MSD1) **Source: SA60484-02**										
Prepared & Analyzed: 12-Apr-07										
PCB 1016	416		µg/kg dry	38.9	486	BRL	86	40-140	11	50
PCB 1260	486		µg/kg dry	38.9	486	BRL	100	40-140	13	50
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*19.4*		µg/kg dry		*38.9*		*50*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*33.0*		µg/kg dry		*38.9*		*85*	*30-150*		

Semivolatile Organic Compounds by GCMS - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 7040654 - SW846 3545A										
Blank (7040654-BLK1)										
Prepared: 11-Apr-07 Analyzed: 12-Apr-07										
Acenaphthene	BRL		µg/kg wet	66.0						
Acenaphthylene	BRL		µg/kg wet	66.0						
Anthracene	BRL		µg/kg wet	66.0						
Benzo (a) anthracene	BRL		µg/kg wet	66.0						
Benzo (a) pyrene	BRL		µg/kg wet	66.0						
Benzo (b) fluoranthene	BRL		µg/kg wet	66.0						
Benzo (g,h,i) perylene	BRL		µg/kg wet	66.0						
Benzo (k) fluoranthene	BRL		µg/kg wet	66.0						
Chrysene	BRL		µg/kg wet	66.0						
Dibenzo (a,h) anthracene	BRL		µg/kg wet	66.0						
Fluoranthene	BRL		µg/kg wet	66.0						
Fluorene	BRL		µg/kg wet	66.0						
Indeno (1,2,3-cd) pyrene	BRL		µg/kg wet	66.0						
1-Methylnaphthalene	BRL		µg/kg wet	66.0						
2-Methylnaphthalene	BRL		µg/kg wet	66.0						
Naphthalene	BRL		µg/kg wet	66.0						
Phenanthrene	BRL		µg/kg wet	66.0						
Pyrene	BRL		µg/kg wet	66.0						
Surrogate: 2-Fluorobiphenyl	*4620*		µg/kg wet		*6670*		*69*	*30-130*		
Surrogate: Terphenyl-dl4	*5670*		µg/kg wet		*6670*		*85*	*30-130*		
LCS (7040654-BS1)										
Prepared: 11-Apr-07 Analyzed: 12-Apr-07										
Acenaphthene	4660		µg/kg wet	66.0	6670		70	40-140		
Acenaphthylene	5160		µg/kg wet	66.0	6670		77	40-140		
Anthracene	5110		µg/kg wet	66.0	6670		77	40-140		
Benzo (a) anthracene	5160		µg/kg wet	66.0	6670		77	40-140		
Benzo (a) pyrene	5310		µg/kg wet	66.0	6670		80	40-140		
Benzo (b) fluoranthene	5550		µg/kg wet	66.0	6670		83	40-140		
Benzo (g,h,i) perylene	5220		µg/kg wet	66.0	6670		78	40-140		
Benzo (k) fluoranthene	4610		µg/kg wet	66.0	6670		69	40-140		
Chrysene	5150		µg/kg wet	66.0	6670		77	40-140		
Dibenzo (a,h) anthracene	5250		µg/kg wet	66.0	6670		79	40-140		
Fluoranthene	5340		µg/kg wet	66.0	6670		80	40-140		
Fluorene	4480		µg/kg wet	66.0	6670		67	40-140		
Indeno (1,2,3-cd) pyrene	5340		µg/kg wet	66.0	6670		80	40-140		
1-Methylnaphthalene	4270		µg/kg wet	66.0	6670		64	40-140		
2-Methylnaphthalene	5760		µg/kg wet	66.0	6670		86	40-140		
Naphthalene	4570		µg/kg wet	66.0	6670		69	40-140		
Phenanthrene	4700		µg/kg wet	66.0	6670		70	40-140		
Pyrene	5080		µg/kg wet	66.0	6670		76	40-140		
Surrogate: 2-Fluorobiphenyl	*4790*		µg/kg wet		*6670*		*72*	*30-130*		
Surrogate: Terphenyl-dl4	*5550*		µg/kg wet		*6670*		*83*	*30-130*		
Duplicate (7040654-DUP1) **Source: SA60410-01**										
Prepared: 11-Apr-07 Analyzed: 12-Apr-07										
Acenaphthene	BRL		µg/kg dry	167		BRL				50
Acenaphthylene	BRL		µg/kg dry	167		BRL				50
Anthracene	BRL		µg/kg dry	167		BRL				50
Benzo (a) anthracene	BRL		µg/kg dry	167		BRL				50
Benzo (a) pyrene	BRL		µg/kg dry	167		BRL				50
Benzo (b) fluoranthene	BRL		µg/kg dry	167		BRL				50
Benzo (g,h,i) perylene	BRL		µg/kg dry	167		BRL				50

Semivolatile Organic Compounds by GCMS - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 7040654 - SW846 3545A										
Duplicate (7040654-DUP1) **Source: SA60410-01**										
Prepared: 11-Apr-07 Analyzed: 12-Apr-07										
Benzo (k) fluoranthene	BRL		µg/kg dry	167		BRL				50
Chrysene	BRL		µg/kg dry	167		BRL				50
Dibenzo (a,h) anthracene	BRL		µg/kg dry	167		BRL				50
Fluoranthene	BRL		µg/kg dry	167		BRL				50
Fluorene	BRL		µg/kg dry	167		BRL				50
Indeno (1,2,3-cd) pyrene	BRL		µg/kg dry	167		BRL				50
1-Methylnaphthalene	BRL		µg/kg dry	167		BRL				50
2-Methylnaphthalene	BRL		µg/kg dry	167		BRL				50
Naphthalene	BRL		µg/kg dry	167		BRL				50
Phenanthrene	BRL		µg/kg dry	167		BRL				50
Pyrene	BRL		µg/kg dry	167		BRL				50
Surrogate: 2-Fluorobiphenyl	*6660*		µg/kg dry		*8440*		*79*	*30-130*		
Surrogate: Terphenyl-dl4	*7710*		µg/kg dry		*8440*		*91*	*30-130*		
Matrix Spike (7040654-MS1) **Source: SA60410-01**										
Prepared: 11-Apr-07 Analyzed: 12-Apr-07										
Acenaphthene	5620		µg/kg dry	83.6	8450	BRL	67	40-140		
Pyrene	6010		µg/kg dry	83.6	8450	BRL	71	40-140		
Surrogate: 2-Fluorobiphenyl	*5790*		µg/kg dry		*8450*		*69*	*30-130*		
Surrogate: Terphenyl-dl4	*6580*		µg/kg dry		*8450*		*78*	*30-130*		
Matrix Spike Dup (7040654-MSD1) **Source: SA60410-01**										
Prepared: 11-Apr-07 Analyzed: 12-Apr-07										
Acenaphthene	5540		µg/kg dry	83.1	8390	BRL	66	40-140	2	30
Pyrene	6040		µg/kg dry	83.1	8390	BRL	72	40-140	1	30
Surrogate: 2-Fluorobiphenyl	*6260*		µg/kg dry		*8390*		*75*	*30-130*		
Surrogate: Terphenyl-dl4	*6600*		µg/kg dry		*8390*		*79*	*30-130*		

Total Metals by EPA 6000/7000 Series Methods - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 7040782 - SW846 3050B										
Blank (7040782-BLK1)										
Prepared: 12-Apr-07 Analyzed: 13-Apr-07										
Lead	BRL		mg/kg wet	0.672						
Duplicate (7040782-DUP1) **Source: SA60390-01**										
Prepared: 12-Apr-07 Analyzed: 13-Apr-07										
Lead	3200	QR6	mg/kg dry	0.817		2230			36	20
Matrix Spike (7040782-MS1) **Source: SA60390-02**										
Prepared: 12-Apr-07 Analyzed: 13-Apr-07										
Lead	604	QM4X	mg/kg dry	0.837	139	695	NR	75-125		
Matrix Spike Dup (7040782-MSD1) **Source: SA60390-02**										
Prepared: 12-Apr-07 Analyzed: 13-Apr-07										
Lead	648	QM4X	mg/kg dry	0.786	131	695	NR	75-125	7	20
Post Spike (7040782-PS1) **Source: SA60390-02**										
Prepared: 12-Apr-07 Analyzed: 13-Apr-07										
Lead	746	QM4X	mg/kg dry	0.884	147	695	35	80-120		
Reference (7040782-SRM1)										
Prepared: 12-Apr-07 Analyzed: 13-Apr-07										
Lead	45.7		mg/kg wet	0.750	44.7		102	81.8-118.1		
Reference (7040782-SRM2)										
Prepared: 12-Apr-07 Analyzed: 13-Apr-07										
Lead	44.2		mg/kg wet	0.750	45.9		96	81.8-118.1		

General Chemistry Parameters - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 7040820 - General Preparation										
Duplicate (7040820-DUP1) **Source: SA60274-01**										
Prepared & Analyzed: 12-Apr-07										
% Solids	86.7		%			86.9			0.2	20

Notes and Definitions

QM4	Visual evaluation of the sample indicates the RPD is above the control limit due to a non-homogeneous sample matrix.
QM4X	The spike recovery was outside of QC acceptance limits for the MS, MSD and/or PS due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.
QR6	The RPD exceeded the QC control limits; however precision is demonstrated with acceptable RPD values for MS/MSD.
BRL	Below Reporting Limit - Analyte NOT DETECTED at or above the reporting limit
dry	Sample results reported on a dry weight basis
NR	Not Reported
RPD	Relative Percent Difference
J	Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).

A plus sign (+) in the Method Reference column indicates the method is not accredited by NELAC.

Laboratory Control Sample (LCS): A known matrix spiked with compound(s) representative of the target analytes, which is used to document laboratory performance.

Matrix Duplicate: An intra-laboratory split sample which is used to document the precision of a method in a given sample matrix.

Matrix Spike: An aliquot of a sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

Method Blank: An analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. The method blank is used to document contamination resulting from the analytical process.

Method Detection Limit (MDL): The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.

Reportable Detection Limit (RDL): The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes the RDL analyte concentration is selected as the lowest non-zero standard in the calibration curve. While the RDL is approximately 5 to 10 times the MDL, the RDL for each sample takes into account the sample volume/weight, extract/digestate volume, cleanup procedures and, if applicable, dry weight correction. Sample RDLs are highly matrix-dependent.

Surrogate: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. These compounds are spiked into all blanks, standards, and samples prior to analysis. Percent recoveries are calculated for each surrogate.

Validated by:
Hanibal C. Tayeh, Ph.D.
Nicole Brown

MADEP MCP ANALYTICAL METHOD REPORT CERTIFICATION FORM

Laboratory Name: Spectrum Analytical, Inc. - Agawam, MA	Project #: 05-207808
Project Location: Boott Mill - Lowell, MA	MADEP RTN [1]:

This form provides certifications for the following data set:
SA60393-01 through SA60393-09

Sample matrices:	Soil				
MCP SW-846 Methods Used	☐ 8260B	☐ 8151A	☐ 8330	☑ 6010B	☐ 7470A/1A
	☑ 8270C	☐ 8081A	☐ VPH	☐ 6020	☐ 9014M [2]
	☑ 8082	☐ 8021B	☐ EPH	☐ 7000S [3]	☐ 7196A

1 List Release Tracking Number (RTN), if known
2 M - SW-846 Method 9014 or MADEP Physiologically Available Cyanide (PAC) Method
3 S - SW-846 Methods 7000 Series List individual method and analyte

An affirmative response to questions A, B, C and D is required for "Presumptive Certainty" status

A	Were all samples received by the laboratory in a condition consistent with that described on the Chain of Custody documentation for the data set?	☑ Yes ☐ No
B	Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines?	☑ Yes ☐ No
C	Does the data included in this report meet all the analytical requirements for "Presumptive Certainty", as described in Section 2.0 (a), (b), (c) and (d) of the MADEP document CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	☑ Yes ☐ No
D	***VPH and EPH methods only***: Was the VPH or EPH method conducted without significant modifications (see Section 11.3 of respective methods)?	☐ Yes ☐ No

A response to questions E and F below is required for "Presumptive Certainty" status

E	Were all analytical QC performance standards and recommendations for the specified methods achieved?	☑ Yes ☐ No
F	Were results for all analyte-list compounds/elements for the specified method(s) reported?	☐ Yes ☑ No

All negative responses are addressed in a case narrative on the cover page of this report.

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.

Hanibal C. Tayeh, Ph.D.
President/Laboratory Director

Date: 4/17/2007

SA 60393 ng

SPECTRUM ANALYTICAL, INC.
Featuring
HANDBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

Page 1 of 1

Special Handling:
☒ Standard TAT - 7 to 10 business days
☐ Rush TAT - Date Needed: _____
- All TATs subject to laboratory approval. Min. 24-hour notification needed for rushes.
- Samples disposed of after 60 days unless otherwise instructed.

Report To: ECS
607 North Ave Suite 11
Wakefield MA 01880
781-246-8877
Project Mgr.: JBM

Invoice To: ECS
P.O. No.: _____ RQN: 003

Project No.: 05-207808
Site Name: Boott Mill
Location: 140 foot of John st. Lowell State: MA
Sampler(s): A. Gibson

1=$Na_2S_2O_3$ 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid
7=CH_3OH 8=$NaHSO_4$ 9=_____ 10=_____

DW=Drinking Water GW=Groundwater WW=Wastewater
O=Oil SW=Surface Water SO=Soil SL=Sludge A=Air
X1=_____ X2=_____ X3=_____

G=Grab C=Composite

Containers: Analyses:

QA Reporting Notes: (check if needed)
☒ Provide MA DEP MCP CAM Report
☐ Provide CT DPH RCP Report
QA/QC Reporting Level
☒ Standard ☐ No QC
☐ Other _____
State specific reporting standards: _____

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Preservative	# of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic		PCB 8082	PAH 8270 C	Lead						
SA 60393-01	1A-N	4/5/07	10:45	G	SO			1	1			X	X	X						
02	2A-N	4/5	14:00	G	SO			1				X								
03	3A-N	4/5	10:00	G	SO			1	1			X	X	X						
04	4A-N	4/5	13:00	G	SO			1				X								
05	5A-N	4/5	9:00	G	SO			1	1			X	X	X						
06	1B-E	4/5	11:15	G	SO			1				X								
07	1C-E	4/5	11:30	G	SO			1	1			X	X	X						
08	1D-S	4/5	13:30	G	SO			1				X								
09	2D-S	4/5	11:45	G	SO			1	1			X	X	X						

☐ Fax results when available to (___) _____
☒ E-mail to vchampagne@ecsconsult.com
EDD Format _____

Condition upon receipt: ☐ Iced ☐ Ambient ☒ °C 4.5 Tege

Relinquished by:	Received by:	Date:	Time:
[signature]	[signature]	4/6/07	1315
[signature]	[signature]	4-6-07	1695

APPENDIX C

BILL OF LADING

no bwsc 612A, so did not file MA Regrenus/00070NH

Massachusetts Department of Environmental Protection **BWSC-012B**
Bureau of Waste Site Cleanup

BILL OF LADING (pursuant to 310 CMR 40.0030)

Release Tracking Number ☐ - ☐

SUMMARY SHEET _____ **OF** _____

I. LOAD INFORMATION:

Load 1:
Date of Shipment: 3/29/07
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Truck/Tractor Registration:
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: 3/29/07
Time of Receipt: ☑ AM ☐ PM
Load Size (cu. yds./tons):

Load 2:
Date of Shipment: 3/29/07
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Truck/Tractor Registration:
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: 3/29/07
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons): 19.98

Load 3:
Date of Shipment:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Truck/Tractor Registration:
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt:
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 4:
Date of Shipment:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Truck/Tractor Registration:
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt:
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 5:
Date of Shipment:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Truck/Tractor Registration:
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt:
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 6:
Date of Shipment:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Truck/Tractor Registration:
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt:
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

J. LOG SHEET VOLUME INFORMATION:
Total Volume Recorded This Page (cu. yds./tons)
Total Carried Forward (cu. yds./tons):
Total Carried Forward and This Page (cu. yds./tons):

A & Connell 100070NH

Massachusetts Department of Environmental Protection **BWSC-012B**

Bureau of Waste Site Cleanup

BILL OF LADING (pursuant to 310 CMR 40.0030)

SUMMARY SHEET _____ **OF** _____

Release Tracking Number ☐ - ☐

I. LOAD INFORMATION:

Load 1:

Date of Shipment:

Time of Shipment: 7:35 ☒ AM ☐ PM

Truck/Tractor Registration: 72061

Trailer Registration (if any):

Signature of Transporter Representative:

Receiving Facility/Temporary Storage Representative:

Date of Receipt: 3/29/07

Time of Receipt: 18:38 ☒ AM ☐ PM

Load Size (cu. yds./tons):

Load 2:

Date of Shipment:

Time of Shipment: ☐ AM ☐ PM

Truck/Tractor Registration:

Trailer Registration (if any):

Signature of Transporter Representative:

Receiving Facility/Temporary Storage Representative:

Date of Receipt:

Time of Receipt: ☐ AM ☐ PM

Load Size (cu. yds./tons):

Load 3:

Date of Shipment:

Time of Shipment: ☐ AM ☐ PM

Truck/Tractor Registration:

Trailer Registration (if any):

Signature of Transporter Representative:

Receiving Facility/Temporary Storage Representative:

Date of Receipt:

Time of Receipt: ☐ AM ☐ PM

Load Size (cu. yds./tons):

Load 4:

Date of Shipment:

Time of Shipment: ☐ AM ☐ PM

Truck/Tractor Registration:

Trailer Registration (if any):

Signature of Transporter Representative:

Receiving Facility/Temporary Storage Representative:

Date of Receipt:

Time of Receipt: ☐ AM ☐ PM

Load Size (cu. yds./tons):

Load 5:

Date of Shipment:

Time of Shipment: ☐ AM ☐ PM

Truck/Tractor Registration:

Trailer Registration (if any):

Signature of Transporter Representative:

Receiving Facility/Temporary Storage Representative:

Date of Receipt:

Time of Receipt: ☐ AM ☐ PM

Load Size (cu. yds./tons):

Load 6:

Date of Shipment:

Time of Shipment: ☐ AM ☐ PM

Truck/Tractor Registration:

Trailer Registration (if any):

Signature of Transporter Representative:

Receiving Facility/Temporary Storage Representative:

Date of Receipt:

Time of Receipt: ☐ AM ☐ PM

Load Size (cu. yds./tons):

J. LOG SHEET VOLUME INFORMATION:

Total Volume Recorded This Page (cu. yds./tons)

Total Carried Forward (cu. yds./tons):

Total Carried Forward and This Page (cu. yds./tons):

Revised 10/3/94

MA Regrenus/00070NH

Massachusetts Department of Environmental Protection **BWSC-012B**
Bureau of Waste Site Cleanup

BILL OF LADING (pursuant to 310 CMR 40.0030)

Release Tracking Number ☐ - ☐

SUMMARY SHEET _____ **OF** _____

I. LOAD INFORMATION:

Load 1:
Signature of Transporter Representative: [signature]
Date of Shipment: 3/29/07
Time of Shipment: ☐ AM ☐ PM
Truck/Tractor Registration:
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative: [signature]
Date of Receipt: 3/29/07
Time of Receipt: ☑ AM ☐ PM
Load Size (cu. yds./tons): 18.87

Load 2:
Signature of Transporter Representative:
Date of Shipment:
Time of Shipment: ☐ AM ☐ PM
Truck/Tractor Registration:
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt:
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 3:
Signature of Transporter Representative:
Date of Shipment:
Time of Shipment: ☐ AM ☐ PM
Truck/Tractor Registration:
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt:
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 4:
Signature of Transporter Representative:
Date of Shipment:
Time of Shipment: ☐ AM ☐ PM
Truck/Tractor Registration:
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt:
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 5:
Signature of Transporter Representative:
Date of Shipment:
Time of Shipment: ☐ AM ☐ PM
Truck/Tractor Registration:
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt:
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 6:
Signature of Transporter Representative:
Date of Shipment:
Time of Shipment: ☐ AM ☐ PM
Truck/Tractor Registration:
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt:
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

J. LOG SHEET VOLUME INFORMATION:
Total Volume Recorded This Page (cu. yds./tons)
Total Carried Forward (cu. yds./tons):
Total Carried Forward and This Page (cu. yds./tons):

Revised 10/3/94

AE Connell 100070NH

Massachusetts Department of Environmental Protection **BWSC-012B**
Bureau of Waste Site Cleanup

BILL OF LADING (pursuant to 310 CMR 40.0030)

Release Tracking Number ☐ - ☐

SUMMARY SHEET _____ OF _____

I. LOAD INFORMATION:

Load 1:
Date of Shipment:
Truck/Tractor Registration: 72061
Signature of Transporter Representative:
Time of Shipment: 7:35 ☑ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: 3/29/07
Time of Receipt: 9:15 ☑ AM ☐ PM
Load Size (cu. yds./tons): 18.39

Load 2:
Date of Shipment:
Truck/Tractor Registration: 72061
Signature of Transporter Representative:
Time of Shipment: 11:15 ☑ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: 3/29/07
Time of Receipt: 3:44 ☐ AM ☑ PM
Load Size (cu. yds./tons): 17.10

Load 3:
Date of Shipment:
Truck/Tractor Registration:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt:
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 4:
Date of Shipment:
Truck/Tractor Registration:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt:
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 5:
Date of Shipment:
Truck/Tractor Registration:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt:
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 6:
Date of Shipment:
Truck/Tractor Registration:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt:
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

J. LOG SHEET VOLUME INFORMATION:
Total Volume Recorded This Page (cu. yds./tons)
Total Carried Forward (cu. yds./tons):
Total Carried Forward and This Page (cu. yds./tons):

Revised 10/3/94

St. Pierre 10000 20 NH

Massachusetts Department of Environmental Protection **BWSC-012B**

Bureau of Waste Site Cleanup

BILL OF LADING (pursuant to 310 CMR 40.0030)

SUMMARY SHEET _____ OF _____

Release Tracking Number: ☐ - ☐

I. LOAD INFORMATION:

Load 1:
Date of Shipment: 3/30/07
Truck/Tractor Registration: N.H. 4062 AR
Signature of Transporter Representative: Alfred St Pierre
Time of Shipment: 7:20 ☑ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: 3/30/07 Time of Receipt: ☑ AM ☐ PM
Load Size (cu. yds./tons):

Load 2:
Date of Shipment: 3/30/07
Truck/Tractor Registration: N.H. 4062 AR
Signature of Transporter Representative: Alfred St Pierre
Time of Shipment: 12:10 ☐ AM ☑ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: 3/30/07 Time of Receipt: ☐ AM ☑ PM
Load Size (cu. yds./tons): 16.66

Load 3:
Date of Shipment:
Truck/Tractor Registration:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 4:
Date of Shipment:
Truck/Tractor Registration:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 5:
Date of Shipment:
Truck/Tractor Registration:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 6:
Date of Shipment:
Truck/Tractor Registration:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

J. LOG SHEET VOLUME INFORMATION:

Total Volume Recorded This Page (cu. yds./tons)
Total Carried Forward (cu. yds./tons):
Total Carried Forward and This Page (cu. yds./tons):

St. PS

10000704

Massachusetts Department of Environmental Protection **BWSC-012B**
Bureau of Waste Site Cleanup

BILL OF LADING (pursuant to 310 CMR 40.0030)

SUMMARY SHEET _____ OF _____

Release Tracking Number

I. LOAD INFORMATION:	Signature of Transporter Representative:	Receiving Facility/Temporary Storage Representative:
Load 1:		
Date of Shipment: 3/30/07	Time of Shipment: 7:25 ☑ AM ☐ PM	Date of Receipt: 3/30/07 Time of Receipt: ☑ AM ☐ PM
Truck/Tractor Registration: 55502 MA	Trailer Registration (if any):	Load Size (cu. yds./tons):
Load 2:	Signature of Transporter Representative:	Receiving Facility/Temporary Storage Representative:
Date of Shipment: 3/30/07	Time of Shipment: 12:05 ☑ AM ☐ PM	Date of Receipt: 3/30/07 Time of Receipt: ☐ AM ☐ PM
Truck/Tractor Registration:	Trailer Registration (if any):	Load Size (cu. yds./tons): 18.06
Load 3:	Signature of Transporter Representative:	Receiving Facility/Temporary Storage Representative:
Date of Shipment:	Time of Shipment: ☐ AM ☐ PM	Date of Receipt: Time of Receipt: ☐ AM ☐ PM
Truck/Tractor Registration:	Trailer Registration (if any):	Load Size (cu. yds./tons):
Load 4:	Signature of Transporter Representative:	Receiving Facility/Temporary Storage Representative:
Date of Shipment:	Time of Shipment: ☐ AM ☐ PM	Date of Receipt: Time of Receipt: ☐ AM ☐ PM
Truck/Tractor Registration:	Trailer Registration (if any):	Load Size (cu. yds./tons):
Load 5:	Signature of Transporter Representative:	Receiving Facility/Temporary Storage Representative:
Date of Shipment:	Time of Shipment: ☐ AM ☐ PM	Date of Receipt: Time of Receipt: ☐ AM ☐ PM
Truck/Tractor Registration:	Trailer Registration (if any):	Load Size (cu. yds./tons):
Load 6:	Signature of Transporter Representative:	Receiving Facility/Temporary Storage Representative:
Date of Shipment:	Time of Shipment: ☐ AM ☐ PM	Date of Receipt: Time of Receipt: ☐ AM ☐ PM
Truck/Tractor Registration:	Trailer Registration (if any):	Load Size (cu. yds./tons):

J. LOG SHEET VOLUME INFORMATION:

Total Volume Recorded This Page (cu. yds./tons)

Total Carried Forward (cu. yds./tons):

Total Carried Forward and This Page (cu. yds./tons):

MA Reg 100070 NH

Massachusetts Department of Environmental Protection **BWSC-012B**
Bureau of Waste Site Cleanup

BILL OF LADING (pursuant to 310 CMR 40.0030)

SUMMARY SHEET 2 OF _____

Release Tracking Number: [ ] - [ ]

I. LOAD INFORMATION:

Load 1:
Date of Shipment: 3/30/07
Time of Shipment: 7:05 ☑ AM ☐ PM
Truck/Tractor Registration:
Trailer Registration (if any):
Signature of Transporter Representative:
Receiving Facility/Temporary Storage Representative:
Date of Receipt: 3/30/07
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 2:
Date of Shipment: 3/30/07
Time of Shipment: 11:45 ☐ AM ☐ PM
Truck/Tractor Registration:
Trailer Registration (if any):
Signature of Transporter Representative:
Receiving Facility/Temporary Storage Representative:
Date of Receipt: 3/30/07
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons): 19.12

Load 3:
Date of Shipment:
Time of Shipment: ☐ AM ☐ PM
Truck/Tractor Registration:
Trailer Registration (if any):
Signature of Transporter Representative:
Receiving Facility/Temporary Storage Representative:
Date of Receipt:
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 4:
Date of Shipment:
Time of Shipment: ☐ AM ☐ PM
Truck/Tractor Registration:
Trailer Registration (if any):
Signature of Transporter Representative:
Receiving Facility/Temporary Storage Representative:
Date of Receipt:
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 5:
Date of Shipment:
Time of Shipment: ☐ AM ☐ PM
Truck/Tractor Registration:
Trailer Registration (if any):
Signature of Transporter Representative:
Receiving Facility/Temporary Storage Representative:
Date of Receipt:
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 6:
Date of Shipment:
Time of Shipment: ☐ AM ☐ PM
Truck/Tractor Registration:
Trailer Registration (if any):
Signature of Transporter Representative:
Receiving Facility/Temporary Storage Representative:
Date of Receipt:
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

J. LOG SHEET VOLUME INFORMATION:
Total Volume Recorded This Page (cu. yds./tons)
Total Carried Forward (cu. yds./tons):
Total Carried Forward and This Page (cu. yds./tons):

Revised 10/3/94

AE O'Conn 100070NH

Massachusetts Department of Environmental Protection **BWSC-012B**
Bureau of Waste Site Cleanup

BILL OF LADING (pursuant to 310 CMR 40.0030)

Release Tracking Number ☐ - ☐

SUMMARY SHEET _____ **OF** _____

I. LOAD INFORMATION:

Load 1:
Date of Shipment: 3-30-07
Truck/Tractor Registration: 72061
Signature of Transporter Representative: [signature]
Time of Shipment: 0638 ☑ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative: [signature]
Date of Receipt: 3/30/07
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons): 15.40

Load 2:
Date of Shipment: 3-30-07
Truck/Tractor Registration: 72061
Signature of Transporter Representative: [signature]
Time of Shipment: 1126 ☑ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative: [signature]
Date of Receipt: 3/30/07
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons): 18.69

Load 3:
Date of Shipment:
Truck/Tractor Registration:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt:
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 4:
Date of Shipment:
Truck/Tractor Registration:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt:
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 5:
Date of Shipment:
Truck/Tractor Registration:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt:
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 6:
Date of Shipment:
Truck/Tractor Registration:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt:
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

J. LOG SHEET VOLUME INFORMATION:
Total Volume Recorded This Page (cu. yds./tons)
Total Carried Forward (cu. yds./tons):
Total Carried Forward and This Page (cu. yds./tons):

Revised 10/3/94

St. Pierre 10000 TONS

Massachusetts Department of Environmental Protection **BWSC-012B**

Bureau of Waste Site Cleanup

BILL OF LADING (pursuant to 310 CMR 40.0030)

SUMMARY SHEET _____ **OF** _____

Release Tracking Number: ☐ - ☐

I. LOAD INFORMATION:

Load 1:
Date of Shipment: 3/30/07
Truck/Tractor Registration: N.H. 4062AR
Signature of Transporter Representative:
Time of Shipment: 7:20 ☑ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: 3/30/07 Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons): 18.14

Load 2:
Date of Shipment:
Truck/Tractor Registration:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 3:
Date of Shipment:
Truck/Tractor Registration:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 4:
Date of Shipment:
Truck/Tractor Registration:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 5:
Date of Shipment:
Truck/Tractor Registration:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 6:
Date of Shipment:
Truck/Tractor Registration:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

J. LOG SHEET VOLUME INFORMATION:

Total Volume Recorded This Page (cu. yds./tons)
Total Carried Forward (cu. yds./tons):
Total Carried Forward and This Page (cu. yds./tons):

Revised 10/3/94

Skips

100070NP

Massachusetts Department of Environmental Protection **BWSC-012B**
Bureau of Waste Site Cleanup

BILL OF LADING (pursuant to 310 CMR 40.0030)

Release Tracking Number ☐ - ☐

SUMMARY SHEET _____ **OF** _____

I. LOAD INFORMATION:

Load 1:
Signature of Transporter Representative: Skip Phillips
Date of Shipment: 3/30/07
Time of Shipment: 7:25 ☐ AM ☐ PM
Truck/Tractor Registration: 55502 MA
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative: [signature]
Date of Receipt: 3/30/07
Time of Receipt: ☑ AM ☐ PM
Load Size (cu. yds./tons): 12.88

Load 2:
Signature of Transporter Representative:
Date of Shipment:
Time of Shipment: ☐ AM ☐ PM
Truck/Tractor Registration:
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt:
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 3:
Signature of Transporter Representative:
Date of Shipment:
Time of Shipment: ☐ AM ☐ PM
Truck/Tractor Registration:
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt:
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 4:
Signature of Transporter Representative:
Date of Shipment:
Time of Shipment: ☐ AM ☐ PM
Truck/Tractor Registration:
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt:
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 5:
Signature of Transporter Representative:
Date of Shipment:
Time of Shipment: ☐ AM ☐ PM
Truck/Tractor Registration:
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt:
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 6:
Signature of Transporter Representative:
Date of Shipment:
Time of Shipment: ☐ AM ☐ PM
Truck/Tractor Registration:
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt:
Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

J. LOG SHEET VOLUME INFORMATION:
Total Volume Recorded This Page (cu. yds./tons)
Total Carried Forward (cu. yds./tons):
Total Carried Forward and This Page (cu. yds./tons):

Revised 10/3/94

MA Reg 100070 NH

Massachusetts Department of Environmental Protection **BWSC-012B**

Bureau of Waste Site Cleanup

BILL OF LADING (pursuant to 310 CMR 40.0030)

SUMMARY SHEET ____ **OF** ____

Release Tracking Number: ☐ - ☐

I. LOAD INFORMATION:

Load 1:
Date of Shipment: 3/30/07
Truck/Tractor Registration:
Signature of Transporter Representative:
Time of Shipment: 7:05 ☑ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: 3/30/07 Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons): 15.89

Load 2:
Date of Shipment:
Truck/Tractor Registration:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 3:
Date of Shipment:
Truck/Tractor Registration:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 4:
Date of Shipment:
Truck/Tractor Registration:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 5:
Date of Shipment:
Truck/Tractor Registration:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 6:
Date of Shipment:
Truck/Tractor Registration:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

J. LOG SHEET VOLUME INFORMATION:

Total Volume Recorded This Page (cu. yds./tons)
Total Carried Forward (cu. yds./tons):
Total Carried Forward and This Page (cu. yds./tons):

Revised 10/3/94

A E O'Connell 100070NH

Massachusetts Department of Environmental Protection **BWSC-012B**
Bureau of Waste Site Cleanup

BILL OF LADING (pursuant to 310 CMR 40.0030)

SUMMARY SHEET _____ **OF** _____

Release Tracking Number: ☐ - ☐

I. LOAD INFORMATION:

Load 1:
Date of Shipment: 3-30-07
Truck/Tractor Registration: 72061
Signature of Transporter Representative:
Time of Shipment: 0638 ☑ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: 3/30/07 Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons): 15.40

Load 2:
Date of Shipment: 3-30-07
Truck/Tractor Registration: 72061
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 3:
Date of Shipment:
Truck/Tractor Registration:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 4:
Date of Shipment:
Truck/Tractor Registration:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 5:
Date of Shipment:
Truck/Tractor Registration:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

Load 6:
Date of Shipment:
Truck/Tractor Registration:
Signature of Transporter Representative:
Time of Shipment: ☐ AM ☐ PM
Trailer Registration (if any):
Receiving Facility/Temporary Storage Representative:
Date of Receipt: Time of Receipt: ☐ AM ☐ PM
Load Size (cu. yds./tons):

J. LOG SHEET VOLUME INFORMATION:

Total Volume Recorded This Page (cu. yds./tons)
Total Carried Forward (cu. yds./tons):
Total Carried Forward and This Page (cu. yds./tons):

Revised 10/3/94

ATTACHMENT 2:

Filter Specification Sheet

High Capacity Groundwater Capsule

The SingleSample® High Capacity Groundwater Capsule (HCGW) is used to filter groundwater samples taken for metals analysis.

The proprietary design of the HCGW Capsule provides filtration volumes equal to or better than other high capacity devices used for low pressure, turbid sample filtration.

MEMBRANE:
.45µm hydrophilic PES.

RATING/CAPACITY:
Designed to filter 1 full liter of turbid sample water.

PRERINSE:
The HCGW Capsule uses a naturally hydrophilic PES membrane that allows flow from the very first drop. Since it is hydrophilic and contaminant free after manufacturing, the HCGW membrane does not require a prerinse. The non-hydrophilic membranes of other devices use a prerinse to remove contaminants or to prewet the filter to establish flow.

CERTIFICATION:
The SingleSample® disposable Filter Capsule is validated for 67 metals and 2 anions.

Element or Compound	LOD ppb (ug/l)	Element or Compound	LOD ppb (ug/l)
Chloride (Cl-)	50.00	Neodymium (Nd)	0.02
Sulfide (SO4-)	10.00	Nickel (Ni)	0.50
Aluminum (Al)	0.20	Niobium (Nb)	0.02
Antimony (Sb)	0.10	Osmium (Os)	0.02
Arsenic (As)	0.20	Palladium (Pd)	0.03
Barium (Ba)	0.10	Platinum (Pt)	0.08
Beryllium (Be)	0.04	Potassium (K)	25.00
Bismuth (Bi)	0.04	Praseodymium (Pr)	0.01
Boron (B)	5.00	Rhenium (Re)	0.06
Cadmium (Cd)	0.03	Rhodium (Rh)	0.02
Calcium (Ca)	25.00	Rubidium (Rb)	0.10
Cerium (Ce)	0.01	Ruthenium (Ru)	0.05
Cesium (Cs)	0.02	Samarium (Sm)	0.04
Chromium (Cr)	0.03	Scandium (Sc)	0.20
Cobalt (Co)	0.02	Selenium (Se)	7.00
Copper (Cu)	0.50	Silver (Ag)	0.03
Dysprosium (Dy)	0.04	Sodium (Na)	25.00
Erbium (Er)	0.02	Strontium (Sr)	0.20
Europium (Eu)	0.02	Tantalum (Ta)	0.02
Gadolinium (Gd)	0.04	Tellurium (Te)	0.04
Gallium (Ga)	0.04	Terbium (Tb)	0.02
Germanium (Ge)	0.05	Thallium (Tl)	0.05
Gold (Au)	0.05	Thorium (Th)	0.02
Hafnium (Hf)	0.03	Thulium (Tm)	0.01
Holmium (Ho)	0.01	Tin (Sn)	0.20
Indium (In)	0.02	Titanium (Ti)	0.05
Iridium (Ir)	0.06	Tungsten (W)	0.20
Iron (Fe)	1.00	Uranium (U)	0.02
Lanthanum (La)	0.01	Vanadium (V)	0.03
Lead (Pb)	0.50	Ytterbium (Yb)	0.03
Lithium (Li)	0.30	Yttrium (Y)	0.02
Lutetium (Lu)	0.01	Zinc (Zn)	1.00
Magnesium (Mg)	10.00	Zirconium (Zr)	0.05
Manganese (Mn)	0.30		
Mercury (Hg)	0.05		
Molybdenum (Mo)	0.05		

© 2004 Voss Technologies. SingleSample® is a registered trademark in VT.

VALIDATED FOR 67 METALS AND 2 ANIONS.

1.800.247.6294

VOSS TECHNOLOGIES

The SingleSample® High Capacity Groundwater Capsule has been used to filter turbid groundwater samples in thousands of wells around the world.

Ultra High Capacity.

We also offer an Ultra High Capacity Groundwater Capsule for applications specifying a 700cm² pleat pack. Available by special order. Call for pricing.

ATTACHMENT 3:

Equipment Decontamination Procedure

DECONTAMINATION PROCEEDURES

Decontamination of field equipment is necessary to minimize the potential for the release of contamination beyond the exclusion zone of the site, reducing health hazards associated with the spread of contaminants; and to ensure the quality of samples by preventing cross-contamination. The following decontamination procedures are based on EPA regulations 40 CFR § 761.360, Subpart S.

REQUIRED SUPPLIES

Large Equipment Decontamination: drill rig, excavator, backhoe/loader, etc.

- Decontamination pad with a foot-print larger that the equipment to be decontaminated, and capable of retaining all removed contaminated material and wash water.
- Simple Green All Purpose Cleaner/Degreaser
- Methanol
- 2- to 5- gal manual-pump sprayer (pump sprayer material must be compatible with the solution used).
- Absorbent pads and stiff-bristle brushes that are not dissolved by the solvents/cleaners used, and that do not shred, crumble, or leave visible fragments on the surface.
- Gloves, goggles, boots, and other protective clothing that are resistant to the solvents/cleaners used.

Small Equipment Decontamination: split spoon soil sampler, bowls, dredges etc.

- 5-gal plastic buckets and/or troughs big enough to fully contain the sampling equipment.
- Simple Green All Purpose Cleaner/Degreaser
- Methanol
- 2- to 5- gal manual-pump sprayer (pump sprayer material must be compatible with the solution used.
- Absorbent pads and stiff-bristle brushes that are not dissolved by the solvents/cleaners used, and that do not shred, crumble, or leave visible fragments on the surface.
- Gloves, goggles, and other protective clothing that are resistant to the solvents/cleaners used.

PROCEDURES

Same Procedures Apply to Both Heavy Equipment Decontamination and Small Equipment Decontamination

1. Set up a decontamination pad that is large enough to fully contain the equipment to be cleaned and that will contain all wash and rinse water used.
2. **First Wash:**
   a. Cover the entire surface of equipment to be decontaminated with Simple Green All Purpose Cleaner/Degreaser. Contain and collect all cleaning solutions for proper disposal.
   b. Scrub rough surfaces with a stiff-bristle brush, adding cleaning solution such that the surface is always very wet.
      i. Wash each 1 square foot area for one minute.
      ii. Wash any surface <1 square foot for 1 minute.
   c. Wipe smooth surfaces with a cleaning solution soaked disposable absorbent pad
      i. Wash each 1 square foot area for one minute.
      ii. Wash any surface <1 square foot for 1 minute.
   d. Mop up or absorb the residual cleaner solution and suds from all surfaces with clean disposable, absorbent pads until the surface appears dry. *Note: This cleaning should remove any residual dirt, dust, grime, or other absorbent materials left on the surface during the first wash.*
3. **First Rinse:**
   a. Rinse off the wash solution with 1 gallon of clean water per square foot of equipment and capture the rinse water.
   b. Mop up the wet surface with clean, disposable, absorbent pad until the surface appears dry.
4. **Second Wash:**
   a. Cover the entire surface with methanol – contain and collect any runoff solvent for disposal.
   b. Scrub rough surfaces with a stiff-bristle brush, adding methanol such that the surface is always very wet.
      i. Wash each square foot area for 1 minute.
      ii. Wash any surface <1 square foot for 1 minute.
   c. Wipe smooth surfaces with a methanol soaked disposable absorbent pad.
      i. Wash each square foot area for 1 minute.
      ii. Wash any surface <1 square foot for 1 minute.
   d. Mop up or absorb the residual methanol from all surfaces with clean disposable, absorbent pads until the surface appears dry.

5. **Second Rinse:**
    a. Wet the entire surface with clean methanol such that all surfaces are very wet for 1 minute and capture the rinse methanol.
    b. Wipe of the residual methanol from the surfaces using a clean, disposable absorbent pad until no liquid is visible on the surface.
6. **Documenting Decontamination:**
    a. Record equipment type, date, time in logbook and document decontamination with pictures. All decontamination documentation must be maintained for three years.
7. **Cleanup After Decontamination:**
    a. After decontamination activities are completed, collect all contaminated waters, used solvents, plastic sheeting, and disposable gloves, boots, and clothing. Place contaminated items in properly labeled drums for disposal. Liquids and solids must be drummed separately.
        i. All wash water, rinse water, methanol and decontamination solutions that have come in contact with contaminated equipment are to be handled, packaged, labeled, marked, stored, and disposed of as hazardous waste.
        ii. All solids, (i.e., plastic sheeting, scrub brushes, absorbent pads, disposable gloves, boots and clothing that have come in contact with contaminated equipment are to be handled, packaged, labeled, marked, stored, and disposed of as hazardous waste.

ATTACHMENT 4:

Dust Monitoring Plan

DUST MONITORING PROCEDURES

Dust monitoring is necessary to minimize the potential for exposure to contamination within and beyond the exclusion zone of the site, reducing health hazards, and to prevent fugitive migration of contamination.

GENERAL STANDARD OPERATING PROCEDURS

Notify Interested Parties and Plan for Emergencies

- Communicate the goals, type, and length of projects and specific behavior rules to the affected groups (onsite workers and residence).
- Have an emergency contact list (hospitals, police, etc.).
- Prevent unauthorized persons from entering the site.

Take General Protective Measures

- Ensure workers are properly trained.
- Choose the method that minimizes the amount of dust generated.
- Choose methods that protect workers, building users, passersby, and the surroundings of the remediation project.
- Use proper containers to hold excavated material.
- Use gloves and skin protection.
- Use eye goggles during windy conditions.
- Do not smoke, drink, or eat in the work area.
- Wash hands prior to breaks.

Exterior Areas

- Mark off the work areas to keep non-workers away.
- Cover any plants with heavy plastic sheeting.
- Close windows and doors near the work area.
- Cover the excavate material prior to off-site disposal.

Leave the Work Area Clean

- Put trash and debris in heavy-duty plastic bags.
- Ensure tools, equipment, and workers, are free of dust and debris before leaving the work area.
- Remind residents to stay out of the work area. When the job is complete:
    - Remove any plastic sheeting carefully, mist with water, fold dirty side in, tape shut, and dispose of it.
    - Check the work area for dust. If any dust or debris is present, then wet the area to reduce the potential for dust from being picked up by the wind.

SITE SPECIFIC PROCEDURES

Same Procedures Apply to Soil Excavation, Loading, and Backfill

1. Once the asphalt is removed and the soils are exposed, lightly spray the surface with water to prevent dust generation. Continue to monitor the soil moisture and apply water to the excavation area and the excavate material as needed, and if the soils are dry during windy conditions.
2. If site conditions become windy, and excessive dust generation is likely, stop work and apply water to the area, including any stockpiled or loaded soil in trucks.
3. During overnight work stoppage, cover the excavation and excavate material with polyethylene sheets. Once a truck has been loaded for off-site transport of the material, cover the soil within the truck with a heavy tarp.
4. Once the excavation work has been completed, shovel, sweep or wash residual soil/dust on the pavement into the excavation.
5. Dust suppression and control shall be maintained in the excavation areas, and off-site haul roads by keeping surfaces wet and clean to prevent wind-blown dust and road mud and debris from occurring during excavation. The nearest access road and access gate area shall be kept clean during excavation activities. If necessary use street sweepers and wet by sprinkling the road surfaces with a tank, gauges, pressure pump and nozzle spray bar. Water shall be dispersed through the nozzle under a minimum pressure of 20 pounds per square inch pressure gauge. Water shall be free from oil, acid and alkali or vegetative matter and shall not be salt or brackish.
6. Air monitoring shall be provided continuously during excavation activities for PM-10 in real time data. Air monitoring shall be coordinated by GEC. Handheld monitors (Thermo Scientific personal DataRAM pDR-1000AN, or similar equipment) shall be used and placed on site down gradient of the established prevailing wind direction prior to initiating excavation activities. Daily fugitive dust levels shall be recorded and assessed to determine the effectiveness of the dust suppression measures and necessary additional mitigation measures.
7. If significant airborne dust is identified, all construction activities shall be temporarily stopped until additional dust suppression (water) is applied to any open excavations or stockpiled material.
8. Organic compounds shall also be monitored during excavation activities using handheld photo ionization detectors (PID). Recorded levels of organic vapor and visual olfactory screening shall be used to determine total organic vapor (TOV) levels during excavation.

APPENDIX B

Proposed Soil Sampling Plan

Table 1
Additional Pre-Excavation Soil Sampling and Analysis

Boring	Soil Interval (feet)	Aroclor PCB Analysis	PCB Congener Analysis ^
Within and Beneath Excavation 2			
B-49A	0-1	X	X
	1-2	X	
	2-3	X	
B-50A	0-1	X	X
	1-2	X	
	2-3	X X **	
	5-7	X	
	7-9	X	
Within Excavation 3			
B-2A	0-1	X	X
	1-2	X	
	2-3	X	
	3-4	X X **	
	4-5	X	
B-16A	0-1	X	X
	1-2	X	
	2-3	X	
	3-4	X	
	4-5	X	
Remainder of Site			
B-10A	0-0.5	X	
	0.5-1	X	
	1-2	X	
	2-3	X X **	
B-11A	0-0.5	X	X X *
	0.5-1	X	
	1-2	X	
	2-3	X	
B-20A	0-0.5	X	
	0.5-1	X	
	1-2	X X **	
	2-3	X	
B-21A	0-0.5	X	X
	0.5-1	X	
	1-2	X	
	2-3	X	
B-48A	0-0.5	X X **	
	0.5-1	X	
	1-2	X	
	2-3	X	
Composite 1A (B-41A + B-42A)	0-0.5	X	
	0.5-1	X	
	1-2	X	
	2-3	X	
	3-4	X	
	4-5	X	
Composite 2A (B-44A to B-47A)	0-0.5	X	
	0.5-1	X	
Composite 5A (B-58A, B-59A, B-60A + B-61A)	0-0.5	X	
	0.5-1	X	
	1-2	X	
	2-3	X	
Composite 6A (B-51A, B-52A, B-55A, B-56A + B-57A)	0-0.5	X	X
	0.5-1	X	
	1-2	X	
	2-3	X	
	TOTAL ANALYSES	59 **	8 *

* Includes one duplicate sample
** Includes five duplicate samples

^ Analysis will be conducted for the following PCB congeners:

3,3',4,4'-TCB (77)	3,3',4,4',5,5'-HxCB (169)	2,3',4,4',5-PeCB (118)	2,3,3',4,4',5'-HxCB (157)
3,4,4',5-TCB (81)	2,3,3',4,4'-PeCB (105)	2',3,4,4',5-PeCB (123)	2,3',4,4',5,5'-HxCB (167)
3,3',4,4',5-PeCB (126)	2,3,4,4',5-PeCB (114)	2,3,3',4,4', 5 -HXCB (156)	2,3,3',4,4',5,5'-HpCB (189)

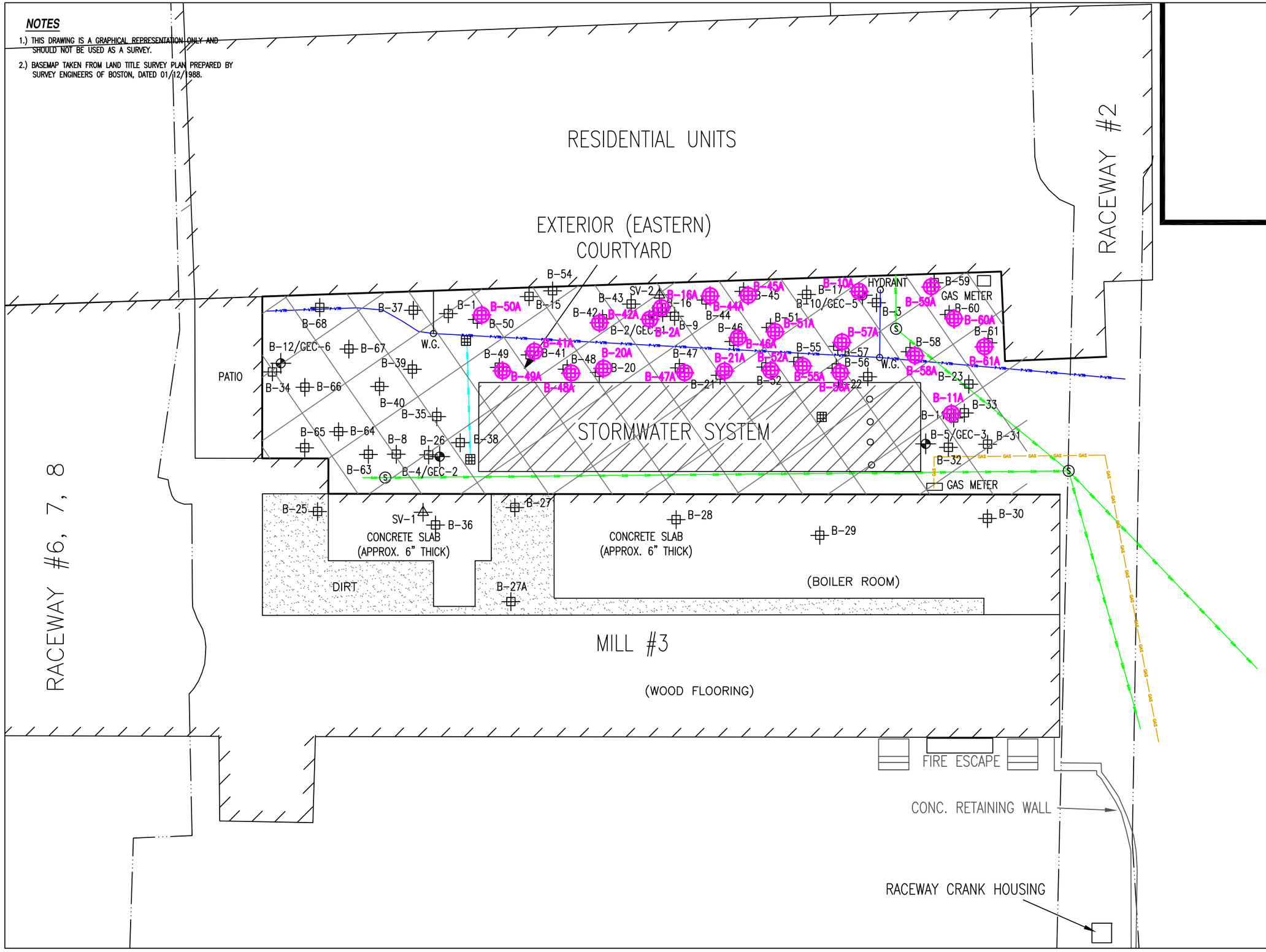
Source: USEPA, *Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-p-dioxin and Dioxin-Like Compounds* , EPA/100/R 10/005, www.epa.gov/osa

Use extraction and analytical methods approved under either Subpart N or Subpart O of 40 CFR Part 761.

NOTES

1.) THIS DRAWING IS A GRAPHICAL REPRESENTATION ONLY AND SHOULD NOT BE USED AS A SURVEY.

2.) BASEMAP TAKEN FROM LAND TITLE SURVEY PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON, DATED 01/12/1988.



Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Soil Boring/ Monitoring Well
- Soil Boring
- Catch Basin
- Wall–Mounted Transformer
- Soil Vapor Point
- Proposed Soil Boring

Proposed Soil Boring Site Plan
(Eastern Courtyard with Grid Overlay)

Boott Mills
130 John Street
Lowell, Massachusetts

GEC Project Number 911-3117
GEC File Number 081413A

FIGURE 1

SCALE 0 10' 20'

N

ATTACHMENT 2

Conceptual Site Model, Baseline Method 3 Risk Characterization and Derivation of Cleanup Standards for PCBs and Lead, and Proposed Conditions for Notice of Activity and Use Limitation

Conceptual Site Model, Baseline Method 3 Risk Characterization, Derivation of Clean-up Standards for PCBs and Lead, and Proposed Conditions for a Notice of Activity and Use Limitation

Boott Mills – Exterior Courtyard PCB Release

130 Foot of John Street

Lowell, Massachusetts

MADEP RTN: 3-26688

July 1, 2014

Goldman Environmental Consultants, Inc. (GEC) has completed a Method 3 Risk Characterization related to the release of polychlorinated biphenyls (PCBs) and metals, including lead and nickel, within the outer (also called exterior) courtyard of the former Boott Mills facility at 130 Foot of John Street in Lowell, Massachusetts. The outer or exterior courtyard is located on the eastern portion of the subject property.

The disposal site includes releases associated with both courtyards located at the property. The second courtyard is located on the western portion of the property and is entirely enclosed by the mill buildings. It is called the inner courtyard. A separate Method 3 Risk Characterization has been conducted for the release (i.e., lead) associated with the second courtyard.

A Method 3 Risk Characterization is a site-specific risk assessment conducted to evaluate the potential for risk of harm to health, safety, welfare and the environment. This risk assessment was conducted following the Massachusetts Department of Environmental Protection's (MADEP) risk assessment policy and guidance documents. This risk assessment assumes the property will be accessed by residents, commercial workers, construction workers and utility workers. The Merrimack River and the Merrimack Canal are identified as potential environmental receptors.

Provided below in Section 1.0 is the Site Description, which will be used to identify potential receptors, exposure points and exposure pathways. Section 2.0 contains the Conceptual Site Model. Section 3.0 contains the Method 3 Risk Characterization. Section 4.0 documents the derivation of Site-specific soil clean-up standards for key contaminants of concern (COC) (i.e., PCB and lead). Section 5.0 provides the conclusions and recommendations of the Risk Characterization.

1.0 Site Description

The property is located at 130 Foot of John Street and consists of a 1.7-acre parcel that is occupied by three adjoining mill buildings identified as Mill buildings 3, 4, and 5. The longitude and latitude of 130 Foot of John Street, Lowell, MA are 42°38'54" north and 71°18'29" east/west. The Universal Transverse Mercator (UTM) coordinates are 310807 meters east and 4724354 meters north. Currently the property buildings contain 39 occupied residential condo units, 78 finished apartments, of which 74 are occupied, 4,000 square feet of occupied commercial space, and 39,000 square feet of unfinished commercial space. The current usage of the surrounding Mill buildings is mixed usage consisting of residential, office, commercial, museum and empty space

The Site Locus is provided as Figure 1. The MADEP Site Scoring Map, showing 500-foot and ½-mile radii, is provided as Figure 2. The Site Plans are provided as Figures 3, 3A, 3B, 3C and 3D. The groundwater flow map is provided as Figure 4. The distribution of PCBs in soils of the exterior courtyard is depicted in Figures 5A to 5E. The distribution of lead in soils of the exterior courtyard is depicted in Figures 6A and 6B. The soil excavation boundaries to achieve a 50 mg/kg PCB cleanup standard are provided in Figure 7A. The soil excavation boundaries to achieve a 10 mg/kg PCB cleanup standard are provided in Figure 7B. All figures are located in the report to which this Method 3 Risk Characterization is appended.

No schools or day cares are known to be located within 500 feet of the property. Institutions are defined at 310 CMR 40.0006 as any publicly or privately owned hospital, health care facility, orphanage, nursing home, convalescent home, educational facility or correctional facility, where such facility in whole or in part provides overnight housing. No institutions are known to be located within 500 feet of the property.

Natural resource areas include: (1) all surface waters, including wetlands, vernal pools, ponds, lakes, streams, rivers and reservoirs; (2) drinking water supplies consisting of Zone II areas, Interim Wellhead Protection Areas, Zone A areas, Potentially Productive Aquifers, and private wells; (3) Areas of Critical Environmental Concern (ACEC); (4) Sole Source Aquifers; (5) local, state and/or federal protected open space; (6) fish habitats; and (7) habitats of Species of Special Concern or Threatened or Endangered Species.

The Merrimack River abuts the property to the north and the Merrimack Canal abuts the property to the west. Other canals located within ½-mile of the disposal site include, the Northern Canal, the Hamilton Canal, and the Eastern Canal. The Concord River is located approximately ½-mile southeast of the disposal site.

The Merrimack River generally flows from northwest to southeast in the vicinity of the property. In the vicinity of the disposal site, the Merrimack River is a Class B (Warm Water,

Treated Water Supply, CSO) water body according to the Massachusetts Surface Water Quality Standards [314 CMR 4.00] for unlisted waters. Class B water bodies are designated as a habitat for fish, other aquatic life and wildlife, and for primary and secondary contact recreation. Class B (Warm Water) water bodies are subject to dissolved oxygen and temperature criteria for warm water fisheries. Class B (Treated Water Supply) water bodies denotes those Class B waters that are used as a source of public water supply after appropriate treatment. Class B (CSO) water bodies occasionally are subject to short-term impairment of swimming or other recreational uses due to untreated combined sewer overflow discharges in a typical year, and the aquatic life community may suffer adverse impact yet is still generally viable.

Based on a review of the MADEP Site Scoring Map (Figure 2), the disposal site is located within a 100-year flood plain. Other 100-year flood plains are located within ½-mile of the disposal site along the Merrimack River, the Eastern Canal, the Hamilton Canal and the Concord River. A Natural Heritage and Endangered Species Program (NHESP) estimated rare wetland habitat is located in the portion of the Merrimack River that abuts the property. Protected Open Spaces are located approximately 500-feet southeast, 500-feet north, ¼-mile southwest, ¼-mile southeast, ½-mile west, ½-mile southwest, ½-mile east and ½-mile north of the property.

The property and surrounding areas are serviced by the municipal potable water supply. Based on the MADEP Site scoring map, the property is not located within a potential or actual drinking water source area. No private water supply wells are located nearby.

2.0 Conceptual Site Model and MCP Regulatory History

The property addressed as 130 Foot of John Street, Lowell, Massachusetts is owned by Boott Mill Developer LLC and contains three adjoining buildings (Building 3, Building 4 and Building 5) utilized as residential condos, residential apartments, and occupied and unfinished commercial space. The property is depicted on Figure 3. The property is located in an area zoned "Down Town Mixed Use". The remainder of the property consists of two paved courtyards located on the eastern and western ends of the buildings. The eastern courtyard is an exterior (also called outer) courtyard and the western courtyard is an enclosed (also called inner) courtyard. The exterior and enclosed courtyards are depicted on Figure 3. The property is part of the former Boott Mill Complex. It is bounded by the Merrimack River to the north and Boott Mill Buildings 6, 8 and 9 abut the property to the south. Foot of John Street abuts the property to the east. Boott Mill Buildings 2, 1 and 7 are located east of the property, across Foot of John Street. The Merrimack Canal abuts the property to the west. The apparent direction of

groundwater flow across the property is to the north, toward the Merrimack River, as depicted in Figure 4.

Historical information indicates that the Site was developed prior to 1892. The Site was occupied by the Boott Mills Cotton Goods manufacturer from 1919 to 1955. Since 1955, industrial and commercial activities / operators at the Site have included, but were not limited to, wooden box manufacturer, clothing manufacturer, cleaner, textiles, restaurant, dress company, plastic container manufacturers, machine and engineering shop, silk screening companies, electronic assembly company, welding shop, vinyl and cotton lamination companies, bearings manufacturer, various commercial uses and residential.

In November 2006, a release of PCBs was discovered in the exterior (outer or eastern) courtyard by TRC Environmental (TRC) of Lowell, MA. TRC was retained by general contractor Consigli Construction, who observed petroleum odor when advancing test pits in the exterior courtyard. Environmental Compliance Services, Inc. (ECS) submitted a Release Abatement Measure (RAM) Plan to the MADEP on December 8, 2006. The RAM Plan provided details on the planned excavation of PCB-contaminated soils. The detection of PCBs in soils at 22.73 mg/kg exceeded its RCS-1 Reportable Concentration (2 mg/kg), and was reported to the MADEP as a 120-day reportable condition on March 20, 2007. Benzo(a)pyrene was also detected at a level (6.23 mg/kg) greater than its RCS-1 Reportable Concentration (2 mg/kg); however, it was not reported to MADEP, perhaps because it was present at a level below its published background concentration (7 mg/kg) for soils associated with fill containing coal ash or wood ash. The PCB release condition was assigned Release Tracking Number (RTN) 3-26688.

Soil excavation was conducted on March 29 and 30, 2007. Excavated soils were directly loaded onto trucks and transported to Turnkey Landfill in Rochester, New Hampshire. The total amount of soils transported off-Site for disposal was 209 tons. On April 5, 2007, nine soil samples were collected from the sidewalls and bottom of the excavation for confirmatory analysis. PCB levels ranged from none detected to 6.15 mg/kg. PCBs, polycylic aromatic hydrocarbons (PAHs) and lead were detected at levels above Method 1 S-1 standards. No separate release notification appears to have occurred for the PAHs and lead. On April 30, 2007, the excavation was backfilled with clean soils and gravel. ECS submitted a RAM Completion Report on January 29, 2008, on behalf of Boott Mill Development Corporation. A stormwater management system was installed in the excavated area subsequent to the RAM.

On July 17, 2008, MADEP issued a Notice of Noncompliance (NON) to "Boott Cotton Mill Development Corporation" (a former owner of the property) for not submitting a Response Action Outcome (RAO) Statement or Tier Classification Submittal within one year of release notification. At that time, RTN 3-26688 was identified as class Tier 1D (for default).

In February 2010 GEC was contracted by an entity interested in purchasing the property to conduct a due diligence Phase I Environmental Site Assessment (ESA) for the Site. The Phase I ESA dated, February 25, 2010, identified: (1) the active disposal site associated with RTN 3-26688 and the known release of PCBs, petroleum hydrocarbons and suspected release of metals to soil in the vicinity of the exterior (eastern) courtyard; and (2) a potential release of oil or hazardous materials (OHM) from an existing wall-mounted transformer and a former maintenance shop located within the enclosed (western) courtyard.

On October 14, 2010, Boott Properties, LLC purchased the property in a foreclosure sale. On January 19, 2011, MADEP issued a Notice of Responsibility to Boott Properties LLC. On October 28, 2011, MADEP issued a NON to Boott Properties LLC for failing to submit a RAO Statement, Tier Classification submittal or Downgradient Property Status submittal.

In June and September, 2011, due diligence subsurface investigations were conducted by GEC to determine the extent and magnitude of contamination across the Site. Subsurface investigations included the installation of several soil borings and monitoring wells, groundwater gauging and sampling activities and the collection of soil vapor samples. Groundwater analytical data are summarized in Tables 1.1 to 1.5, soil analytical data are summarized in Tables 2.1 to 2.3, and soil vapor analytical data are summarized in Table 3. Depth to groundwater and groundwater elevation measurements are provided in Table 4. The tables are provided in the report to which this risk characterization is attached.

The recent discovery of contaminants not reported to MADEP under RTN 3-26688 was reported by GEC to Boott Mill Developer LLC, a new party interested in purchasing the property, in December 2011. The release triggered a 120-day reporting obligation pursuant to 310 CMR 40.0315(1) for lead concentrations in soil; however, since Boott Mill Developer LLC was not the owner at that time they were under no obligation to notify. GEC prepared a Phase II Limited Subsurface Investigation Report, dated December 8, 2011, summarizing the latest subsurface investigations along with conclusion and recommendations. The report was ultimately provided to Boott Properties, LLC (the owner at that time) and they were notified of their reporting obligations. Boott Properties, LLC then retained GEC to report the release to the MADEP. The MADEP was notified of the condition on February 22, 2012, using Release Notification Form BWSC-103, which was submitted electronically through eDEP. This release incident was assigned RTN 3-30667. This RTN was linked to RTN 3-26688 during Tier Classification in April 2012.

On March 20, 2012, Boott Properties LLC entered into Administrative Consent Order with Penalty (ACOP) (ACOP-NE-12-3A001) with MADEP. The ACOP required the submittal of the Phase I Initial Site Investigation and Tier Classification Submittal by November 30, 2012. The Phase I Initial Site Investigation Report, Phase II Scope of Work and Tier Classification

Submittal was submitted to MADEP on April 11, 2012. The Site was classified as a Tier 2 disposal Site.

A RAM Plan was submitted to MADEP and to Region I of the U.S. Environmental Protection Agency (USEPA Region I) on August 2, 2012 by GEC on behalf of Boott Properties, LLC. On September 27, 2012, Boott Mill Developer LLC purchased the property from Boott Properties, LLC. This RAM plan detailed the planned excavation of PCB- and lead-contaminated soils. Additional investigations were proposed prior to implementing the RAM. These investigations were conducted during October 2012. On December 3, 2012, a RAM Status Report was submitted to MADEP by GEC on behalf of Boott Properties, LLC (now the prior owner). A Tier 2 Transfer Submittal was submitted to MADEP on December 3, 2012. This Tier 2 Transfer Submittal transferred responsibility for conducting response actions from the prior owner (Boott Properties, LLC) to the current owner (Boott Mill Developer LLC). On December 18, 2012, MADEP issued a NOR to Boott Mill Developer LLC. Additional investigations were conducted during May 8 and 9, 2013 to provide sufficient data to determine the boundaries of excavation during the RAM and to obtain PCB data within each 3-meter by 3-meter section of the exterior courtyard. On June 7, 2013, two RAM Status Reports were submitted by GEC on behalf of the new property owner, Boott Mill Developer LLC. Separate RAM Status Reports were submitted for the interior and exterior courtyards.

GEC's investigations within the exterior courtyard found evidence of residual PCB contamination above the applicable MADEP Method 1 S-1 Standards (2 mg/kg at that time), with one soil sample containing PCB (124 mg/kg) at a level exceeding its Upper Concentration Limit (UCL) (100 mg/kg). PCB was also detected in four areas of the exterior courtyard at levels exceeding the >1 to 10 mg/kg limit for self-implementing clean up in High Occupancy areas where a protective cap will be installed, under the Toxic Substances Control Act (TSCA) regulations. Based on the recent subsurface investigations, GEC concludes that the remedial activities conducted by ECS as described in their January 2008 report did not completely address the release of PCBs, reportedly from a wall-mounted transformer formerly located on the northern side of the exterior courtyard. The levels of residual PCB contamination is higher than reported in the RAM Completion Report, and the vertical and horizontal extent of contamination is larger than reported in the RAM Completion Report. Figures 5A and 5B shows the levels of PCBs detected at each sampling location and depth interval for samples collected by the end of August 2013. Figure 5A provides the data for discrete samples and Figure 5B provides the data for composite samples.

During August 2013, a *RAM Plan Modification and Application for Risk-Based Cleanup of PCBs*, was submitted to USEPA Region I and to MADEP. This submittal contained the following elements: (1) plan for excavation of PCB-contaminated soils; (2) description of field

investigations; (3) Conceptual Site Model, baseline Method 3 Risk Characterization, derivation of Site-specific cleanup standards for PCBs and lead, and proposed conditions for Notice of Activity and Use Limitation; (4) Quality Assurance and Quality Control (QA/QC) Plan and Standard Operating Procedures; (5) Data Usability and Data Representativeness Evaluation; (6) feasibility evaluation of PCB remedial alternatives; (7) Soil Management Plan for used during RAM excavation; and (8) Soil Management Plan for use during Post-Class A-3 RAO soil disturbance activities.

In a letter, dated October 22, 2013, USEPA Region I provided their comments to the request for risk-based PCB cleanup under 40 CFR § 761.61(c). GEC on behalf of Boott Mill Developer LLC responded to USEPA Region I's comments in a letter dated, December 20, 2013. GEC's response letter included a field investigation plan to address the following elements: (1) the collection of soil samples from the 0-0.5, 0.5-1, 1-2 and 2-3 foot intervals for analysis of PCBs to determine if any shallow thickness contained more than 10 mg/kg PCBs; (2) the collection of soil samples from the 0-1, 1-2, 2-3, 3-4 and 4-5 foot intervals near B-2 and B-16 to determine if any one-foot thickness of soils contained levels greater than 50 mg/kg PCBs; (3) Soxhlet extraction via USEPA Method 3540; (4) analysis of soil samples for PCBs via USEPA Method 8280A; and (5) analysis of select soil samples for PCB dioxin-like congeners via USEPA Method 8270M. The soil sampling plan was provided as Table 2 in GEC's December 20, 2013 response letter to USEPA Region I. The field investigation was conducted in March 2014.

Following the completion of the field investigation and initial evaluation of the data, a determination was made that a small fraction of the PCB contamination contained the dioxin-like congeners of PCB. During subsequent discussions, USEPA Region I recommended that the PCB cleanup standard be set at 50 mg/kg, so long as justified based on a benefit-cost estimate.

Based on this new potential cleanup standard, an additional investigation was conducted to determine the volume of soils containing more than 50 mg/kg PCBs. Additional analysis of dioxin-like congeners was not conducted because the dioxin-like congeners contribute to a small portion of the risk estimates, as documented in Section 3.0, below. This additional investigation was conducted during June 2014.

The March and June 2014 field investigations are described in the *Revised Remedial Abatement Measure (RAM) Plan and Application for Risk-Based Cleanup Standard for PCB* report to which this appendix is attached. The sampling locations are depicted in Figures 3A to 3C. The distribution of PCB for samples collected during March and June 2014 are depicted on Figures 5C to 5E. The analytical data are summarized in Table 2.2.1 for PCBs, and summarized and interpreted in Tables 2.2.2 to 2.2.4 for dioxin-like congeners of PCBs. These tables and figures are contained in the report to which this Appendix is attached. Based on the results of the additional investigations and the proposed new cleanup standard, the portion of the Conceptual

Site Model related to soil contamination has been revised. In addition, revisions to the Conceptual Site Model are also made in response to USEPA Region I's comments of the initial *Remedial Abatement Measure (RAM) Plan and Application for Risk-Based Cleanup Standard for PCB*.

Soil Contamination: PCB contamination is located beneath nearly the entire exterior courtyard. At the western end of the courtyard, the level of PCB at the 0-3 foot interval was 0.25 mg/kg in B-12. At the east end of the courtyard, no PCBs were detected at any depth interval in borings B-23 or B-31. The eastern extent of soil contamination is at boring B-31, where 0.27 mg/kg PCB was detected in the 0-3 foot interval. The soil contamination extends to the south beneath Mill Building no. 3, where PCBs were detected in eight of sixteen soil samples at levels ranging from 0.16 to 0.45 mg/kg. The PCB contamination extends at least to the north wall of the exterior courtyard. No borings could be advanced beneath Mill Building no. 5, because the ground floor is finished with residential units. Soil samples obtained from a boring north of Mill Building no. 5 did not contain detectable levels of PCBs. For most of the courtyard, the vertical extent of PCB contamination is between three and seven feet below grade, except for areas of PCB contamination described below. Refer to Figures 5A to 5E for the spatial and vertical distribution of PCB in soils, based on the analytical results of discrete and composite soil samples.

At EPA Region I's request, the 0-3 foot interval soils were subdivided and analyzed for PCBs. Samples were collected from the 0-0.5, 0.5-1, 1-2 and 2-3 foot intervals. For the 0-3 foot range, the lowest levels of PCBs were usually detected in the 0-0.5 and 0.5-1 foot intervals and the highest in the 2-3 foot interval. The highest levels of PCBs were generally detected in the 2 to 5 foot interval of the courtyard. Most of the soils shallower than 2 feet are relatively clean, and n soils below 5 feet, the levels of PCBs gradually decrease. By nine feet below grade there is little to no PCB contamination.

There is uncertainty regarding the original source of the PCB release. However, the current observed distribution of PCBs reflect historic activities that resulted in the disturbance and turnover of soils within the courtyard. A historic remediation project removed some PCB soils from the courtyard. The installation of the stormwater system and installation of utility lines also resulted in the historic disturbance of soils. It appears that some clean soils were placed over the ground prior to paving the courtyard.

Select soil samples were analyzed for both PCB dioxin-like congeners and Aroclor PCBs, and the results were compared. The proportion of total Aroclor PCBs attributable to dioxin-like congeners of PCBs ranged between 0.9 and 3.4% (Table 2.2.4). The dioxin-like congeners detected were principally 2,3',4,4',5-pentachlorobiphenyl and 2,3,4,4',4'-pentachlorobiphenyl,

followed by lower concentrations of 3,3',4,4'-tetrachlorobiphenyl, 2',3,4,4',5-pentachlorobiphenyl, 2,3,4,4',5-pentachlorobiphenyl, 2,3',4,4',5,5'-hexachlorobiphenyl, 2,3,3',4,4',5-hexachlorobiphenyl and 2,3,3',4,4',5'-hexachlorobiphenyl. Each of these dioxin-like congeners had 1,2,3,7-tetrachlorodibenzo-p-dioxin (TCDD) toxicity equivalence factors (TEF) ranging from 0.00003 to 0.0001 (Table 2.2.3). For each sample analyzed for dioxin-like congeners the TCDD toxic equivalence (TEQ) was calculated by summing the product of the TEF and the concentration detected of each congener. The maximum TEQ was 1.65E-3 µg/kg or 1.65E-6 mg/kg (Table 2.2.3 and 2.2.4). The concentration of TEQ for each mg/kg Aroclor PCB in soils is estimated to be 1.22E-6 mg/kg (Table 6.4). These results indicate that a small proportion of the PCBs contain TCDD toxic equivalent PCB. Each total Aroclor PCB exposure point concentration was multiplied by the maximum TEQ per mg/kg Aroclor PCB to obtain the corresponding dioxin-like PCB (as TCDD toxic equivalent). (Table 6.4) This approach was used in lieu of obtaining separate congener PCB data for each sampling point.

There are three locations where PCBs were detected in soils at levels greater than 50 mg/kg, and these areas are identified as PCB Hot Spots. These three areas, located within the exterior courtyard, are described in detail in Section 3.5, below. The locations and depths of each PCB Hot Spot are depicted in Figure 7A. The soils of the exterior courtyard contained visible evidence of ash, gasified coal and coal. Therefore, MADEP's published background concentrations for soils associated with fill containing coal ash or wood ash are suitable for use at the Site. The following metals were detected in at least one soil sample at a level exceeding MADEP's applicable published background concentrations: barium, chromium, lead, mercury, nickel and vanadium.

Lead was detected in scattered locations throughout the exterior courtyard, at levels ranging to 1,800 mg/kg. Elevated levels of lead were present mostly within the 0-3 foot interval, but extended to 5 feet at the west end of the courtyard. No hot spot of lead contamination was identified. Refer to Figures 6A and 6B for a distribution of lead in the 0-3 and 3-7 foot intervals, respectively.

During 2011, the highest level of chromium was detected in a soil sample from B-9. To determine whether chromium is attributable to hexavalent chromium (Cr(VI)), during October 2012, two soil samples were collected from a boring (B-16) located near B-9 and analyzed for chromium, oxidation-reduction potential (ORP) and pH. No Cr(VI) was detected in either soil sample, and, based on the results of the ORP and pH analyses, the soil samples indicated a reducing condition making the presence of Cr(VI) unlikely. Therefore, chromium is assumed to be present as trivalent chromium.

Chromium, barium and nickel were detected at levels exceeding background concentrations in some 0-3 foot interval soil samples collected throughout the exterior courtyard.

Occasionally, these metals were present at levels exceeding background concentrations to depths extending to 5 feet below grade. Vanadium was detected in only one soil sample (collected from the 10-15 foot interval) at a level exceeding background.

No VOCs or VPH were detected in any soil sample. Low levels of EPH were detected, below Method 1 S-1 standards. Occasionally individual PAHs were detected at levels above MADEP's applicable background concentrations; however, in each case ash or gasified coal was observed in the sample. There is no evidence of petroleum contamination (petroleum odor, visible signs of soil staining or oil, or elevated readings during photoionization detector (PID) headspace screening). Therefore, the presence of PAHs is attributed to the ash present in the soils.

No PCBs were detected in any of the groundwater samples collected for dissolved PCB analysis. In addition, groundwater samples were collected from GEC-1, GEC-2, GEC-4, GEC-6 and GEC-7 for analysis of VOCs and from GEC-2 and GEC-6 for analysis of VPH. Little or no VPH or VOCs were detected in the groundwater samples. Based on these results, leaching of PCBs, VOCs and VPH from soils to groundwater is not a significant issue. Insufficient VOCs and VPH are present in groundwater to result in the co-solution of PCBs in groundwater.

Groundwater Contamination: Depth to groundwater ranges between 11 and 15 feet below ground surface. EPH and PCBs were detected in unfiltered groundwater, but not in filtered groundwater, which indicates that dissolved-phase EPH and PCBs are not present in groundwater at detectable levels. Although PCBs were detected in unfiltered groundwater at a level exceeding its Method 1 GW-2 standard, it was detected in groundwater samples from two monitoring wells that were recently installed and the groundwater samples were collected via bailing rather than low flow technique. Subsequent filtered and unfiltered groundwater samples collected from these two monitoring wells via low flow technique did not contain detectable levels of PCBs. These results indicate that the presence of PCBs in the original groundwater samples was likely attributable to the collection of turbid samples containing suspended soil particulates.

PAHs were consistently detected in unfiltered groundwater, but only two dissolved-phase PAHs (i.e., 0.11 µg/l benzo(b)fluoranthene and 0.079 µg/l benzo(a)pyrene) were detected in groundwater in a single groundwater sample. The PCBs and most of the PAHs detected in the exterior courtyard groundwater samples are likely attributable to the presence of soil particulates suspended in the water samples. The levels of dissolved-phase PAHs detected were very low. The presence of PAHs in soils is attributable to the presence of coal ash in the soils, which is a background condition; therefore, their presence in groundwater (due to suspension of particulates in the water sample) is also a background condition.

Dissolved-phase barium (100 μg/l) was detected in one of three groundwater samples. Dissolved-phase lead (12 μg/l) was detected in one of five groundwater samples. No PCBs, VOCs, EPH, PAHs or dissolved-phase metals were detected in the groundwater sample collected from the inner courtyard.

Soil Migration and Exposure Pathways: Currently, the contaminated soils are covered by asphalt and / or concrete pavement and building foundations. In the future, a protective barrier (such as a TSCA cap over the exterior courtyard soils and a building foundation over the Mill Building #5 soils) is presumed to be maintained over these soils. There is no mechanism for surficial runoff of these soils toward the Merrimack River, or for tracking of soils or dust generation. The contaminants present in soils are poorly soluble in water and non-volatile. They would tend to remain adsorbed to soils, and not to leach to groundwater or volatilize into the vadose zone. Little to no VOCs or VPH, which might enhance the solubility of PCBs in groundwater, is present in soils or groundwater. The exterior courtyard is not an ecological resource area, is covered and maintained with a protective barrier via a Notice of Activity and Use Limitation, and future gardening of edible produce is presumed prohibited through best management practices. Therefore, bioconcentration or bioaccumulation of the OHM, including PCBs, in biota is unlikely to occur. Based on the foregoing, the soil contamination is not a source of contamination to other media and is unlikely to migrate away from its current location. The existing groundwater and soil vapor data support this conclusion.

Under current conditions, there is no mechanism for human exposure to the soil contamination under the pavement or building foundation, except perhaps during periods of utility repair work. Exposure to the soils may occur in the future, if the pavement or building foundation is removed or during future construction activities. During such times, exposure pathways may include direct contact to the soils, incidental ingestion of soils and inhalation of dusts generated during soil disturbance activities.

Soil Vapor / Vapor Intrusion into Indoor Air / Vapor in Utility Trench or Construction Excavation: No VPH or VOCs were detected in groundwater or soils of the exterior courtyard. The only OHM detected in groundwater at a level exceeding Method 1 GW-2 standards is PCB. PCBs were detected in a groundwater sample collected from GEC-1 located in PCB Hot Spot #3 and from GEC-2 located in PCB Hot Spot #2, shortly after well installation via bailing. Subsequent PCB analyses of filtered and unfiltered groundwater samples collected via low-flow technique from GEC-1 and GEC-2 did not result in the detection of PCBs. No dissolved-phase PCBs were detected in groundwater. However, because PCBs are present in both soils and groundwater near Mill Buildings no. 3 and 5, soil vapor points were installed and

soil vapor samples collected for analysis of PCBs via USEPA Method TO-10A. One soil vapor point was installed in Mill Building no. 3, near PCB Hot Spot #2 and one soil vapor point was installed in the exterior courtyard within PCB Hot Spot #3 near GEC-1. The soil vapor sampling program is described in detail in the Phase I Initial Site Investigation report. No PCBs were detected in either soil vapor sample. Based on the foregoing, vapor intrusion of VOCs, VPH or PCBs into the indoor air of either building is not a pertinent migration pathway for the Site. In addition, volatilization of VOCs, VPH or PCBs into a utility trench or construction excavation is not a pertinent migration pathway.

Groundwater Migration and Exposure Pathways: Based on the available groundwater data, there is no significant dissolved-phase contamination associated with the Site. Dissolved-phase contamination was occasionally detected, but no plume of dissolved-phase groundwater contamination is emanating from the exterior courtyard and migrating towards the Merrimack River. Dissolved-phase barium, lead, benzo(a)pyrene and benzo(b)fluoranthene were occasionally detected (no more than once each). Acetone was detected in one groundwater sample collected near in the Merrimack River, at a very low level (11 μg/l). No VOCs were detected in any other soil or groundwater sample collected from the Site. No non-aqueous phase liquid or free phase product has been encountered at the Site.

The Merrimack River abuts the Site and generally flows from northwest to southeast in the vicinity of the Site. Canals associated with the Merrimack River are located proximal to the Site. Based on an evaluation of the available groundwater data, almost all the OHM detected in groundwater appear to be adsorbed to soils and are not present in a dissolved state. As a result, groundwater contamination is unlikely to migrate with groundwater flow and discharge to the Merrimack River or its associated canals. Therefore, a significant impact to surface water is unlikely to be occurring or to occur in the future. The levels of dissolved-phase OHM detected in groundwater will be evaluated further during Stage 1 Environmental Screening. No private or public water supply well is located near the Site; therefore, a water supply well is unlikely to intercept contaminated groundwater. Groundwater as a source of vapor is evaluated above.

Human exposure to groundwater is unlikely to occur, because the depth to groundwater is approximately 11 to 15 feet below grade, which is too deep for utility workers to contact the groundwater during a utility repair project. In addition, if groundwater is encountered during a future construction project, de-watering of the excavation would likely minimize human contact to the groundwater. No water supply wells are located proximal to the Site; therefore, human exposure to well water is unlikely to occur. Significant migration of contamination to the Merrimack River is unlikely to occur; therefore, contact with surface water or sediments or

ingestion of fish or other aquatic organisms are unlikely to result in exposure to Site-related contamination.

Human and Environmental Receptors / Site-Specific Risk Characterization Assumptions: Actual and potential receptors, which may be exposed to OHM associated with the outer courtyard release, include the following: (1) current and future residents, including children; (2) current and future commercial or industrial workers; (3) utility workers; and (4) future construction workers. Exposure pathways for soils include direct contact and incidental ingestion during a construction or utility project. For air, the exposure pathway is inhalation of dusts during a utility or construction project. Little to no volatile contamination exists in soils or groundwater at the Site; therefore, inhalation of vapors from a utility trench or construction excavation is not an exposure pathway for the Site. The depth to groundwater is eleven feet or more below grade; therefore, for a utility project, a utility worker is assumed not exposed to groundwater via direct contact. For a future construction project, dewatering of the excavation is presumed to occur if groundwater enters the excavation, which would limit potential exposure to groundwater to occasional acute exposure. The vapor intrusion pathway was eliminated as a migration pathway for this Site. Therefore, inhalation of vapors in indoor air is not an exposure pathway. The Merrimack River and the Merrimack Canal are located adjacent to the Site. These environmental resource areas are identified as potential environmental receptors.

Assumptions were used in the risk characterization to eliminate exposure pathways and to mitigate potential exposure to OHM associated with the outer courtyard release. These assumptions include the following: (1) no single family residential use; (2) no gardening of edible produce; (3) for multi-family residential, child's school, child's daycare, institutional, playground or active recreational use, soils must remain covered with one or more protective barriers except temporarily during a construction or utility repair project; (4) the protective barrier(s) must be periodically inspected and maintained in an intact condition; (5) during a construction or utility project when soils are disturbed, work must be conducted in accordance with a Site-specific Soil Management Plan, which must include provisions to minimize contact to soils by children; and (6) following completion of the construction or utility project, soils must be returned to the Site and re-covered with one or more protective barriers or transported off-Site in accordance with pertinent local, state and federal regulations. There are no limits specific to commercial or industrial use.

3.0 METHOD 3 RISK CHARACTERIZATION

The following Risk Characterization was prepared in accordance with the Massachusetts Contingency Plan (MCP), as revised through 6/26/2009 [310 CMR 40.0900], guidance provided

by MADEP in *Guidance for Disposal Site Risk Characterization in Support of the Massachusetts Contingency Plan* (updated in 1996), and subsequent technical updates. The purpose of this Risk Characterization is to determine if conditions are consistent with a finding of No Significant Risk of Harm; one of the elements required of a Class A or B Response Action Outcome; or if additional response actions are required.

To characterize risk of harm to health, public welfare and the environment, a Method 3 Risk Characterization was conducted. The Method 3 Risk Characterization relies on detailed information about the Site, the nature, magnitude and extent of OHM in each affected media, migration pathways of the OHM, and potential exposures to human and environmental receptors under all current and reasonably foreseeable Site activities and uses. Potential risks of harm to human health, public welfare and the environment are evaluated independently. In addition, a separate characterization of risk of harm to safety was conducted.

3.1 Site and Receptor Information

3.1.1 Selection of Method to Characterize Risk of Harm to Human Health, Public Welfare, and the Environment

According to the MCP, the method used to characterize risk is determined based on the availability of promulgated soil and groundwater standards, the media impacted, the presence of environmental receptors, the potential for migration to other media, and the bioaccumulation potential of Site-specific contaminants.

A Method 3 Risk Characterization, which may be used to characterize the risk of harm to health, public welfare, and the environment for any disposal site, was selected. A Method 3 Risk Characterization uses a cumulative risk approach, which compares Site-specific information to the following:

(1) a cumulative cancer risk limit, which is an Excess Lifetime Cancer Risk (ELCR) of one-in-one hundred thousand (1.0E-05);
(2) a cumulative non-cancer risk limit, which is a Hazard Index (HI) equal to one (1.0);
(3) promulgated health, safety, public welfare and environmental standards; and
(4) Upper Concentration Limits and other criteria, as described at 310 CMR 40.0990 - 40.0999.

A Method 3 Risk Characterization was selected because levels of PCBs and two metals (i.e., lead and perhaps nickel) in soils exceed applicable Method 1 soil standards. In addition, a Method 3 Risk Characterization is an applicable risk characterization method for any site.

3.1.2 Identification of Oil and/or Hazardous Material for Risk Characterization

According to the *Guidance for Disposal Site Risk Characterization,* chemicals detected at a disposal site should be considered COC and should be carried throughout the risk assessment process unless one of the following conditions is true: (1) the chemicals are present at a low frequency of detection and in low concentrations; (2) the chemicals are present at levels consistent with background concentrations for the area and there is no evidence that their presence is related to activities at the site, or; (3) the chemicals are field or laboratory contaminants. Based on the results of the investigations conducted at the Site, soil and groundwater are the media known or suspected to be impacted by OHM.

Analyses were conducted for three environmental media at this Site: (1) groundwater (Tables 1.1 to 1.5); (2) soils (Tables 2.1 to 2.3); and (3) soil vapor (Table 3). Two soil vapor samples were collected from the Site for analysis of PCBs via USEPA Method TO-10A. No PCBs were detected in the soil vapor samples, with detection limits up to 0.049 $\mu g/m^3$, which is less than the calculated sub-slab soil gas screening value (0.70 $\mu g/m^3$) derived using USEPA's inhalation Reference Concentration (0.01 $\mu g/m^3$) for an excess lifetime cancer risk of 1E-06 [USEPA Integrated Risk Information System (IRIS)] and MADEP's soil vapor to indoor air attenuation factor of 70 [MADEP's *Interim Final Vapor Intrusion Guidance*, updated March 2013] (Table 3). No significant volatile OHM were detected in either soil or groundwater samples. Based on the foregoing, vapor intrusion into indoor air is not a significant migration pathway for this Site. Indoor air is eliminated as a media of concern. Groundwater and soil are identified as media of concern.

For this risk characterization, the COC for groundwater and soil were evaluated and identified in Tables 5.1 to 6.4.

PCBs, EPH subsets, PAHs, barium, lead and acetone were detected in groundwater, as documented in Tables 5.1 to 5.5. No dissolved-phase PCBs or EPH subsets were detected in groundwater. Most PAHs were not detected in dissolved-phase in groundwater. The presence of PCBs, EPH subsets, lead and most PAHs in unfiltered groundwater samples is most likely due to their presence in soils. The presence of PAHs is attributable to background concentrations, but the PAHs were retained as groundwater COC to be conservative. All OHM detected in groundwater were identified as COC for the purposes of comparing Site conditions to the groundwater Upper Concentration Limits.

Two dissolved-phase PAHs (i.e., benzo(a)anthracene and benzo(b)fluoranthene) were detected at very low levels in groundwater of monitoring well GEC-1 (Table 5.2). Two dissolved-phase metals (i.e., barium and lead) were detected in groundwater of monitoring well

GEC-1 (Table 5.3). Acetone was detected in monitoring well GEC-7 (Table 5.5). Given the limited number of wells impacted and relatively low levels detected, a significant impact to the Merrimack River is unlikely to occur. However these five OHM were retained as potential surface water COC for Stage 1 Environmental Screening.

PCBs, EPH subsets, PAHs and metals were detected in soils. During soil boring, coal ash, gasified coal and coal pieces were observed in the soil throughout the courtyard area. For metals and PAHs detected in soils, the MADEP's background concentrations for soils associated with fill containing wood or coal ash was identified as appropriate for the Site. No published background concentrations exist for PCBs or EPH subsets; therefore, the background concentrations for these OHM are identified as zero.

The OHM detected in soils were evaluated to identify soil COC for the risk assessment, as documented in Tables 6.1.1 for EPH and PAHs, 6.2.1 for PCBs and 6.3.1 for metals. For metals and PAHs, this entailed comparing the maximum level detected to the applicable published background concentration, as documented in Tables 6.1.1 and 6.3.1. The following EPH subsets were detected in soils and were included as COC: C19-C36 aliphatic hydrocarbons and C11-C22 aromatic hydrocarbons.

PCBs were detected in soils and are included as COC. One hundred eighty-five soil samples were collected for analysis of PCBs. Aroclors 1242, 1248 and 1252 were detected in one, ninety-eight and one hundred eight samples, respectively. A subset of eight soil samples, including one duplicate, were collected for analysis of both PCB Aroclors and PCB congeners. For these samples, the total dioxin-like congeners accounted for between <0.15 and 3.4 percent of the total PCBs [Table 2.2.4]. The TCDD Toxic Equivalence for each sample ranged between 4.76E-8 and 1.65E-6 mg/kg [Table 2.2.3 and 2.2.4]. The fraction of TCDD Toxic Equivalence per mg/kg PCBs in the reference soil sample was approximately 1.22E-06 mg/kg, which indicates that relatively little TCDD dioxin-like congeners exist in the soils [Table 6.4]. However, the TCDD dioxin-like PCBs were retained as a separate COC.

PAHs were detected in soils but were detected at levels less than or comparable to MADEP's published background samples for soils containing coal ash or wood ash, as documented on Table 6.1.1. Out of 18 soil samples, three soil samples had levels of one or more PAHs that exceeded the applicable published background concentrations. Based on the boring logs, the soil intervals with the elevated PAH levels contained ash and / or gasified coal. No odors, elevated PID readings or soil staining were observed in these soils. Based on these findings, the PAHs were determined to be present at levels consistent with background conditions.

The following metals were detected in one or more soil samples: antimony, arsenic, barium, cadmium, chromium, lead, mercury, nickel, vanadium and zinc. As documented in Table

6.3.1, the following metals were always detected at levels consistent with or less than MADEP's published background concentrations: antimony, arsenic, beryllium, cadmium and zinc. These metals were eliminated as soil COC.

For chromium, as of September 1, 2011, the maximum concentration (48 mg/kg) of chromium was detected at B-9 0-3 foot interval. On October 5, 2012, another boring (B-16) was advanced near B-9 and soil samples from the 0-3 and 3-5 foot intervals were collected for analysis of total chromium and hexavalent chromium (Cr(VI)). The maximum concentration (78 mg/kg) of chromium for the Site was detected in the 0-3 foot sample of B-16. The 3-5 foot sample contained 14 mg/kg chromium. No Cr(VI) was detected in either soil sample. The ORP and pH analysis for soils collected from the 0-3 and 3-5 foot intervals indicated the presence of reducing environments, which means that there is a tendency for Cr(VI) not to exist in these samples. Based on the foregoing Cr(VI) is not a soil COC for the Site. The chromium species is represented by trivalent chromium (Cr(III)).

The following OHM are identified as soil COC: (1) cadmium, (2) Cr(III), (3) lead, (4) mercury, (5) nickel, (6) PCBs, (7) dioxin-like PCB (TCDD equivalent), (8) vanadium, (9) C19-C36 aliphatic hydrocarbons and (10) C11-C22 aromatic hydrocarbons. These same OHM are also identified as COC for dusts.

3.2 Identification of Groundwater and Soil Categories

During a Method 3 risk characterization, soil and groundwater categories are identified to aid in the development of potential receptor exposure profiles and to identify applicable or suitably analogous standards as described in 310 CMR 40.0933(3).

3.2.1 Groundwater Categories

MCP groundwater categories are established by MADEP for the characterization of risk at disposal sites; these categories describe the potential for different types of exposure. Appropriate groundwater categories are identified, based on site characteristics, site activity and use, and the nature and extent of the release, in accordance with the MCP (310 CMR 40.0932).

The groundwater categories describe the potential for three different types of exposure. Groundwater at all disposal sites shall be considered a potential source of discharge to surface water and shall be classified, at a minimum, as category GW-3 [310 CMR 40.0932(3)]. GW-2 groundwater is considered to be a potential source of vapors of OHM to indoor air [310 CMR 40.0932(6)]. GW-1 groundwater is considered a potential or actual supply of potable water [310 CMR 40.0932(4)]. Based on the available information, the following MCP groundwater categories are applicable to the site.

Groundwater Category	Yes	No	Criteria
1		**X**	Groundwater is within Zone II of a public water Supply well. If yes the groundwater is categorized as GW-1.
1		X	1a. Groundwater is within an Interim Wellhead Protection Area of a public water supply well.
			1b. A demonstration has been made that there is no hydrogeologic connection between the groundwater and the public water supply well.
		X	If the answer to 1a is yes, and to 1b is no, then the groundwater is categorized as GW-1.
1		X	1c. Groundwater is within an area designated by the MADEP as a Potentially Productive Aquifer (PPA).
		X	1d. Groundwater is located within a medium or high yield aquifer, but has been designated by the MADEP as a non-PPA, due to its urban or industrial character, but site inspection indicates that this assumption does not apply.
			1e. Site-specific information on the types/transmissivity of soils shows that the groundwater is not located within the true boundary of the medium or high yield aquifer.
			1f. The groundwater within the PPA is naturally brackish, or has naturally high levels of metals, such that the development of the aquifer is not technologically or economically feasible.
		X	If the answer to 1c or 1d is yes, and the answer to 1e or 1f is no, then groundwater is categorized GW-1.
1		**X**	Groundwater is within Zone A of Class A surface water body. If yes, the groundwater is classified as GW-1.
1		X	1g. Groundwater is located 500 feet or more from a public water system distribution pipeline.
	X		1h. The groundwater is located on a parcel of land or at a facility where any portion of that parcel or facility is located within 500 feet from a public water supply distribution pipeline.
		X	If the answer to 1g is yes, and to 1h is no, then groundwater is categorized GW-1.
1		X	1i. Groundwater is located within 500 feet of a private potable water supply well that was in use at the time of notification pursuant to 310 CMR 40.0300, and was installed in conformance with applicable laws, by-laws or regulations.
			1j. The private well(s) has been removed from service, and meets the conditions specified in 310 CMR 40.0932(d)(1).
			1k. It has been demonstrated that no hydrogeologic connection exists between the groundwater and private well(s).
		X	If the answer to 1i is yes, and to 1j or 1k is no, then the groundwater is classified as GW-1.
1		**X**	Groundwater is located within a locally designated Potential Drinking Water Source. If yes, then groundwater is categorized as GW-1.

Groundwater Category	Yes	No	Criteria
2	X		2a. Groundwater is located within 30 feet of an existing occupied building or structure
	X		2b. The annual average depth to groundwater in that area is 15 feet or less
	X		Do both 2a and 2b apply? If yes, the groundwater is categorized GW-2
3	**X**		Groundwater at all disposal sites is considered a potential source of discharge to surface water and is classified as GW-3

3.2.2 Soil Categories

MCP soil categories S-1, S-2, and S-3 describe a range of potential exposures to a particular volume of soil. Soil category S-1 is associated with the highest exposure potential, and category S-3 is associated with the lowest exposure potential. In this section, appropriate soil categories are identified for the site based on soil accessibility, intensity and frequency of use, and on the age groups of potential receptors.

The three soil categories describe a range of the potential for exposure to soil. Three criteria, defined below, are used to describe the exposure potential for the purposes of categorizing soil:

1) Frequency of use, which indicates how often a receptor makes use of, or has access to, the disposal site; high frequency for children is valid if children reside, attend school or attend day care at the disposal site, or if large numbers of children visit the disposal site; high frequency for adults is valid if adults reside at the disposal site, or work at the disposal site on a continuing basis;

2) Intensity of use, which describes the nature of the Site Activities and Uses that could potentially result in exposure to the receptor; high intensity activities include digging, gardening and recreational sports; passive activities, such as, walking, shopping and bird watching, are considered low intensity activities;

3) Accessibility of the soil to potential receptors, which is characterized as one of the following: "accessible"; "potentially accessible"; or "isolated" [310 CMR 40.0933].

Soil categories are assigned to specific volumes of soils. For current scenarios, the appropriate soil category for a specific soil volume is based on current site conditions, uses, and the age of the receptor. For future conditions, the soil category is assumed to be S-1 unless assumptions are used to limit future activities and uses. A matrix, which is used to select the appropriate current and future soil categories for each volume of soil on site, is provided below.

Receptor Characteristics

<table>
<tr><td></td><td colspan="4">Children Present</td><td colspan="4">Adults Only Present</td></tr>
<tr><td></td><td colspan="2">High Frequency</td><td colspan="2">Low Frequency</td><td colspan="2">High Frequency</td><td colspan="2">Low Frequency</td></tr>
<tr><td>Access.
Of Soil</td><td>High
Intensity</td><td>Low
Intensity</td><td>High
Intensity</td><td>Low
Intensity</td><td>High
Intensity</td><td>Low
Intensity</td><td>High
Intensity</td><td>Low
Intensity</td></tr>
<tr><td>AS</td><td colspan="2" rowspan="2">Category S-1</td><td rowspan="2">S-2</td><td>S-1</td><td colspan="3">Category S-2</td></tr>
<tr><td>PAS</td><td colspan="2">Category S-2</td><td>S-2</td><td colspan="3" rowspan="2">Category S-3</td></tr>
<tr><td>ISS</td><td colspan="3">Category S-3</td><td colspan="4"></td></tr>
<tr><td colspan="9">* Category S-1 also applies to any accessible soil where current or reasonably foreseeable use of the soil is for growing fruits and vegetables for human consumption</td></tr>
</table>

AS = Accessible (Surficial) Soil (0 to 3 feet deep, unpaved)
PAS = Potentially Accessible Soil (3 to 15 feet, unpaved; 0 to 15 feet, paved)
ISS = Isolated Subsurface Soils (greater than 15 feet or under the footprint of a building or permanent structure)

Based on the above criteria for soil classification and the current and future site uses provided in Section 1.0, a soil category was assigned to each volume of soil for both future and current conditions, as documented below. The appropriate soil category depends on property use, the location of the exposure point where the soil volume resides, the depth interval of the soil volume, and whether the soil volume is covered by pavement, building or other barrier. Each exposure point / depth interval combination is evaluated in the charts below.

Currently, the property is used for multi-family residential purposes, and the soil contamination is located beneath pavement and / or below a building foundation. For future sensitive uses (e.g., residential, school and daycare), soils are presumed to remain covered with one or more protective barriers, such as pavement or a building foundation. For the purpose of soil categorization, for current and future non-sensitive uses (i.e., commercial/industrial uses), conservative assumptions were made that all soils are equally accessible, regardless of depth or location.

Soil Categories for Current and Future Conditions
Current and Future Conditions: Exterior Courtyard and Beneath Mill #5 Building
Location: 130 Foot of John Street (Residential Use: All Soil Intervals)

Soil Volume	Receptor	Criteria	Comment	Soil Category
Potentially accessible or isolated subsurface soils (all soils covered with pavement, building footprint or permanent structure) *	Child – Residential	Frequency	High – presumed to live at site	S-2
		Intensity	Low – soil disturbance activities are presumed not to occur under current or future conditions, except for construction / utility work	
		Gardening	Is not and will not occur	
Potentially accessible or isolated subsurface soils (all soils covered with pavement, building footprint or permanent structure) *	Adult – Residential	Frequency	High – presumed to live at site	S-3
		Intensity	Low – soil disturbance activities are presumed not to occur under current or future conditions, except for construction / utility work	
		Gardening	Is not and will not occur	
Potentially accessible or isolated subsurface soils (all soils covered with pavement, building footprint or permanent structure)*	Adult – Commercial	Frequency	High – presumed to work at site	S-3
		Intensity	Low – soil disturbance activities are presumed not to occur under current or future conditions, except for construction / utility work	
		Gardening	Is not and will not occur	
Potentially accessible or isolated subsurface soils (all soils covered with pavement, building footprint or permanent structure) *	Adult – Utility / Construction	Frequency	Low – presumed to work at site only during a construction or utility project	S-3
		Intensity	High – soil disturbance activities are presumed to occur	
		Gardening	Is not and will not occur	

Soil volume	Soil Category
Current	S-2
Future	S-2

* An assumption is made that all soils of the Site will be covered with one or more protective barrier(s).

Current Conditions: Mill Building #3
Location: 130 Foot of John Street (Residential Use: All Soil Intervals)

Soil Volume	Receptor	Criteria	Comment	Soil Category
Isolated subsurface soils (all soils covered with building footprint)	Child – Residential	Frequency	High – presumed to live at site in the near future	S-3
		Intensity	Low – soil disturbance activities are presumed not to occur under current conditions, except for construction / utility work	
		Gardening	Is not and will not occur	
Isolated subsurface soils (all soils covered with building footprint)	Adult – Residential	Frequency	High – presumed to live at site in the near future	S-3
		Intensity	Low – soil disturbance activities are presumed not to occur under current or future conditions, except for construction / utility work	
		Gardening	Is not and will not occur	
Isolated subsurface soils (all soils covered with building footprint)	Adult – Commercial	Frequency	High – presumed to work at site	S-3
		Intensity	Low – soil disturbance activities are presumed not to occur under current or future conditions, except for construction / utility work	
		Gardening	Is not and will not occur	
Isolated subsurface soils (all soils covered with building footprint)	Adult – Utility / Construction	Frequency	Low – presumed to work at site only during a construction or utility project	S-3
		Intensity	High – soil disturbance activities are presumed to occur	
		Gardening	Is not and will not occur	

Soil volume	Soil Category
Current	S-3
Future	

Future Conditions: Mill Building #3
Location: 130 Foot of John Street (Residential Use: All Soil Intervals)

Soil Volume	Receptor	Criteria	Comment	Soil Category
Accessible soils	Child – Residential	Frequency	High – presumed to live at site	S-1
		Intensity	High – soil disturbance activities are presumed to occur under future conditions	
		Gardening	Is not and will not occur	
Accessible soils	Adult – Residential	Frequency	High – presumed to live at site	S-1
		Intensity	High – soil disturbance activities are presumed to occur under future conditions	
		Gardening	Is not and will not occur	
Accessible soils	Adult – Commercial	Frequency	High – presumed to work at site	S-1
		Intensity	High – soil disturbance activities are presumed to occur under future conditions	
		Gardening	Is not and will not occur	
Accessible soils	Adult – Utility / Construction	Frequency	Low – presumed to work at site only during a construction or utility project	S-2
		Intensity	High – soil disturbance activities are presumed to occur	
		Gardening	Is not and will not occur	
			Soil volume	**Soil Category**
			Current	
			Future	S-1

3.2.3 Soil and Groundwater Categories

In summary, the following categories apply to the soil and groundwater of the Site:

Media	Category	Location, Depth Interval and Comment
Groundwater	GW-2	Part of aquifer within 30 feet of existing building, and at a depth of 15 feet or less.
	GW-3	Entire aquifer impacted by the release
Soil of Exterior Courtyard and Beneath Mill #5 Building	S-2	Presumed Current and Future Residential Conditions: 0-15 Foot (All soils covered with a protective barrier)
	S-3	Presumed Current and Future Commercial Conditions: 0-15 Foot (All soils covered with a protective barrier)
	S-3	Construction / Utility Work: 0-15 Foot (All soils covered with protective barrier, except during construction / utility work)
Soil beneath Mill #3 Building	S-3	Current Residential / Commercial Conditions (All soils covered with building foundation)
	S-3	Current Construction / Utility Work (All soils covered with building foundation)
	S-1	Future Residential / Commercial Conditions (All soils exposed)
	S-2	Future Construction / Utility Work (All soils exposed)

Note: The lowest soil category applicable to a soil volume, after considering all receptors and current and foreseeable uses, is provided. An assumption is made that gardening of edible produce will not occur in the future in the soils of the exterior courtyard, Mill #5 building or Mill #3 building, except under Best Management Practices. For the exterior courtyard and Mill #5 building, an assumption is made that future use may include multi-family residential, child school, daycare, institution, play ground, active recreational, commercial, industrial or passive recreational use, but will not include single-family residences; In addition, for the exterior courtyard and Mill #5 building, all soils must be covered by protective barriers, except during short-term construction or utility work, which will be conducted under Site-specific Soil Management Plan. These assumptions require the implementation of an Activity and Use Limitation. No assumptions requiring a Notice of Activity and Use Limitation were assumed for Mill #3 building.

3.3 Potential Human Receptor Exposure Profiles

Human populations located at the property or on nearby properties include the following: (1) on-Site residents of a multi-family residential complex; (2) on-Site commercial workers; (3) on-Site construction workers; (4) on-Site utility workers; (5) on-Site customers / visitors / trespassers; (6) nearby residents; (7) nearby commercial workers; and (8) nearby customers / visitors / trespassers. Risks to on-Site and nearby customers / visitors / trespassers, nearby commercial workers and nearby residents are believed to be adequately represented by on-Site residents and on-Site commercial workers. Children are typically considered the more sensitive receptor group; therefore, when calculating non-cancer risk, risk estimates were calculated for child residents and residents were presumed present for 30 years from age 1 to 31 years. Risk estimates were calculated for child / adult on-Site residents, adult on-Site commercial workers, adult on-Site construction workers, and adult on-Site utility workers.

Currently, the property is used for a combination of residential and commercial purposes. These uses are assumed to occur into the future. For the area defined by the exterior courtyard and Mill Building #5, all soils are covered with one or more protective barriers (such as pavement or a building foundation) and are assumed to remain so covered in the future. For the area

defined by Mill Building #3, the soils are currently covered by the building foundation, but may not be covered by a building foundation or other protective cover in the future.

During the risk characterization, assumptions were made that prohibit certain future uses and activities. For the exterior courtyard and Mill #5 building, future property use is presumed to not include single-family residences. It is also presumed to not include gardening of edible produce, except under Best Management Practices. A protective barrier is presumed to be maintained over soils containing PCB contamination. During excavation activities or other soil disturbance activities, soil management plans will be employed to mitigate child exposure to contaminated soils. Following excavation or soil disturbance activities, soils will be returned to the excavation or transported off-site in accordance with federal, state and local regulations; and the protective barrier will be replaced. For the Mill #3 building, future property uses is presumed to not include gardening of edible produce, except under Best Management Practices.

The exposure pathways or profiles for each target receptor group for current and reasonably foreseeable conditions are described below.

Current and Future On-Site Residents, including Children: Exterior Courtyard and Mill #5 Building

This receptor is presumed to be a 1-31 year old female, who resides at a multi-family residential complex. Exposure to soils is presumed not to occur, except during a 6-month construction project, which occurs sometime during the period when the receptor is aged between 1 and 2 years. The receptor is presumed to weigh 10.7 kilograms (kg) during this period.

Based on future conditions, this receptor may be exposed to soil contamination via dermal contact and incidental ingestion, 2 days per week, for 26 weeks. Dermal contact is presumed to occur to face, hands, forearms, lower legs and feet. Incidental ingestion of soil is presumed to occur at a rate of 100 mg/day. More frequent exposure to soils is presumed limited by implementation of a soil management plan. During the construction project, inhalation of dusts is conservatively presumed to occur 24 hours per day, 7 days per week for 26 weeks.

No ingestion of home-grown edible produce is presumed to occur. Little to no volatile COC exist in the soils or groundwater; therefore, inhalation of vapors attributable to soil vapor intrusion is not an exposure pathway for the Site. Migration of Site-related OHM to the Merrimack River is not a significant fate and transport pathway for the Site; therefore, dermal contact and incidental ingestion of surface water and sediment, and ingestion of fish or other aquatic organisms are not significant exposure pathways. No private or public water supply well is located near the Site or is likely to be located near the Site in the future; therefore, ingestion, dermal contact or inhalation of Site-related OHM in potable or irrigation water is unlikely to occur.

Current and Future On-Site Residents, including Children: Mill #3 Building

This receptor is presumed to be a 1-31 year old female, who resides at a single-family or multi-family residential complex. Exposure to soils is presumed not to occur during the ages of 1-31 years and (for chronic exposure) during the ages of 1-8 years. The receptor is presumed to weigh 17.0 kg from age 1-8 years, 39.9 kg from age 8-15 years and 58.7 kg from age 15-31 years.

This receptor may be exposed to soil contamination via dermal contact and incidental ingestion, 5 days per week during the thirty warmest weeks of the year. Dermal contact is presumed to occur to face, hands, forearms, lower legs and feet. Incidental ingestion of soil is presumed to occur at a rate of 100 mg/day from age 1-8 years and 50 mg/kg from age 8-31 years. Inhalation of dusts is presumed to occur 24 hours per day on the days of soil exposure.

No ingestion of home-grown edible produce is presumed to occur. Little to no volatile COC exist in the soils or groundwater; therefore, inhalation of vapors attributable to soil vapor intrusion is not an exposure pathway for the Site. Migration of Site-related OHM to the Merrimack River is not a significant fate and transport pathway for the Site; therefore, dermal contact and incidental ingestion of surface water and sediment, and ingestion of fish or other aquatic organisms are not significant exposure pathways. No private or public water supply well is located near the Site or is likely to be located near the Site in the future; therefore, ingestion, dermal contact or inhalation of Site-related OHM in potable or irrigation water is unlikely to occur.

Current and Future On-Site Adult Commercial Workers: Exterior Courtyard, Mill #5 Building and Mill #3 Building

This receptor is presumed to be an 18-45 year old female, who is a commercial worker. She is presumed to work on-site 8 hours per day, 5 days per week for 27 years. Exposure to soils is presumed to occur, during 4 days per week during the 30 warmest weeks of the year for 27 years. During this period, the receptor is presumed to weigh 61.1 kilograms (kg).

Dermal contact is presumed to occur to face, hands, forearms, lower legs and feet. Incidental ingestion of soil is presumed to occur at a rate of 50 mg/day. Inhalation of dusts is presumed trivial in comparison to that of the construction worker.

No private or public water supply well is located near the Site or is likely to be located near the Site in the future; therefore, ingestion, dermal contact or inhalation of Site-related OHM in potable, irrigation, industrial or commercial water is unlikely to occur.

Future On-Site Construction Workers: Exterior Courtyard, Mill #5 Building and Mill #3 Building

This receptor is presumed to be a 22 year old female, weighing 58 kg, who is a construction worker. She is presumed to work on-site during a future six-month construction project, for 8 hours per day, 5 days per week, for 26 weeks.

Under future conditions, the on-site construction worker may be exposed to soil contamination via dermal contact to face, hands, forearms, feet and lower legs, enhanced incidental ingestion at a rate of 100 mg/day, and inhalation of dusts presuming mild exertion. Following inhalation of dust, this receptor is presumed to cough up a portion of the inhaled dust and to then ingest the dust.

An excavation is presumed to extend to a depth of 15 feet below grade, which would intercept the groundwater table. However, de-watering of the excavation is presumed to eliminate direct contact to groundwater, except perhaps during brief exposures to maintain the de-watering equipment. Little to no volatile COC are present in the soils or groundwater; therefore, inhalation of vapors in a construction excavation is not an exposure pathway.

Future or Current On-Site Utility Workers: Exterior Courtyard, Mill #5 Building and Mill #3 Building

This receptor is presumed to be a 22 year old female, weighting 58 kg, who is a utility worker. She is presumed to work on-site during a five-day utility project, for 10 hours, over the course of one week.

She may be exposed to soil contamination via dermal contact to face, hands, forearms, feet and lower legs, enhanced incidental ingestion at a rate of 100 mg/day, and inhalation of dusts presuming mild exertion. Dermal contact is presumed to occur to the utility worker's face, hands, forearms, lower legs and feet. Following inhalation of dust, this receptor is presumed to cough up a portion of the inhaled dust, then to ingest the dust.

A utility trench is presumed to extend to a depth of 6 feet below grade, which is above the water table. Therefore, direct contact to trench water is not an exposure pathway. Little to no volatile COC are present in the soils or groundwater; therefore, inhalation of vapors in a utility trench is not an exposure pathway.

3.4 Identification of Environmental Receptors

As indicated in Sections 1.0 and 2.1, environmental resource areas located proximal to the Site are the Merrimack River and Merrimack Canal. These resource areas are identified as potential environmental receptors.

3.5 Identification of Exposure Points

An exposure point is a location of potential contact between a human or environmental receptor and a release of OHM. Exposure points for soil, groundwater, surface water and air are identified in accordance with MCP guidance and regulations [310 CMR 40.0924].

Groundwater and Surface Water

No human exposure points exist for groundwater. No hot spot of groundwater contamination was detected. The following monitoring wells located within or downgradient of the exterior courtyard were used to compare Site conditions to Upper Concentration Limits for groundwater: GEC-1 to GEC-3 and GEC-5 to GEC-7.

No significant impact to the Merrimack River is expected to occur, because very little actual or assumed dissolved-phase contamination exists in groundwater. To be conservative, the groundwater data was used to estimate a potential impact to the surface water for the purpose of Stage 1 Environmental Screening.

The groundwater samples considered representative of conditions for the comparison to Upper Concentration Limits and use in the Stage 1 Environmental Screening are provided in Tables 5.1 to 5.5.

The receptors potentially exposed to groundwater or surface water exposure points are identified below.

Media Exposure Point	Receptor / Risk	Comment
Exterior Courtyard Groundwater	Comparison to Groundwater Upper Concentration Limit	None
Merrimac River Surface Water	Stage 1 Environmental Screening	None

Soils

The following exposure points were presumed to exist: (1) the exterior courtyard, which was further divided into three PCB Hot Spots (which are presumed to be remediated in the near future) and one exposure point for the remainder of the exterior courtyard; (2) beneath Mill #5 building, for which no distinct soil data exists and, therefore, are conservatively assumed to be represented by conditions within the remainder of the exterior courtyard; and (3) beneath Mill #3 building.

For soil of the exterior courtyard of the 130 Foot of John Street property, six potential exposure points were identified defined, based on an evaluation of the horizontal and vertical

distribution of OHM in soil in combination with the soil category(ies) determined to be applicable. The soil data were evaluated to determine if any Hot Spots of soil contamination exist on Site. A Hot Spot is defined, in part, within the MCP as a discrete area where the concentrations of OHM are substantially higher than those present in the surrounding area. Hot Spots are identified based on consideration of both the concentrations or thickness of an OHM within a contaminated area and the spatial pattern of that contamination. The areal extent and spatial pattern of a Hot Spot may be determined through the analytical results from multiple samples taken within the area, or the results of limited sampling in combination with other knowledge about the release, such as the presence of discoloration, odors or a defined source area. Discrete areas where the average concentration within the area is greater than ten but less than one hundred 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 an OHM is greater than one hundred times the concentration in the surrounding area shall be considered a Hot Spot. In no case shall concentrations of OHM equal to or less than an applicable Method 1 standard be considered indicative of a Hot Spot.

The maximum concentration of each OHM detected in any soil sample was compared to the applicable MCP Method 1 S-1, S-2 or S-3 soil standard and the TSCA limit for soils beneath a cap in a High Occupancy Area, as part of an evaluation of whether a Hot Spot of soil contamination might exist. Except for PCBs, all soil COC were always detected at a level less than 10 times the applicable MCP Method 2 S-1, S-2 or S-3 soil standards. PCBs were detected in discrete samples of throughout the exterior courtyard at levels exceeding 30 mg/kg (ten times the Method 1 S-2 and S-3 standard) and / or above 10 mg/kg (the TSCA limit for soils beneath a cap in a High Occupancy Area). Refer to Figure 7B for a depiction of areas containing soils samples with more than 10 mg/kg PCB. No discrete Hot Spot in the exterior courtyard was identified on this basis.

The soil data was also evaluated against the 50 mg/kg TSCA standard for soils beneath a cap in a Low Occupancy Area. Three areas of the property contained soil samples where one or more soil sample contained a level of PCB that exceeded the 50 mg/kg standard. These three areas were identified as PCB Hot Spots and are depicted on Figure 7A.

Hot Spot #1 is located immediately west of the fire hydrant and its supply line on the east side of the exterior courtyard and extends to the southern wall of the Mill #5 building, to near boring B-17 on the west where PCB concentrations are known to be non-detect in soil samples collected from the 0-3, 3-5 and 5-7 foot intervals, and to near boring B-57B where PCB concentrations are known to be no more than 5.2 mg/kg based on soil samples collected from the 1-2, 2-3 and 3-5 foot intervals. Hot Spot # 1 extends to a depth of three to four feet below grade,

below which PCB concentrations are known to be less than 50 mg/kg based on previously collected soil sample (B-10 3-6' = 1.1 mg/kg PCB).

Hot Spot #2 is located west of the stormwater system and extendds to the northern wall of the Mill #3 building, to borings B-38, B-38A and B-71 to the north where PCB concentrations are known to be less than 50 mg/kg based on previously collected soil samples, and to near boring B-8 on the west where PCB concentrations are known to be less than 50 mg/kg based on previously collected soil samples. Hot Spot #2 extends to a depth of 7 feet below grade where PCB concentrations are known to be less than 10 mg/kg based on previously collected soil samples (B-26 7-9' = 3.1 mg/kg PCB; B-26 9-12' = no PCB detected).

Hot Spot #3 is located between Hot Spots #1 and #2. It extends from the southern wall of the Mill #5 building to the north, to the stormwater system to the south, to borings B-9 and B-16 to the east where PCB concentrations are known to be less than 50 mg/kg, and to borings B-48 and B-48A where PCB concentrations are known to be less than 50 mg/kg based on previously collected soil samples. Hot Spot #3 extends to a depth of approximately 5 feet below grade where PCB concentrations are known to be less than 50 mg/kg based on previously collected soil samples (B-16 5-7', 7-9' and 9-12').

No exposure to the soils of the PCB Hot Spots is occurring under current conditions. In addition, the soils of the three PCB Hot Spots will be excavated and transported off-site for disposal in the near future under a Soil Management Plan and Health and Safety Plan by persons who are 40-hour trained under HAZWOPER. Therefore, the three PCB Hot Spots are not considered exposure points for residents, commercial workers, construction workers or utility workers. The locations of the Hot Spots are depicted on Figure 7A.

The three remaining exposure points addressed within this risk characterization are the following: (1) the remainder of the exterior courtyard (including beneath the three Hot Spots) and beneath Mill #5 building; and (2) beneath Mill #3 building. The comparison of OHM concentrations in soils to MCP Method 1 S-2 and S-3 soil standards are documented in Tables 6.1.2, 6.2.4 and 6.3.2. A comparison of OHM concentrations in soils to Upper Concentration Limits and TSCA standards are documented in Tables 6.1.3, 6.2.5 and 6.3.3.

The exposure point used to compare Site conditions to Upper Concentration Limits for soils is the remainder of the exterior courtyard, beneath Mill Building #3 and beneath Mill Building #5. All borings within this area were considered representative of this exposure point.

For the remainder of the exterior courtyard / beneath Mill Building #5, three soil intervals are identified for exposure: (1) the 0- to 3-foot interval or surficial soils; (2) the 0- to 6-foot interval or utility-zone soils; and (3) the 0- to 15-foot interval or construction-zone soils. For beneath Mill Building #3, the same soil intervals exist, but each soil interval is represented by all

the existing data for beneath this building. The receptors potentially exposed to each exposure point and soil interval are identified below.

Depth interval (feet)	Receptor	Comment
Hot Spot 1 (0-4 foot interval), Hot Spot 2 (0-7 foot interval), and Hot Spot 3 (0-5 foot interval)	Resident, Commercial Worker, Utility Worker, Construction Worker	Soils presumed to be excavated and transported off-Site for disposal in the near future. Therefore, exposure is presumed not to occur.
Remainder of Exterior Courtyard (0-3, 0-6 and 0-15 foot intervals) (Also representative of beneath Mill #5 Building)	Resident	Assumed covered by protective barrier except for a limited time during construction or utility repair project. No gardening of edible produce.
Beneath Mill #3 Building (all soil intervals)	Resident	No assumptions used requiring a protective barrier, even though a protective barrier (building foundation) currently exists. No gardening of edible produce.
Remainder of Exterior Courtyard (0-3, 0-6 and 0-15 foot intervals) (Also representative of beneath Mill #5 Building)	Commercial Worker	No assumptions used to limit exposure
Beneath Mill #3 Building (all soil intervals)	Commercial Worker	No assumptions used to limit exposure
Remainder of Exterior Courtyard (0-6 foot interval) (Also representative of beneath Mill #5 Building)	Utility worker	No assumptions used to limit exposure
Beneath Mill #3 Building (0-6 foot interval)	Utility worker	No assumptions used to limit exposure
Remainder of Exterior Courtyard (0-15 foot interval) (Also representative of beneath Mill #5 Building)	Construction Worker	No assumptions used to limit exposure
Beneath Mill #3 Building (0-15 foot interval)	Construction Worker	No assumptions used to limit exposure
Remainder of Exterior Courtyard, beneath Mill #5 Building, beneath Mill #3 Building	Comparison to Soil Upper Concentration Limits	None

Dusts

For dusts in outdoor air, the exposure points are the on-Site exposure points. The soil samples, representative of exposure point conditions at each soil exposure point, were used to calculate dust exposure point conditions.

3.6 Identification of Exposure Point Concentrations

Except for TCDD Toxicity Equivalent PCBs, exposure point concentrations (EPCs) were calculated for each COC in soil and groundwater for each exposure point and soil interval using measured values in collected samples. For the TCDD Toxicity Equivalent PCBs, the EPCs were calculated using the EPCs for PCBs and the TCDD Toxicty Equivalence per 1 mg PCB per kg soil, as documented in Tables 2.2.1 to 2.2.4 and 6.4. In addition, dust EPCs were estimated based on the use of a formula for air-borne particulates in ambient air. The approaches used to calculate EPCs for each COC in each environmental medium at each exposure point are described below.

The EPCs are determined consistent with Method 3 Risk Characterization, a chemical-specific approach, which estimates potential non-cancer and cancer risks for each receptor and compares these risks to MADEP-identified risk limits. For soils and groundwater, the EPCs are the mean, 95th percentile upper confidence limit on the mean concentration, or maximum concentrations, dependent on the type of exposure, data variability, and amount of available data. As a conservative measure, when calculating the mean or 95th percentile upper confidence limit, one-half the sample detection limit is used as a proxy concentration for samples in which a chemical was not detected.

For each COC in groundwater, the data set was examined for each exposure point to determine the appropriate method to derive EPC for comparison to Upper Concentration Limits, as documented in Tables 5.1 to 5.5. For each groundwater COC, the maximum concentration detected in any groundwater sample was conservatively selected as the EPC for comparison to Upper Concentration Limits.

For the Stage 1 Environmental Screening, for three COC (i.e., acetone, benzo(a)anthracene and benzo(b)fluoranthene) the dissolved-phase groundwater mean concentration for all wells was used as a conservative surrogate for the value present in the surface water of the Merrimack River. Except for one groundwater metal COC (i.e., lead), the maximum dissolved-phase concentration was used as the surface water EPC for the Stage 1 Environmental Screening. For barium and lead, the mean dissolved-phase groundwater EPC for all wells was calculated, then the 10-fold groundwater-to-surface water attenuation factor was applied to the groundwater EPC to derive a surface water EPC, as documented in Table 5.3. The 10-fold groundwater-to-surface water attenuation factor was obtained from MADEP's

spreadsheet for deriving GW-3 standards. The groundwater and surface water EPCs are calculated on Table 5.1 to 5.5.

For each COC in soils, the data sets were examined for each soil exposure point and exposure interval to determine the appropriate method to derive EPC, as documented in Tables 6.1.2, 6.2.2 to 6.2.4 and 6.3.2. Except as identified below, for each OHM at each soil exposure point, the mean concentration was identified as the appropriate method to derive EPC for each COC, each exposure point and each soil interval, and for comparison to Self-Implementing Standards for PCB cleanup under the Toxic Substances Control Act (TSCA) and to the soil Upper Concentration Limits.

Exposure Point	COC and EPC Method	Comment
Exterior courtyard / beneath Mill #5 building, all soil intervals	PCB: 95th PUCL	human health risk assessment; 95th PUCL for PCB also used to derive TCDD toxicity equivalent PCB EPC
Beneath Mill #3 building	PCB: Maximum Concentration	human health risk assessment; maximum concentration also used to derive TCDD toxicity equivalent PCB EPC
Entire Site, excluding hot spots	PCB: Maximum Concentration	Comparison to Upper Concentrations Limits; maximum concentration also used to derive TCDD toxicity equivalent PCB EPC

Notes: 95th PUCL = 95th percentile upper confidence limit on the mean concentration

Approximately 185 soil samples were analyzed for PCBs. The data were evaluated, as documented in Tables 6.2.3 and 6.2.4, to determine which samples to identify as representative of for each depth interval and exposure point. Some samples were considered not representative if the samples were located with a PCB Hot Spot that was planned for excavation. Some composited samples were considered not representative if discrete samples from the same boring locations comprising the composite were later analyzed for PCBs.

Multiple samples were collected from the 0 to 3 foot interval (i.e., 0-0.5, 0.5-1, 0-1, 1-2, 2-3, 1-3, 0-3 and/or 0-5 foot intervals) at some boring locations. For the 0-3 foot exposure interval, the maximum concentration of PCBs detected in any sample collected from within the 0-3 foot interval at a given location was identified as representative of that location. These maximum concentrations were then used to derive the EPC for the 0-3 foot interval for the exterior courtyard exposure point. Given that the highest PCB concentration within the 0-3 foot

interval were usually detected in the 1-3 or 2-3 foot interval, this approach is conservative and would likely over-estimate the actual EPC for PCBs in the 0-3 foot interval.

For the 0-6 and 0-15 foot interval, for each boring location, a representative PCB concentration was detected by calculating a vertically weighted PCB concentration using the PCB concentrations for the different sampling depths. This data was then used to calculate the PCB EPC for the 0-6 and 0-15 foot intervals for the exterior courtyard exposure point.

The EPC for TCDD toxicity equivalent PCB was calculated by multiplying the PCB EPC by the proportion of TCDD toxicity equivalent PCB detected in the representative soils samples that were analyzed for both Aroclor PCBs and dioxin-like PCB congeners, as documented in Table 6.4. TCDD toxicity equivalence for the representative soil samples was calculated in Table 2.2.3 and 2.2.4. The proportion of the PCB EPC attributable to dioxin-like congeners was not subtracted from the PCB EPC because the dioxin-like congeners constitute a small percent of the PCBs (0.90 to 3.4%) and do not significantly affect the risk estimates.

The soil EPCs are derived and the formulae used are provided in Tables 6.1.3, 6.2.5 and 6.3.3, and the soil EPCs are summarized for each receptor and soil interval in Table 6.4. For dusts in outdoor air, EPCs are estimated assuming soil disturbance is occurring. The formula used is provided below. The soil EPCs are used to estimate dust EPCs. The dust EPCs are derived and summarized in Tables 6.4 and 6.5.

$$EPC_{air} = [OHM]_{soil} \times PF \times PM_{10} \times CF$$

Where:

EPC_{air}	=	Exposure Point Concentration for inhalation of particulates in air (mg/m^3_{air})
$[OHM]_{soil}$	=	Soil concentration ($mg_{contaminant}/kg_{soil}$)
PM_{10}	=	Respirable particulate concentration in air (60 $\mu g/m^3_{air}$)
PF	=	Proportion of respirable particulate concentrations attributable to the site (0.50, unitless)
CF	=	Conversion factor (10^{-6} kg/mg)

3.7 Characterization of Risk of Harm to Safety

Safety hazards include the potential for fire or explosion, and physical dangers that may pose a threat of bodily injury to people. Conditions that also constitute a risk of harm to safety include the presence of unconfined materials that exhibit characteristics of corrosivity, reactivity, flammability, or are considered infectious materials.

OHM present at the Site are not flammable or explosive at the concentrations detected. Also, none of the OHM detected exhibit characteristics of corrosivity or reactivity at the concentrations detected, nor are considered infectious materials. Based on current and reasonably foreseeable conditions and in the surrounding environment, no applicable or suitable analogous safety standards were identified for OHM detected.

There are no release-related physical dangers present at the Site. No old or corroded drums, lagoons, pits or other physical hazards associated with the releases are present. Conditions attributable to the release are limited to soil and groundwater and do not present hazards to humans apart from those assessed in the characterization of risk of harm to human health. A condition of No Significant Risk of Harm to safety exists at the Site.

3.8 Characterization of Risk of Harm to Human Health

3.8.1 Hazard Assessment

3.8.1.1 Extent of Oil and/or Hazardous Material

The extent of the release and the migration pathways are described in Section 2.0. The OHM identified as COC are identified in Tables 5.1 to 5.5 for groundwater and Table 6.4 for soil. The background conditions are identified in Section 3.1.2, and Site conditions are compared to background in Section 3.1.2.

3.8.1.2 Toxicity Profiles

A descriptive summary of human health effects associated with each COC is available from MADEP's *Documentation for the Risk Assessment ShortForm - Residential Scenario*, or from USEPA's *Integrated Risk Information System* (IRIS).

3.8.2 Dose-Response Values

The dose-response assessment relates the likelihood or severity of an adverse effect to the level of exposure. Dose-response values are provided for the following three categories: non-carcinogenic (threshold) health effects; carcinogenic (non-threshold) health effects; and relative absorption factors (RAFs), which are used to relate toxicity information identified in the literature to exposure pathways of concern at the disposal Site. Dose-response information for each COC is obtained from published literature describing epidemiological or toxicological studies. For each COC, dose-response values were obtained primarily from sources published by MADEP and the United States Environmental Protection Agency (USEPA), i.e., the Integrated Risk Information

System (IRIS) or the Health Effects Assessment Summary Tables (HEAST). The first source of dose-response values is MADEP (i.e., toxicity values used by the MADEP to develop MCP Method 1 Numerical Standards, provided in MADEP's Risk Assessment Shortforms or those specifically adopted or derived by MADEP pending revisions to the MCP Method 1 Numerical Standards). The second source of dose-response values is USEPA's IRIS followed by USEPA's HEAST. For COCs that do not have dose-response values available through MADEP, HEAST or IRIS, values were obtained from the USEPA's Superfund Health Risk Technical Support Center in Cincinnati, Ohio. RAFs were obtained from published sources of the MADEP.

3.8.2.1 Non-carcinogenic Effects

For non-carcinogenic effects, a threshold is believed to exist below which a dose level or exposure level for a given OHM is not expected to result in an adverse health effect. As a result, a sub-threshold dose-response value, set in a conservative manner, would be expected to be protective of human health. Two types of sub-threshold values are Reference Doses (RfD) and Reference Concentrations (RfC). RfD is a sub-threshold dose in milligrams per kilogram body weight per day (mg/kg/day), at which daily exposure of a human population is likely to be free of adverse effects during a lifetime. RfC is an inhalation exposure concentration in milligrams or micrograms per cubic meter of air (mg/m^3 or $\mu g/m^3$), to which daily exposure of a human population is likely to be free of adverse effects. Wherever subchronic non-cancer dose-response values are not available, chronic dose-response values are used as surrogates. If RfC values were not available, a surrogate value was calculated via route-to-route extrapolation using the RfD.

Subchronic and chronic oral RfD values are provided in the attachments to this risk characterization (i.e., Attachments 2A to 2D). The sources of these values are identified on the same tables.

3.8.2.2 Carcinogenic Effects

For carcinogenic effects, no threshold dose is believed to exist which is associated with no risk. The USEPA evaluates available toxicity data and, based on this evaluation, chemicals are assigned to a weight-of-evidence class. The weight-of-evidence classification rates the likelihood that an agent is a human carcinogen. Three major factors are considered in characterizing the overall weight-of-evidence for carcinogenicity: (1) the quality of evidence from human studies; (2) the quality of evidence from animal studies; and (3) other supportive information, such as mutagenicity data and structure-activity data. Historically, the USEPA used Group A to E to identify weight-of-evidence carcinogenicity ratings. These groups are presented and defined below.

Weight-of-Evidence Category	Definition
Group A - Human Carcinogen	This category indicates there is sufficient evidence from epidemiological studies to support a causal association between an agent and human cancer
Group B - Probable Human Carcinogen	This category generally indicates there is at least limited evidence from epidemiologic studies of carcinogenicity to humans (Group B1) or that, in the absence of data on humans, there is sufficient evidence of carcinogenicity in animals (Group B2)
Group C - Possible Human Carcinogen	This category indicates that there is limited evidence of carcinogenicity in animals in the absence of data on humans
Group D – Not Classified	This category indicates that the evidence for carcinogenicity in animals is inadequate, or no data are available
Group E – No Evidence of Carcinogenicity to Humans	This category indicates that there is evidence of non-carcinogenicity in at least two adequate animal tests in different species or in both epidemiologic and animal studies

More recently, as carcinogenicity is re-evaluated for a chemical, USEPA has dropped the use of group ratings and uses descriptors instead. Gradually with time, more chemicals are receiving descriptor ratings. Some chemicals descriptors are dose or route dependent. The five descriptors are as follows: (1) carcinogenic to humans; (2) likely to be carcinogenic to humans; (3) suggestive evidence of carcinogenic potential; (4) inadequate information to assess carcinogenic potential; and (5) not likely to be carcinogenic to humans. The carcinogenic potential for each COC is described based on its current description within IRIS.

Cancer Slope Factors (CSFs) and Unit Risks (URs) are the relevant toxicity criteria for assessing cancer risks. CSFs and URs are typically calculated for chemicals in Groups A, B1, and B2, and occasionally calculated for chemicals in Group C. The oral CSF is the largest possible linear slope, within the upper 95% Confidence Limit, expressed as the risk per unit dose, and is typically given in units of $(mg/kg/day)^{-1}$. The inhalation UR is the upper 95% Confidence Limit of the mean incremental lifetime cancer risk estimated to result from lifetime exposure to an agent if it is in the air at a concentration of 1 $\mu g/m^3$ or in the drinking water at a concentration of 1 µg/L. Use of the CSF or UR assumes that the estimated dose received by a receptor is expressed as a lifetime average.

The following COC detected at the Site are listed as carcinogens: nickel, which is a Class A carcinogen; and lead and PCBs, which are Class B2 carcinogens. The TCDD toxicity equivalent PCBs are also carcinogens. The remaining COC are either listed as Class D or insufficient data is available on their carcinogenicity.

For Class A carcinogen nickel, an inhalation UR is derived, but the oral CSF is not available. For the Class B2 carcinogen lead, too many uncertainties exist in the cancer studies to derive oral CSF or inhalation UR; therefore, lead was not included as a cancer COC. PCBs and nickel were identified as the cancer COC. The oral CSFs and inhalation URs are provided in the attachments attached to this risk characterization (i.e., Attachments 2A to 2D).

3.8.2.3 Relative Absorption Factors (RAFs)

The RAF is used to account for differences in the absorption efficiency under exposure conditions for the site compared to the absorption efficiency for the study used to develop the associated dose-response value. RAFs used in the Risk Characterization are values provided in MADEP's excel Toxicity workbook for deriving MCP Method 1 Numerical Standards, and in MADEP's draft guidance entitled, *Characterizing Risks Posed by Petroleum Contaminated Sites: Implementation of MADEP VPH/EPH Approach Public Comment Draft,* dated October 31, 1997. RAF's for non-cancer and cancer COC are provided in the attachments attached to this risk characterization (i.e., Attachments 2A to 2D).

3.8.2.4 Permeability Coefficients (K_p)

The K_p is a value used to estimate the rate of transfer of a chemical through the skin. K_p's used in the Risk Characterization are values provided in MADEP's excel Toxicity workbook for deriving MCP Method 1 Numerical Standards, and in MADEP's draft guidance entitled, *Characterizing Risks Posed by Petroleum Contaminated Sites: Implementation of MADEP VPH/EPH Approach Public Comment Draft,* dated October 31, 1997. No K_p were used for this risk characterization.

3.8.3 Exposure Assessment

3.8.3.1 Development of Exposure Profiles

Exposure profiles are provided in Section 3.3. These profiles were developed considering current and reasonably foreseeable activities and uses of the Site.

3.8.3.2 Quantitative Estimation of Exposure

Once exposure profiles are developed describing the COC, exposure points, and the receptors of concern, the potential exposures experienced by the receptors are quantified. The quantitative exposure estimates are then used to estimate risk, as described below.

The types of exposure or dose used to characterize risk depend on the exposure pathway under evaluation and the nature of the toxicity information available for each chemical. The Average Daily Dose (ADD) and Lifetime Average Daily Dose (LADD), in units of mg/kg/day, are calculated to estimate non-cancer and cancer effects from exposure to COC via incidental ingestion and dermal contact pathways. The Average Daily Exposure (ADE) and Lifetime Average Daily Exposure (LADE) are calculated and used when estimating non-cancer and cancer effects from exposure to COC via inhalation.

Estimates of exposure are provided in tables contained within the attachments to this risk characterization (i.e., Attachments 2A to 2D). These same tables provide the equations and exposure factors used to calculate exposure estimates.

3.8.3.3 Calculation of Risks

Chronic and Subchronic Non-Cancer Risk: The measure used to describe the potential for non-cancer health effects is the Hazard Index (HI). For a given chemical the HI is the ratio of a receptor's exposure level (or dose) to the "allowable" exposure level. A Hazard Index of 1.0 or less indicates that the receptor's exposure is equal to or less than the allowable exposure level, and it is considered unlikely that adverse health effects will occur. For a given route of exposure HIs are calculated as follows:

$$HI_{route\text{-}specific} = (E_1/Rf_1) + (E_2/Rf_2) + \ldots + (E_i/Rf_i)$$

Where:

E_i = Non-cancer exposure intake or concentration for the ith chemical; and

Rf_i = RfD (oral) or RfC (inhalation) for the ith chemical.

Route-specific HIs are added to obtain a cumulative non-cancer HI for each receptor group and exposure point. The cumulative non-cancer HI for each receptor is compared to MADEP's cumulative non-cancer risk limit, which is a Hazard Index of 1.0.

Chronic HIs were calculated for on-Site Commercial Workers, even though a protective barrier will exist for this Site. This was done to demonstrate the relatively low level of risk posed to these receptors for the portion of the outer courtyard outside of the two PCB hot spots. Subchronic HIs were calculated for the remaining receptors, because exposure is presumed to occur for relatively short periods of time, such as during a one week utility repair project or during a six-month construction project. For each COC-receptor-exposure point combination, HIs are calculated in tables provided in attachments to this risk characterization (i.e., Attachments

2A to 2D). For each receptor, the total cumulative HIs are compared to MADEP's non-cancer risk limit of 1.0 in the same attachments.

Cancer Risk: The potential for carcinogenic (i.e., non-threshold) health effects is characterized as the Excess Lifetime Cancer Risk (ELCR). The ELCR represents the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the potential carcinogen. For a given chemical, the estimated ELCR is the product of the receptor's quantified exposure and a measure of carcinogenic potency (i.e., cancer slope factor or unit risk factor). For a given route of exposure, the ELCR is calculated as follows:

$$ELCR_{route\text{-}specific} = (EI_1 \times SF_1) + (EI_2 \times SF_2) + \ldots + (EI_i \times SF_i)$$

Where:

EI_i = Cancer exposure intake or concentration for the ith chemical; and

SF_i = Slope Factor for the ith chemical.

Route-specific ELCRs are added to obtain a cumulative ELCR for each receptor group and exposure point. The cumulative ELCR for each receptor will be compared to MADEP's cumulative cancer risk limit, which is an ELCR equal to one-in-one hundred thousand (1×10^{-5}).

For each COC-receptor-exposure point combination, ELCRs are calculated in tables provided in attachments to this risk characterization (i.e., Attachments 2A to 2D). . For each receptor, the total cumulative ELCR is compared to MADEP's cancer risk of one-in-one hundred thousand (1×10^{-5}) in the same attachments.

3.8.4 Identification of Applicable and/or Suitably Analogous Public Health Standards

The MCP requires that the characterization of risk of harm to human health include a comparison of s to applicable or suitably analogous public health standards. If the PCB clean-up is to be conducted under the Self-Implementing regulations of TSCA, they would be identified as applicable public health standards. For the purpose of this risk characterization, the PCB clean-up is assumed to be conducted entirely or partially under the Self-Implementing regulations of TSCA.

3.8.5 Characterization of Risk of Harm to Human Health

Risk of Subchronic and Chronic Threshold (Non-Carcinogenic) Health Effects: For each receptor group, the total cumulative subchronic or chronic HI is compared to MADEP's cumulative non-cancer risk limit of 1.0. Subchronic HI were calculated for resident, construction

worker and utility worker. Limits on future exposure to residents, entailing the maintenance of a protective barrier over soils and implementation of a soil management plan during future construction or utility work, were assumed. Chronic HI were calculated for commercial worker, because no limits on future exposures were assumed. The results of the non-cancer risk assessments for the receptors are summarized in the attachments to this risk characterization (i.e., Attachments 2A to 2D). The cumulative HIs are compared to the non-cancer risk limit in Table 7.

Based on these findings, no significant non-cancer risk exists for all receptors, presuming that the three PCB Hot Spots are remediated and that a protective barrier is maintained over the soils of the exterior courtyard and the soils beneath the Mill #5 building. The principal drivers of the non-cancer risks are PCBs and lead.

Risk of Non-Threshold (Carcinogenic) Health Effects: For each receptor group, the total cumulative ELCR is compared to MADEP's cumulative cancer risk limit of 1E-05. ELCRs were calculated for resident, commercial worker and construction worker. Limits on future exposure to residents, entailing the maintenance of a protective barrier over soils and implementation of a soil management plan during future construction or utility work, were assumed. The results of the cancer risk assessments for the receptors are summarized in tables within the attachments to this risk characterization (i.e., Attachments 2A to 2D). A comparison of the cumulative ELCRs to the cancer risk limit is provided in Table 7.

Based on these findings, no significant cancer risk exists for all receptors presuming that the three PCB Hot Spots are remediated and that a protective barrier is maintained over the soils of the exterior courtyard and the soils beneath the Mill #5 building. The principal driver of the risk is PCBs.

Comparison of Site Conditions to Applicable or Suitably Analogous Public Health Standards: For the exterior courtyard, the PCB exposure point concentration for the exterior courtyard and beneath Mill Building #5 is within the High Occupancy interval (>1 to 10 mg/kg PCB) presuming a cap is present. Although individual samples exceed 10 mg/kg PCB, all samples outside the three PCB Hot Spot are less than 50 mg/kg, which is the limit for Low Occupancy presuming a cap is present. For the soils beneath Mill Building #3, all soil samples contained less than 1 mg/kg PCB, which is the TSCA limit for High Occupancy when a cap is not present.

3.8.6 Conclusions Regarding Risk of Harm to Human Health and Conditions for Notice of Activity and Use Limitation

Risk of harm to human health was characterized for the Site via a MCP Method 3 Human Health Risk Characterization. Assumptions limiting future activities or uses of the Site were considered during the course of the risk characterization.

The total cumulative HIs for all receptors, exposure points and soil intervals were less than MCP's Method 3 non-cancer risk limit, presuming that the three PCB Hot Spots are remediated. The total cumulative ELCR for all receptors, exposure points and soil intervals were less than the MCP's Method 3 cancer risk limit, presuming that the three Hot Spots are remediated for Hot Spot #1. These findings presume that a protective barrier is maintained over the soils of the exterior courtyard and Mill Building #5. For the exterior courtyard, the EPCs for PCBs exceed the TSCA High Occupancy limit for Self-Implementing Cleanup when no cap is present. No soil sample collected from beneath Mill Building #3 contained a level of PCB that exceeded the High Occupancy limit for Self-Implementing Cleanup when no cap is present. For the exterior courtyard, the EPCs for PCBs are less than the TSCA High Occupancy limit for Self-Implementing Cleanup when a cap is present, although individual samples exceed this limit. Outside of the three PCB Hot Spots, no soil sample contained a level of PCB that exceeds the Low Occupancy limit for Self-Implementing Cleanup when a cap is present. An assumption is made that the three PCB Hot Spots will be remediated and a protective barrier will remain in place over the soils of the exterior courtyard and Mill Building #5. The protective barrier will be a TSCA cap that is compliant with the technical requirements specified at 40 CFR 761.75(b), and is principally intended to mitigate human exposure.

These results rely on the remediation of PCB Hot Spots #1 to #3. These areas should be remediated until levels of PCBs and lead are reduced so that No Significant Risk has been achieved and no confirmatory soil sample contains more than 50 mg/kg PCBs. The principal drivers of the risk are PCBs and lead. Clean-up levels will be derived for PCBs and lead, to aid in the remediation (see Section 4.0).

No Significant Risk of harm to human health exists for the remainder of the PCB release area, assuming some limits on future activities and uses. Gardening of edible produce is presumed not to be conducted within the disposal site boundaries through Best Management Practices. A protective barrier is assumed to be maintained over the soils of the exterior courtyard and beneath Mill Building #5. This latter This latter assumption will require the implementation of a Notice of Activity and Use Limitation for a portion of the subject property in order for the findings of the Risk Characterization to be valid. Specific requirements of the

Notice of Activity and Use Limitation are provided in Section 5. Refer to Figure 3D for the area subject to the recommended Notice of Activity and use Limitation.

3.8.7 Uncertainty Analysis

Uncertainty is inherent in the risk assessment process, which includes a variety of scientific judgments. In general, during the course of a risk characterization, conservative assumptions or decisions are made in order to minimize the possibility that uncertainty would result in a false indication of no significant risk of harm. Uncertainties specific to this risk assessment are provided below.

Site Characterization: Uncertainties relating to the adequacy of Site characterization, including the sampling plan and analytical data, always exist, but can be minimized with a carefully planned field investigation. In general, conservative assumptions were made throughout the risk characterization, to account for limitations in Site data. A Data Validation and Representativeness Evaluation attached as Attachment 5, was conducted and concluded that the analytical data are valid and collectively the data are representative of Site conditions.

No directly measured levels of particulate-bound OHM (dusts) in ambient air were obtained. It was not possible to obtain these data, because current site conditions are not consistent with the evaluated exposure pathway. Equations with conservative input values were used to provide estimates of OHM as dusts.

Assumptions concerning the frequency, duration, and magnitude of receptor exposures: Either means, 95th percentile upper confidence limits on the mean or maximum concentrations were used to obtain estimates of EPCs. Maximum concentrations or 95th percentile upper confidence limits on the mean were used when significant data variability exists for a specific exposure point and media, or where a limited amount of data is available. Exposure factors selected were generally consistent with those used in MADEP's documentation for developing Method 1 Standards, or recommended by MADEP in its *Guidance Document for Disposal Site Risk Characterization* and related Technical Updates. However, because a protective barrier is assumed to be present, some of the exposure factors for on-Site resident assumed lower levels of exposure than used to develop Method 1 Standards.

Availability and accuracy of the toxicity data: The development of dose-response values and relative absorption factors has uncertainties dependent on the amount of quality toxicity data available for the chemical. However, dose-response values that were derived, recommended or provided by MADEP were used in this risk characterization.

3.9 Characterization of Risk of Harm to the Environment

The Method 3 Environmental Risk Characterization was conducted in accordance with 310 CMR 40.0995. This characterization was conducted for all current and reasonably foreseeable site activities and uses. An Environmental Risk Characterization entails a Stage I Environmental Screening and a comparison of OHM concentrations to Upper Concentration Limits provided at 310 CMR 40.0996. The Environmental Risk Characterization is documented below.

3.9.1 Stage I Environmental Screening

A Stage I Environmental Screening was conducted following the procedure provided at 310 CMR 40.0995(3), and the guidance provided in Chapter 9 of the MADEP's *Guidance for Disposal Site Risk Characterization*. The Stage I Environmental Screening is the first stage of a two-stage process used to determine whether a risk of harm to site biota and habitats exists. Stage I is used to identify and document conditions which do not warrant a Stage II Environmental Risk Characterization, either because there is no potentially significant exposure pathway, or because environmental harm is readily apparent and additional assessment would be redundant. The Stage I Environmental Screening is conducted in a three-step process. First, available information is evaluated to determine whether there is evidence of current or potential exposure to environmental receptors. Second, if current or potential exposure is identified, each such exposure is evaluated to determine whether significant environmental harm is "readily apparent." Finally, for each exposure with no “readily apparent” significant environmental harm, an evaluation is conducted to determine if the exposure is "potentially significant".

3.9.1.1 Identification of Current and Potential Exposure

Available evidence is evaluated to determine whether there is current or potential future exposure of environmental receptors to OHM at or from the Site. This evaluation is provided below.

Criteria	Current or Potential Exposure	Comment
1. Current or past physical evidence that OHM at or from the disposal site have come to be located in surface soil, surface water, sediment or wetlands	No	There is no current or past physical evidence of OHM impacting surface water, sediment or wetlands. The nearest surface water resource is the Merrimac River, which abuts the Site. Although surface soil was impacted, it is located below a building foundation or pavement. No area of the Site is a natural resource area. There is little to no dissolved-phase contamination that is likely to impact the Merrimac River.
2. Records or other evidence of current or past impacts of OHM from the disposal site on wildlife, fish, shellfish, or other aquatic biota	No	Based on local and state records searches and interviews with persons with knowledge of the site, there is no evidence of current or past impacts of OHM from the disposal site on biota.
3. Analytical data indicating the presence of OHM attributable to the site in question in surface water or sediments (including wetlands)	No	There is little to no evidence of a significant migration pathway whereby OHM attributable to the site might impact the surface water or sediments of the Merrimac River. Therefore, no surface water or sediment analytical data were collected.
4. The potential for the transport of OHM in the groundwater or surface runoff to such receptors as surface water or sediments (including wetlands) identified as environmental receptors	Maybe	A small amount of dissolved-phase groundwater contamination exists. The levels detected are very low and are unlikely to measurably impact the Merrimac River. However, this pathway will be evaluated further. The contaminated soils are covered by building foundations or pavement, and, therefore, are unlikely to impact surface water via surface runoff.
5. The presence of OHM at the disposal site within two feet of the ground surface and the potential for such contamination to result in exposure to wildlife	No	The soil contamination is located beneath pavement and building foundations; the site is located in an urban setting with no wildlife habitat value.

Based on the foregoing, a potential current and future exposure pathway was identified, which would require further evaluation for evidence of "readily apparent" environmental harm and / or "potentially significant" exposure. Therefore, the next two steps of the Stage 1 Environmental Screening are provided below.

3.9.1.2 Evaluation for Readily Apparent Harm

The following potential current and future exposure pathway was identified for the Site: (1) the surface water of the Merrimack River. This potential current and future exposure pathway was evaluated to determine if conditions exist indicating readily apparent harm.

Criteria	Readily Apparent Harm	Comment
1. Visual evidence of stressed biota attributable to the release at the disposal site, including, without limitation, fish kills and/or abiotic conditions	No	Stressed biota attributable to the release is not evident.
2. The existence of OHM attributable to the disposal site in concentrations which exceed Massachusetts Surface Water Quality Standards promulgated in 314 CMR 4.00, which include USEPA Ambient Water Quality Criteria applied pursuant to 314 CMR 4.05(5)(e)	No	No surface water data exist for the OHM of concern. The following dissolved-phase OHM were detected in groundwater: acetone, barium, lead, benzo(a)anthracene and benzo(k)fluoranthene. Of these OHM, Ambient Water Quality Criteria (AWQC) exist for lead. The AWQC for lead pertain to dissolved lead. The dissolved lead EPC for surface water is less than the lowest AWQC for lead. Therefore, no OHM attributable to the disposal site exists at a concentration that exceeds AWQC.
3. Visible presence of oil, tar or other non-aqueous phase hazardous material over an area equal to or greater than two acres, or over an area equal to or greater than 1,000 square feet in sediment	No	No non-aqueous phase oil, tar or other non-aqueous phase hazardous material was observed at the site.

Based on the results of this evaluation, a condition of readily apparent harm has not been identified for the Merrimack River.

3.9.1.3 Evaluation for Potentially Significant Exposure

The current and potential future exposure pathway identified for the site, i.e., exposure of surface water of the Merrimack River, was evaluated to determine if conditions exist indicating potentially significant exposure. This evaluation entails a comparison of site conditions to effects-based screening criteria, such as the following: (1) USEPA Ambient Water Quality Criteria (AWQC); (2) Massachusetts Surface Water Standards (MSWS); (3) environmental concentrations specifically adopted by the MADEP as screening criteria; and (4) site size, location or landscape characteristics specifically adopted by the MADEP as screening criteria.

Under MADEP guidance, screening for potentially significant exposure is conducted separately for the following generic habitats and biota: (1) aquatic habitats and organisms; (2)

terrestrial habitats and organisms; and (3) wetland habitats. Current and potential future exposure pathways for aquatic habitats apply to this Site. The evaluation for potentially significant exposure was limited to this habitat type.

Aquatic Habitats and Organisms

Effects-based screening for aquatic habitats and organisms was conducted consistent with the guidance provided in Chapter 9.4 of the MADEP's *Guidance for Disposal Site Risk Characterization*, as revised by the following MADEP Technical Updates: (1) *Revised Sediment Screening Values* (January 2006); and (2) *Area-based Screening for Sediment Contamination* (January 2006). Other resources used in the effects-based screening for aquatic habitats and organisms include the following: (1) *Sediment Toxicity of Petroleum Hydrocarbon Fractions*, by Battelle, of Duxbury, MA, for MADEP (September 2007); and (2) the GW3 Table in MADEP's MCP GW excel workbook used to develop MCP numerical standards, December 2009.

Stage I Screening of aquatic habitats and organisms entails comparison of concentrations of OHM of concern to (1) surface water quality screening criteria, and (2) sediment quality screening criteria, as applicable. For this Site, surface water was identified as a current or potential exposure pathway. Effects-based screening criteria for surface water are the USEPA's Ambient Water Quality Criteria (AWQC) and the lowest ecologically-based criteria provided in MADEP's MCP GW excel workbook (GW3 Table) used to develop the MCP numerical standards, in December 2009. The effects-based screening for surface water of the Merrimack River is provided below.

Surface Water

No surface water samples were collected from the Merrimack River for analysis of OHM. The dissolved-phase groundwater EPC were used as a surrogate for surface water EPCs (i.e., acetone, benzo(a)anthracene, benzo(b)fluoranthene) or were used to derive surface water EPCs by applying the 10-fold groundwater-to-surface water attenuation factor to the dissolved-phase groundwater EPCs (barium and lead). No surface water EPC exceeds its lowest AWQC or lowest ecologically-based criteria, as documented in Tables 5.2, 5.3 and 5.5.

Based on these results, potentially significant exposures related to surface waters of the Merrimack River do not and are unlikely to exist.

3.9.1.4 Applicable or Suitably Analogous Standards

The Environmental Risk Characterization requires a comparison of site conditions to applicable or suitably analogous environmental standards. This evaluation is conducted consistent

with the guidance provided in Chapter 9.7 of the MADEP's *Guidance for Disposal Site Risk Characterization*. A level of no significant risk of harm to the environment does not exist or has not been achieved if concentrations of oil and hazardous material at or from the site exceed or are likely to exceed any applicable or suitably analogous standards.

The following environmental standards were evaluated to determine if they were applicable or suitably analogous standards (ASAS) relevant to the site.

Environmental Standard	ASAS?	ASAS Criteria	Criteria Exceeded?
Massachusetts Surface Water Quality Standards [314 CMR 4.00]	No	No Surface Water is likely to be impacted by the release	N/A
Massachusetts Wetland Regulations [310 CMR 10.00]	No	No Wetland is likely to be impacted by the release	N/A

N/A = Not Applicable

An impact to surface water is unlikely to occur based on the absence of significant dissolved-phase groundwater contamination and the presence of pavement or building foundation over the soils. Even though a comparison of groundwater conditions to Stage 1 Screening Criteria was conducted in an abundance of caution, there is very little likelihood of surface water or a wetland associated with the Merrimack River being impacted by the release. Therefore, an ASAS criteria is unlikely to be exceeded.

3.9.2 Comparison to Upper Concentration Limits

The risk of harm to the environment is also characterized by comparing the concentration of each OHM to the Upper Concentration Limits (UCLs) in soil and groundwater, as described in 310 CMR 40.0996. Typically, the mean concentration of a chemical for the site in its entirety, as well as any identified hot spot, is compared to the applicable UCL.

The soil data were compared to applicable UCLs to determine if any location could be considered a hot spot of soil contamination, for the purpose of comparing Site conditions to UCLs. The maximum concentration of each soil and groundwater COC, presuming PCB Hot Spots #1, #2 and #3 are remediated, were compared to applicable UCL, as documented in Tables 5.1 to 5.5 and 9. The maximum concentrations of all COC in soil or groundwater were less than the applicable Upper Concentration Limits.

The presence of non-aqueous phase liquid (NAPL) having a thickness equal to or greater than one-half inch in any environmental media is considered a level that exceeds UCLs. No NAPL was observed or measured at the Site; therefore, the NAPL UCL is not exceeded.

Based on a comparison of conditions to applicable UCLs, a conclusion is made that No Significant Risk of harm to the environment exists for future conditions at the Site.

3.9.3 Conclusions Regarding Environmental Risk

Based on the foregoing characterization, no condition of Readily Apparent Harm and no potentially significant exposure pathway exist. No Applicable or Suitably Analogous environmental Standard is exceeded. Based on the foregoing, a condition of No Significant Risk of harm to the environment exists at the Site for current conditions. No Stage II environmental risk characterization is needed. Soil and groundwater EPCs do not exceed applicable UCLs, which mean that a condition of No Significant Risk of harm to the environment exists for future conditions. Based on the foregoing, a condition of no significant harm to the environment exists for current and future conditions at the Site.

3.10 Characterization of the Risk to Public Welfare

Conditions were evaluated to determine if a significant adverse impact to public welfare may be experienced by a community in the vicinity of the Site. No nuisance conditions, loss of property value, or unilateral restriction of the use of another person's property exists. In addition, no monetary or non-pecuniary costs were identified, which are 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 or private resources directly attributable to the release of OHM. No Significant Risk of harm to public welfare exists for current conditions. As documented above in Section 3.9.2 and Tables 5.1 to 5.5 and 9, no groundwater or soil UCL was exceeded for any exposure point or OHM at the Site, which means that a condition of No Significant Risk of Harm to public welfare exists for future conditions at the Site.

3.11 Risk Characterization Conclusions

Based on the foregoing risk characterization for the exterior courtyard release, a condition of No Significant Risk of harm to health, safety, welfare and the environment is achieved for current and future conditions, presuming that the three PCB Hot Spots are remediated. Assumptions limiting future activities or uses of the Site were considered during the course of the risk characterization.

These assumptions are identified in Section 3.8.6 and require the following actions in order for the findings of the risk characterization to be valid: (1) the remediation of PCB Hot Spots #1, #2 and #3 such that no soil sample contains more than 50 mg/kg PCB and a condition of No Significant Risk of harm exists for all receptors for each PCB Hot Spot area; (2)

installation and maintenance of a protective barrier over all the soils of the exterior courtyard and Mill Building #5; (3) the implementation of a Notice of Activity and Use Limitation requiring the periodic inspection and maintenance of the protective barrier; and (4) the prohibition of gardening of edible produce in the soils of the PCB release area through Best Management Practices. Specific requirements of the Notice of Activity and Use Limitation are provided in Section 5.0. Refer to Figure 3D for the area subject to the recommended Notice of Activity and use Limitation.

The principal risk drivers for the human health risk characterization are PCB and, to a lesser extent, lead. Site-specific PCB and lead cleanup standards are needed prior to beginning clean up.

4.0 Derivation of Site-Specific Clean-up Standards for PCBs and Lead

Based on the results of the baseline human health risk assessment, documented in Section 3.0, PCBs and to a lesser extent lead were the principal COC driving risk estimates for non-cancer effects. The non-cancer risk estimates for construction / utility worker and to lesser extent for resident were approached but did not exceed the MCP non-cancer risk limits. No Significant Risk of harm from cancer was found following short-term exposure to residents, construction workers and utility workers. The cancer risk estimates were significantly below the MCP cancer risk limits.

Based on the foregoing, the baseline human health non-cancer risk assessments for residents, construction workers and utility workers will be used as the bases for developing Site-specific soil PCB and lead clean-up values for PCB Hot Spots #1 to #3. The exposure assumptions and dose response factors are the same as used in the baseline risk assessments for each receptor. The soil EPCs for all COC, except PCBs, TCDD toxicity equivalent PCBs and lead, are the same as those used for the baseline risk assessments for exterior courtyard.

The calculation of non-cancer risk estimates to support the Site-specific soil PCB and lead clean-up standards for utility worker, construction worker and resident are documented in the tables of the appendices attached to this risk characterization (Attachments 2E and 2F). A Site-specific risk-based clean-up standard of **10 mg/kg** for PCB was calculated. This value is also intended to be consistent with the TSCA limit maximum of 10 mg/kg when a cap is present in a High Occupancy area. For **lead**, the Site-specific clean-up standard is **450 mg/kg**. These clean-up standards, together with the EPCs for the other soil COC, resulted in a cumulative hazard index of 1 or less for all three receptors. The 10 mg/kg cleanup standard for PCB is intended to be compared to the 95th percentile upper confidence limit on the mean for PCBs in the exterior

courtyard exposure point for the 0-3, 0-6 and 0-15 exposure intervals. The lead clean-up standard is not directly used, because the PCB Hot Spot remediation is not directly intended to reduce levels of lead in soils. The lead clean-up standard is only used to determine what cleanup level of PCB is acceptable to achieve No Significant Risk of harm.

A secondary cleanup standard also applies to PCB. An assumption is made that following remediation, no single soil sample will contain more than **50 mg/kg PCB**, which is the TSCA limit when a cap is present in a Low Occupancy Area. The cleanup standards are summarized in Table 8.

5.0 Findings and Conclusions of Risk Characterization

A Method 3 Risk Characterization was conducted for the exterior courtyard release. It was conducted to comply with the MCP and also because a PCB clean-up under TSCA is proposed to be a combination of Self-Implementing Clean-up and Disposal under 40 CFR 761.61(a)(3) and Risk-Based Clean-up and Disposal under 40 CFR 761.61(c). The Self-Implementing Clean-up will be conducted and will include the installation of a TSCA cap, with the following exception: (1) storm drainage catch basins, a storm drainage system and utility lines will exist beneath the cap; and (2) all or a portion of the cap may be temporarily removed to allow for the repair or maintenance of subsurface utilities or to allow for construction activities. The TSCA cap will be constructed of six inches of asphalt pavement underlain by six inches of processed gravel.

Based on the Method 3 Risk Characterization, once the three PCB Hot Spots are adequately remediated, a condition of No Significant Risk of harm to safety, welfare and the environment is achieved for current and future conditions and the PCB EPCs do not exceed the TSCA High Occupancy limit presuming the presence of a cap. Assumptions regarding activities and uses of the Site were used in this risk characterization. These assumptions require the following actions: (1) the remediation of PCB Hot Spots #1, #2 and #3, such that Site-specific PCB cleanup standards are achieved; (2) the installation and maintenance of a protective barrier (cap) over all the soils of the exterior courtyard and Mill Building #5; (3) the recording or registering of a Notice of Activity and Use Limitation (deed restriction) requiring the periodic inspection and maintenance of the protective barrier/cap (TSCA also requires deed notation when a cap is used); and (4) the prohibition of gardening of edible produce in soils of the disposal Site (exterior courtyard, Mill Building #5 and Mill Building #3) via Best Management Practices.

Currently pavement exists over the soils of the exterior courtyard and building foundations exist over the soils beneath Mill Buildings #3 and #5. The pavement and building foundations are protective barriers impeding human contact to the soils. The pavement of the

exterior courtyard (along with underlying base layer) will be removed during remediation of the PCB Hot Spots and in order to install a TSCA cap. The existing foundation floor of Mill Building #5 is presumed to be an adequate protective barrier. An assumption is made that, except for Mill Building #3, these protective barriers will remain in place, except temporarily during a future utility repair or construction project. There is no requirement to maintain a protective barrier over the soils beneath Mill Building #3.

The proposed TSCA cap is planned to meet the technical requirements of a TSCA cap specified at 40 CFR 761.61(a)(7) and 761.75(b), except that storm drainage catch basins will exist through the cap and utility lines and storm drainage system will exist beneath the cap. The cap will meet one of the intents of the TSCA cap, i.e., to mitigate human exposure. Another technical requirement of a TSCA cap is to keep PCB from leaching to groundwater. The depth to groundwater ranges from approximately 11 to 15 feet below ground surface. PCB contamination in soil extends to near or below the water table within one of the PCB Hot Spots. However, although PCB contamination has been detected in groundwater, it is not present in dissolved phase but rather is bound to particulates. No VOCs or VPH, which may result in the co-solution of PCBs in groundwater, are present at the Site. Therefore, Site conditions are not conducive to leaching of PCBs to groundwater or the migration of PCBs in groundwater toward the Merrimack River. The presence of storm water catch basins penetrating the existing pavement and a storm drainage system beneath the existing pavement would provide an opportunity for PCBs to leach from soil to groundwater if the potential for leaching exists. The lack of significant impact to groundwater indicates that the storm water catch basins penetrating the TSCA cap and the storm water system beneath the TSCA cap will not result in significant leaching of PCBs to groundwater. A cap intended to mitigate leaching of PCBs to groundwater is not necessary. Periodic monitoring of groundwater conditions is not necessary.

The soils of PCB Hot Spots #1 to #3 will have to be remediated to achieve No Significant Risk of harm to human health and to comply with the TSCA High Occupancy limit presuming the presence of a cap (protective barrier). A Site-specific clean-up standard of **10 mg/kg** for **PCB** was calculated. This value is intended to be consistent with the maximum TSCA risk limit maximum of 10 mg/kg when a cap is present in a High Occupancy area. This cleanup standard is not compared to each confirmatory soil sample, but is compared to the exterior courtyard EPC for PCBs. The EPC for PCB is the 95th percentile upper confidence limit on the mean. The maximum permitted concentration in any confirmatory soil sample is **50 mg//kg for PCBs** (the TSCA Low Occupancy Limit). The cleanup standards are summarized in Table 8.

Refer to Figure 5C for the locations of PCB Hot Spots #1 to #3, which will be targeted during soil remediation. The planned depth of remediation would be between three and four feet for PCB Hot Spot #1, seven feet for PCB Hot Spot #2, and five feet for PCB Hot Spot #3. PCB

Hot Spot #1 has a dimension of approximately 10 feet by approximately 7 feet. The estimated volume of soils to be excavated from this area is 10 cubic yards.

PCB Hot Spot #2 has a dimension of approximately 9 to 12 feet long on the south-north axis to approximately 12 feet wide on the north end of the east-west axis. The estimated volume of soils to be excavated from this area is 32 cubic yards. Utility lines (sewer and stormwater including a catch basin) are known or suspected to traverse this area and the stormwater system is located at the eastern edge of the planned excavation. These structures may reduce the volume of soils to be excavated.

PCB Hot Spot #3 has a dimension of approximately 19 feet long on the south-north axis to approximately 10 feet wide on the north end of the east-west axis and 18 feet wide on the south end of the east-west axis. The estimated volume of soils to be excavated from this area is 43 cubic yards. A utility line (water) is known or suspected to traverse through Excavation #3 in an east-west direction, which may reduce the volume of soils to be excavated.

The TSCA regulations (40 CFR 761.61(a)(8)) require a notation be placed on the deed within 60 days of the completion of the remediation. The deed notation should state that the land was used for PCB remediation waste disposal, the applicable PCB clean-up levels left in soils beneath the cap (or protective barrier), and the requirement to maintain the cap (protective barrier).

The proposed permitted uses and activities, inconsistent uses and activities, and conditions and obligations of the Notice of Activity and Use Limitation are provided below. Refer to Figure 3D for the area subject to the recommended Notice of Activity and Use Limitation.

Activity and Use Limitation
Portion of 130 Foot of John Street, Lowell, MA
(Exterior Courtyard and Mill Building #5)

Permitted Uses and Activities
Activities and uses consistent with multi-family residential, school, day care, playground, institutional, commercial or industrial use of the property, and the maintenance thereof.
Construction and excavation related to construction, subject to conditions and obligations listed below.
Installation or repair of underground utilities, subject to obligations and conditions listed below.
Property maintenance activities, subject to conditions and obligations listed below.
Emergency underground utility repair, provided that excavated soils are either returned to the site or removed from the site in accordance with pertinent regulations.
All other lawfully-permitted uses and activities not prohibited by this Notice of AUL.
Such other activities or uses, which in the Opinion of an LSP, shall present no greater risk of harm to health, safety, welfare and the environment than the activities and uses set forth in this paragraph.

Inconsistent Uses and Activities
Single-family residential use.
Relocation of soil from the property to an off-property location unless the LSP renders an opinion which states that such relocation is consistent with maintaining no significant risk and pertinent local, state and federal regulations.
Conditions and Obligations
The land subject to this Notice of Activity and Use Limitation was used for PCB remediation waste disposal under 40 CFR 761.61 of the Toxic Substances and Control Act. The PCB clean-up level left in soils beneath the protective barriers is between >1 and 10 mg/kg for most soils although individual samples may contain 50 mg/kg PCBs. There is a requirement under TSCA to maintain the protective barrier.
All soils are covered by one or more protective barriers, as allowed by a Licensed Site Professional. The purpose of the protective barriers is to impede direct contact to soils. For the Mill Building #5 area, the protective barrier may be one or more of the following: building foundation, asphalt and/or concrete pavement. For the exterior courtyard, the protective barrier must be a TSCA cap constructed of six inches of asphalt underlain by six inches of processed gravel.
Ornamental landscape vegetation may be planted in containers placed on top of a protective barrier, but may not be planted within, as part of, or through a protective barrier.
The protective barrier(s) must be periodically inspected and maintained in good condition.
Any openings in the protective barrier must be repaired within 72 hours of discovery in compliance with TSCA.
The protective barrier(s) may be temporarily removed for a construction or utility project. Following completion of the construction or utility project, the protective barrier(s) must be promptly re-installed.
Soil excavation of up to 20 cubic yards in order to repair, maintain or install a utility line may be conducted without notification of the Massachusetts Department of Environmental Protection or Region I of the Environmental Protection Agency so long as the excavated soils are returned to the utility trench upon completion of the project and the protective barrier(s) are promptly re-installed.
Utility repair, maintenance and installation must be conducted under a Site-specific Soil Management Plan prepared under the direction of a Licensed Site Professional. The Site-specific Soil Management Plan for utility work must be maintained on-Site in case emergency utility repair is needed.
If a construction project entails soil excavation, the project must be conducted in accordance with 310 CMR 40.1067(4), and Remediation Waste must be handled in accordance with the provisions of 310 CMR 40.0030 and the pertinent TSCA regulations for PCBs.
The construction project must be conducted under a Site-Specific Soil Management Plan prepared specifically for the project under the direction of a Licensed Site Professional. The purpose of the Soil Management Plan is to specify requirements for handling, short-term storage and disposition of excavated soils; and must contain provisions to limit child exposure to both excavated and exposed soils. The Soil Management Plan must be implemented under the direction of a Licensed Site Professional
During a construction project, following the completion of excavation, soils must be: (1) returned to the site and the protective barrier re-installed over the soils, or (2) the excavation may be backfilled with clean soils and the protective barrier re-installed and the excavated soils must be removed from the site in accordance with pertinent local, state and federal regulations.

ATTACHMENT 2A

Table 1.1
Cancer Dose-Response Values:
Oral Slope Factors

Chemical Name	CAS Number	Oral Slope Factor 1/(mg/kg/day)	Weight of Evidence Class	Source	Date Last Revised
barium	7440-39-3		No Data	MADEP, 4/14	
chromium (III)	16065-83-1		No Data	MADEP, 4/14	
dioxin (TCDD equivalents)	1746-01-6	1.5E+05	B2	MADEP, 4/14	
lead	7439-92-1		B2	MADEP, 4/14	
mercury	7439-97-6		D	MADEP, 4/14	
nickel	7440-02-0		A	MADEP, 4/14	
polychlorinated biphenyls	1336-36-3	2.0E+00	B2	MADEP, 4/14	
vanadium	7440-62-2		No Data	MADEP, 4/14	
C19-C36 Aliphatics	N/A		No Data	MADEP, 4/14	
C11-C22 Aromatics	N/A		No Data	MADEP, 4/14	

Notes: mg/kg/day = milligrams per kilogram body weight per day
N/A = not available

Weight of Evidence:
A = Human carcinogen
B1 = Probable human carcinogen
B2 = Probable human carcinogen
C = Possible human carcinogen
D = Not classifiable as to human carcinogenicity
E = Evidence of noncarcinogenicity for humans

References: MADEP, 4/14. Construction Worker Shortform 2012, Table CW-5 Chemical Specific Data, Vlookup Version v0414

Prepared By:
Reviewed By:
6/30/2014

Table 1.2
Relative Absorption Factors (RAFs) - Cancer

Chemical Name	CAS Number	Soil Ingestion RAF Cancer	Water Ingestion RAF Cancer	Soil Dermal RAF Cancer	Water Dermal RAF Cancer
barium	7440-39-3	NC	NC	NC	NC
chromium (III)	16065-83-1	NC	NC	NC	NC
dioxin (TCDD equivalents)	1746-01-6	1	1	0.1	1
lead	7439-92-1	NC	NC	NC	NC
mercury	7439-97-6	NC	NC	NC	NC
nickel	7440-02-0	NC	NC	NC	NC
polychlorinated biphenyls	1336-36-3	1	1	0.1	1
vanadium	7440-62-2	NC	NC	NC	NC
C9-C18 Aliphatics	N/A	NC	NC	NC	NC
C11-C22 Aromatics	N/A	NC	NC	NC	NC

Notes: (1) RAF values from MADEP (1994). Default value of one (1) assigned to dermal contact with water.
NC = RAF not provided because compound is not a Class A, B1, B2 or, when applicable, C carcinogen
N/A = not available or because no oral cancer slope factor is available.

References: MADEP, 4/14. Construction Worker Shortform 2012, Table CW-5 Chemical Specific Data, Vlookup Version v0414

Prepared By:
Reviewed By:
6/30/2014

Table 1.3
Identification of Exposure Point Concentrations for Commercial/Industrial Workers: Soil

Chemical Name	CAS Number	Outer Courtyard (0-3 Foot Interval)	Outer Courtyard (0-6 Foot Interval)	Outer Courtyard (0-15 Foot Interval)	Beneath Mill #3 Building			
barium	7440-39-3	7.50E+01	1.06E+02	8.10E+01				
chromium (III)	16065-83-1	3.0E+01	2.8E+01	2.5E+01				
dioxin (TCDD equivalents)	1746-01-6	1.1E-05	8.5E-06	6.4E-06	6.2E-07			
lead	7439-92-1	4.19E+02	3.25E+02	2.87E+02				
mercury	7439-97-6	3.5E-01	6.0E-01	4.1E-01				
nickel	7440-02-0	3.1E+01	2.6E+01	2.2E+01				
polychlorinated biphenyls	1336-36-3	8.3E+00	7.0E+00	5.2E+00	5.1E-01			
vanadium	7440-62-2	2.2E+01	2.3E+01	2.4E+01				
C19-C36 Aliphatics *	N/A	3.27E+02	3.27E+02	1.42E+02				
C11-C22 Aromatics *	N/A	3.03E+02	3.03E+02	1.25E+02				

unit, milligram per kilogram (mg/kg), ppm

Prepared By:EAF
Reviewed By:
Preparation date: 6/30/2014
Revision date:

Table 1.4
Calculation of Lifetime Average Daily Dose for Soil Exposure: Commercial On-Site Worker (Chronic)

Receptor: On-Site Commercial Worker

		Exposure Point:	Outer Courtyard (0-3 Foot Interval)		Outer Courtyard (0-6 Foot Interval)		Outer Courtyard (0-15 Foot Interval)		Beneath Mill #3 Building		0.00E+00	
Chemical Name	**CAS Number**	**Weight of Evidence Class**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**
dioxin (TCDD equivalents)	1746-01-6		2.27E-13	1.09E-12	1.85E-13	8.86E-13	1.38E-13	6.61E-13	1.35E-14	6.47E-14		
nickel	7440-02-0											
polychlorinated biphenyls	1336-36-3		1.80E-07	8.64E-07	1.51E-07	7.25E-07	1.13E-07	5.41E-07	1.10E-08	5.29E-08		

Formula: Lifetime Average Daily Dose (LADD) for exposure to soils via ingestion (ing) and dermal contact

$$\text{LADD-dermal} = \frac{[\text{OHM-soil}]*SA*AF*RAF*EF*ED*EP*C}{BW*AP}$$

$$\text{LADD-ing} = \frac{[\text{OHM-soil}]*IR*RAF*EF*ED*EP*C}{BW*AP}$$

Unit: LADD, mg/kg/day

Receptor: Commercial Worker

Description	**Abbreviation**	**Unit**	**Default Value**	**Source**	**Site-Specific Value**	**Source / Description**	**Input Value**
Exposure point concentration	[OHM-soil]	mg/kg			See Soil EPC Table		See Soil EPC Table
Skin surface area in contact with soil on days exposed	SA	square centimeter/day	3473	[1], female worker who is exposed to face, hands, forearms, lower legs and feet			3.47E+03
Mass of soil adhered to the unit surface area of skin exposed	AF	mg/sq. cm.	0.03	[1]			3.00E-02
Relative Absorption Factor	RAF	unitless	See RAF Table				See RAF Table
Exposure frequency: # exposure events during EP / # days in EP	EF	events/year	120	4 days per week, for 30 weeks per year	130	If subchronic exposure presumed: Exposure occurs five days per week during a six-month construction project	1.20E+02
Exposure duration: typical duration of each exposure event	ED	years/event	2.74E-03	1 day per event or 1/365 of a year per event			2.74E-03
Exposure period: period of time over which exposure may occur	EP	years	27	[2], ages 18-25, 25-35, 35-45 years	1	If subchronic exposure presumed: Exposure occurs over a six month construction period occuring during one year.	2.70E+01
Unit Conversion Factor	C	kg/mg	1.00E-06	for dermal contact			1.00E-06
Unit Conversion Factor	C	kg/mg	1.00E-06	for ingestion			1.00E-06
Body weight of the receptor during the AP	BW	kg	61.1	[2], average BW from 18-45 years old for females	57.1	If subchronic exposure presumed: Average BW for an 18-25 year old female	6.11E+01
Averaging Period	AP	years	70	[2]			7.00E+01
Ingestion rate	IR	mg/day	50	[2]			5.00E+01

References:

[1] MADEP's Technical Update, Weighted Skin-Soil Adherence Factors, April 2002.
[2] MADEP's Guidance for Disposal Site Risk Characterization in Support of the Massachusetts Contingency Plan, Interim Final Policy BWSC/ORS-95-141

Table 1.5
Calculation of Excess Lifetime Cancer Risk (ELCR) for Exposure to Soil: Commercial On-Site Worker (Chronic)

Receptor: On-Site Commercial Worker																
		Exposure Point:	Outer Courtyard (0-3 Foot Interval)			Outer Courtyard (0-6 Foot Interval)			Outer Courtyard (0-15 Foot Interval)			Beneath Mill #3 Building			0.00		
Chemical Name	CAS Number	Weight of Evidence Class	Dermal Contact	Incidental Ingestion	Dust Inhalation	Dermal Contact	Incidental Ingestion	Dust Inhalation	Dermal Contact	Incidental Ingestion	Dust Inhalation	Dermal Contact	Incidental Ingestion	Dust Inhalation	Dermal Contact	Incidental Ingestion	Dust Inhalation
dioxin (TCDD equivalents)	1746-01-6		3.4E-08	1.6E-07		2.8E-08	1.3E-07		2.1E-08	9.9E-08		2.0E-09	9.7E-09				
nickel	7440-02-0																
polychlorinated biphenyls	1336-36-3		3.6E-07	1.7E-06		3.0E-07	1.5E-06		2.3E-07	1.1E-06		2.2E-08	1.1E-07				
Total ELCR: Route and Expos. Pt.			3.9E-07	1.9E-06	0.0E+00	3.3E-07	1.6E-06	0.0E+00	2.5E-07	1.2E-06	0.0E+00	2.4E-08	1.2E-07	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Proportion of complete exposure point				1.0E+00			1.0E+00			1.0E+00			1.0E+00			1.0E+00	
Adjusted Total ELCR: Route and Expos. Pt.			3.9E-07	1.9E-06	0.0E+00	3.3E-07	1.6E-06	0.0E+00	2.5E-07	1.2E-06	0.0E+00	2.4E-08	1.2E-07	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Total ELCR: Expos. Pt.				2.3E-06			1.9E-06			1.4E-06			1.4E-07			0.0E+00	

Formula:
Cumulative ELCR = $\sum ELCR_{ingestion\ -\ chemicalspecific} + \sum ELCR_{dermalcontact\ -\ chemicalspecific} + \sum ELCR_{inhalation:chemical\ -\ specific}$

ELCR ingestion-chemical specific = LADD-ingestion-chemical specific x Oral Slope Factor-chemical specific
ELCR dermal contact-chemical specific = LADD-dermal contact-chemical specific x Oral Slope Factor-chemical specific
ELCR ingestion-chemical specific = LADE-inhalation-chemical specific x Unit Risk-inhalation-chemical specific

ELCR = Excess Lifetime Cancer Risk, unit less
LADD = Lifetime Average Daily Dose, mg/kg/day
LADE = Lifetime Average Daily Exposure, mg/cu m

Prepared By:EAF
Reviewed By:
Preparation date:
Revision date: 6/30/2014

Table 1.6
Calculation of Total Excess Lifetime Cancer Risk (ELCR): On-Site Commercial Worker (Chronic)

Receptor	On-Site Commercial Worker							On-Site Commercial Worker						
Exposure Point #	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Pathway:														
Soil Exposure Point:														
Incidental ingestion of soil, normal	1.9E-06	1.6E-06	1.2E-06	1.2E-07										
Dermal contact with soil	3.9E-07	3.3E-07	2.5E-07	2.4E-08										
Total ELCR	2.3E-06	1.9E-06	1.4E-06	1.4E-07										
MCP Cancer Risk Limit	1.E-05	1.E-05	1.E-05	1.E-05										
Does Total ELCR exceed MCP Cancer Risk Limit?	No	No	No	No										
Significant Risk of Harm?	No	No	No	No										

Definintion of exposure points							
Exposure Point #	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Soil Exposure Point:	Outer Courtyard (0-3 Foot Interval)	Outer Courtyard (0-6 Foot Interval)	Outer Courtyard (0-15 Foot Interval)	Beneath Mill #3 Building			

NO LIMITATIONS ON FUTURE ACTIVITIES AND USES WERE ASSUMED FOR THIS RECEPTOR.

Prepared By:EAF
Reviewed By:
Preparation Date:
Revision Date:6/30/2014

Table 2.1
Noncancer Dose-Response Values:
Oral Reference Dose

Chemical Name	CAS Number	Subchronic Oral RfD (mg/kg/day)	Uncertainty/ Modifying Factors	Source	Date Last Checked	Chronic Oral RfD (mg/kg/day)	Uncertainty/ Modifying Factors	Source	Date Last Checked
barium	7440-39-3	7.0E-02		MADEP (6)	02/13	2.0E-01		MADEP(6)	02/13
chromium (III)	16065-83-1	1.5E+00		MADEP (6)	02/13	1.5E+00		MADEP (6)	02/13
dioxin (TCDD equivalents)	1746-01-6	7.0E-10		MADEP (6)	05/14	7.0E-10		MADEP (6)	05/14
lead	7439-92-1	7.5E-04		MADEP (6)	02/13	7.5E-04		MADEP (6)	02/13
mercury (from mercuric chloride)	7439-97-6	3.0E-04		MADEP (6)	02/13	3.0E-04		MADEP (6)	02/13
nickel (soluble salts)	7440-02-0	2.0E-02		MADEP (6)	02/13	2.0E-02		MADEP (6)	02/13
polychlorinated biphenyls, as PCB-1254	1336-36-3	5.0E-05		MADEP (6)	02/13	2.0E-05		MADEP (6)	02/13
vanadium	7440-62-2	9.0E-03		MADEP (6)	02/13	9.0E-03		MADEP (6)	02/13
C19-C36 Aliphatics	N/A	6.0E+00		MADEP (6)	02/13	2.0E+00		MADEP (6)	02/13
C11-C22 Aromatics	N/A	3.0E-01		MADEP (6)	02/13	3.0E-02		MADEP (6)	02/13

Notes: MADEP = Massachusetts Department of Environmental Protection
mg/kg/day = milligrams per kilogram body weight per day
N/A = Not available

Reference: MADEP, 4/14. Construction Worker Shortform 2012, Table CW-5 Chemical Specific Data, Vlookup Version v0414

Prepared By:
Reviewed By:
6/30/2014

Table 2.2
Relative Absorption Factors - Non-cancer

Chemical Name	CAS Number	Soil Ingestion RAF	Water Ingestion RAF	Soil Dermal RAF	Water Dermal RAF
barium	7440-39-3	1	1	0.1	1
chromium (III)	16065-83-1	1	1	0.1	1
dioxin (TCDD equivalent)	1746-01-6	1	1	0.1	1
lead	7439-92-1	0.5	0.5	0.006	1
mercury	7439-97-6	0.5	1	0.1	1
nickel	7440-02-0	1	1	0.2	1
polychlorinated biphenyls	1336-36-3	1	1	0.1	1
vanadium	7440-62-2	1	1	0.1	1
C19-C36 Aliphatics	N/A	1	1	0.2	1
C11-C22 Aromatics	N/A	0.3	0.91	0.1	1

Notes: (1) RAF values are from MADEP (1995, 2002, 2006). A default value of one (1) was assigned to dermal contact with water.

References: MADEP, 4/14. Construction Worker Shortform 2012, Table CW-5 Chemical Specific Data, Vlookup Version v0414

Prepared By:
Reviewed By:
6/30/2014

Table 2.3
Exposure Point Concentrations for Commercial / Industrial Workers: Soil

Chemical Name	CAS Number	Outer Courtyard (0-3 Foot Interval)	Outer Courtyard (0-6 Foot Interval)	Outer Courtyard (0-15 Foot Interval)	Beneath Mill #3 Building			
barium	7440-39-3	7.50E+01	1.06E+02	8.10E+01				
chromium (III)	16065-83-1	3.0E+01	2.8E+01	2.5E+01				
dioxin (TCDD equivalents)	1746-01-6	1.1E-05	8.5E-06	6.4E-06	6.2E-07			
lead	7439-92-1	4.19E+02	3.25E+02	2.87E+02				
mercury	7439-97-6	3.5E-01	6.0E-01	4.1E-01				
nickel	7440-02-0	3.1E+01	2.6E+01	2.2E+01				
polychlorinated biphenyls	1336-36-3	8.3E+00	7.0E+00	5.2E+00	5.1E-01			
vanadium	7440-62-2	2.2E+01	2.3E+01	2.4E+01				
C19-C36 Aliphatics *	N/A	3.27E+02	3.27E+02	1.42E+02				
C11-C22 Aromatics *	N/A	3.03E+02	3.03E+02	1.25E+02				

unit, milligram per kilogram (mg/kg), ppm

Prepared By:
Reviewed By:
6/30/2014

Table 2.4
Calculation of Average Daily Dose for Soil Exposure: Commercial On-Site Worker

Receptor: On-Site Commercial Worker

	Exposure Point:	Outer Courtyard (0-3 Foot Interval)		Outer Courtyard (0-6 Foot Interval)		Outer Courtyard (0-15 Foot Interval)		Beneath Mill #3 Building		0.00E+00	
Chemical Name	**CAS Number**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**
barium	7440-39-3	4.20E-06	2.02E-05	5.94E-06	2.85E-05	4.54E-06	2.18E-05				
chromium (III)	16065-83-1	1.68E-06	8.07E-06	1.57E-06	7.53E-06	1.40E-06	6.73E-06				
dioxin (TCDD equivalents)	1746-01-6	5.89E-13	2.82E-12	4.79E-13	2.30E-12	3.57E-13	1.71E-12	3.49E-14	1.68E-13		
lead	7439-92-1	1.41E-06	5.64E-05	1.09E-06	4.37E-05	9.65E-07	3.86E-05				
mercury	7439-97-6	1.96E-08	4.71E-08	3.36E-08	8.07E-08	2.30E-08	5.52E-08				
nickel	7440-02-0	3.48E-06	8.34E-06	2.92E-06	7.00E-06	2.47E-06	5.92E-06				
polychlorinated biphenyls	1336-36-3	4.67E-07	2.24E-06	3.92E-07	1.88E-06	2.92E-07	1.40E-06	2.86E-08	1.37E-07		
vanadium	7440-62-2	1.23E-06	5.92E-06	1.29E-06	6.19E-06	1.35E-06	6.46E-06				
C19-C36 Aliphatics	N/A	3.67E-05	8.80E-05	3.67E-05	8.80E-05	1.59E-05	3.82E-05				
C11-C22 Aromatics	N/A	1.70E-05	2.45E-05	1.70E-05	2.45E-05	7.01E-06	1.01E-05				

Formula: Daily Dose (ADD) for exposure to soils via ingestion (ing) and dermal contact

$$\text{ADD-dermal} = \frac{[\text{OHM-soil}]*SA*AF*RAF*EF*ED*EP*C}{BW*AP}$$

$$\text{ADD-ing} = \frac{[\text{OHM-soil}]*IR*RAF*EF*ED*EP*C}{BW*AP}$$

Unit: ADD, mg/kg/day

Receptor: Commercial Worker

Description	**Abbreviation**	**Unit**	**Default Value**	**Source**	**Site-Specific Value**	**Source / Description**	**Input Value**
Exposure point concentration	[OHM-soil]	mg/kg			See Soil EPC Table		See Soil EPC Table
Skin surface area in contact with soil on days exposed	SA	square centimeter/day	3473	[2], female worker who is exposed to face, hands, forearms, lower legs and feet			3.47E+03
Mass of soil adhered to the unit surface area of skin exposed	AF	mg/sq. cm.	0.03	[2], weighted AF for office worker			3.00E-02
Relative Absorption Factor	RAF	unitless	See RAF Table				See RAF Table
Exposure frequency: # exposure events during EP / # days in EP	EF	events/year	120	4 days per week for 30 weeks per year	130	5 days per week during a six-month construction project	1.20E+02
Exposure duration: typical duration of each exposure event	ED	years/event	2.74E-03	1 day per event or 1/365 of a year per event			2.74E-03
Exposure period: period of time over which exposure may occur	EP	years	27	[1], ages 18-25, 25-35, 35-45 years	0.5	exposure occurs during a six month construction project	2.70E+01
Unit Conversion Factor	C	kg/mg	1.00E-06	for dermal contact			1.00E-06
Unit Conversion Factor	C	kg/mg	1.00E-06	for ingestion			1.00E-06
Body weight of the receptor during the AP	BW	kg	61.1	[1], [2], average BW from 18-45 years old for females	57.1	average BW for an 18-25 year old female	6.11E+01
Averaging Period	AP	years	27	[1]	0.5		2.70E+01
Ingestion rate	IR	mg/day	50	[1]			5.00E+01

References:

[1] MADEP's Guidance for Disposal Site Risk Characterization in Support of the Massachusetts Contingency Plan, Interim Final Policy BWSC/ORS-95-141

[2] MADEP. Technical Update: Weighted Skin-Soil Adherence Factors

Prepared By:EAF
Reviewed By:
Preparation Date:
Revision Date: 6/30/2014

Table 2.5
Calculation of Hazard Index (HI) for Exposure to Soil: Commercial On-Site Worker

Receptor: On-Site Commercial Worker

	Exposure Point:	Outer Courtyard (0-3 Foot Interval)			Outer Courtyard (0-6 Foot Interval)			Outer Courtyard (0-15 Foot Interval)			Beneath Mill #3 Building			0.0E+00		
Chemical Name	**CAS Number**	**Dermal Contact**	**Incidental Ingestion**	**Dust Inhalation**	**Dermal Contact**	**Incidental Ingestion**	**Dust Inhalation**	**Dermal Contact**	**Incidental Ingestion**	**Dust Inhalation**	**Dermal Contact**	**Incidental Ingestion**	**Dust Inhalation**	**Dermal Contact**	**Incidental Ingestion**	**Dust Inhalation**
barium	7440-39-3	2.1E-05	1.0E-04		3.0E-05	1.4E-04		2.3E-05	1.1E-04							
chromium (III)	16065-83-1	1.1E-06	5.4E-06		1.0E-06	5.0E-06		9.3E-07	4.5E-06							
dioxin (TCDD equivalents)	1746-01-6	8.4E-04	4.0E-03		6.8E-04	3.3E-03		5.1E-04	2.4E-03		5.0E-05	2.4E-04				
lead	7439-92-1	1.9E-03	7.5E-02		1.5E-03	5.8E-02		1.3E-03	5.1E-02							
mercury	7439-97-6	6.5E-05	1.6E-04		1.1E-04	2.7E-04		7.7E-05	1.8E-04							
nickel	7440-02-0	1.7E-04	4.2E-04		1.5E-04	3.5E-04		1.2E-04	3.0E-04							
polychlorinated biphenyls	1336-36-3	2.3E-02	1.1E-01		2.0E-02	9.4E-02		1.5E-02	7.0E-02		1.4E-03	6.9E-03				
vanadium	7440-62-2	1.4E-04	6.6E-04		1.4E-04	6.9E-04		1.5E-04	7.2E-04							
C19-C36 Aliphatics	N/A	1.8E-05	4.4E-05		1.8E-05	4.4E-05		8.0E-06	1.9E-05							
C11-C22 Aromatics	N/A	5.7E-04	8.2E-04		5.7E-04	8.2E-04		2.3E-04	3.4E-04							
Total HI: Route and Expos. Pt.		2.7E-02	1.9E-01	0.0E+00	2.3E-02	1.6E-01	0.0E+00	1.7E-02	1.3E-01	0.0E+00	1.5E-03	7.1E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Proportion of complete exposure point			1.0E+00			1.0E+00			1.0E+00			1.0E+00			1.0E+00	
Adjusted Total HI: Route and Expos. Pt.		2.7E-02	1.9E-01	0.0E+00	2.3E-02	1.6E-01	0.0E+00	1.7E-02	1.3E-01	0.0E+00	1.5E-03	7.1E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Total HI: Expos. Pt.			2.2E-01			1.8E-01			1.4E-01			8.6E-03			0.0E+00	

Formula:

Cumulative HI = $\sum HI_{ingestion\ -\ chemicalspecific} + \sum HI_{dermalcontact\ -\ chemicalspecific} + \sum HI_{inhalation:chemical\ -\ specific}$

HI ingestion-chemical specific = ADD-ingestion-chemical specific x Oral Reference Dose-chemical specific
HI dermal contact-chemical specific = ADD-dermal contact-chemical specific x Oral Reference Dose-chemical specific
HI ingestion-chemical specific = ADE-inhalation-chemical specific x Inhalation Reference Concentration-inhalation-chemical specific

HI = Hazard Index, unitless
ADD = Average Daily Dose, mg/kg/day
ADE = Average Daily Exposure, mg/cu m

Prepared By:EAF
Reviewed By:
Preparation Date:
Revision Date: 6/30/2014

Table 2.6
Calculation of Total Hazard Index (HI): On-Site Commercial Workers

Receptor	On-Site Worker, Commercial													
Exposure Point #	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Pathway:														
Soil Exposure Point:														
Incidental ingestion of soil, normal	1.9E-01	1.6E-01	1.3E-01	7.1E-03										
Dermal contact with soil	2.7E-02	2.3E-02	1.7E-02	1.5E-03										
Total HI	2.2E-01	1.8E-01	1.4E-01	8.6E-03										
	Chronic	Chronic	Chronic	Chronic										
MCP Non-Cancer Risk Limit	1.E+00	1.E+00	1.E+00	1.E+00										
Significant Risk?	No	No	No	No										

Definintion of exposure points							
Exposure Point #	1	2	3	4	5	6	7
Soil Exposure Point:	Outer Courtyard (0-3 Foot Interval)	Outer Courtyard (0-6 Foot Interval)	Outer Courtyard (0-15 Foot Interval)	Beneath Mill #3 Building			

THERE ARE NO LIMITATIONS REGARDING FUTURE ACTIVITIES AND USES ASSUMED FOR THIS RECEPTOR.

Prepared By:EAF
Reviewed By:
Preparation Date:
Revision Date:6/30/2014

ATTACHMENT 2B

Table 1.1
Cancer Dose Response Values:
Oral Slope Factors

Chemical Name	CAS Number	Oral Slope Factor 1/(mg/kg/day)	Weight of Evidence Class	Source	Date Last Revised
barium	7440-39-3		No Data	MADEP, 4/14	
chromium (III)	16065-83-1		No Data	MADEP, 4/14	
dioxin (TCDD equivalents)	1746-01-6	1.5E+05	B2	MADEP, 4/14	
lead	7439-92-1		B2	MADEP, 4/14	
mercury	7439-97-6		D	MADEP, 4/14	
nickel	7440-02-0		A	MADEP, 4/14	
polychlorinated biphenyls	1336-36-3	2.0E+00	B2	MADEP, 4/14	
vanadium	7440-62-2		No Data	MADEP, 4/14	
C19-C36 Aliphatics	N/A		No Data	MADEP, 4/14	
C11-C22 Aromatics	N/A		No Data	MADEP, 4/14	

Notes: mg/kg/day = milligrams per kilogram body weight per day
N/A = not available

Weight of Evidence: A = Human carcinogen
B1 = Probable human carcinogen
B2 = Probable human carcinogen
C = Possible human carcinogen
D = Not classifiable as to human carcinogenicity
E = Evidence of noncarcinogenicity for humans

References: MADEP, 4/14. Construction Worker Shortform 2012, Table CW-5 Chemical Specific Data, Vlookup Version v0414

Table 1.2
Cancer Dose Response Values:
Inhalation Unit Risks Factors

Chemical Name	CAS Number	Unit Risk Factor 1/(mg/cu. m)	Weight of Evidence Class	Source	Date Last Revised
barium	7440-39-3		No Data	MADEP 3/13	
chromium (III)	16065-83-1		No Data	MADEP 3/13	
dioxin (TCDD equivalents)	1746-01-6	3.3E+04	B2	MADEP 3/13	
lead	7439-92-1		B2	MADEP 3/13	
mercury	7439-97-6		D	MADEP 3/13	
nickel	7440-02-0	4.8E-01	A	MADEP 3/13	
polychlorinated biphenyls	1336-36-3	1.0E-01	B2	MADEP 3/13	
vanadium	7440-62-2		No Data	MADEP 3/13	
C19-C36 Aliphatics	N/A		No Data	MADEP 3/13	
C11-C22 Aromatics	N/A		No Data	MADEP 3/13	

Notes: mg/cu. m. = milligrams per cubic meter

Weight of Evidence:
A = Human carcinogen
B1 = Probable human carcinogen
B2 = Probable human carcinogen
C = Possible human carcinogen
D = Not classifiable as to human carcinogenicity
E = Evidence of noncarcinogenicity for humans
N/A = Not available

References: MADEP, 3/13. MCP Toxicity excel spreadsheet used for the development of the MCP Numerical Standards (draft)

Table 1.3
Cancer Dose Response Values: Relative Absorption Factors (RAFs)

Chemical Name	CAS Number	Soil Ingestion RAF Cancer	Water Ingestion RAF Cancer	Soil Dermal RAF Cancer	Water Dermal RAF Cancer
barium	7440-39-3	NC	NC	NC	NC
chromium (III)	16065-83-1	NC	NC	NC	NC
dioxin (TCDD equivalents)	1746-01-6	1	1	0.1	1
lead	7439-92-1	NC	NC	NC	NC
mercury	7439-97-6	NC	NC	NC	NC
nickel	7440-02-0	NC	NC	NC	NC
polychlorinated biphenyls	1336-36-3	1	1	0.1	1
vanadium	7440-62-2	NC	NC	NC	NC
C9-C18 Aliphatics	N/A	NC	NC	NC	NC
C11-C22 Aromatics	N/A	NC	NC	NC	NC

Notes: (1) RAF values from MADEP (1994). Default value of one (1) assigned to dermal contact with water.
NC = RAF not provided because compound is not a Class A, B1, B2 or, when applicable, C carcinogen
N/A = not available or because no oral cancer slope factor is available.

References: MADEP, 4/14. Construction Worker Shortform 2012, Table CW-5 Chemical Specific Data, Vlookup Version v0414

Prepared By:
Reviewed By:
Preparation date:
Revision date: 6/30/2014

Table 1.4
Exposure Point Concentrations for Residents (Eastern Courtyard): Soil

Chemical Name	CAS Number	Outer Courtyard (0-3 Foot Interval)	Outer Courtyard (0-6 Foot Interval)	Outer Courtyard (0-15 Foot Interval)		
barium	7440-39-3	7.50E+01	1.06E+02	8.10E+01		
chromium (III)	16065-83-1	3.0E+01	2.8E+01	2.5E+01		
dioxin (TCDD equivalents)	1746-01-6	1.1E-05	8.5E-06	6.4E-06		
lead	7439-92-1	4.19E+02	3.25E+02	2.87E+02		
mercury	7439-97-6	3.5E-01	6.0E-01	4.1E-01		
nickel	7440-02-0	3.1E+01	2.6E+01	2.2E+01		
polychlorinated biphenyls	1336-36-3	8.3E+00	7.0E+00	5.2E+00		
vanadium	7440-62-2	2.2E+01	2.3E+01	2.4E+01		
C19-C36 Aliphatics *	N/A	3.27E+02	3.27E+02	1.42E+02		
C11-C22 Aromatics *	N/A	3.03E+02	3.03E+02	1.25E+02		

unit, milligram per kilogram (mg/kg), ppm
PCE = tetrachloroethene

Prepared By:
Reviewed By:
Preparation Date: 6/30/2014

Table 1.5
Derivation of Exposure Point Concentrations: Dust

Chemical Name	CAS Number	Outer Courtyard (0-3 Foot Interval)	Outer Courtyard (0-6 Foot Interval)	Outer Courtyard (0-15 Foot Interval)				
barium	7440-39-3	4.50E-03	6.36E-03	4.86E-03				
chromium (III)	16065-83-1	1.80E-03	1.68E-03	1.50E-03				
dioxin (TCDD equivalents)	1746-01-6	6.30E-10	5.12E-10	3.82E-10				
lead	7439-92-1	2.51E-02	1.95E-02	1.72E-02				
mercury	7439-97-6	2.10E-05	3.60E-05	2.46E-05				
nickel	7440-02-0	1.86E-03	1.56E-03	1.32E-03				
polychlorinated biphenyls	1336-36-3	5.00E-04	4.19E-04	3.13E-04				
vanadium	7440-62-2	1.32E-03	1.38E-03	1.44E-03				
C19-C36 Aliphatics *	N/A	1.96E-02	1.96E-02	8.52E-03				
C11-C22 Aromatics *	N/A	1.82E-02	1.82E-02	7.50E-03				

Formula: EPC-air = [OHM]-soil * PF * PM-10 * CF

where,
EPC-air = Exposure Point Concentration (ug/cu m)
[OHM]-soil = soil concentration (mg/kg)
PM-10 = respirable particulate concentration in air (60 ug/cu m)
PF = proportion of respirable particulate concentrations attributable to the site (1.0)
CF = conversion factor (1E-06 kg/ug)

Units: Soil EPC = mg/kg
Dust EPC = ug/cu m

Prepared By:
Reviewed By:
Preparation date: 6/30/2014

Table 1.6
Calculation of Lifetime Average Daily Dose for Soil Exposure: Resident, aged 1 to 2 Years

Receptor: Resident, aged 1-31 years

		Exposure Point:	Outer Courtyard (0-3 Foot Interval)		Outer Courtyard (0-6 Foot Interval)		Outer Courtyard (0-15 Foot Interval)		0.00E+00		0.00E+00	
Chemical Name	**CAS Number**	**Weight of Evidence Class**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**
dioxin (TCDD equivalents)	1746-01-6		1.17E-13	6.78E-13	9.49E-14	5.52E-13	7.08E-14	4.12E-13				
nickel	7440-02-0											
polychlorinated biphenyls	1336-36-3		9.26E-08	5.38E-07	7.77E-08	4.52E-07	5.79E-08	3.37E-07				

Formula: Lifetime Average Daily Dose (LADD) for exposure to soils via ingestion (ing) and dermal contact

$$\text{LADD-dermal} = \frac{[\text{OHM-soil}]*SA*AF*RAF*EF*ED*EP*C}{BW*AP}$$

$$\text{LADD-ing} = \frac{[\text{OHM-soil}]*IR*RAF*EF*ED*EP*C}{BW*AP}$$

Unit: LADD, mg/kg/day

Receptor: Resident, aged 1 to 31 years

Description	**Abbreviation**	**Unit**	**Default Value**	**Source**	**Site-Specific Value**	**Source / Description**	**Input Value**
Exposure point concentration	[OHM-soil]	mg/kg			See Soil EPC Table		See Soil EPC Table
Skin surface area in contact with soil on days exposed	SA	square centimeter/day	4427	[1], child, aged 8 to 15 years (face, hands, forearms, lower legs and feet)			0.00E+00
			5653	[1], adult, aged 15 to 31 years (face, hands, forearms, lower legs and feet)			0.00E+00
			2431	[1], child, aged 1-8 years (face, hands, forearms, lower legs and feet)	1670	child, aged 1 to 2 years (face, hands, forearms, lower legs and feet)	1.67E+03
Mass of soil adhered to the unit surface area of skin exposed	AF	mg/sq. cm.	0.35	[2], child, aged 1-8 years	3.50E-01	child, aged 1 to 2 years	3.50E-01
			0.13	[2], adult, aged 15-31 years			0.00E+00
			0.14	[2], older child, aged 8-15 years			0.00E+00
Relative Absorption Factor	RAF	unitless	See RAF Table				See RAF Table
Exposure frequency: # exposure events during EP / # days in EP	EF	events/year	150	[1] 5 days per week during the 30 warmest weather weeks of the year	52	For exterior courtyard: Exposure presumed to occur no more than two days per week during a six month construction period.	5.20E+01
Exposure duration: typical duration of each exposure event	ED	years/event	2.74E-03	1 day per event or 1/365 of a year per event			2.74E-03
Exposure period: period of time over which exposure may occur	EP	years	7	[1], child, aged 8 to 15 years			7.00E+00
			16	[1], adult, aged 15 to 31 years			1.60E+01
			7	[1], young child, aged 1-8 years	1.0	subchronic exposure of 1 year old boy or girl (Subchronic)	1.00E+00
Unit Conversion Factor	C	kg/mg	1.00E-06	for dermal contact			1.00E-06
Unit Conversion Factor	C	kg/mg	1.00E-06	for ingestion			1.00E-06
Body weight of the receptor during the AP	BW	kg	39.9	[1], child, aged 8-15 years			3.99E+01
			58.7	[1], adult, aged 15 to 31 years			5.87E+01
			17.0	[1], young child, aged 1-8 years	1.07E+01	subchronic exposure of 1 year old boy or girl	1.07E+01
Averaging Period	AP	years	70	[1]			7.00E+01
Ingestion rate	IR	mg/day	50	[1], age 8 or greater			5.00E+01
			100	[1], age 1-8 years			1.00E+02

References:

[1] MADEP's Guidance for Disposal Site Risk Characterization in Support of the Massachusetts Contingency Plan, Interim Final Policy BWSC/ORS-95-141 [Updated using exposure assumptions of MADEP's Method 1 Numerical Standard Development Workbook, 5/2009].

[2] MADEP's Technical Update, Weighted Skin-Soil Adherence Factors, April 2002.

Table 1.7
Calculation of Lifetime Average Daily Exposure from Inhalation of Dust: Resident, aged 1 to 2 Years

Receptor: Resident, aged 1 to 31 years									
Chemical Name	**CAS Number**	**Weight of Evidence Class**	**Outer Courtyard (0-3 Foot Interval)**	**Outer Courtyard (0-6 Foot Interval)**	**Outer Courtyard (0-15 Foot Interval)**				
dioxin (TCDD equivalents)	1746-01-6		4.5E-15	3.7E-15	2.7E-15				
nickel	7440-02-0		1.3E-08	1.1E-08	9.4E-09				
polychlorinated biphenyls	1336-36-3		3.6E-09	3.0E-09	2.2E-09				

A = USEPA Known Human Carcinogen
B1 or B2 = USEPA Probable Human Carcinogen
C = USEPA Possible Human Carcinogen
NC or blank space = Not a carcinogen or insufficient information

Formula: Lifetime Average Daily Exposure (LADE) via inhalation (ihl) of dusts

$$LADE\text{-}ihl = \frac{[OHM\text{-}dust]*EF*ED*EP*C}{AP}$$

Unit: LADE, mg/cu m

Receptor: Resident, aged 1 to 31 years

Description	**Abbreviation**	**Unit**	**Default Value**	**Source**	**Site-Specific Value**	**Source / Description**	**Input Value**
Exposure point concentration	[OHM-dust]	ug/cu. m.			See Dust EPC Table		See Dust EPC Table
Exposure frequency: # exposure events during EP / # days in EP	EF	events/year	150	[1] 5 days per week during the 30 warmest weather weeks of the year			0.00E+00
			150	[1] 5 days per week during the 30 warmest weather weeks of the year	182	Seven days per week during a six-month construction project, during age 1-2 years	1.82E+02
Exposure duration: typical duration of each exposure event	ED	years/event	2.74E-03	1 day per event or 1/365 of a year			2.74E-03
Exposure period: period of time over which exposure may occur	EP	years	23	[1], from age 8 to 31 years			2.30E+01
			7	[1], from age 1 to 8 years	1.00E+00	Presume exposure occurs during a construction project from age 1 to 2 years of age, to either a girl or boy.	1.00E+00
Unit Conversion Factor	C	mg/ug	1.00E-03	for inhalation			1.00E-03
Averaging Period	AP	years	70	[1]			7.00E+01

References:

[1] MADEP's Guidance for Disposal Site Risk Characterization in Support of the Massachusetts Contingency Plan, Interim Final Policy BWSC/ORS-95-141

Prepared By:EAF
Reviewed By:
Preparation Date:
Revision Date:6/30/2014

Table 1.8
Calculation of Excess Lifetime Cancer Risk (ELCR) for Exposure to Soil and Dust: Resident, aged 1 to 2 Years

Receptor: Resident, aged 1 to 31 years																
		Exposure Point:	Outer Courtyard (0-3 Foot Interval)			Outer Courtyard (0-6 Foot Interval)			Outer Courtyard (0-15 Foot Interval)			0.00E+00			0.00E+00		
Chemical Name	CAS Number	Weight of Evidence Class	Dermal Contact	Incidental Ingestion	Dust Inhalation	Dermal Contact	Incidental Ingestion	Dust Inhalation	Dermal Contact	Incidental Ingestion	Dust Inhalation	Dermal Contact	Incidental Ingestion	Dust Inhalation	Dermal Contact	Incidental Ingestion	Dust Inhalation
dioxin (TCDD equivalents)	1746-01-6		1.8E-08	1.0E-07	1.5E-10	1.4E-08	8.3E-08	1.2E-10	1.1E-08	6.2E-08	9.0E-11						
nickel	7440-02-0				6.4E-09			5.3E-09			4.5E-09						
polychlorinated biphenyls	1336-36-3		1.9E-07	1.1E-06	3.6E-10	1.6E-07	9.0E-07	3.0E-10	1.2E-07	6.7E-07	2.2E-10						
Total ELCR: Route and Expos. Pt.			2.0E-07	1.2E-06	6.9E-09	1.7E-07	9.9E-07	5.8E-09	1.3E-07	7.3E-07	4.8E-09	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Proportion of complete exposure point				1.0E+00			1.0E+00			1.0E+00			1.0E+00			1.0E+00	
Adjusted Total ELCR: Route and Expos. Pt.			2.0E-07	1.2E-06	6.9E-09	1.7E-07	9.9E-07	5.8E-09	1.3E-07	7.3E-07	4.8E-09	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Total ELCR: Expos. Pt.				1.4E-06			1.16E-06			8.7E-07			0.0E+00			0.0E+00	

Formula:

Cumulative ELCR = $\sum ELCR_{ingestion\ -\ chemicalspecific} + \sum ELCRdermalcontact - chemicalspecific + \sum ELCR_{inhalation:\ chemical\ -\ specific}$

ELCR ingestion-chemical specific = LADD-ingestion-chemical specific x Oral Slope Factor-chemical specific
ELCR dermal contact-chemical specific = LADD-dermal contact-chemical specific x Oral Slope Factor-chemical specific
ELCR ingestion-chemical specific = LADE-inhalation-chemical specific x Unit Risk-inhalation-chemical specific

ELCR = Excess Lifetime Cancer Risk, unit less
LADD = Lifetime Average Daily Dose, mg/kg/day
LADE = Lifetime Average Daily Exposure, mg/cu m

Table 1.9
Calculation of Total Excess Lifetime Cancer Risk (ELCR): Resident, aged 1 to 2 Years

Receptor	Resident							Youth Trespasser or Visitor						
Exposure Point #	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Pathway:														
Soil Exposure Point:														
Incidental ingestion of soil, normal	1.2E-06	9.9E-07	7.3E-07											
Inhalation of dusts from disturbed soil	6.9E-09	5.8E-09	4.8E-09											
Dermal contact with soil	2.0E-07	1.7E-07	1.3E-07											
Total ELCR	1.4E-06	1.2E-06	8.7E-07											
MCP Cancer Risk Limit	1.E-05	1.E-05	1.E-05											
Does Total ELCR exceed MCP Cancer Risk Limit?	No	No	No											
Significant Risk of Harm?	No	No	No											

Definition of exposure points	Resident						
Exposure Point #	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Soil Exposure Point:	Outer Courtyard (0-3 Foot Interval)	Outer Courtyard (0-6 Foot Interval)	Outer Courtyard (0-15 Foot Interval)				

ASSUMPTIONS FOR BOTH OUTER COURTYARD AND BENEATH MILL #3 BUILDING:
NO SINGLE FAMILY RESIDENCE. NO GARDENING OF EDIBLE PRODUCE. EXCLUDE FILL BACKGROUND.

ASSUMPTIONS FOR OUTER COURTYARD ONLY:
EXPOSURE TO SOILS OCCURS ONLY DURING A SINGLE SIX-MONTH CONSTRUCTION PROJECT, AFTER WHICH TIME
THE SOILS ARE RETURNED TO EXCAVATION OR ARE TRANSPORTED OFF-SITE.
ASSUME CONTROLS ARE USED TO LIMIT RESIDENTIAL EXPOSURE TO SOILS DURING CONSTRUCTION PROJECT.
PROTECTIVE COVER MUST REMAIN OVER SOILS EXCEPT DURING CONSTRUCTION OR UTILITY PROJECT, AFTER WHICH TIME THE PROTECTIVE COVER MUST BE RE-INSTALLED.

Table 1.10
Exposure Point Concentrations for Residents (Beneath Mill #3 Building): Soil

Chemical Name	CAS Number	Beneath Mill #3 Building				
dioxin (TCDD equivalents)	1746-01-6	6.2E-07				
polychlorinated biphenyls	1336-36-3	5.1E-01				

unit, milligram per kilogram (mg/kg), ppm
PCE = tetrachloroethene

Prepared By:
Reviewed By:
Preparation Date: 6/30/2014

Table 1.11
Derivation of Exposure Point Concentrations: Dust

Chemical Name	CAS Number	Beneath Mill #3 Building						
dioxin (TCDD equivalents)	1746-01-6	3.74E-11						
polychlorinated biphenyls	1336-36-3	3.06E-05						

Formula: EPC-air = [OHM]-soil * PF * PM-10 * CF

where, EPC-air = Exposure Point Concentration (ug/cu m)
[OHM]-soil = soil concentration (mg/kg)
PM-10 = respirable particulate concentration in air (60 ug/cu m)
PF = proportion of respirable particulate concentrations attributable to the site (1.0)
CF = conversion factor (1E-06 kg/ug)

Units: Soil EPC = mg/kg
Dust EPC = ug/cu m

Prepared By:
Reviewed By:
Preparation date: 6/30/2014

Table 1.12
Calculation of Lifetime Average Daily Dose for Soil Exposure: Resident, aged 1 to 31 Years

Receptor: Resident, aged 1-31 years

		Exposure Point:	Beneath Mill #3 Building		0.00E+00		0.00E+00		0.00E+00		0.00E+00	
Chemical Name	**CAS Number**	**Weight of Evidence Class**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**
dioxin (TCDD equivalents)	1746-01-6		2.41E-13	2.33E-13								
nickel	7440-02-0											
polychlorinated biphenyls	1336-36-3		1.97E-07	1.90E-07								

Formula: Lifetime Average Daily Dose (LADD) for exposure to soils via ingestion (ing) and dermal contact

$$\text{LADD-dermal} = \frac{[\text{OHM-soil}]*SA*AF*RAF*EF*ED*EP*C}{BW*AP}$$

$$\text{LADD-ing} = \frac{[\text{OHM-soil}]*IR*RAF*EF*ED*EP*C}{BW*AP}$$

Unit: LADD, mg/kg/day

Receptor: Resident, aged 1 to 31 years

Description	**Abbreviation**	**Unit**	**Default Value**	**Source**	**Site-Specific Value**	**Source / Description**	**Input Value**
Exposure point concentration	[OHM-soil]	mg/kg			See Soil EPC Table		See Soil EPC Table
Skin surface area in contact with soil on days exposed	SA	square centimeter/day	4427	[1], child, aged 8 to 15 years (face, hands, forearms, lower legs and feet)			4.43E+03
			5653	[1], adult, aged 15 to 31 years (face, hands, forearms, lower legs and feet)			5.65E+03
			2431	[1], child, aged 1-8 years (face, hands, forearms, lower legs and feet)	1670	child, aged 1 to 2 years (face, hands, forearms, lower legs and feet)	2.43E+03
Mass of soil adhered to the unit surface area of skin exposed	AF	mg/sq. cm.	0.35	[2], child, aged 1-8 years	3.50E-01	child, aged 1 to 2 years	3.50E-01
			0.13	[2], adult, aged 15-31 years			1.30E-01
			0.14	[2], older child, aged 8-15 years			1.40E-01
Relative Absorption Factor	RAF	unitless	See RAF Table				See RAF Table
Exposure frequency: # exposure events during EP / # days in EP	EF	events/year	150	[1] 5 days per week during the 30 warmest weather weeks of the year	52	Exposure presumed to occur no more than two days per week during a six month construction period	1.50E+02
Exposure duration: typical duration of each exposure event	ED	years/event	2.74E-03	1 day per event or 1/365 of a year per event			2.74E-03
Exposure period: period of time over which exposure may occur	EP	years	7	[1], child, aged 8 to 15 years			7.00E+00
			16	[1], adult, aged 15 to 31 years			1.60E+01
			7	[1], young child, aged 1-8 years	1.0	subchronic exposure of 1 year old boy or girl (Subchronic)	7.00E+00
Unit Conversion Factor	C	kg/mg	1.00E-06	for dermal contact			1.00E-06
Unit Conversion Factor	C	kg/mg	1.00E-06	for ingestion			1.00E-06
Body weight of the receptor during the AP	BW	kg	39.9	[1], child, aged 8-15 years			3.99E+01
			58.7	[1], adult, aged 15 to 31 years			5.87E+01
			17.0	[1], young child, aged 1-8 years	1.07E+01	subchronic exposure of 1 year old boy or girl	1.70E+01
Averaging Period	AP	years	70	[1]			7.00E+01
Ingestion rate	IR	mg/day	50	[1], age 8 or greater			5.00E+01
			100	[1], age 1-8 years			1.00E+02

References:

[1] MADEP's Guidance for Disposal Site Risk Characterization in Support of the Massachusetts Contingency Plan, Interim Final Policy BWSC/ORS-95-141 [Updated using exposure assumptions of MADEP's Method 1 Numerical Standard Development Workbook, 5/2009].

[2] MADEP's Technical Update, Weighted Skin-Soil Adherence Factors, April 2002.

Table 1.13
Calculation of Lifetime Average Daily Exposure from Inhalation of Dust: Resident, aged 1 to 31 Years

Receptor: Resident, aged 1 to 31 years									
Chemical Name	**CAS Number**	**Weight of Evidence Class**	**Beneath Mill #3 Building**						
dioxin (TCDD equivalents)	1746-01-6		6.6E-15						
nickel	7440-02-0								
polychlorinated biphenyls	1336-36-3		5.4E-09						

A = USEPA Known Human Carcinogen
B1 or B2 = USEPA Probable Human Carcinogen
C = USEPA Possible Human Carcinogen
NC or blank space = Not a carcinogen or insufficient information

Formula: Lifetime Average Daily Exposure (LADE) via inhalation (ihl) of dusts

$$LADE\text{-}ihl = \frac{[OHM\text{-}dust]*EF*ED*EP*C}{AP}$$

Unit: LADE, mg/cu m

Receptor: Resident, aged 1 to 31 years

Description	Abbreviation	Unit	Default Value	Source	Site-Specific Value	Source / Description	Input Value
Exposure point concentration	[OHM-dust]	ug/cu. m.			See Dust EPC Table		See Dust EPC Table
Exposure frequency: # exposure events during EP / # days in EP	EF	events/year	150	[1] 5 days per week during the 30 warmest weather weeks of the year			1.50E+02
			150	[1] 5 days per week during the 30 warmest weather weeks of the year	182	Seven days per week during a six-month construction project, during age 1-2 years	1.50E+02
Exposure duration: typical duration of each exposure event	ED	years/event	2.74E-03	1 day per event or 1/365 of a year			2.74E-03
Exposure period: period of time over which exposure may occur	EP	years	23	[1], from age 8 to 31 years			2.30E+01
			7	[1], from age 1 to 8 years	1.00E+00	Presume exposure occurs during a construction project from age 1 to 2 years of age, to either a girl or boy.	7.00E+00
Unit Conversion Factor	C	mg/ug	1.00E-03	for inhalation			1.00E-03
Averaging Period	AP	years	70	[1]			7.00E+01

References:

[1] MADEP's Guidance for Disposal Site Risk Characterization in Support of the Massachusetts Contingency Plan, Interim Final Policy BWSC/ORS-95-141

Prepared By:EAF
Reviewed By:
Preparation Date:
Revision Date:6/30/2014

Table 1.14
Calculation of Excess Lifetime Cancer Risk (ELCR) for Exposure to Soil and Dust: Resident, aged 1 to 31 Years

Receptor: Resident, aged 1 to 31 years																
Exposure Point:			Beneath Mill #3 Building			0.00E+00			0.00E+00			0.00E+00			0.00E+00	
Chemical Name	CAS Number	Weight of Evidence Class	Dermal Contact	Incidental Ingestion	Dust Inhalation	Dermal Contact	Incidental Ingestion	Dust Inhalation	Dermal Contact	Incidental Ingestion	Dust Inhalation	Dermal Contact	Incidental Ingestion	Dust Inhalation	Dermal Contact	Incidental Ingestion	Dust Inhalation
dioxin (TCDD equivalents)	1746-01-6		3.6E-08	3.5E-08	2.2E-10												
nickel	7440-02-0																
polychlorinated biphenyls	1336-36-3		3.9E-07	3.8E-07	5.4E-10												
Total ELCR: Route and Expos. Pt.			4.3E-07	4.2E-07	7.6E-10	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Proportion of complete exposure point				1.0E+00			1.0E+00			1.0E+00			1.0E+00			1.0E+00	
Adjusted Total ELCR: Route and Expos. Pt.			4.3E-07	4.2E-07	7.6E-10	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Total ELCR: Expos. Pt.				8.5E-07			0.00E+00			0.0E+00			0.0E+00			0.0E+00	

Formula:

Cumulative ELCR = $\sum ELCR_{ingestion\ -\ chemicalspecific} + \sum ELCRdermalcontact - chemicalspecific + \sum ELCR_{inhalation:\ chemical\ -\ specific}$

ELCR ingestion-chemical specific = LADD-ingestion-chemical specific x Oral Slope Factor-chemical specific
ELCR dermal contact-chemical specific = LADD-dermal contact-chemical specific x Oral Slope Factor-chemical specific
ELCR ingestion-chemical specific = LADE-inhalation-chemical specific x Unit Risk-inhalation-chemical specific

ELCR = Excess Lifetime Cancer Risk, unit less
LADD = Lifetime Average Daily Dose, mg/kg/day
LADE = Lifetime Average Daily Exposure, mg/cu m

Prepared By:EAF
Reviewed By:
Preparation Date:
Revision Date:6/30/2014

Table 1.15
Calculation of Total Excess Lifetime Cancer Risk (ELCR): Resident, aged 1 to 31 Years

Receptor	Resident							Youth Trespasser or Visitor						
Exposure Point #	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Pathway:														
Soil Exposure Point:														
Incidental ingestion of soil, normal	4.2E-07													
Inhalation of dusts from disturbed soil	7.6E-10													
Dermal contact with soil	4.3E-07													
Total ELCR	8.5E-07													
MCP Cancer Risk Limit	1.E-05													
Does Total ELCR exceed MCP Cancer Risk Limit?	No													
Significant Risk of Harm?	No													

Definition of exposure points	Resident						
Exposure Point #	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Soil Exposure Point:	Beneath Mill #3 Building						

ASSUMPTIONS FOR BOTH OUTER COURTYARD AND BENEATH MILL #3 BUILDING:
NO SINGLE FAMILY RESIDENCE. NO GARDENING OF EDIBLE PRODUCE. EXCLUDE FILL BACKGROUND.

ASSUMPTIONS FOR OUTER COURTYARD ONLY:
EXPOSURE TO SOILS OCCURS ONLY DURING A SINGLE SIX-MONTH CONSTRUCTION PROJECT, AFTER WHICH TIME
THE SOILS ARE RETURNED TO EXCAVATION OR ARE TRANSPORTED OFF-SITE.
ASSUME CONTROLS ARE USED TO LIMIT RESIDENTIAL EXPOSURE TO SOILS DURING CONSTRUCTION PROJECT.
PROTECTIVE COVER MUST REMAIN OVER SOILS EXCEPT DURING CONSTRUCTION OR UTILITY PROJECT, AFTER WHICH TIME THE PROTECTIVE COVER MUST BE RE-INSTALLED.

Table 2.1
Noncancer Dose-Response Values:
Oral Reference Dose

Chemical Name	CAS Number	Subchronic Oral RfD (mg/kg/day)	Uncertainty/ Modifying Factors	Source	Date Last Checked	Chronic Oral RfD (mg/kg/day)	Uncertainty/ Modifying Factors	Source	Date Last Checked
barium	7440-39-3	7.0E-02		MADEP (7)	06/14	2.0E-01		MADEP(6)	06/14
chromium (III)	16065-83-1	1.5E+00		MADEP (7)	06/14	1.5E+00		MADEP (6)	06/14
dioxin (TCDD equivalents)	1746-01-6	7.0E-10		MADEP (7)	06/14	7.0E-10		MADEP (6)	06/14
lead	7439-92-1	7.5E-04		MADEP (7)	06/14	7.5E-04		MADEP (6)	06/14
mercury (from mercuric chloride)	7439-97-6	3.0E-04		MADEP (7)	06/14	3.0E-04		MADEP (6)	06/14
nickel (soluble salts)	7440-02-0	2.0E-02		MADEP (7)	06/14	2.0E-02		MADEP (6)	06/14
polychlorinated biphenyls, as PCB-1254	1336-36-3	5.0E-05		MADEP (7)	06/14	2.0E-05		MADEP (6)	06/14
vanadium	7440-62-2	9.0E-03		MADEP (7)	06/14	9.0E-03		MADEP (8)	06/14
C19-C36 Aliphatics	N/A	6.0E+00		MADEP (7)	06/14	2.0E+00		MADEP (6)	06/14
C11-C22 Aromatics	N/A	3.0E-01		MADEP (7)	06/14	3.0E-02		MADEP (6)	06/14

Notes: MADEP = Massachusetts Department of Environmental Protection
mg/kg/day = milligrams per kilogram body weight per day
N/A = Not available

Reference: MADEP (6) = Dose response values updated from MADEP's Excel Workbook: Toxicity Values used to derive MCP Method 1 Numerical Standards (3/2013) (dr
MADEP (7) = Construction Worke Shortform 2012, Table CW-5 Chemical Specific Data, Vlookup Version v0414.
MADEP (8) = Resident Shortform 2012, Table RS-8 Chemical Specific Data, Vlookup Version v0414.

Prepared By:
Reviewed By:
Preparation date:6/30/2014

Table 2.2
Noncancer Dose-Response Values:
Inhalation Reference Concentrations

Chemical Name	CAS Number	Subchronic Inhalation RfC (mg/cu m)	Uncertainty/ Modifying Factors	Source	Date Last Checked	Chronic Inhalation RfC (mg/cu m)	Uncertainty/ Modifying Factors	Source	Date Last Checked
barium	7440-39-3	5.0E-03		MADEP(5)	02/13	5.0E-04		MADEP(5)	02/13
chromium (III) (as metal)	16065-83-1	3.0E-04		MADEP(5)	02/13	1.0E-04		MADEP(5)	02/13
dioxin (TCDD equivalents)	1746-01-6	2.0E-09		Note 1		2.0E-09		Note 1	
lead	7439-92-1	1.0E-03		MADEP(5)	02/13	1.0E-03		MADEP(5)	02/13
mercury	7439-97-6	3.0E-04		MADEP(5)	02/13	3.0E-04		MADEP(5)	02/13
nickel	7440-02-0	1.0E-03		MADEP(5)	02/13	1.0E-03		MADEP(5)	02/13
polychlorinated biphenyls	1336-36-3	2.0E-05		MADEP(5)	02/13	2.0E-05		MADEP(5)	02/13
vanadium	7440-62-2	1.0E-03		MADEP(5)	02/13	1.0E-03		MADEP(5)	02/13
C19-C36 Aliphatics	N/A	6.0E-01		Note 2	02/13	2.0E-01		Note 2	02/13
C11-C22 Aromatics	N/A	5.0E-01		MADEP(5)	02/13	5.0E-02		MADEP(5)	02/13

Notes: MADEP = Massachusetts Department of Environmental Protection
mg/cu m = milligrams per cubic meter of air

References: MADEP (5) = Toxicity Spreadsheet and reference page for in excel workbook "Development of MCP Risk-Based Levels for Soil and Groundwater" (3/2013)
(C = SC) = the Chronic Inhalation RfC was adopted as the Subchronic Inhalation RfC

Note 1: RfD-Ihl for dioxin (TCDD equivalents) = 5.7E-10 mg/kg/d
RfC-Ihl for dioxin (TCDD equivalents) = (5.7E-10 mg/kg/d) *70 kg) / 20 m^3/d = 2.0E-9 mg/m^3
Note 2: For C19-C36 aliphatics, the chronic RfC for C9-C18 aliphatics was used as a surrogate

Prepared By:
Reviewed By:
Preparation date:
Revision date: 6/30/2014

Table 2.3
Relative Absorption Factors: Non-Cancer

Chemical Name	CAS Number	Soil Ingestion RAF	Water Ingestion RAF	Soil Dermal RAF	Water Dermal RAF
barium	7440-39-3	1	1	0.1	1
chromium (III)	16065-83-1	1	1	0.1	1
dioxin (TCDD equivalent)	1746-01-6	1	1	0.1	1
lead	7439-92-1	0.5	0.5	0.006	1
mercury	7439-97-6	0.5	1	0.1	1
nickel	7440-02-0	1	1	0.2	1
polychlorinated biphenyls	1336-36-3	1	1	0.1	1
vanadium	7440-62-2	1	1	0.1	1
C19-C36 Aliphatics	N/A	1	1	0.2	1
C11-C22 Aromatics	N/A	0.3	0.91	0.1	1

Notes: (1) RAF values are from MADEP (1995, 2002, 2006). A default value of one (1) was assigned to dermal contact with water.

References: MADEP, 4/14. Construction Worker Shortform 2012, Table CW-5 Chemical Specific Data, Vlookup Version v0414

Prepared By:
Reviewed By:
Preparation date: 6/30/2014

Table 2.4
Soil Concentrations used to Derive Dust Exposure Point Concentrations

Chemical Name	CAS Number	Outer Courtyard (0-3 Foot Interval)	Outer Courtyard (0-6 Foot Interval)	Outer Courtyard (0-15 Foot Interval)	Beneath Mill #3 Building			
barium	7440-39-3	7.50E+01	1.06E+02	8.10E+01				
chromium (III)	16065-83-1	3.00E+01	2.80E+01	2.50E+01				
dioxin (TCDD equivalents)	1746-01-6	1.05E-05	8.54E-06	6.37E-06	6.23E-07			
lead	7439-92-1	4.19E+02	3.25E+02	2.87E+02				
mercury (from mercuric chloride)	7439-97-6	3.50E-01	6.00E-01	4.10E-01				
nickel (soluble salts)	7440-02-0	3.10E+01	2.60E+01	2.20E+01				
polychlorinated biphenyls, as	1336-36-3	8.33E+00	6.99E+00	5.21E+00	5.10E-01			
vanadium	7440-62-2	2.20E+01	2.30E+01	2.40E+01				
C19-C36 Aliphatics	N/A	3.27E+02	3.27E+02	1.42E+02				
C11-C22 Aromatics	N/A	3.03E+02	3.03E+02	1.25E+02				

unit, milligram per kilogram (mg/kg), ppm
Abbreviations:

Table 2.5
Exposure Point Concentrations for Dust

Chemical Name	CAS Number	Outer Courtyard (0-3 Foot Interval)	Outer Courtyard (0-6 Foot Interval)	Outer Courtyard (0-15 Foot Interval)	Beneath Mill #3 Building	0.00	0.00	0.00
barium	7440-39-3	4.50E-03	6.36E-03	4.86E-03				
chromium (III)	16065-83-1	1.80E-03	1.68E-03	1.50E-03				
dioxin (TCDD equivalents)	1746-01-6	6.30E-10	5.12E-10	3.82E-10	3.74E-11			
lead	7439-92-1	2.51E-02	1.95E-02	1.72E-02				
mercury (from mercuric chloride)	7439-97-6	2.10E-05	3.60E-05	2.46E-05				
nickel (soluble salts)	7440-02-0	1.86E-03	1.56E-03	1.32E-03				
polychlorinated biphenyls, as PCB-1254	1336-36-3	5.00E-04	4.19E-04	3.13E-04	3.06E-05			
vanadium	7440-62-2	1.32E-03	1.38E-03	1.44E-03				
C19-C36 Aliphatics	N/A	1.96E-02	1.96E-02	8.52E-03				
C11-C22 Aromatics	N/A	1.82E-02	1.82E-02	7.50E-03				

Formula: EPC-air = [OHM]-soil * PF * PM-10 * CF

where,
EPC-air = Exposure Point Concentration (ug/cu m)
[OHM]-soil = soil concentration (mg/kg)
PM-10 = respirable particulate concentration in air (60 ug/cu m)
PF = proportion of respirable particulate concentrations attributable to the site (1.0)
CF = conversion factor (1E-06 kg/ug)

Units: Soil EPC = mg/kg
Dust EPC = ug/cu m

Refer to Table 6.4 for Soil Concentrations used to derive Dust Exposure Point Concentrations

Prepared By: EAF
Reviewed By:
Preparation Date: 6/30/2014
Revision Date:

Table 2.6
Calculation of Average Daily Dose for Soil Exposure: Child Resident, aged 1 Year

Receptor: Child Resident, aged 1 year

	Exposure Point:	Outer Courtyard (0-3 Foot Interval)		Outer Courtyard (0-6 Foot Interval)		Outer Courtyard (0-15 Foot Interval)		Beneath Mill #3 Building		0.00E+00	
Chemical Name	**CAS Number**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**
barium	7440-39-3	2.92E-05	4.99E-05	4.12E-05	7.06E-05	3.15E-05	5.39E-05				
chromium (III)	16065-83-1	1.17E-05	2.00E-05	1.09E-05	1.86E-05	9.73E-06	1.66E-05				
dioxin (TCDD equivalents)	1746-01-6	4.09E-12	6.99E-12	3.32E-12	5.69E-12	2.48E-12	4.24E-12	1.40E-12	2.39E-12		
lead	7439-92-1	9.78E-06	1.39E-04	7.59E-06	1.08E-04	6.70E-06	9.55E-05				
mercury (from mercuric chloride)	7439-97-6	1.36E-07	1.17E-07	2.33E-07	2.00E-07	1.60E-07	1.36E-07				
nickel (soluble salts)	7440-02-0	2.41E-05	2.06E-05	2.02E-05	1.73E-05	1.71E-05	1.46E-05				
polychlorinated biphenyls, as PCB-1254	1336-36-3	3.24E-06	5.55E-06	2.72E-06	4.65E-06	2.03E-06	3.47E-06	1.14E-06	1.96E-06		
vanadium	7440-62-2	8.56E-06	1.46E-05	8.95E-06	1.53E-05	9.34E-06	1.60E-05				
C19-C36 Aliphatics	N/A	2.54E-04	2.18E-04	2.54E-04	2.18E-04	1.11E-04	9.45E-05				
C11-C22 Aromatics	N/A	1.18E-04	6.05E-05	1.18E-04	6.05E-05	4.86E-05	2.50E-05				

Table 2.6
Calculation of Average Daily Dose for Soil Exposure: Child Resident, aged 1 Year

Formula: Daily Dose (ADD) for exposure to soils via ingestion (ing) and dermal contact

$$ADD\text{-}dermal = \frac{[OHM\text{-}soil]*SA*AF*RAF*EF*ED*EP*C}{BW*AP}$$

$$ADD\text{-}ing = \frac{[OHM\text{-}soil]*IR*RAF*EF*ED*EP*C}{BW*AP}$$

Unit: ADD, mg/kg/day

Receptor: Child Resident, aged 1 to 8 years (Chronic) and aged 1 year (Subchronic)

Description	Abbreviation	Unit	Default Value	Source	Site-Specific Value	Source / Description	Input Value
Exposure point concentration	[OHM-soil]	mg/kg			See Soil EPC Table		See Soil EPC Table
Skin surface area in contact with soil on days exposed	SA	square centimeter/day	2431	[2], child, aged 1 to 8 years (face, hands, forearms, lower legs and feet)	1670	child, aged 1 to 2 years (face, hands, forearms, lower legs and feet)	1.67E+03
Mass of soil adhered to the unit surface area of skin exposed	AF	mg/sq. cm.	0.35	[1], for child resident			3.50E-01
Relative Absorption Factor	RAF	unitless	See RAF Table				See RAF Table
# exposure events during EP / # days in EP	EF	events/year	150	[2], 5 days per week during the 30 warmest weeks of the year	26	Exterior Courtyard: One day per week during a six-month construction project. Beneath Mill #3 Building: 5 days per week during the 30 warmest weeks of the year	2.60E+01
Exposure duration: typical duration of each exposure event	ED	years/event	2.74E-03	1 day per event or 1/365 of a year per event			2.74E-03
Exposure period: period of time over which exposure may occur	EP	years	7	[2], child, aged 1 to 8 years	1.0	subchronic exposure of 1 year old boy or girl (Subchronic)	1.00E+00
Unit Conversion Factor	C	kg/mg	1.00E-06	for dermal contact			1.00E-06
Unit Conversion Factor	C	kg/mg	1.00E-06	for ingestion			1.00E-06
Body weight of the receptor during the AP	BW	kg	17	[2], child, aged 1 to 8 years	1.07E+01	subchronic exposure of 1 year old boy or girl	1.07E+01
Averaging Period	AP	years	7	[2]	1.0	subchronic exposure of 1 year old boy or girl	1.00E+00
Ingestion rate	IR	mg/day	100	[2]			1.00E+02

References:

[1] MADEP's Technical Update, Weighted Skin-Soil Adherence Factors, April 2002.
[2] MADEP's Guidance for Disposal Site Risk Characterization in Support of the Massachusetts Contingency Plan, Interim Final Policy BWSC/ORS-95-141

1 day per week for 26 weeks for outer courtyard soil intervals
5 days per week 30 weeks per year for 7 years for beneath Mill #3 building (chronic)
5 days per week 30 weeks per year for 1 year for beneath Mill #3 building (subchronic)

Table 2.7
Calculation of Average Daily Exposure for Dust: Child Resident, aged 1

Receptor: Child Resident, aged 1 year								
Chemical Name	**CAS Number**	**Outer Courtyard (0-3 Foot Interval)**	**Outer Courtyard (0-6 Foot Interval)**	**Outer Courtyard (0-15 Foot Interval)**	**Beneath Mill #3 Building**	**0.00**	**0.00**	**0.00**
barium	7440-39-3	2.2E-06	3.2E-06	2.4E-06				
chromium (III)	16065-83-1	9.0E-07	8.4E-07	7.5E-07				
dioxin (TCDD equivalents)	1746-01-6	3.1E-13	2.6E-13	1.9E-13	1.9E-14			
lead	7439-92-1	1.3E-05	9.7E-06	8.6E-06				
mercury (from mercuric chloride)	7439-97-6	1.0E-08	1.8E-08	1.2E-08				
nickel (soluble salts)	7440-02-0	9.3E-07	7.8E-07	6.6E-07				
polychlorinated biphenyls, as PCB-1254	1336-36-3	2.5E-07	2.1E-07	1.6E-07	1.5E-08			
vanadium	7440-62-2	6.6E-07	6.9E-07	7.2E-07				
C19-C36 Aliphatics	N/A	9.8E-06	9.8E-06	4.2E-06				
C11-C22 Aromatics	N/A	9.1E-06	9.1E-06	3.7E-06				

Formula: Average Daily Exposure (ADE) via inhalation (ihl) of dusts

$$ADE\text{-}ihl = \frac{[OHM\text{-}dust]*EF*ED*EP*C}{AP}$$

Unit: ADE, mg/cu m

Receptor: Child Resident, aged 1 to 8 years (Chronic) and aged 1 year (Subchronic)

Description	**Abbreviation**	**Unit**	**Default Value**	**Source**	**Site-Specific Value**	**Source / Description**	**Input Value**
Exposure point concentration	[OHM-dust]	ug/cu. m.			See Dust EPC Table		See Dust EPC Table
Exposure frequency: # exposure events during EP / # days in EP	EF	events/year	150	[2], 5 days per week during the 30 warmest weeks of the year	182	Seven days per week during a six-month construction project	1.82E+02
Exposure duration: typical duration of each exposure event	ED	years/event	2.74E-03	1 day per event, or 1/365 of a year per event			2.74E-03
Exposure period: period of time over which exposure may occur	EP	years	7	[1], from age 1 to 8 years	1.00E+00	subchronic exposure of 1 year old boy or girl	1.00E+00
Unit Conversion Factor	C	mg/ug	1.00E-03	for inhalation			1.00E-03
Averaging Period	AP	years	7	[1]	1.00E+00	subchronic exposure of 1 year old boy or girl	1.00E+00

References:

[1] MADEP's Guidance for Disposal Site Risk Characterization in Support of the Massachusetts Contingency Plan, Interim Final Policy BWSC/ORS-95-141

Table 2.8
Calculation of Hazard Index (HI) for Exposure to Soil and Dust: Child Resident, aged 1 Year

Receptor: Child Resident, aged 1 year															
	Exposure Point:	Outer Courtyard (0-3 Foot Interval)			Outer Courtyard (0-6 Foot Interval)			Outer Courtyard (0-15 Foot Interval)			Beneath Mill #3 Building			0.0E+00		
Chemical Name	CAS Number	Dermal Contact	Incidental Ingestion	Dust Inhalation	Dermal Contact	Incidental Ingestion	Dust Inhalation	Dermal Contact	Incidental Ingestion	Dust Inhalation	Dermal Contact	Incidental Ingestion	Dust Inhalation	Dermal Contct	Incidental Ingestion	Dust Inhalation
barium	7440-39-3	4.2E-04	7.1E-04	4.5E-04	5.9E-04	1.0E-03	6.3E-04	4.5E-04	7.7E-04	4.8E-04						
chromium (III)	16065-83-1	7.8E-06	1.3E-05	3.0E-03	7.3E-06	1.2E-05	2.8E-03	6.5E-06	1.1E-05	2.5E-03						
dioxin (TCDD equivalents)	1746-01-6	5.8E-03	1.0E-02	1.6E-04	4.7E-03	8.1E-03	1.3E-04	3.5E-03	6.1E-03	9.5E-05	2.0E-03	3.4E-03	9.3E-06			
lead	7439-92-1	1.3E-02	1.9E-01	1.3E-02	1.0E-02	1.4E-01	9.7E-03	8.9E-03	1.3E-01	8.6E-03						
mercury (from mercuric chloride)	7439-97-6	4.5E-04	3.9E-04	3.5E-05	7.8E-04	6.7E-04	6.0E-05	5.3E-04	4.5E-04	4.1E-05						
nickel (soluble salts)	7440-02-0	1.2E-03	1.0E-03	9.3E-04	1.0E-03	8.7E-04	7.8E-04	8.6E-04	7.3E-04	6.6E-04						
polychlorinated biphenyls, as PCB-1254	1336-36-3	6.5E-02	1.1E-01	1.2E-02	5.4E-02	9.3E-02	1.0E-02	4.1E-02	6.9E-02	7.8E-03	2.3E-02	3.9E-02	7.6E-04			
vanadium	7440-62-2	9.5E-04	1.6E-03	6.6E-04	9.9E-04	1.7E-03	6.9E-04	1.0E-03	1.8E-03	7.2E-04						
C19-C36 Aliphatics	N/A	4.2E-05	3.6E-05	1.6E-05	4.2E-05	3.6E-05	1.6E-05	1.8E-05	1.6E-05	7.1E-06						
C11-C22 Aromatics	N/A	3.9E-04	2.0E-04	1.8E-05	3.9E-04	2.0E-04	1.8E-05	1.6E-04	8.3E-05	7.5E-06						
Total HI: Route and Expos. Pt.		8.7E-02	3.1E-01	3.0E-02	7.3E-02	2.5E-01	2.5E-02	5.6E-02	2.1E-01	2.1E-02	2.5E-02	4.3E-02	7.7E-04	0.0E+00	0.0E+00	0.0E+00
Proportion of complete exposure point			1.0E+00			1.0E+00			1.0E+00			1.0E+00			1.0E+00	
Adjusted Total HI: Route and Expos. Pt.		8.7E-02	3.1E-01	3.0E-02	7.3E-02	2.5E-01	2.5E-02	5.6E-02	2.1E-01	2.1E-02	2.5E-02	4.3E-02	7.7E-04	0.0E+00	0.0E+00	0.0E+00
Total HI: Expos. Pt.			4.3E-01			3.5E-01			2.8E-01			6.8E-02			0.0E+00	

Formula:

Cumulative HI = $\sum HI_{ingestion\ -\ chemicalspecific} + \sum HI_{dermalcontact\ -\ chemicalspecific} + \sum HI_{inhalation:chemical\ -\ specific}$

HI ingestion-chemical specific = ADD-ingestion-chemical specific x Oral Slope Factor-chemical specific
HI dermal contact-chemical specific = ADD-dermal contact-chemical specific x Oral Slope Factor-chemical specific
HI inhalation-chemical specific = ADE-inhalation-chemical specific x Unit Risk-inhalation-chemical specific

HI = Hazard Index, unitless
ADD = Average Daily Dose, mg/kg/day
ADE = Average Daily Exposure, mg/cu m

Subchronic Oral Reference Dose		X
Chronic Oral Reference Dose		
Subchronic Inhalation Reference Concentration		X
Chronic Inhalation Reference Concentration		

Use capital X to indicate selection

Prepared By:EAF
Reviewed By:
Preparation Date:
Revision Date:6/30/2014

Table 2.9
Calculation of Total Hazard Index (HI): Child Resident, aged 1 Year

Receptor	Child Resident, aged 1 year							Child Resident, aged 1-8 years						
Exposure Point #	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Pathway:														
Soil Exposure Point:														
Incidental ingestion of soil, normal	3.1E-01	2.5E-01	2.1E-01	4.3E-02										
Inhalation of dusts from disturbed soil	3.0E-02	2.5E-02	2.1E-02	7.7E-04										
Dermal contact with soil	8.7E-02	7.3E-02	5.6E-02	2.5E-02										
Total HI	4.3E-01 Subchronic	3.5E-01 Subchronic	2.8E-01 Subchronic	6.8E-02 Subchronic										
MCP Non-Cancer Risk Limit	1.E+00	1.E+00	1.E+00	1.E+00										
Does Total HI exceed MCP Non-Cancer Risk Limit?	No	No	No	No										
Significant Risk of Harm?	No	No	No	No										

Definintion of exposure points							
Exposure Point #	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Soil Exposure Point:	Outer Courtyard (0-3 Foot Interval)	Outer Courtyard (0-6 Foot Interval)	Outer Courtyard (0-15 Foot Interval)	Beneath Mill #3 Building			

ASSUMPTIONS FOR BOTH OUTER COURTYARD AND BENEATH MILL #3 BUILDING:
NO SINGLE FAMILY RESIDENCE. NO GARDENING OF EDIBLE PRODUCE. EXCLUDE FILL BACKGROUND.

ASSUMPTIONS FOR OUTER COURTYARD ONLY:
EXPOSURE TO SOILS OCCURS ONLY DURING A SINGLE SIX-MONTH CONSTRUCTION PROJECT, AFTER WHICH TIME
THE SOILS ARE RETURNED TO EXCAVATION OR ARE TRANSPORTED OFF-SITE.
ASSUME CONTROLS ARE USED TO LIMIT RESIDENTIAL EXPOSURE TO SOILS DURING CONSTRUCTION PROJECT.
PROTECTIVE COVER MUST REMAIN OVER SOILS EXCEPT DURING CONSTRUCTION OR UTILITY PROJECT, AFTER WHICH TIME THE PROTECTIVE COVER MUST BE RE-INSTALLED.

Table 2.10
Calculation of Average Daily Dose for Soil Exposure: Child Resident, aged 1 to 8 Years

Receptor: Child Resident, aged 1-8 years

	Exposure Point:	Beneath Mill #3 Building		0.00E+00		0.00E+00		0.00E+00		0.00E+00		0.00E+00	
Chemical Name	**CAS Number**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**
barium	7440-39-3												
chromium (III)	16065-83-1												
dioxin (TCDD equivalents)	1746-01-6	1.28E-12	1.51E-12										
lead	7439-92-1												
mercury (from mercuric chloride)	7439-97-6												
nickel (soluble salts)	7440-02-0												
polychlorinated biphenyls, as PCB-1254	1336-36-3	1.05E-06	1.23E-06										
vanadium	7440-62-2												
C19-C36 Aliphatics	N/A												
C11-C22 Aromatics	N/A												

Formula: Daily Dose (ADD) for exposure to soils via ingestion (ing) and dermal contact

$$\text{ADD-dermal} = \frac{[\text{OHM-soil}]*SA*AF*RAF*EF*ED*EP*C}{BW*AP}$$

$$\text{ADD-ing} = \frac{[\text{OHM-soil}]*IR*RAF*EF*ED*EP*C}{BW*AP}$$

Unit: ADD, mg/kg/day

Receptor: Child Resident, aged 1 to 8 years (Chronic) and aged 1 year (Subchronic)

Description	**Abbreviation**	**Unit**	**Default Value**	**Source**	**Site-Specific Value**	**Source / Description**	**Input Value**
Exposure point concentration	[OHM-soil]	mg/kg			See Soil EPC Table		See Soil EPC Table
Skin surface area in contact with soil on days exposed	SA	square centimeter/day	2431	[2], child, aged 1 to 8 years (face, hands, forearms, lower legs and feet)	1670	child, aged 1 to 2 years (face, hands, forearms, lower legs and feet)	2.43E+03
Mass of soil adhered to the unit surface area of skin exposed	AF	mg/sq. cm.	0.35	[1], for child resident			3.50E-01
Relative Absorption Factor	RAF	unitless	See RAF Table				See RAF Table
# exposure events during EP / # days in EP	EF	events/year	150	[2], 5 days per week during the 30 warmest weeks of the year	26	One day per week during a six-month construction project	1.50E+02
Exposure duration: typical duration of each exposure event	ED	years/event	2.74E-03	1 day per event or 1/365 of a year per event			2.74E-03
Exposure period: period of time over which exposure may occur	EP	years	7	[2], child, aged 1 to 8 years	1.0	subchronic exposure of 1 year old boy or girl (Subchronic)	7.00E+00
Unit Conversion Factor	C	kg/mg	1.00E-06	for dermal contact			1.00E-06
Unit Conversion Factor	C	kg/mg	1.00E-06	for ingestion			1.00E-06
Body weight of the receptor during the AP	BW	kg	17	[2], child, aged 1 to 8 years	1.07E+01	subchronic exposure of 1 year old boy or girl	1.70E+01
Averaging Period	AP	years	7	[2]	1.0	subchronic exposure of 1 year old boy or girl	7.00E+00
Ingestion rate	IR	mg/day	100	[2]			1.00E+02

References:

[1] MADEP's Technical Update, Weighted Skin-Soil Adherence Factors, April 2002.
[2] MADEP's Guidance for Disposal Site Risk Characterization in Support of the Massachusetts Contingency Plan,

Prepared By:EAF
Reviewed By:
Preparation Date:
Revision Date:6/30/2014

Table 2.10
Calculation of Average Daily Dose for Soil Exposure: Child Resident, aged 1 to 8 Years

Interim Final Policy BWSC/ORS-95-141

Table 2.11
Calculation of Average Daily Exposure for Dust: Child Resident, aged 1 to 8 Years

Receptor: Child Resident, aged 1-8 years								
Chemical Name	**CAS Number**	**Beneath Mill #3 Building**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
barium	7440-39-3							
chromium (III)	16065-83-1							
dioxin (TCDD equivalents)	1746-01-6	1.5E-14						
lead	7439-92-1							
mercury (from mercuric chloride)	7439-97-6							
nickel (soluble salts)	7440-02-0							
polychlorinated biphenyls, as PCB-1254	1336-36-3	1.3E-08						
vanadium	7440-62-2							
C19-C36 Aliphatics	N/A							
C11-C22 Aromatics	N/A							

Formula: Average Daily Exposure (ADE) via inhalation (ihl) of dusts

$$ADE\text{-}ihl = \frac{[OHM\text{-}dust]*EF*ED*EP*C}{AP}$$

Unit: ADE, mg/cu m

Receptor: Child Resident, aged 1 to 8 years (Chronic) and aged 1 year (Subchronic)

Description	**Abbreviation**	**Unit**	**Default Value**	**Source**	**Site-Specific Value**	**Source / Description**	**Input Value**
Exposure point concentration	[OHM-dust]	ug/cu. m.			See Dust EPC Table		See Dust EPC Table
Exposure frequency: # exposure events during EP / # days in EP	EF	events/year	150	[2], 5 days per week during the 30 warmest weeks of the year	182	Seven days per week during a six-month construction project	1.50E+02
Exposure duration: typical duration of each exposure event	ED	years/event	2.74E-03	1 day per event, or 1/365 of a year per event			2.74E-03
Exposure period: period of time over which exposure may occur	EP	years	7	[1], from age 1 to 8 years	1.00E+00	subchronic exposure of 1 year old boy or girl	7.00E+00
Unit Conversion Factor	C	mg/ug	1.00E-03	for inhalation			1.00E-03
Averaging Period	AP	years	7	[1]	1.00E+00	subchronic exposure of 1 year old boy or girl	7.00E+00

References:

[1] MADEP's Guidance for Disposal Site Risk Characterization in Support of the Massachusetts Contingency Plan, Interim Final Policy BWSC/ORS-95-141

Prepared By:EAF
Reviewed By:
Preparation date:
Revision date:6/30/2014

Table 2.12
Calculation of Hazard Index (HI) for Exposure to Soil and Dust: Child Resident, aged 1 to 8 Years

Receptor: Child Resident, aged 1-8 years																
Exposure Point:		**Beneath Mill #3 Building**			**0.0E+00**			**0.0E+00**			**0.0E+00**			**0.0E+00**		
Chemical Name	**CAS Number**	**Dermal Contact**	**Incidental Ingestion**	**Dust Inhalation**	**Dermal Contact**	**Incidental Ingestion**	**Dust Inhalation**	**Dermal Contact**	**Incidental Ingestion**	**Dust Inhalation**	**Dermal Contact**	**Incidental Ingestion**	**Dust Inhalation**	**Dermal Contct**	**Incidental Ingestion**	**Dust Inhalation**
barium	7440-39-3															
chromium (III)	16065-83-1															
dioxin (TCDD equivalents)	1746-01-6	1.8E-03	2.2E-03	7.7E-06												
lead	7439-92-1															
mercury (from mercuric chloride)	7439-97-6															
nickel (soluble salts)	7440-02-0															
polychlorinated biphenyls, as PCB-1254	1336-36-3	5.2E-02	6.2E-02	6.3E-04												
vanadium	7440-62-2															
C19-C36 Aliphatics	N/A															
C11-C22 Aromatics	N/A															
Total HI: Route and Expos. Pt.		5.4E-02	6.4E-02	6.4E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Proportion of complete exposure point			1.0E+00			1.0E+00			1.0E+00			1.0E+00			1.0E+00	
Adjusted Total HI: Route and Expos. Pt.		5.4E-02	6.4E-02	6.4E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Total HI: Expos. Pt.			1.2E-01			0.0E+00			0.0E+00			0.0E+00			0.0E+00	

Formula:

Cumulative HI = $\sum HI_{ingestion\ -\ chemicalspecific} + \sum HI_{dermalcontact\ -\ chemicalspecific} + \sum HI_{inhalation:chemical\ -\ specific}$

HI ingestion-chemical specific = ADD-ingestion-chemical specific x Oral Slope Factor-chemical specific
HI dermal contact-chemical specific = ADD-dermal contact-chemical specific x Oral Slope Factor-chemical specific
HI inhalation-chemical specific = ADE-inhalation-chemical specific x Unit Risk-inhalation-chemical specific

HI = Hazard Index, unitless
ADD = Average Daily Dose, mg/kg/day
ADE = Average Daily Exposure, mg/cu m

Subchronic Oral Reference Dose		
Chronic Oral Reference Dose	X	
Subchronic Inhalation Reference Concentration		
Chronic Inhalation Reference Concentration	X	

Use capital X to indicate selection

Prepared By:EAF
Reviewed By:
Preparation Date:
Revision Date:6/30/2014

Table 2.13
Calculation of Total Hazard Index (HI): Child Resident, aged 1 to 8 Years

Receptor	Child Resident, aged 1-8 years							Child Resident, aged 1 year						
Exposure Point #	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Pathway:														
Soil Exposure Point:														
Incidental ingestion of soil, normal	6.4E-02													
Inhalation of dusts from disturbed soil	6.4E-04													
Dermal contact with soil	5.4E-02													
Total HI	1.2E-01 Chronic													
MCP Non-Cancer Risk Limit	1.E+00													
Does Total HI exceed MCP Non-Cancer Risk Limit?	No													
Significant Risk of Harm?	No													

Definintion of exposure points							
Exposure Point #	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Soil Exposure Point:	Beneath Mill #3 Building						

ASSUMPTIONS FOR BOTH OUTER COURTYARD AND BENEATH MILL #3 BUILDING:
NO SINGLE FAMILY RESIDENCE. NO GARDENING OF EDIBLE PRODUCE. EXCLUDE FILL BACKGROUND.

ASSUMPTIONS FOR OUTER COURTYARD ONLY:
EXPOSURE TO SOILS OCCURS ONLY DURING A SINGLE SIX-MONTH CONSTRUCTION PROJECT, AFTER WHICH TIME
THE SOILS ARE RETURNED TO EXCAVATION OR ARE TRANSPORTED OFF-SITE.
ASSUME CONTROLS ARE USED TO LIMIT RESIDENTIAL EXPOSURE TO SOILS DURING CONSTRUCTION PROJECT.
PROTECTIVE COVER MUST REMAIN OVER SOILS EXCEPT DURING CONSTRUCTION OR UTILITY PROJECT, AFTER WHICH TIME THE PROTECTIVE COVER MUST BE RE-INSTALLED.

ATTACHMENT 2C

Method 3 Risk Assessment for Chemicals in Soil - Construction Worker Shortform 2012 (sf12cw)

Index

Tab	
EPCs	Table CW-1: Select chemicals and enter Exposure Point Concentrations (EPCs). Estimated risks are shown to the right.
C Eq	Table CW-2: Equations to calculate cancer risks
NC Eq	Table CW-3: Equations to calculate noncancer risks
Exp	Table CW-4: Definitions and exposure factors
Chem	Table CW-5: Chemical-specific data
Cyanide	Table CW-6: Cyanide Calculations

Spreadsheets designed by Andrew Friedmann, MassDEP
Questions and Comments may be addressed to:
Lydia Thompson
Massachusetts Department of Environmental Protection
Office of Research and Standards
One Winter Street
Boston, MA 02108 USA
Telephone: (617) 556-1165
Fax: (617) 556-1006
Email: Lydia.Thompson@state.ma.us

Construction Worker - Soil: Table CW-1
Exposure Point Concentration (EPC) and Risk
Based on Construction Worker 18-25 years of age

Outer Courtyard: 0-15 Foot Interval
ATTACHMENT 2C

ShortForm Version 10-12
Vlookup Version v0414

ELCR (all chemicals) = 2.1E-07
HI (all chemicals) = 6.0E-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}	Subchronic HQ_{total}
POLYCHLORINATED BIPHENYLS (PCBs)	5.2E+00	9.1E-08	9.2E-08	2.4E-09	1.4E-10	1.9E-07	1.3E-01	1.3E-01	3.3E-03	9.7E-03	2.7E-01
TCDD, 2,3,7,8- (equivalents)	6.4E-06	8.4E-09	8.4E-09	2.2E-10	5.6E-11	1.7E-08	1.1E-02	1.1E-02	2.9E-04	1.2E-04	2.3E-02
BARIUM	8.1E+01						1.4E-03	1.4E-03	3.7E-05	6.0E-04	3.5E-03
CHROMIUM(III)	2.5E+01						2.1E-05	2.1E-05	5.3E-07	3.1E-03	3.1E-03
LEAD	2.9E+02						2.4E-01	2.8E-02	6.1E-03	1.1E-02	2.8E-01
MERCURY	4.1E-01						8.4E-04	1.7E-03	2.2E-05	5.1E-05	2.6E-03
NICKEL	2.2E+01				2.8E-09	2.8E-09	1.4E-03	2.7E-03	3.5E-05	8.2E-04	4.9E-03
VANADIUM	2.4E+01						3.3E-03	3.3E-03	8.5E-05	8.9E-04	7.6E-03
ALIPHATICS C19 to C36	1.4E+02						2.9E-05	5.9E-05	7.6E-07		8.9E-05
AROMATICS C11 to C22	1.3E+02						1.5E-04	5.2E-04	4.0E-06	9.3E-06	6.8E-04

MassDEP ORS
Contact: Lydia Thompson
Lydia.Thompson@state.ma.us
617-556-1165

Construction Worker - Soil: Table CW-2

Equations to Calculate Cancer Risk for Construction Worker

Vlookup Version v0414

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	$\mu g/m^3$

MassDEP ORS
Contact: Lydia Thompson
Lydia.Thompson@state.ma.us
617-556-1165

Construction Worker - Soil: Table CW-3

Equations to Calculate Noncancer Risk for Construction Worker

Vlookup Version v0414

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	$µg/m^3$

MassDEP ORS
Contact: Lydia Thompson
Lydia.Thompson@state.ma.us
617-556-1165

Construction Worker - Soil: Table CW-4
Definitions and Exposure Factors

Vlookup Version v0414

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

MassDEP ORS
Contact: Lydia Thompson
Lydia.Thompson@state.ma.us
617-556-1165

Construction Worker - Soil: Table CW-5
Chemical-Specific Data

Vlookup Version v0414

Oil or Hazardous Material	Oral CSF $(mg/kg\text{-}day)^{-1}$	$RAF_{c\text{-}ing}$	$RAF_{c\text{-}derm}$	$RAF_{c\text{-}inh}$	Inhalation CSF $(mg/kg\text{-}day)^{-1}$	Subchronic Oral RfD mg/kg-day	Subchronic $RAF_{nc\text{-}ing}$	Subchronic $RAF_{nc\text{-}derm}$	Subchronic $RAF_{nc\text{-}inh}$	Subchronic Inhalation RfD
POLYCHLORINATED BIPHENYLS (PCBs)	2.0E+00	1	0.1	1	3.5E-01	5.0E-05	1	0.1	1	5.7E-06
TCDD, 2,3,7,8- (equivalents)	1.5E+05	1	0.1	1	1.2E+05	7.0E-10	1	0.1	1	5.7E-10
BARIUM						7.0E-02	1	0.1	1	1.4E-03
CHROMIUM(III)						1.5E+00	1	0.1	1	8.6E-05
LEAD						7.5E-04	0.5	0.006	1	2.9E-04
MERCURY						3.0E-04	0.5	0.1	1	8.6E-05
NICKEL					1.7E+00	2.0E-02	1	0.2	1	2.9E-04
VANADIUM						9.0E-03	1	0.1	1	2.9E-04
ALIPHATICS C19 to C36						6.0E+00	1	0.2		
AROMATICS C11 to C22						3.0E-01	0.3	0.1	1	1.4E-01

MassDEP ORS
Contact: Lydia Thompson
Lydia.Thompson@state.ma.us
617-556-1165

Method 3 Risk Assessment for Chemicals in Soil - Construction Worker Shortform 2012 (sf12cw)

Index

Tab	
EPCs	Table CW-1: Select chemicals and enter Exposure Point Concentrations (EPCs). Estimated risks are shown to the right.
C Eq	Table CW-2: Equations to calculate cancer risks
NC Eq	Table CW-3: Equations to calculate noncancer risks
Exp	Table CW-4: Definitions and exposure factors
Chem	Table CW-5: Chemical-specific data
Cyanide	Table CW-6: Cyanide Calculations

Spreadsheets designed by Andrew Friedmann, MassDEP
Questions and Comments may be addressed to:
Lydia Thompson
Massachusetts Department of Environmental Protection
Office of Research and Standards
One Winter Street
Boston, MA 02108 USA
Telephone: (617) 556-1165
Fax: (617) 556-1006
Email: Lydia.Thompson@state.ma.us

Construction Worker - Soil: Table CW-1
Exposure Point Concentration (EPC) and Risk
Based on Construction Worker 18-25 years of age

Beneath Mill #3 Building, all intervals ShortForm Version 10-12
ATTACHMENT 2C Vlookup Version v0414

ELCR (all chemicals) = 2.0E-08
HI (all chemicals) = 2.9E-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}	Subchronic HQ_{total}
POLYCHLORINATED BIPHENYLS (PCBs)	5.1E-01	8.9E-09	9.0E-09	2.3E-10	1.4E-11	1.8E-08	1.3E-02	1.3E-02	3.3E-04	9.5E-04	2.6E-02
TCDD, 2,3,7,8- (equivalents)	6.2E-07	8.2E-10	8.3E-10	2.1E-11	5.5E-12	1.7E-09	1.1E-03	1.1E-03	2.8E-05	1.2E-05	2.2E-03
BARIUM											
CHROMIUM(III)											
LEAD											
MERCURY											
NICKEL											
VANADIUM											
ALIPHATICS C19 to C36											
AROMATICS C11 to C22											

MassDEP ORS
Contact: Lydia Thompson
Lydia.Thompson@state.ma.us
617-556-1165

Construction Worker - Soil: Table CW-2

Equations to Calculate Cancer Risk for Construction Worker

Vlookup Version v0414

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	$\mu g/m^3$

MassDEP ORS
Contact: Lydia Thompson
Lydia.Thompson@state.ma.us
617-556-1165

Construction Worker - Soil: Table CW-3

Equations to Calculate Noncancer Risk for Construction Worker

Vlookup Version v0414

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	$µg/m^3$

MassDEP ORS
Contact: Lydia Thompson
Lydia.Thompson@state.ma.us
617-556-1165

Construction Worker - Soil: Table CW-4
Definitions and Exposure Factors

Vlookup Version v0414

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

MassDEP ORS
Contact: Lydia Thompson
Lydia.Thompson@state.ma.us
617-556-1165

Construction Worker - Soil: Table CW-5
Chemical-Specific Data

Vlookup Version v0414

Oil or Hazardous Material	Oral CSF $(mg/kg\text{-}day)^{-1}$	$RAF_{c\text{-}ing}$	$RAF_{c\text{-}derm}$	$RAF_{c\text{-}inh}$	Inhalation CSF $(mg/kg\text{-}day)^{-1}$	Subchronic Oral RfD mg/kg-day	Subchronic $RAF_{nc\text{-}ing}$	Subchronic $RAF_{nc\text{-}derm}$	Subchronic $RAF_{nc\text{-}inh}$	Subchronic Inhalation RfD
POLYCHLORINATED BIPHENYLS (PCBs)	2.0E+00	1	0.1	1	3.5E-01	5.0E-05	1	0.1	1	5.7E-06
TCDD, 2,3,7,8- (equivalents)	1.5E+05	1	0.1	1	1.2E+05	7.0E-10	1	0.1	1	5.7E-10
BARIUM						7.0E-02	1	0.1	1	1.4E-03
CHROMIUM(III)						1.5E+00	1	0.1	1	8.6E-05
LEAD						7.5E-04	0.5	0.006	1	2.9E-04
MERCURY						3.0E-04	0.5	0.1	1	8.6E-05
NICKEL					1.7E+00	2.0E-02	1	0.2	1	2.9E-04
VANADIUM						9.0E-03	1	0.1	1	2.9E-04
ALIPHATICS C19 to C36						6.0E+00	1	0.2		
AROMATICS C11 to C22						3.0E-01	0.3	0.1	1	1.4E-01

MassDEP ORS
Contact: Lydia Thompson
Lydia.Thompson@state.ma.us
617-556-1165

ATTACHMENT 2D

Method 3 Risk Assessment for Chemicals in Soil - Construction Worker Shortform 2012 (sf12cw)

Index

Tab	
EPCs	Table CW-1: Select chemicals and enter Exposure Point Concentrations (EPCs). Estimated risks are shown to the right.
C Eq	Table CW-2: Equations to calculate cancer risks
NC Eq	Table CW-3: Equations to calculate noncancer risks
Exp	Table CW-4: Definitions and exposure factors
Chem	Table CW-5: Chemical-specific data
Cyanide	Table CW-6: Cyanide Calculations

Spreadsheets designed by Andrew Friedmann, MassDEP
Questions and Comments may be addressed to:
Lydia Thompson
Massachusetts Department of Environmental Protection
Office of Research and Standards
One Winter Street
Boston, MA 02108 USA
Telephone: (617) 556-1165
Fax: (617) 556-1006
Email: Lydia.Thompson@state.ma.us

Construction Worker - Soil: Table CW-1
Exposure Point Concentration (EPC) and Risk
Based on Construction Worker 18-25 years of age

Outer Courtyard: 0-6 Foot Interval ShortForm Version 10-12

ATTACHMENT 2D - UTILITY WORKER Vlookup Version v0414

ELCR (all chemicals) = 2.8E-07
HI (all chemicals) = 7.4E-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}
POLYCHLORINATED BIPHENYLS (PCBs)	6.99E+00	1.2E-07	1.2E-07	3.2E-09	1.9E-10	2.5E-07	1.7E-01	1.7E-01	4.5E-03	1.3E-02	3.6E-01
TCDD, 2,3,7,8- (equivalents)	8.54E-06	1.1E-08	1.1E-08	2.9E-10	7.5E-11	2.3E-08	1.5E-02	1.5E-02	3.9E-04	1.6E-04	3.1E-02
BARIUM	1.06E+02						1.9E-03	1.9E-03	4.8E-05	7.9E-04	4.6E-03
CHROMIUM(III)	2.80E+01						2.3E-05	2.3E-05	6.0E-07	3.5E-03	3.5E-03
LEAD	3.25E+02						2.7E-01	3.2E-02	6.9E-03	1.2E-02	3.2E-01
MERCURY	6.00E-01						1.2E-03	2.5E-03	3.2E-05	7.4E-05	3.8E-03
NICKEL	2.60E+01				3.3E-09	3.3E-09	1.6E-03	3.2E-03	4.1E-05	9.7E-04	5.8E-03
VANADIUM	2.30E+01						3.1E-03	3.2E-03	8.2E-05	8.6E-04	7.3E-03
ALIPHATICS C19 to C36	3.27E+02						6.7E-05	1.4E-04	1.7E-06		2.0E-04
AROMATICS C11 to C22	3.03E+02						3.7E-04	1.3E-03	9.7E-06	2.3E-05	1.7E-03

MassDEP ORS
Contact: Lydia Thompson
Lydia.Thompson@state.ma.us
617-556-1165

Construction Worker - Soil: Table CW-2

Equations to Calculate Cancer Risk for Construction Worker

Vlookup Version v0414

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	$\mu g/m^3$

MassDEP ORS
Contact: Lydia Thompson
Lydia.Thompson@state.ma.us
617-556-1165

Construction Worker - Soil: Table CW-3

Equations to Calculate Noncancer Risk for Construction Worker

Vlookup Version v0414

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	$µg/m^3$

MassDEP ORS
Contact: Lydia Thompson
Lydia.Thompson@state.ma.us
617-556-1165

Construction Worker - Soil: Table CW-4
Definitions and Exposure Factors

Vlookup Version v0414

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

MassDEP ORS
Contact: Lydia Thompson
Lydia.Thompson@state.ma.us
617-556-1165

Construction Worker - Soil: Table CW-5
Chemical-Specific Data

Vlookup Version v0414

Oil or Hazardous Material	Oral CSF $(mg/kg\text{-}day)^{-1}$	$RAF_{c\text{-}ing}$	$RAF_{c\text{-}derm}$	$RAF_{c\text{-}inh}$	Inhalation CSF $(mg/kg\text{-}day)^{-1}$	Subchronic Oral RfD mg/kg-day	Subchronic $RAF_{nc\text{-}ing}$	Subchronic $RAF_{nc\text{-}derm}$	Subchronic $RAF_{nc\text{-}inh}$	Subchronic Inhalation RfD
POLYCHLORINATED BIPHENYLS (PCBs)	2.0E+00	1	0.1	1	3.5E-01	5.0E-05	1	0.1	1	5.7E-06
TCDD, 2,3,7,8- (equivalents)	1.5E+05	1	0.1	1	1.2E+05	7.0E-10	1	0.1	1	5.7E-10
BARIUM						7.0E-02	1	0.1	1	1.4E-03
CHROMIUM(III)						1.5E+00	1	0.1	1	8.6E-05
LEAD						7.5E-04	0.5	0.006	1	2.9E-04
MERCURY						3.0E-04	0.5	0.1	1	8.6E-05
NICKEL					1.7E+00	2.0E-02	1	0.2	1	2.9E-04
VANADIUM						9.0E-03	1	0.1	1	2.9E-04
ALIPHATICS C19 to C36						6.0E+00	1	0.2		
AROMATICS C11 to C22						3.0E-01	0.3	0.1	1	1.4E-01

MassDEP ORS
Contact: Lydia Thompson
Lydia.Thompson@state.ma.us
617-556-1165

Method 3 Risk Assessment for Chemicals in Soil - Construction Worker Shortform 2012 (sf12cw)

Index

Tab	
EPCs	Table CW-1: Select chemicals and enter Exposure Point Concentrations (EPCs). Estimated risks are shown to the right.
C Eq	Table CW-2: Equations to calculate cancer risks
NC Eq	Table CW-3: Equations to calculate noncancer risks
Exp	Table CW-4: Definitions and exposure factors
Chem	Table CW-5: Chemical-specific data
Cyanide	Table CW-6: Cyanide Calculations

Spreadsheets designed by Andrew Friedmann, MassDEP
Questions and Comments may be addressed to:
Lydia Thompson
Massachusetts Department of Environmental Protection
Office of Research and Standards
One Winter Street
Boston, MA 02108 USA
Telephone: (617) 556-1165
Fax: (617) 556-1006
Email: Lydia.Thompson@state.ma.us

Construction Worker - Soil: Table CW-1
Exposure Point Concentration (EPC) and Risk
Based on Construction Worker 18-25 years of age

Beneath Mill #3 Building, all intervals ShortForm Version 10-12

ATTACHMENT 2D - UTILITY WORKER Vlookup Version v0414

ELCR (all chemicals) = 2.0E-08
HI (all chemicals) = 2.9E-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}
POLYCHLORINATED BIPHENYLS (PCBs)	5.1E-01	8.9E-09	9.0E-09	2.3E-10	1.4E-11	1.8E-08	1.3E-02	1.3E-02	3.3E-04	9.5E-04	2.6E-02
TCDD, 2,3,7,8- (equivalents)	6.2E-07	8.2E-10	8.3E-10	2.1E-11	5.5E-12	1.7E-09	1.1E-03	1.1E-03	2.8E-05	1.2E-05	2.2E-03
BARIUM											
CHROMIUM(III)											
LEAD											
MERCURY											
NICKEL											
VANADIUM											
ALIPHATICS C19 to C36											
AROMATICS C11 to C22											

MassDEP ORS
Contact: Lydia Thompson
Lydia.Thompson@state.ma.us
617-556-1165

Construction Worker - Soil: Table CW-2

Equations to Calculate Cancer Risk for Construction Worker

Vlookup Version v0414

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	$\mu g/m^3$

MassDEP ORS
Contact: Lydia Thompson
Lydia.Thompson@state.ma.us
617-556-1165

Construction Worker - Soil: Table CW-3

Equations to Calculate Noncancer Risk for Construction Worker

Vlookup Version v0414

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	$µg/m^3$

MassDEP ORS
Contact: Lydia Thompson
Lydia.Thompson@state.ma.us
617-556-1165

Construction Worker - Soil: Table CW-4
Definitions and Exposure Factors

Vlookup Version v0414

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

MassDEP ORS
Contact: Lydia Thompson
Lydia.Thompson@state.ma.us
617-556-1165

Construction Worker - Soil: Table CW-5
Chemical-Specific Data

Vlookup Version v0414

Oil or Hazardous Material	Oral CSF $(mg/kg\text{-}day)^{-1}$	$RAF_{c\text{-}ing}$	$RAF_{c\text{-}derm}$	$RAF_{c\text{-}inh}$	Inhalation CSF $(mg/kg\text{-}day)^{-1}$	Subchronic Oral RfD mg/kg-day	Subchronic $RAF_{nc\text{-}ing}$	Subchronic $RAF_{nc\text{-}derm}$	Subchronic $RAF_{nc\text{-}inh}$	Subchronic Inhalation RfD
POLYCHLORINATED BIPHENYLS (PCBs)	2.0E+00	1	0.1	1	3.5E-01	5.0E-05	1	0.1	1	5.7E-06
TCDD, 2,3,7,8- (equivalents)	1.5E+05	1	0.1	1	1.2E+05	7.0E-10	1	0.1	1	5.7E-10
BARIUM						7.0E-02	1	0.1	1	1.4E-03
CHROMIUM(III)						1.5E+00	1	0.1	1	8.6E-05
LEAD						7.5E-04	0.5	0.006	1	2.9E-04
MERCURY						3.0E-04	0.5	0.1	1	8.6E-05
NICKEL					1.7E+00	2.0E-02	1	0.2	1	2.9E-04
VANADIUM						9.0E-03	1	0.1	1	2.9E-04
ALIPHATICS C19 to C36						6.0E+00	1	0.2		
AROMATICS C11 to C22						3.0E-01	0.3	0.1	1	1.4E-01

MassDEP ORS
Contact: Lydia Thompson
Lydia.Thompson@state.ma.us
617-556-1165

ATTACHMENT 2E

Table 1.1
Noncancer Dose-Response Values:
Oral Reference Dose

Chemical Name	CAS Number	Subchronic Oral RfD (mg/kg/day)	Uncertainty/ Modifying Factors	Source	Date Last Checked	Chronic Oral RfD (mg/kg/day)	Uncertainty/ Modifying Factors	Source	Date Last Checked
barium	7440-39-3	7.0E-02		MADEP (7)	06/14	2.0E-01		MADEP(6)	06/14
chromium (III)	16065-83-1	1.5E+00		MADEP (7)	06/14	1.5E+00		MADEP (6)	06/14
dioxin (TCDD equivalents)	1746-01-6	7.0E-10		MADEP (7)	06/14	7.0E-10		MADEP (6)	06/14
lead	7439-92-1	7.5E-04		MADEP (7)	06/14	7.5E-04		MADEP (6)	06/14
mercury (from mercuric chloride)	7439-97-6	3.0E-04		MADEP (7)	06/14	3.0E-04		MADEP (6)	06/14
nickel (soluble salts)	7440-02-0	2.0E-02		MADEP (7)	06/14	2.0E-02		MADEP (6)	06/14
polychlorinated biphenyls, as PCB-1254	1336-36-3	5.0E-05		MADEP (7)	06/14	2.0E-05		MADEP (6)	06/14
vanadium	7440-62-2	9.0E-03		MADEP (7)	06/14	9.0E-03		MADEP (8)	06/14
C19-C36 Aliphatics	N/A	6.0E+00		MADEP (7)	06/14	2.0E+00		MADEP (6)	06/14
C11-C22 Aromatics	N/A	3.0E-01		MADEP (7)	06/14	3.0E-02		MADEP (6)	06/14

Notes: MADEP = Massachusetts Department of Environmental Protection
mg/kg/day = milligrams per kilogram body weight per day
N/A = Not available

Reference: MADEP (6) = Dose response values updated from MADEP's Excel Workbook: Toxicity Values used to derive MCP Method 1 Numerical Standards (3/2013) (dr
MADEP (7) = Construction Worke Shortform 2012, Table CW-5 Chemical Specific Data, Vlookup Version v0414.
MADEP (8) = Resident Shortform 2012, Table RS-8 Chemical Specific Data, Vlookup Version v0414.

Prepared By:
Reviewed By:
Preparation date: 6/30/2014
Revision date:

Table 1.2
Noncancer Dose-Response Values:
Inhalation Reference Concentrations

Chemical Name	CAS Number	Subchronic Inhalation RfC (mg/cu m)	Uncertainty/ Modifying Factors	Source	Date Last Checked	Chronic Inhalation RfC (mg/cu m)	Uncertainty/ Modifying Factors	Source	Date Last Checked
barium	7440-39-3	5.0E-03		MADEP(5)	02/13	5.0E-04		MADEP(5)	02/13
chromium (III) (as metal)	16065-83-1	3.0E-04		MADEP(5)	02/13	1.0E-04		MADEP(5)	02/13
dioxin (TCDD equivalents)	1746-01-6	2.0E-09		Note 1		2.0E-09		Note 1	
lead	7439-92-1	1.0E-03		MADEP(5)	02/13	1.0E-03		MADEP(5)	02/13
mercury	7439-97-6	3.0E-04		MADEP(5)	02/13	3.0E-04		MADEP(5)	02/13
nickel	7440-02-0	1.0E-03		MADEP(5)	02/13	1.0E-03		MADEP(5)	02/13
polychlorinated biphenyls	1336-36-3	2.0E-05		MADEP(5)	02/13	2.0E-05		MADEP(5)	02/13
vanadium	7440-62-2	1.0E-03		MADEP(5)	02/13	1.0E-03		MADEP(5)	02/13
C19-C36 Aliphatics	N/A	6.0E-01		Note 2	02/13	2.0E-01		Note 2	02/13
C11-C22 Aromatics	N/A	5.0E-01		MADEP(5)	02/13	5.0E-02		MADEP(5)	02/13

Notes: MADEP = Massachusetts Department of Environmental Protection
mg/cu m = milligrams per cubic meter of air

References: MADEP (5) = Toxicity Spreadsheet and reference page for in excel workbook "Development of MCP Risk-Based Levels for Soil and Groundwater" (3/2013)
(C = SC) = the Chronic Inhalation RfC was adopted as the Subchronic Inhalation RfC

Note 1: RfD-Ihl for dioxin (TCDD equivalents) = 5.7E-10 mg/kg/d
RfC-Ihl for dioxin (TCDD equivalents) = (5.7E-10 mg/kg/d) *70 kg) / 20 m^3/d = 2.0E-9 mg/m^3

Note 2: For C19-C36 aliphatics, the chronic RfC for C9-C18 aliphatics was used as a surrogate

Prepared By:
Reviewed By:
Preparation date:
Revision date: 6/30/2014

Table 1.3
Relative Absorption Factors: Non-Cancer

Chemical Name	CAS Number	Soil Ingestion RAF	Water Ingestion RAF	Soil Dermal RAF	Water Dermal RAF
barium	7440-39-3	1	1	0.1	1
chromium (III)	16065-83-1	1	1	0.1	1
dioxin (TCDD equivalent)	1746-01-6	1	1	0.1	1
lead	7439-92-1	0.5	0.5	0.006	1
mercury	7439-97-6	0.5	1	0.1	1
nickel	7440-02-0	1	1	0.2	1
polychlorinated biphenyls	1336-36-3	1	1	0.1	1
vanadium	7440-62-2	1	1	0.1	1
C19-C36 Aliphatics	N/A	1	1	0.2	1
C11-C22 Aromatics	N/A	0.3	0.91	0.1	1

Notes: (1) RAF values are from MADEP (1995, 2002, 2006). A default value of one (1) was assigned to dermal contact with water.

References: MADEP, 4/14. Construction Worker Shortform 2012, Table CW-5 Chemical Specific Data, Vlookup Version v0414

Prepared By:
Reviewed By:
Preparation date: 6/30/2014
Revision date:

Table 1.4
Soil Concentrations used to Derive Dust Exposure Point Concentrations

Chemical Name	CAS Number	Derivation of Clean Up Standards						
barium	7440-39-3	1.06E+02						
chromium (III)	16065-83-1	3.00E+01						
dioxin (TCDD equivalents)	1746-01-6	**1.22E-05**						
lead	7439-92-1	**4.50E+02**						
mercury (from mercuric chloride)	7439-97-6	6.00E-01						
nickel (soluble salts)	7440-02-0	3.10E+01						
polychlorinated biphenyls, as	1336-36-3	**1.00E+01**						
vanadium	7440-62-2	2.40E+01						
C19-C36 Aliphatics	N/A	3.27E+02						
C11-C22 Aromatics	N/A	3.03E+02						

unit, milligram per kilogram (mg/kg), ppm
Abbreviations:

Prepared By:
Reviewed By:
Preparation Date:
Revision Date: 6/30/2014

Table 1.5
Exposure Point Concentrations for Dust

Chemical Name	CAS Number	Derivation of Clean Up Standards	0.00	0.00	0.00	0.00	0.00	0.00
barium	7440-39-3	6.36E-03						
chromium (III)	16065-83-1	1.80E-03						
dioxin (TCDD equivalents)	1746-01-6	7.32E-10						
lead	7439-92-1	2.70E-02						
mercury (from mercuric chloride)	7439-97-6	3.60E-05						
nickel (soluble salts)	7440-02-0	1.86E-03						
polychlorinated biphenyls, as PCB-1254	1336-36-3	6.00E-04						
vanadium	7440-62-2	1.44E-03						
C19-C36 Aliphatics	N/A	1.96E-02						
C11-C22 Aromatics	N/A	1.82E-02						

Formula: EPC-air = [OHM]-soil * PF * PM-10 * CF

where,
EPC-air = Exposure Point Concentration (ug/cu m)
[OHM]-soil = soil concentration (mg/kg)
PM-10 = respirable particulate concentration in air (60 ug/cu m)
PF = proportion of respirable particulate concentrations attributable to the site (1.0)
CF = conversion factor (1E-06 kg/ug)

Units: Soil EPC = mg/kg
Dust EPC = ug/cu m

Refer to Table 6.4 for Soil Concentrations used to derive Dust Exposure Point Concentrations

Prepared By: EAF
Reviewed By:
Preparation Date: 6/30/2014
Revision Date:

Table 1.6
Calculation of Average Daily Dose for Soil Exposure: Child Resident, aged 1 Year

Receptor: Child Resident, aged 1 year

	Exposure Point:	Derivation of Clean Up Standards		0.00E+00		0.00E+00		0.00E+00		0.00E+00	
Chemical Name	**CAS Number**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**	**Dermal Contact**	**Incidental Ingestion**
barium	7440-39-3	4.12E-05	7.06E-05								
chromium (III)	16065-83-1	1.17E-05	2.00E-05								
dioxin (TCDD equivalents)	1746-01-6	4.75E-12	8.12E-12								
lead	7439-92-1	1.05E-05	1.50E-04								
mercury (from mercuric chloride)	7439-97-6	2.33E-07	2.00E-07								
nickel (soluble salts)	7440-02-0	2.41E-05	2.06E-05								
polychlorinated biphenyls, as PCB-1254	1336-36-3	3.89E-06	6.66E-06								
vanadium	7440-62-2	9.34E-06	1.60E-05								
C19-C36 Aliphatics	N/A	2.54E-04	2.18E-04								
C11-C22 Aromatics	N/A	1.18E-04	6.05E-05								

Formula: Daily Dose (ADD) for exposure to soils via ingestion (ing) and dermal contact

ADD-dermal = $\frac{[\text{OHM-soil}]*SA*AF*RAF*EF*ED*EP*C}{BW*AP}$

ADD-ing = $\frac{[\text{OHM-soil}]*IR*RAF*EF*ED*EP*C}{BW*AP}$

Unit: ADD, mg/kg/day

Receptor: Child Resident, aged 1 to 8 years (Chronic) and aged 1 year (Subchronic)

Description	**Abbreviation**	**Unit**	**Default Value**	**Source**	**Site-Specific Value**	**Source / Description**	**Input Value**
Exposure point concentration	[OHM-soil]	mg/kg			See Soil EPC Table		See Soil EPC Table
Skin surface area in contact with soil on days exposed	SA	square centimeter/day	2431	[2], child, aged 1 to 8 years (face, hands, forearms, lower legs and feet)	1670	child, aged 1 to 2 years (face, hands, forearms, lower legs and feet)	1.67E+03
Mass of soil adhered to the unit surface area of skin exposed	AF	mg/sq. cm.	0.35	[1], for child resident			3.50E-01
Relative Absorption Factor	RAF	unitless	See RAF Table				See RAF Table
# exposure events during EP / # days in EP	EF	events/year	150	[2], 5 days per week during the 30 warmest weeks of the year	26	Exterior Courtyard: One day per week during a six-month construction project. Beneath Mill #3 Building: 5 days per week during the 30 warmest weeks of the year	2.60E+01
Exposure duration: typical duration of each exposure event	ED	years/event	2.74E-03	1 day per event or 1/365 of a year per event			2.74E-03
Exposure period: period of time over which exposure may occur	EP	years	7	[2], child, aged 1 to 8 years	1.0	subchronic exposure of 1 year old boy or girl (Subchronic)	1.00E+00
Unit Conversion Factor	C	kg/mg	1.00E-06	for dermal contact			1.00E-06
Unit Conversion Factor	C	kg/mg	1.00E-06	for ingestion			1.00E-06
Body weight of the receptor during the AP	BW	kg	17	[2], child, aged 1 to 8 years	1.07E+01	subchronic exposure of 1 year old boy or girl	1.07E+01
Averaging Period	AP	years	7	[2]	1.0	subchronic exposure of 1 year old boy or girl	1.00E+00
Ingestion rate	IR	mg/day	100	[2]			1.00E+02

References:

[1] MADEP's Technical Update, Weighted Skin-Soil Adherence Factors, April 2002.
[2] MADEP's Guidance for Disposal Site Risk Characterization in Support of the Massachusetts Contingency Plan, Interim Final Policy BWSC/ORS-95-141

1 day per week for 26 weeks for outer courtyard soil intervals

Prepared By:EAF
Reviewed By:
Preparation Date:
Revision Date:6/30/2014

Table 1.7
Calculation of Average Daily Exposure for Dust: Child Resident, aged 1

Receptor: Child Resident, aged 1 year								
Chemical Name	**CAS Number**	**Derivation of Clean Up Standards**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
barium	7440-39-3	3.2E-06						
chromium (III)	16065-83-1	9.0E-07						
dioxin (TCDD equivalents)	1746-01-6	3.6E-13						
lead	7439-92-1	1.3E-05						
mercury (from mercuric chloride)	7439-97-6	1.8E-08						
nickel (soluble salts)	7440-02-0	9.3E-07						
polychlorinated biphenyls, as PCB-1254	1336-36-3	3.0E-07						
vanadium	7440-62-2	7.2E-07						
C19-C36 Aliphatics	N/A	9.8E-06						
C11-C22 Aromatics	N/A	9.1E-06						

Formula: Average Daily Exposure (ADE) via inhalation (ihl) of dusts

$$ADE\text{-}ihl = \frac{[OHM\text{-}dust]*EF*ED*EP*C}{AP}$$

Unit: ADE, mg/cu m

Receptor: Child Resident, aged 1 to 8 years (Chronic) and aged 1 year (Subchronic)

Description	**Abbreviation**	**Unit**	**Default Value**	**Source**	**Site-Specific Value**	**Source / Description**	**Input Value**
Exposure point concentration	[OHM-dust]	ug/cu. m.			See Dust EPC Table		See Dust EPC Table
Exposure frequency: # exposure events during EP / # days in EP	EF	events/year	150	[2], 5 days per week during the 30 warmest weeks of the year	182	Seven days per week during a six-month construction project	1.82E+02
Exposure duration: typical duration of each exposure event	ED	years/event	2.74E-03	1 day per event, or 1/365 of a year per event			2.74E-03
Exposure period: period of time over which exposure may occur	EP	years	7	[1], from age 1 to 8 years	1.00E+00	subchronic exposure of 1 year old boy or girl	1.00E+00
Unit Conversion Factor	C	mg/ug	1.00E-03	for inhalation			1.00E-03
Averaging Period	AP	years	7	[1]	1.00E+00	subchronic exposure of 1 year old boy or girl	1.00E+00

References:

[1] MADEP's Guidance for Disposal Site Risk Characterization in Support of the Massachusetts Contingency Plan, Interim Final Policy BWSC/ORS-95-141

Table 1.8
Calculation of Hazard Index (HI) for Exposure to Soil and Dust: Child Resident, aged 1 Year

Receptor: Child Resident, aged 1 year																	
	Exposure Point:	Derivation of Clean Up Standards			0.0E+00			0.0E+00			0.0E+00			0.0E+00			
Chemical Name	CAS Number	Dermal Contact	Incidental Ingestion	Dust Inhalation	Dermal Contact	Incidental Ingestion	Dust Inhalation	Dermal Contact	Incidental Ingestion	Dust Inhalation	Dermal Contact	Incidental Ingestion	Dust Inhalation	Dermal Contct	Incidental Ingestion	Dust Inhalation	
barium	7440-39-3	5.9E-04	1.0E-03	6.3E-04													
chromium (III)	16065-83-1	7.8E-06	1.3E-05	3.0E-03													
dioxin (TCDD equivalents)	1746-01-6	6.8E-03	1.2E-02	1.8E-04													
lead	7439-92-1	1.4E-02	2.0E-01	1.3E-02													
mercury (from mercuric chloride)	7439-97-6	7.8E-04	6.7E-04	6.0E-05													
nickel (soluble salts)	7440-02-0	1.2E-03	1.0E-03	9.3E-04													
polychlorinated biphenyls, as PCB-1254	1336-36-3	7.8E-02	1.3E-01	1.5E-02													
vanadium	7440-62-2	1.0E-03	1.8E-03	7.2E-04													
C19-C36 Aliphatics	N/A	4.2E-05	3.6E-05	1.6E-05													
C11-C22 Aromatics	N/A	3.9E-04	2.0E-04	1.8E-05													
Total HI: Route and Expos. Pt.		1.0E-01	3.5E-01	3.4E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
Proportion of complete exposure point			1.0E+00			1.0E+00			1.0E+00			1.0E+00			1.0E+00		
Adjusted Total HI: Route and Expos. Pt.		1.0E-01	3.5E-01	3.4E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
Total HI: Expos. Pt.			4.9E-01			0.0E+00			0.0E+00			0.0E+00			0.0E+00		

Formula:

Cumulative HI = $\sum HI_{ingestion\ -\ chemicalspecific} + \sum HI_{dermalcontact\ -\ chemicalspecific} + \sum HI_{inhalation:chemical\ -\ specific}$

HI ingestion-chemical specific = ADD-ingestion-chemical specific x Oral Slope Factor-chemical specific
HI dermal contact-chemical specific = ADD-dermal contact-chemical specific x Oral Slope Factor-chemical specific
HI inhalation-chemical specific = ADE-inhalation-chemical specific x Unit Risk-inhalation-chemical specific

HI = Hazard Index, unitless
ADD = Average Daily Dose, mg/kg/day
ADE = Average Daily Exposure, mg/cu m

Subchronic Oral Reference Dose		X
Chronic Oral Reference Dose		
Subchronic Inhalation Reference Concentration		X
Chronic Inhalation Reference Concentration		

Use capital X to indicate selection

Prepared By:EAF
Reviewed By:
Preparation Date:
Revision Date:6/30/2014

Table 1.9
Calculation of Total Hazard Index (HI): Child Resident, aged 1 Year
(DERIVATION OF LEAD AND PCB CLEANUP STANDARDS)

Receptor	Child Resident, aged 1 year							Child Resident, aged 1-8 years						
Exposure Point #	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Pathway:														
Soil Exposure Point:														
Incidental ingestion of soil, normal	3.5E-01													
Inhalation of dusts from disturbed soil	3.4E-02													
Dermal contact with soil	1.0E-01													
Total HI	4.9E-01 Subchronic													
MCP Non-Cancer Risk Limit	1.E+00													
Does Total HI exceed MCP Non-Cancer Risk Limit?	No													
Significant Risk of Harm?	No													

Definintion of exposure points							
Exposure Point #	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Soil Exposure Point:	Derivation of Clean Up Standards						

ASSUMPTIONS FOR BOTH OUTER COURTYARD AND BENEATH MILL #3 BUILDING:
NO SINGLE FAMILY RESIDENCE. NO GARDENING OF EDIBLE PRODUCE. EXCLUDE FILL BACKGROUND.

ASSUMPTIONS FOR OUTER COURTYARD ONLY:
EXPOSURE TO SOILS OCCURS ONLY DURING A SINGLE SIX-MONTH CONSTRUCTION PROJECT, AFTER WHICH TIME
THE SOILS ARE RETURNED TO EXCAVATION OR ARE TRANSPORTED OFF-SITE.
ASSUME CONTROLS ARE USED TO LIMIT RESIDENTIAL EXPOSURE TO SOILS DURING CONSTRUCTION PROJECT.
PROTECTIVE COVER MUST REMAIN OVER SOILS EXCEPT DURING CONSTRUCTION OR UTILITY PROJECT, AFTER WHICH TIME THE PROTECTIVE COVER MUST BE RE-INSTALLED.

ATTACHMENT 2F

Method 3 Risk Assessment for Chemicals in Soil - Construction Worker Shortform 2012 (sf12cw)

Index

Tab	
EPCs	Table CW-1: Select chemicals and enter Exposure Point Concentrations (EPCs). Estimated risks are shown to the right.
C Eq	Table CW-2: Equations to calculate cancer risks
NC Eq	Table CW-3: Equations to calculate noncancer risks
Exp	Table CW-4: Definitions and exposure factors
Chem	Table CW-5: Chemical-specific data
Cyanide	Table CW-6: Cyanide Calculations

Spreadsheets designed by Andrew Friedmann, MassDEP
Questions and Comments may be addressed to:
Lydia Thompson
Massachusetts Department of Environmental Protection
Office of Research and Standards
One Winter Street
Boston, MA 02108 USA
Telephone: (617) 556-1165
Fax: (617) 556-1006
Email: Lydia.Thompson@state.ma.us

Construction Worker - Soil: Table CW-1
Exposure Point Concentration (EPC) and Risk
Based on Construction Worker 18-25 years of age

DERIVATION OF CLEAN UP STANDARDS ShortForm Version 10-12
ATTACHMENT 2F Vlookup Version v0414
UTILITY AND CONSTRUCTION WORKER

ELCR (all chemicals) = 3.9E-07
HI (all chemicals) = 1.0E+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}	Subchronic HQ_{total}
POLYCHLORINATED BIPHENYLS (PCBs)	**1.00E+01**	1.8E-07	1.8E-07	4.5E-09	2.7E-10	3.6E-07	2.5E-01	2.5E-01	6.4E-03	1.9E-02	5.2E-01
TCDD, 2,3,7,8- (equivalents)	**1.22E-05**	1.6E-08	1.6E-08	4.2E-10	1.1E-10	3.3E-08	2.1E-02	2.2E-02	5.6E-04	2.3E-04	4.4E-02
BARIUM	1.06E+02						1.9E-03	1.9E-03	4.8E-05	7.9E-04	4.6E-03
CHROMIUM(III)	3.00E+01						2.5E-05	2.5E-05	6.4E-07	3.7E-03	3.8E-03
LEAD	**4.50E+02**						3.7E-01	4.5E-02	9.6E-03	1.7E-02	4.4E-01
MERCURY	6.00E-01						1.2E-03	2.5E-03	3.2E-05	7.4E-05	3.8E-03
NICKEL	3.10E+01				3.9E-09	3.9E-09	1.9E-03	3.8E-03	4.9E-05	1.2E-03	7.0E-03
VANADIUM	2.40E+01						3.3E-03	3.3E-03	8.5E-05	8.9E-04	7.6E-03
ALIPHATICS C19 to C36	3.27E+02						6.7E-05	1.4E-04	1.7E-06		2.0E-04
AROMATICS C11 to C22	3.03E+02						3.7E-04	1.3E-03	9.7E-06	2.3E-05	1.7E-03

MassDEP ORS
Contact: Lydia Thompson
Lydia.Thompson@state.ma.us
617-556-1165

Construction Worker - Soil: Table CW-2

Equations to Calculate Cancer Risk for Construction Worker

Vlookup Version v0414

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	$\mu g/m^3$

MassDEP ORS
Contact: Lydia Thompson
Lydia.Thompson@state.ma.us
617-556-1165

Construction Worker - Soil: Table CW-3

Equations to Calculate Noncancer Risk for Construction Worker

Vlookup Version v0414

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	$µg/m^3$

MassDEP ORS
Contact: Lydia Thompson
Lydia.Thompson@state.ma.us
617-556-1165

Construction Worker - Soil: Table CW-4
Definitions and Exposure Factors

Vlookup Version v0414

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

MassDEP ORS
Contact: Lydia Thompson
Lydia.Thompson@state.ma.us
617-556-1165

Construction Worker - Soil: Table CW-5
Chemical-Specific Data

Vlookup Version v0414

Oil or Hazardous Material	Oral CSF $(mg/kg\text{-}day)^{-1}$	$RAF_{c\text{-}ing}$	$RAF_{c\text{-}derm}$	$RAF_{c\text{-}inh}$	Inhalation CSF $(mg/kg\text{-}day)^{-1}$	Subchronic Oral RfD mg/kg-day	Subchronic $RAF_{nc\text{-}ing}$	Subchronic $RAF_{nc\text{-}derm}$	Subchronic $RAF_{nc\text{-}inh}$	Subchronic Inhalation RfD
POLYCHLORINATED BIPHENYLS (PCBs)	2.0E+00	1	0.1	1	3.5E-01	5.0E-05	1	0.1	1	5.7E-06
TCDD, 2,3,7,8- (equivalents)	1.5E+05	1	0.1	1	1.2E+05	7.0E-10	1	0.1	1	5.7E-10
BARIUM						7.0E-02	1	0.1	1	1.4E-03
CHROMIUM(III)						1.5E+00	1	0.1	1	8.6E-05
LEAD						7.5E-04	0.5	0.006	1	2.9E-04
MERCURY						3.0E-04	0.5	0.1	1	8.6E-05
NICKEL					1.7E+00	2.0E-02	1	0.2	1	2.9E-04
VANADIUM						9.0E-03	1	0.1	1	2.9E-04
ALIPHATICS C19 to C36						6.0E+00	1	0.2		
AROMATICS C11 to C22						3.0E-01	0.3	0.1	1	1.4E-01

MassDEP ORS
Contact: Lydia Thompson
Lydia.Thompson@state.ma.us
617-556-1165

ATTACHMENT 3

QA/QC & SOPs, dated July 8, 2014

Quality Assurance/Quality Control (QA/QC) Plan &
Standard Operating Procedures (SOPs)
Boott Mills – Exterior Courtyard
130 Foot of John Street
Lowell, Massachusetts
MADEP RTN: 3-26688

July 8, 2014

Introduction

This document describes the Quality Assurance/Quality Control (QA/QC) Plan and Standard Operating Proceedures (SOPs) followed during the implementation of subsurface investigations conducted in the exterior courtyard of 130 Foot of John Street, in Lowell, Massachusetts. This document also describes the QA/QC Plan and SOPs that will be followed during the soil excavation activities and confirmatory soil sampling.

Subsurface Investigations

Laboratories

Analyses were conducted for three environmental media at this Site: (1) groundwater; (2) soils; and (3) soil vapor. All samples were collected in accordance with SOPs attached to this QA/QC Plan and submitted to state-certified laboratories for analyses under chain-of-custody (COC) documentation in accordance with SOPs. The laboratories used are certified, licensed and approved to conduct the analyses conducted. The following three laboratories were utilized during the subsurface investigation conducted in the exterior courtyard of 130 Foot of John Street.

Groundwater Analytical, Inc.
228 Main Street
Buzzards Bay, Massachusetts 02532
Note: This laboratory is no longer in business, but at the time the laboratory was used, it was a state-certified laboratory.

Alpha Analytical
Eight Walkup Drive
Westborough, Massachusetts 01581-1019

Contest Analytical Laboratory
39 Spruce Street
East Longmeadow, Massachusetts 01028

Refer to Table 1, attached to this QA/QC Plan for a summary of sample type, which laboratory conducted specific analyses and analyses performed.

Analytical Methods

Throughout the subsurface investigation soil vapor, groundwater and soil samples were collected and analyzed for polychlorinated biphenyls (PCBs), Extractable Petroleum Hydrocarbons (EPH), polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), total petroleum hydrocarbons (TPH), metals and/or additional waste disposal criteria. Refer to Table 1, attached to this QA/QC Plan, for a summary of sample type, which laboratory conducted specific analyses and analyses performed. Below is a summary of what analyses were performed on soil vapor, groundwater and soil samples. All methods used are United States Environmental Protection Agency (USEPA) Methods and/or Massachusetts Department of Environmental Protection (MADEP) Compendium of Analytical Method (CAM) Methods.

Soil vapor samples were analyzed for the following:

- PCBs via USEPA Method TO-10A.

Groundwater samples were analyzed for the following:

- PCBs via USEPA Method 8082
- VPH via MADEP VPH Method or MADEP VPH-04-1.1 Method
- VOCs via USEPA Method 8260B
- EPH via MADEP EPH Method or MADEP EPH 04-1.1 Method
- PAHs via USEPA Method 8270C Modified or USEPA Method 8270D
- Metals via USEPA Method 6010B
- Hardness via USEPA Method SM18-20 2340B

Soil samples were analyzed for the following:

- PCBs via USEPA Method 8082 or USEPA Method 8082A
- EPH & PAHs via MADEP EPH with PAHs
- PAHs via USEPA Method 8270C and USEPA Method 8270D
- VOCs via USEPA Method 5035 and USEPA Method 8260C

- TPH via USEPA Method 8100M
- Metals via USEPA 6010B/7471A, USEPA Method 6010C, USEPA Method 6010C/7196A/SM2580A/SM9045C, and USEPA Method 6010C/7471B/1311
- Flashpoint via SW-846 1010
- Ignitability via SW-846 1030
- pH via SW-846 9045C
- Reactive Cyanide via SW-846 9014
- Reactive Sulfide via SW-846 903A
- Specific conductance via SM18-20 2510B

All data collected during the subsurface investigation for 130 Foot of John Street, Lowell, Massachusetts has been validated in accordance with CAM and MADEP's applicable guidance and is included as Attachment 5 to the Release Abatement Measure (RAM) Plan Modification Report and Application for Risk-Based Cleanup of Polychlorinated Biphenyls (PCBs) dated, July 2014.

Excavation Activities & Confirmatory Sampling

Laboratories

Analyses will be conducted for one environmental media at this Site during confirmatory sampling: (1) soils. All excavation activities and sampling will be conducted in accordance with SOPs attached to this QA/QC Plan and all samples will be submitted to a state-certified laboratoriy for analyses under COC documentation in accordance with SOPs. The laboratory to be used is certified, licensed and approved to conduct the analyses conducted. The following laboratory will be utilized during the confirmatory sampling conducted in the exterior courtyard of 130 Foot of John Street.

Contest Analytical Laboratory
39 Spruce Street
East Longmeadow, Massachusetts 01028

Analytical Methods

Throughout the confirmatory soil sampling soil samples will be collected and analyzed for Archlor PCBs via USEPA Method 8082A with Soxhlet Extraction. The attached SOPs and QA/QC will be followed during the upcoming confirmatory soil sampling.

All data collected during the confirmatory sampling for 130 Foot of John Street, Lowell, Massachusetts will be validated in accordance with CAM and MADEP's applicable guidance.

Attachments:
Table 1 – Summary of Analyses for Soil, Groundwater and Soil Vapor
SOP – Boring/Well Installation
SOP – Soil Sampling via Test Boring
SOP – Headspace Screening of Soil Samples with a Photoionization Detector (PID)
SOP – Observation Well Sampling Using a Low Flow Sampler
SOP - Installation of Permanent Sub-Slab Soil Vapor Points And Sampling of Sub-Slab Soil Vapor
SOP – Sample Preservation and Chain of Custody
SOP – GEC QA/QC
SOP – Sampling with a Spade or Scoop

TABLE 1
SUMMARY OF ANALYSES FOR SOIL, GROUNDWATER AND SOIL VAPOR:
BOOTT MILLS
130 Foot of John Street, Lowell, MA

Sample ID	Sample Date	Sample Type	Laboratory	MADEP EPH w/PAHs	MADEP EPH	MADEP-EPH-04-1.1	MADEP VPH or MADEP VPH-04-1.1	EPA 5035	EPA 8082	EPA 8082A	EPA 8082A with Soxhlet extraction via EPA 3540	dioxin-like PCB Congeners EPA 8270M	EPA 6010B/7471A	EPA 8270C	EPA 8270C Modified	EPA 8270D
B-1 1-5'	06/06/2011	Soil	Groundwater Analytical	X					X				X			
B-1 10-15'	06/06/2011	Soil	Groundwater Analytical	X					X				X			
B-2 1-5'	06/06/2011	Soil	Groundwater Analytical	X					X				X			
B-2 10-15'	06/06/2011	Soil	Groundwater Analytical	X					X				X			
B-3 5-10'	06/06/2011	Soil	Groundwater Analytical	X					X				X			
B-4 2-5'	06/06/2011	Soil	Groundwater Analytical	X					X				X			
B-4 12-15'	06/06/2011	Soil	Groundwater Analytical	X					X				X			
B-5 10-15'	06/06/2011	Soil	Groundwater Analytical	X					X				X			
B-8 0-3'	09/01/2011	Soil	Alpha Analytical					X	X				X	X		
B-8 0-1'	09/01/2011	Soil	Alpha Analytical						X							
B-8 1-3'	09/01/2011	Soil	Alpha Analytical						X							
B-8 5-10'	09/01/2011	Soil	Alpha Analytical					X	X				X	X		
B-8 10-15'	09/01/2011	soil	Alpha Analytical					X								
B-9 0-3'	09/01/2011	Soil	Alpha Analytical					X					X	X		
B-9 0-1'	09/01/2011	Soil	Alpha Analytical						X							
B-9 1-3'	09/01/2011	Soil	Alpha Analytical						X							
B-10 0-3'	09/01/2011	Soil	Alpha Analytical						X				X	X		
B-10 3-6'	09/01/2011	Soil	Alpha Analytical						X							
B-11 0-3'	09/01/2011	Soil	Alpha Analytical					X	X				X	X		
B-11 3-6'	09/01/2011	Soil	Alpha Analytical						X							
B-12 0-3'	09/01/2011	Soil	Alpha Analytical						X				X	X		
B-12 3-6'	09/01/2011	Soil	Alpha Analytical						X							
B-15 0-3'	10/05/2012	Soil	Contest Analytical Laboratory							X						
B-15 3-5'	10/05/2012	Soil	Contest Analytical Laboratory							X						
B-15 5-7'	10/05/2012	Soil	Contest Analytical Laboratory							X						
B-16 0-3'	10/05/2012	Soil	Contest Analytical Laboratory													
B-16 3-5'	10/05/2012	Soil	Contest Analytical Laboratory													
B-16 5-7'	10/05/2012	Soil	Contest Analytical Laboratory							X						
B-16 7-9'	10/05/2012	Soil	Contest Analytical Laboratory							X						
B-16 9-12'	10/05/2012	Soil	Contest Analytical Laboratory							X						
B-17 0-3'	10/05/2012	Soil	Contest Analytical Laboratory							X						
B-17 3-5'	10/05/2012	Soil	Contest Analytical Laboratory							X						
B-17 5-7'	10/05/2012	Soil	Contest Analytical Laboratory							X						
B-20 0-3'	10/05/2012	Soil	Contest Analytical Laboratory							X						
B-20 3-5'	10/05/2012	Soil	Contest Analytical Laboratory							X						
B-20 5-7'	10/05/2012	Soil	Contest Analytical Laboratory							X						
B-21 0-3'	10/05/2012	Soil	Contest Analytical Laboratory							X						
B-21 3-5'	10/05/2012	Soil	Contest Analytical Laboratory							X						
B-22 0-3'	10/05/2012	Soil	Contest Analytical Laboratory													
B-22 3-5'	10/05/2012	Soil	Contest Analytical Laboratory							X						
B-22 5-7'	10/05/2012	Soil	Contest Analytical Laboratory							X						
B-23 0-3'	10/05/2012	Soil	Contest Analytical Laboratory							X						
B-23 3-5'	10/05/2012	Soil	Contest Analytical Laboratory							X						
B-25 0-3'	10/17/2012	Soil	Contest Analytical Laboratory							X						
B-25 3-5'	10/17/2012	Soil	Contest Analytical Laboratory							X						
B-25 5-7'	10/17/2012	Soil	Contest Analytical Laboratory							X						
B-26 5-7'	10/09/2012	Soil	Contest Analytical Laboratory							X						
B-26 7-9'	10/09/2012	Soil	Contest Analytical Laboratory							X						
B-26 9-12'	10/09/2012	Soil	Contest Analytical Laboratory							X						
B-27 0-3'	10/09/2012	Soil	Contest Analytical Laboratory							X						
B-27 3-5'	10/09/2012	Soil	Contest Analytical Laboratory							X						
B-27A 0-3'	10/17/2012	Soil	Contest Analytical Laboratory							X						
B-27A 3-5'	10/17/2012	Soil	Contest Analytical Laboratory							X						
B-27A 5-7'	10/17/2012	Soil	Contest Analytical Laboratory							X						
B-28 0-3'	10/17/2012	Soil	Contest Analytical Laboratory							X						

TABLE 1
SUMMARY OF ANALYSES FOR SOIL, GROUNDWATER AND SOIL VAPOR:
BOOTT MILLS
130 Foot of John Street, Lowell, MA

Sample ID	Sample Date	Sample Type	Laboratory	EPA 8270D/8100M	EPA 8260B	EPA 8260C	EPA 6010B	EPA 6010B / SM18-20 2340B	EPA 6010C	EPA 6010C / 7471B / 1311	EPA 6010C/7196A / SM2580A /SM9045C	EPA TO-10A	SW-846 1010/1030/9045C/9014/ 9030A; SM18-20 2510B
B-1 1-5'	06/06/2011	Soil	Groundwater Analytical										
B-1 10-15'	06/06/2011	Soil	Groundwater Analytical										
B-2 1-5'	06/06/2011	Soil	Groundwater Analytical										
B-2 10-15'	06/06/2011	Soil	Groundwater Analytical										
B-3 5-10'	06/06/2011	Soil	Groundwater Analytical										
B-4 2-5'	06/06/2011	Soil	Groundwater Analytical										
B-4 12-15'	06/06/2011	Soil	Groundwater Analytical										
B-5 10-15'	06/06/2011	Soil	Groundwater Analytical										
B-8 0-3'	09/01/2011	Soil	Alpha Analytical										
B-8 0-1'	09/01/2011	Soil	Alpha Analytical										
B-8 1-3'	09/01/2011	Soil	Alpha Analytical										
B-8 5-10'	09/01/2011	Soil	Alpha Analytical										
B-8 10-15'	09/01/2011	soil	Alpha Analytical										
B-9 0-3'	09/01/2011	Soil	Alpha Analytical										
B-9 0-1'	09/01/2011	Soil	Alpha Analytical										
B-9 1-3'	09/01/2011	Soil	Alpha Analytical										
B-10 0-3'	09/01/2011	Soil	Alpha Analytical										
B-10 3-6'	09/01/2011	Soil	Alpha Analytical										
B-11 0-3'	09/01/2011	Soil	Alpha Analytical										
B-11 3-6'	09/01/2011	Soil	Alpha Analytical										
B-12 0-3'	09/01/2011	Soil	Alpha Analytical										
B-12 3-6'	09/01/2011	Soil	Alpha Analytical										
B-15 0-3'	10/05/2012	Soil	Contest Analytical Laboratory										
B-15 3-5'	10/05/2012	Soil	Contest Analytical Laboratory										
B-15 5-7'	10/05/2012	Soil	Contest Analytical Laboratory										
B-16 0-3'	10/05/2012	Soil	Contest Analytical Laboratory								X		
B-16 3-5'	10/05/2012	Soil	Contest Analytical Laboratory								X		
B-16 5-7'	10/05/2012	Soil	Contest Analytical Laboratory										
B-16 7-9'	10/05/2012	Soil	Contest Analytical Laboratory										
B-16 9-12'	10/05/2012	Soil	Contest Analytical Laboratory										
B-17 0-3'	10/05/2012	Soil	Contest Analytical Laboratory						X				
B-17 3-5'	10/05/2012	Soil	Contest Analytical Laboratory						X				
B-17 5-7'	10/05/2012	Soil	Contest Analytical Laboratory						X				
B-20 0-3'	10/05/2012	Soil	Contest Analytical Laboratory										
B-20 3-5'	10/05/2012	Soil	Contest Analytical Laboratory										
B-20 5-7'	10/05/2012	Soil	Contest Analytical Laboratory										
B-21 0-3'	10/05/2012	Soil	Contest Analytical Laboratory						X				
B-21 3-5'	10/05/2012	Soil	Contest Analytical Laboratory						X				
B-22 0-3'	10/05/2012	Soil	Contest Analytical Laboratory						X				
B-22 3-5'	10/05/2012	Soil	Contest Analytical Laboratory						X				
B-22 5-7'	10/05/2012	Soil	Contest Analytical Laboratory										
B-23 0-3'	10/05/2012	Soil	Contest Analytical Laboratory						X				
B-23 3-5'	10/05/2012	Soil	Contest Analytical Laboratory						X				
B-25 0-3'	10/17/2012	Soil	Contest Analytical Laboratory										
B-25 3-5'	10/17/2012	Soil	Contest Analytical Laboratory										
B-25 5-7'	10/17/2012	Soil	Contest Analytical Laboratory										
B-26 5-7'	10/09/2012	Soil	Contest Analytical Laboratory										
B-26 7-9'	10/09/2012	Soil	Contest Analytical Laboratory										
B-26 9-12'	10/09/2012	Soil	Contest Analytical Laboratory										
B-27 0-3'	10/09/2012	Soil	Contest Analytical Laboratory										
B-27 3-5'	10/09/2012	Soil	Contest Analytical Laboratory										
B-27A 0-3'	10/17/2012	Soil	Contest Analytical Laboratory										
B-27A 3-5'	10/17/2012	Soil	Contest Analytical Laboratory										
B-27A 5-7'	10/17/2012	Soil	Contest Analytical Laboratory										
B-28 0-3'	10/17/2012	Soil	Contest Analytical Laboratory										

TABLE 1
SUMMARY OF ANALYSES FOR SOIL, GROUNDWATER AND SOIL VAPOR:
BOOTT MILLS
130 Foot of John Street, Lowell, MA

Sample ID	Sample Date	Sample Type	Laboratory	MADEP EPH w/PAHs	MADEP EPH	MADEP-EPH-04-1.1	MADEP VPH or MADEP VPH-04-1.1	EPA 5035	EPA 8082	EPA 8082A	EPA 8082A with Soxhlet extraction via EPA 3540	dioxin-like PCB Congeners EPA 8270M	EPA 6010B/7471A	EPA 8270C	EPA 8270C Modified	EPA 8270D
B-29 0-3'	10/17/2012	Soil	Contest Analytical Laboratory							X						
B-29 3-5'	10/17/2012	Soil	Contest Analytical Laboratory							X						
B-29 5-6'	10/17/2012	Soil	Contest Analytical Laboratory							X						
B-30 0-3'	10/17/2012	Soil	Contest Analytical Laboratory							X						
B-30 3-4.5'	10/17/2012	Soil	Contest Analytical Laboratory							X						
B-31 0-3'	10/09/2012	Soil	Contest Analytical Laboratory							X						
B-31 3-5'	10/09/2012	Soil	Contest Analytical Laboratory							X						
B-32 0-3'	10/09/2012	Soil	Contest Analytical Laboratory							X						
B-32 3-5'	10/09/2012	Soil	Contest Analytical Laboratory							X						
B-33 0-3'	10/10/2012	Soil	Contest Analytical Laboratory													
B-33 3-5'	10/10/2012	Soil	Contest Analytical Laboratory													
B-34 0-3'	10/05/2012	Soil	Contest Analytical Laboratory													
B-34 3-5'	10/05/2012	Soil	Contest Analytical Laboratory							X						
B-35 0-3'	10/05/2012	Soil	Contest Analytical Laboratory							X						
B-35 3-5'	10/05/2012	Soil	Contest Analytical Laboratory							X						
B-35 5-7'	10/05/2012	Soil	Contest Analytical Laboratory							X						
B-35 7-9'	10/05/2012	Soil	Contest Analytical Laboratory							X						
B-36 0-3'	10/17/2012	Soil	Contest Analytical Laboratory							X						
B-36 3-5'	10/17/2012	Soil	Contest Analytical Laboratory							X						
B-37 0-3'	10/05/2012	Soil	Contest Analytical Laboratory							X						
B-37 3-5'	10/05/2012	Soil	Contest Analytical Laboratory							X						
B-38 0-9'	05/08/2013	Soil	Contest Analytical Laboratory							X						
B-38 9-12'	05/08/2013	Soil	Contest Analytical Laboratory							X						
B-39 0-3'	05/08/2013	Soil	Contest Analytical Laboratory							X						
B-39 3-9'	05/08/2013	Soil	Contest Analytical Laboratory							X						
B-48 0-3'	05/09/2013	Soil	Contest Analytical Laboratory							X						
B-48 3-9'	05/09/2013	Soil	Contest Analytical Laboratory							X						
B-49 0-3'	05/08/2013	Soil	Contest Analytical Laboratory							X						
B-49 3-9'	05/08/2013	Soil	Contest Analytical Laboratory							X						
B-50 0-3'	05/08/2013	Soil	Contest Analytical Laboratory							X						
B-50 3-9'	05/08/2013	Soil	Contest Analytical Laboratory							X						
Composite 1 0-5'	05/08/2013	Soil	Contest Analytical Laboratory							X						
Composite 2 0-5'	05/08/2013	Soil	Contest Analytical Laboratory							X						
Composite 3 0-3'	05/08/2013	Soil	Contest Analytical Laboratory							X						
Composite 3 3-9'	05/08/2013	Soil	Contest Analytical Laboratory							X						
Composite 4 0-3'	05/08/2013	Soil	Contest Analytical Laboratory							X						
Composite 4 3-9'	05/08/2013	Soil	Contest Analytical Laboratory							X						
Composite 5 0-3'	05/09/2013	Soil	Contest Analytical Laboratory							X						
Composite 5 3-9'	05/09/2013	Soil	Contest Analytical Laboratory							X						
Composite 6 0-3'	05/09/2013	Soil	Contest Analytical Laboratory							X						
Composite 6 3-9'	05/09/2013	Soil	Contest Analytical Laboratory							X						
B-2A 0-1'	03/04/2014	Soil	Contest Analytical Laboratory								X	X				
B-2A 1-2'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-2A 2-3'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-2A 3-4'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-2A 4-5'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-2A 4-5' DUP	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-10A 0-0.5'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-10A 0.5-1'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-10A 1-2'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-10A 2-3'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-10A 2-3' DUP	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-11A 0-0.5'	03/04/2014	Soil	Contest Analytical Laboratory								X	X				
B-11A 0-0.5' DUP	03/04/2014	Soil	Contest Analytical Laboratory								X	X				
B-11A 0.5-1'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-11A 1-2'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-11A 2-3'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-16A 0-1'	03/04/2014	Soil	Contest Analytical Laboratory								X	X				
B-16A 1-2'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-16A 2-3'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-16A 3-4'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-16A 4-5'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-20A 0-0.5'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-20A 0.5-1'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-20A 1-2'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-20A 1-2' DUP	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-20A 2-3'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-21A 0-0.5'	03/04/2014	Soil	Contest Analytical Laboratory								X	X				
B-21A 0.5-1'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-21A 1-2'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-21A 2-3'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-48A 0-0.5'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-48A 0-0.5' DUP	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-48A 0.5-1'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-48A 1-2'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-48A 2-3'	03/04/2014	Soil	Contest Analytical Laboratory								X					

TABLE 1
SUMMARY OF ANALYSES FOR SOIL, GROUNDWATER AND SOIL VAPOR:
BOOTT MILLS
130 Foot of John Street, Lowell, MA

Sample ID	Sample Date	Sample Type	Laboratory	EPA 8270D/8100M	EPA 8260B	EPA 8260C	EPA 6010B	EPA 6010B / SM18-20 2340B	EPA 6010C	EPA 6010C / 7471B / 1311	EPA 6010C/7196A / SM2580A /SM9045C	EPA TO-10A	SW-846 1010/1030/9045C/9014/ 9030A; SM18-20 2510B
B-29 0-3'	10/17/2012	Soil	Contest Analytical Laboratory										
B-29 3-5'	10/17/2012	Soil	Contest Analytical Laboratory										
B-29 5-6'	10/17/2012	Soil	Contest Analytical Laboratory										
B-30 0-3'	10/17/2012	Soil	Contest Analytical Laboratory						X				
B-30 3-4.5'	10/17/2012	Soil	Contest Analytical Laboratory						X				
B-31 0-3'	10/09/2012	Soil	Contest Analytical Laboratory						X				
B-31 3-5'	10/09/2012	Soil	Contest Analytical Laboratory						X				
B-32 0-3'	10/09/2012	Soil	Contest Analytical Laboratory						X				
B-32 3-5'	10/09/2012	Soil	Contest Analytical Laboratory						X				
B-33 0-3'	10/10/2012	Soil	Contest Analytical Laboratory						X				
B-33 3-5'	10/10/2012	Soil	Contest Analytical Laboratory						X				
B-34 0-3'	10/05/2012	Soil	Contest Analytical Laboratory						X				
B-34 3-5'	10/05/2012	Soil	Contest Analytical Laboratory						X				
B-35 0-3'	10/05/2012	Soil	Contest Analytical Laboratory										
B-35 3-5'	10/05/2012	Soil	Contest Analytical Laboratory										
B-35 5-7'	10/05/2012	Soil	Contest Analytical Laboratory										
B-35 7-9'	10/05/2012	Soil	Contest Analytical Laboratory										
B-36 0-3'	10/17/2012	Soil	Contest Analytical Laboratory										
B-36 3-5'	10/17/2012	Soil	Contest Analytical Laboratory										
B-37 0-3'	10/05/2012	Soil	Contest Analytical Laboratory										
B-37 3-5'	10/05/2012	Soil	Contest Analytical Laboratory										
B-38 0-9'	05/08/2013	Soil	Contest Analytical Laboratory										
B-38 9-12'	05/08/2013	Soil	Contest Analytical Laboratory										
B-39 0-3'	05/08/2013	Soil	Contest Analytical Laboratory										
B-39 3-9'	05/08/2013	Soil	Contest Analytical Laboratory										
B-48 0-3'	05/09/2013	Soil	Contest Analytical Laboratory										
B-48 3-9'	05/09/2013	Soil	Contest Analytical Laboratory										
B-49 0-3'	05/08/2013	Soil	Contest Analytical Laboratory										
B-49 3-9'	05/08/2013	Soil	Contest Analytical Laboratory										
B-50 0-3'	05/08/2013	Soil	Contest Analytical Laboratory										
B-50 3-9'	05/08/2013	Soil	Contest Analytical Laboratory										
Composite 1 0-5'	05/08/2013	Soil	Contest Analytical Laboratory										
Composite 2 0-5'	05/08/2013	Soil	Contest Analytical Laboratory										
Composite 3 0-3'	05/08/2013	Soil	Contest Analytical Laboratory										
Composite 3 3-9'	05/08/2013	Soil	Contest Analytical Laboratory										
Composite 4 0-3'	05/08/2013	Soil	Contest Analytical Laboratory										
Composite 4 3-9'	05/08/2013	Soil	Contest Analytical Laboratory										
Composite 5 0-3'	05/09/2013	Soil	Contest Analytical Laboratory										
Composite 5 3-9'	05/09/2013	Soil	Contest Analytical Laboratory										
Composite 6 0-3'	05/09/2013	Soil	Contest Analytical Laboratory										
Composite 6 3-9'	05/09/2013	Soil	Contest Analytical Laboratory										
B-2A 0-1'	03/04/2014	Soil	Contest Analytical Laboratory										
B-2A 1-2'	03/04/2014	Soil	Contest Analytical Laboratory										
B-2A 2-3'	03/04/2014	Soil	Contest Analytical Laboratory										
B-2A 3-4'	03/04/2014	Soil	Contest Analytical Laboratory										
B-2A 4-5'	03/04/2014	Soil	Contest Analytical Laboratory										
B-2A 4-5' DUP	03/04/2014	Soil	Contest Analytical Laboratory										
B-10A 0-0.5'	03/04/2014	Soil	Contest Analytical Laboratory										
B-10A 0.5-1'	03/04/2014	Soil	Contest Analytical Laboratory										
B-10A 1-2'	03/04/2014	Soil	Contest Analytical Laboratory										
B-10A 2-3'	03/04/2014	Soil	Contest Analytical Laboratory										
B-10A 2-3' DUP	03/04/2014	Soil	Contest Analytical Laboratory										
B-11A 0-0.5'	03/04/2014	Soil	Contest Analytical Laboratory										
B-11A 0-0.5' DUP	03/04/2014	Soil	Contest Analytical Laboratory										
B-11A 0.5-1'	03/04/2014	Soil	Contest Analytical Laboratory										
B-11A 1-2'	03/04/2014	Soil	Contest Analytical Laboratory										
B-11A 2-3'	03/04/2014	Soil	Contest Analytical Laboratory										
B-16A 0-1'	03/04/2014	Soil	Contest Analytical Laboratory										
B-16A 1-2'	03/04/2014	Soil	Contest Analytical Laboratory										
B-16A 2-3'	03/04/2014	Soil	Contest Analytical Laboratory										
B-16A 3-4'	03/04/2014	Soil	Contest Analytical Laboratory										
B-16A 4-5'	03/04/2014	Soil	Contest Analytical Laboratory										
B-20A 0-0.5'	03/04/2014	Soil	Contest Analytical Laboratory										
B-20A 0.5-1'	03/04/2014	Soil	Contest Analytical Laboratory										
B-20A 1-2'	03/04/2014	Soil	Contest Analytical Laboratory										
B-20A 1-2' DUP	03/04/2014	Soil	Contest Analytical Laboratory										
B-20A 2-3'	03/04/2014	Soil	Contest Analytical Laboratory										
B-21A 0-0.5'	03/04/2014	Soil	Contest Analytical Laboratory										
B-21A 0.5-1'	03/04/2014	Soil	Contest Analytical Laboratory										
B-21A 1-2'	03/04/2014	Soil	Contest Analytical Laboratory										
B-21A 2-3'	03/04/2014	Soil	Contest Analytical Laboratory										
B-48A 0-0.5'	03/04/2014	Soil	Contest Analytical Laboratory										
B-48A 0-0.5' DUP	03/04/2014	Soil	Contest Analytical Laboratory										
B-48A 0.5-1'	03/04/2014	Soil	Contest Analytical Laboratory										
B-48A 1-2'	03/04/2014	Soil	Contest Analytical Laboratory										
B-48A 2-3'	03/04/2014	Soil	Contest Analytical Laboratory										

TABLE 1
SUMMARY OF ANALYSES FOR SOIL, GROUNDWATER AND SOIL VAPOR:
BOOTT MILLS
130 Foot of John Street, Lowell, MA

Sample ID	Sample Date	Sample Type	Laboratory	MADEP EPH w/PAHs	MADEP EPH	MADEP-EPH-04-1.1	MADEP VPH or MADEP VPH-04-1.1	EPA 5035	EPA 8082	EPA 8082A	EPA 8082A with Soxhlet extraction via EPA 3540	dioxin-like PCB Congeners EPA 8270M	EPA 6010B/7471A	EPA 8270C	EPA 8270C Modified	EPA 8270D
B-49A 0-1'	03/04/2014	Soil	Contest Analytical Laboratory								X	X				
B-49A 1-2'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-49A 2-3'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-50A 0-1'	03/04/2014	Soil	Contest Analytical Laboratory								X	X				
B-50A 1-2'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-50A 2-3'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-50A 2-3' DUP	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-50A 5-7'	03/04/2014	Soil	Contest Analytical Laboratory								X					
B-50A 7-9'	03/04/2014	Soil	Contest Analytical Laboratory								X					
COMP 1A 0-0.5'	03/05/2014	Soil	Contest Analytical Laboratory								X					
COMP 1A 0.5-1'	03/05/2014	Soil	Contest Analytical Laboratory								X					
COMP 1A 1-2'	03/05/2014	Soil	Contest Analytical Laboratory								X					
COMP 1A 2-3'	03/05/2014	Soil	Contest Analytical Laboratory								X					
COMP 1A 3-4'	03/05/2014	Soil	Contest Analytical Laboratory								X					
COMP 1A 4-5'	03/05/2014	Soil	Contest Analytical Laboratory								X					
COMP 2A 0-0.5'	03/05/2014	Soil	Contest Analytical Laboratory								X					
COMP 2A 0.5-1'	03/05/2014	Soil	Contest Analytical Laboratory								X					
COMP 5A 0-0.5'	03/05/2014	Soil	Contest Analytical Laboratory								X					
COMP 5A 0.5-1'	03/05/2014	Soil	Contest Analytical Laboratory								X					
COMP 5A 1-2'	03/05/2014	Soil	Contest Analytical Laboratory								X					
COMP 5A 2-3'	03/05/2014	Soil	Contest Analytical Laboratory								X					
COMP 6A 0-0.5'	03/05/2014	Soil	Contest Analytical Laboratory								X	X				
COMP 6A 0.5-1'	03/05/2014	Soil	Contest Analytical Laboratory								X					
COMP 6A 1-2'	03/05/2014	Soil	Contest Analytical Laboratory								X					
COMP 6A 2-3'	03/05/2014	Soil	Contest Analytical Laboratory								X					
B-51B 1-2'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-51B 2-3'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-51B 3-5'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-52B 1-2'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-52B 2-3'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-52B 3-5'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-55B 1-2'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-55B 2-3'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-55B 3-5'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-56B 1-2'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-56B 2-3'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-56B 3-4'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-57B 1-2'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-57B 2-3'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-57B 3-5'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-69 0-0.5'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-69 0.5-1'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-69 1-2'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-69 2-5'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-69 5-7'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-70 0-0.5'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-70 0.5-1'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-70 1-2'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-70 2-5'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-70 5-7'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-71 0-0.5'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-71 0.5-1'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-71 1-2'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-72 0-0.5'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-72 0.5-1'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-72 1-2'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-73 0-0.5'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-73 0.5-1'	06/04/2014	Soil	Contest Analytical Laboratory								X					
B-73 1-2'	06/04/2014	Soil	Contest Analytical Laboratory								X					
ASC-1	06/04/2014	Soil	Contest Analytical Laboratory								X					
ASC-2	06/04/2014	Soil	Contest Analytical Laboratory								X					
ASC-3	06/04/2014	Soil	Contest Analytical Laboratory								X					
ASC-4	06/04/2014	Soil	Contest Analytical Laboratory								X					
ASC-5	06/04/2014	Soil	Contest Analytical Laboratory								X					
ASC-6	06/04/2014	Soil	Contest Analytical Laboratory								X					
WC-1 (B-16 1-5')	10/05/2012	Soil	Contest Analytical Laboratory							X						
WC-2 (B-26 2-5')	10/09/2012	Soil	Contest Analytical Laboratory							X						
GEC-1	06/15/2011	Groundwater	Groundwater Analytical		X				X						X	
	09/07/2011	Groundwater	Alpha Analytical						X						X	
	10/22/2012	Groundwater	Contest Analytical Laboratory			X										X
GEC-2	06/15/2011	Groundwater	Groundwater Analytical		X				X						X	
	09/12/2011	Groundwater	Contest Analytical Laboratory				X		X						X	
	10/22/2012	Groundwater	Contest Analytical Laboratory			X										X
GEC-3	06/15/2011	Groundwater	Groundwater Analytical		X				X						X	
GEC-4	06/15/2011	Groundwater	Groundwater Analytical		X				X						X	
GEC-6	09/12/2011	Groundwater	Contest Analytical Laboratory				X		X							

TABLE 1
SUMMARY OF ANALYSES FOR SOIL, GROUNDWATER AND SOIL VAPOR:
BOOTT MILLS
130 Foot of John Street, Lowell, MA

Sample ID	Sample Date	Sample Type	Laboratory	EPA 8270D/8100M	EPA 8260B	EPA 8260C	EPA 6010B	EPA 6010B / SM18-20 2340B	EPA 6010C	EPA 6010C / 7471B / 1311	EPA 6010C/7196A / SM2580A /SM9045C	EPA TO-10A	SW-846 1010/1030/9045C/9014/ 9030A; SM18-20 2510B
B-49A 0-1'	03/04/2014	Soil	Contest Analytical Laboratory										
B-49A 1-2'	03/04/2014	Soil	Contest Analytical Laboratory										
B-49A 2-3'	03/04/2014	Soil	Contest Analytical Laboratory										
B-50A 0-1'	03/04/2014	Soil	Contest Analytical Laboratory										
B-50A 1-2'	03/04/2014	Soil	Contest Analytical Laboratory										
B-50A 2-3'	03/04/2014	Soil	Contest Analytical Laboratory										
B-50A 2-3' DUP	03/04/2014	Soil	Contest Analytical Laboratory										
B-50A 5-7'	03/04/2014	Soil	Contest Analytical Laboratory										
B-50A 7-9'	03/04/2014	Soil	Contest Analytical Laboratory										
COMP 1A 0-0.5'	03/05/2014	Soil	Contest Analytical Laboratory										
COMP 1A 0.5-1'	03/05/2014	Soil	Contest Analytical Laboratory										
COMP 1A 1-2'	03/05/2014	Soil	Contest Analytical Laboratory										
COMP 1A 2-3'	03/05/2014	Soil	Contest Analytical Laboratory										
COMP 1A 3-4'	03/05/2014	Soil	Contest Analytical Laboratory										
COMP 1A 4-5'	03/05/2014	Soil	Contest Analytical Laboratory										
COMP 2A 0-0.5'	03/05/2014	Soil	Contest Analytical Laboratory										
COMP 2A 0.5-1'	03/05/2014	Soil	Contest Analytical Laboratory										
COMP 5A 0-0.5'	03/05/2014	Soil	Contest Analytical Laboratory										
COMP 5A 0.5-1'	03/05/2014	Soil	Contest Analytical Laboratory										
COMP 5A 1-2'	03/05/2014	Soil	Contest Analytical Laboratory										
COMP 5A 2-3'	03/05/2014	Soil	Contest Analytical Laboratory										
COMP 6A 0-0.5'	03/05/2014	Soil	Contest Analytical Laboratory										
COMP 6A 0.5-1'	03/05/2014	Soil	Contest Analytical Laboratory										
COMP 6A 1-2'	03/05/2014	Soil	Contest Analytical Laboratory										
COMP 6A 2-3'	03/05/2014	Soil	Contest Analytical Laboratory										
B-51B 1-2'	06/04/2014	Soil	Contest Analytical Laboratory										
B-51B 2-3'	06/04/2014	Soil	Contest Analytical Laboratory										
B-51B 3-5'	06/04/2014	Soil	Contest Analytical Laboratory										
B-52B 1-2'	06/04/2014	Soil	Contest Analytical Laboratory										
B-52B 2-3'	06/04/2014	Soil	Contest Analytical Laboratory										
B-52B 3-5'	06/04/2014	Soil	Contest Analytical Laboratory										
B-55B 1-2'	06/04/2014	Soil	Contest Analytical Laboratory										
B-55B 2-3'	06/04/2014	Soil	Contest Analytical Laboratory										
B-55B 3-5'	06/04/2014	Soil	Contest Analytical Laboratory										
B-56B 1-2'	06/04/2014	Soil	Contest Analytical Laboratory										
B-56B 2-3'	06/04/2014	Soil	Contest Analytical Laboratory										
B-56B 3-4'	06/04/2014	Soil	Contest Analytical Laboratory										
B-57B 1-2'	06/04/2014	Soil	Contest Analytical Laboratory										
B-57B 2-3'	06/04/2014	Soil	Contest Analytical Laboratory										
B-57B 3-5'	06/04/2014	Soil	Contest Analytical Laboratory										
B-69 0-0.5'	06/04/2014	Soil	Contest Analytical Laboratory										
B-69 0.5-1'	06/04/2014	Soil	Contest Analytical Laboratory										
B-69 1-2'	06/04/2014	Soil	Contest Analytical Laboratory										
B-69 2-5'	06/04/2014	Soil	Contest Analytical Laboratory										
B-69 5-7'	06/04/2014	Soil	Contest Analytical Laboratory										
B-70 0-0.5'	06/04/2014	Soil	Contest Analytical Laboratory										
B-70 0.5-1'	06/04/2014	Soil	Contest Analytical Laboratory										
B-70 1-2'	06/04/2014	Soil	Contest Analytical Laboratory										
B-70 2-5'	06/04/2014	Soil	Contest Analytical Laboratory										
B-70 5-7'	06/04/2014	Soil	Contest Analytical Laboratory										
B-71 0-0.5'	06/04/2014	Soil	Contest Analytical Laboratory										
B-71 0.5-1'	06/04/2014	Soil	Contest Analytical Laboratory										
B-71 1-2'	06/04/2014	Soil	Contest Analytical Laboratory										
B-72 0-0.5'	06/04/2014	Soil	Contest Analytical Laboratory										
B-72 0.5-1'	06/04/2014	Soil	Contest Analytical Laboratory										
B-72 1-2'	06/04/2014	Soil	Contest Analytical Laboratory										
B-73 0-0.5'	06/04/2014	Soil	Contest Analytical Laboratory										
B-73 0.5-1'	06/04/2014	Soil	Contest Analytical Laboratory										
B-73 1-2'	06/04/2014	Soil	Contest Analytical Laboratory										
ASC-1	06/04/2014	Soil	Contest Analytical Laboratory										
ASC-2	06/04/2014	Soil	Contest Analytical Laboratory										
ASC-3	06/04/2014	Soil	Contest Analytical Laboratory										
ASC-4	06/04/2014	Soil	Contest Analytical Laboratory										
ASC-5	06/04/2014	Soil	Contest Analytical Laboratory										
ASC-6	06/04/2014	Soil	Contest Analytical Laboratory										
WC-1 (B-16 1-5')	10/05/2012	Soil	Contest Analytical Laboratory	X		X				X			X
WC-2 (B-26 2-5')	10/09/2012	Soil	Contest Analytical Laboratory	X		X				X			X
GEC-1	06/15/2011	Groundwater	Groundwater Analytical				X						
	09/07/2011	Groundwater	Alpha Analytical		X			X					
	10/22/2012	Groundwater	Contest Analytical Laboratory										
GEC-2	06/15/2011	Groundwater	Groundwater Analytical				X						
	09/12/2011	Groundwater	Contest Analytical Laboratory		X								
	10/22/2012	Groundwater	Contest Analytical Laboratory										
GEC-3	06/15/2011	Groundwater	Groundwater Analytical				X						
GEC-4	06/15/2011	Groundwater	Groundwater Analytical		X		X						
GEC-6	09/12/2011	Groundwater	Contest Analytical Laboratory		X			X					

TABLE 1
SUMMARY OF ANALYSES FOR SOIL, GROUNDWATER AND SOIL VAPOR:
BOOTT MILLS
130 Foot of John Street, Lowell, MA

Sample ID	Sample Date	Sample Type	Laboratory	MADEP EPH w/PAHs	MADEP EPH	MADEP-EPH-04-1.1	MADEP VPH or MADEP VPH-04-1.1	EPA 5035	EPA 8082	EPA 8082A	EPA 8082A with Soxhlet extraction via EPA 3540	dioxin-like PCB Congeners EPA 8270M	EPA 6010B/7471A	EPA 8270C	EPA 8270C Modified	EPA 8270D
GEC-7	09/12/2011	Groundwater	Contest Analytical Laboratory						X							
SV-1	09/05/2011	Soil Vapor	Contest Analytical Laboratory													
SV-2	09/05/2011	Soil Vapor	Contest Analytical Laboratory													

TABLE 1
SUMMARY OF ANALYSES FOR SOIL, GROUNDWATER AND SOIL VAPOR:
BOOTT MILLS
130 Foot of John Street, Lowell, MA

Sample ID	Sample Date	Sample Type	Laboratory	EPA 8270D/8100M	EPA 8260B	EPA 8260C	EPA 6010B	EPA 6010B / SM18-20 2340B	EPA 6010C	EPA 6010C / 7471B / 1311	EPA 6010C/7196A / SM2580A /SM9045C	EPA TO-10A	SW-846 1010/1030/9045C/9014/ 9030A; SM18-20 2510B
GEC-7	09/12/2011	Groundwater	Contest Analytical Laboratory		X								
SV-1	09/05/2011	Soil Vapor	Contest Analytical Laboratory									X	
SV-2	09/05/2011	Soil Vapor	Contest Analytical Laboratory									X	

Standard Operating Procedure
Boring/Well Installation

This protocol is designed to insure that proper techniques are used, safety is considered, and quality assurance maintained during soil boring and well installation.

DIGSAFE, municipalities and the owner are contacted prior to any soil boring or well installation to minimize chances of damaging underground utilities (DIGSAFE contacts utility companies to mark the location of utilities to the site). The Geologist or Inspector surveys the site visually for markings delineating the location of underground utilities. If warranted, the inspector modifies the drilling program to compensate for field conditions.

GEC personnel continuously monitors all drilling activities and is responsible for maintaining independent field notes, well logs and ensuring that proper procedures are followed.

Samples will be collected in ½, 1, 2, 3, or 5 foot sampling intervals depending on the goal of the sampling.

When samples are opened GEC will immediately collect a sample for headspace analysis. This sample is collected in a glass jar with an aluminum bladder below the lid. Sample will be warmed, if possible. Warming of the sample will typically take place inside the cab of vehicle. After warming for approximately 5-10 minutes the jar will be screened with the appropriate PID.

After collecting a headspace sample GEC will characterize soil, noting texture, color, moisture content, change in strata, any odors and the presence of staining or free product.

Samples will be collected according to a prescribed sampling plan or by field observation of obvious contamination.

All cuttings from drilling remain on the subject property and may be used as backfill in borings not completed as a monitoring wells. Or unless otherwise specified by a Soil Management Plan.

Monitoring well screens are set to depths adequate for the required sampling. In periods of high water table, well screens should extend one to two feet above groundwater. In periods of low water table, well screens should extend five to eight feet above groundwater. It is important to ensure that the screen is set above the seasonally high water table. Monitoring wells are typically constructed with a silica sand filter surrounding and extending to one to two feet above the screen. A solid PVC riser pipe extends from the top of the screen to ground level, has a one to two foot bentonite pellet seal above the screened interval and clean fill extending from the bentonite seal to within one food of ground surface. Above the clean fill is a cement seal and protective cover at the surface. No glues or solvents are employed in the well construction.

Soil Logs are to be maintained by the Geologist and should contain the following:

- Date and Location of boring/well
- Drilling contractor
- Job number
- Depth of sampling
- Boring number
- Depth to well point.
- Soil description includes; soil colors, grain size from greatest percentage to lowest, rock fragments, obvious fill constituents, staining, and odor if obvious.
- Changes in soil strata and elevation of the water table are also noted.

Standard Operating Procedure
Soil Sampling via Test Boring

Soil samples collected during the performance of test borings will, in most cases, either involve collection of "undisturbed" samples with an appropriate sampler or “grab” samples directly from the auger flights. Clearly, soil samples can be most easily recovered directly from the auger flights as the soil cuttings are brought to the surface, however, this technique does not provide an “undisturbed” sample and the actual depth from which the sample is collected is not known. The preferable method of sample collection for most purposes utilizes a GeoProbe or split barrel core (or split spoon) sampler. Either sampler can obtain samples of unconsolidated material from discrete depths with reasonable accuracy. Such samples may be referred to as “discrete interval” samples.

Note: The top few inches of either a GeoProbe or split spoon sample may include displaced material from above the sample interval,. Field personnel should be aware of this and exclude this portion of the sampler contents from the collected sample.

Auger Samples:

1. Samples are collected off the auger flight using the actual sample container or a clean instrument such as a spoon or spatula. Care must be taken when collecting the sample from the augers to avoid material, which is obviously not from the sampling horizon of interest (i.e. pavement in soil zones which are definitely not fill). Standard Operating Procedures which may be specific to the sample containers and the intended purpose of the sample (i.e. chemical analyses, PID screening) should be followed. Collect at least one sample in a clean 8 oz. glass jar (half filled) for PID screening and should be sealed and treated in an appropriate manner. Collect a second sample off the auger insuring that both samples are as close to identical in content samples as possible. This second sample should be used in describing the sediment characteristics.

2. Make a note of the appropriate depth of the augers in order to approximate depth of sample. With a sharp writing instrument, or permanent marker record the project number, boring number, sample number, estimated depth of sample and sample method (e.g. AUG for auger samples) on the top of the jar first jar. This jar should then be stored in a safe container (cooler or cardboard box) for later transport or set aside for PID screening.

3. Carefully examine the contents of the second jar to determine the lithology, i.e. the mineralogy, texture, sorting, moisture and color characteristics of the sediment sample. A complete and accurate description of the sediment sample should be recorded on the Test Boring Report, including the sediment characteristics, depth from which sample was recovered, collection method, and any notable features associated with the sample. Include the results of PID screening on the Test Boring Report.

4. Once a complete and accurate record of the sediment characteristics has been recorded on the Test Boring Report, the second soil sample may be discarded and the glass jar rinsed with water and dried. This glass jar may be reused to contain subsequent samples for sample characterization. Glass jars used for any purpose other than sediment description should not be reused.

Discrete Interval Samples:

Note: Discrete interval samples should be retrieved from the boring and/or opened only upon the direction of the GEC site rep. This is especially important for samples being collected for VOC analyses.

1. Upon retrieving the discrete interval sampler, examine the lower end or tip of the sampler; ensuring that any material collected in the tip of the sampler is not discarded. Examine the spoon to determine if any up-hole material was inadvertently collected in the sampler and remove these materials if possible. Using a clean spoon or spatula, prepare a head-space sample by half filling a clean 8 oz. “drillers” glass jar with three to five sub-samples which represent the spoon contents. Quickly cover the top of the jar with one or two sheets of clean aluminum foil and subsequently apply the screw cap to tightly seal the jar.

2. After opening the sampler and preparing a head-space sample, scrape away a path of material with a clean spoon, spatula or knife before examining the spoon contents for visually notable features (i.e. lithology, mineralogy, texture, sorting, packing, stratigraphic horizons, color changes, staining). In a field book accurately describe the soil sample in accordance with GEC's soil description and boring log protocol. Make note of visually notable features in field notes along with the boring number and sample depth.

3. With a sharp writing instrument, or permanent marker record the project number, boring number, sample number, estimated depth of sample, estimated recovery, and sample method (e.g. SS for split spoon) on the top of the jar first jar. This same information, as well as the depth of penetration, sample recovery and blow counts per six inches, should be recorded on the Test Boring Report. After describing the soil sample thoroughly, where necessary decontaminate the sampler to ensure that potential contaminants do not remain on the spoon prior to being reassembled and returned to the driller.

3. Soil descriptions should include such things as lithologic intervals, mineralogy, texture, sorting, and packing (if possible) characteristics of the sediment sample. A complete and accurate description of the sediment sample should be recorded on the Test Boring Report, including the sediment characteristics, depth from which sample was recovered, collection method, and any notable features associated with the sample.

4. Once a complete and accurate record of the sediment characteristics has been recorded on the Test Boring Report, the second soil may be discarded and the glass jar rinsed with water and dried. This glass jar may be reused to contain subsequent samples for sample characterization. Glass jars used for any purpose other than sediment description should not be reused.

Upon completion of test boring, samples should be packed in a cooler or cardboard box, or other appropriate container, for transport. Prior to transportation, care should be taken to insure that the glass jars are tightly sealed, to prevent spillage of contents, and that the jars will not be broken during the transportation. The box should be labeled on either of the end with the project number, location, date, boring numbers, and the name of the inspector. .

Standard Operating Procedure
Head Space Screening of Soil Samples
with a Photoionization Detector (PID)

Volatile organic compounds (VOCs) adsorbed to soil volatilize from the soil particles into the static headspace created within a container and the soil in direct proportion to the concentration of VOCs adsorbed to the soil. The concentration of VOCs in the headspace can be determined with a photoionization detector (PID), thus providing a relative indication of the concentration of VOCs in the soil.

Screening of soil samples for VOCs via the static headspace method involves seven steps, outlined below.

1) Collect two soil samples and place each in a separate, 8 ounce jar. One jar will be used as a duplicate for quality assurance purposes.

2) Place a layer of aluminum foil over the jar openings to form a seal. Screw the lids onto the jars, covering the aluminum foil.

3) Shake the jars for approximately 15 seconds and then allow the jar to equilibrate to room temperature (60°C to 70°C).

4) Prepare the PID for operation in accordance with the applicable standard operating procedure.

5) Remove the metal lid from the jar, puncture the aluminum foil and record the highest reading recorded by the PID.

6) Compare the results of the screening for the sample and the duplicate. A difference of up to 20% between the sample and duplicate is acceptable.

Depending on the situation and applicable criteria, the screening procedure outlined above may indicate that further analysis is warranted for a given sample. If so, collect soil samples in accordance with the applicable standard operating procedures.

Standard Operating Procedure
Observation Well Sampling
Using a Low Flow Sampler

This protocol is designed to ensure that proper techniques are used, safety is considered, and quality assurance maintained during the performance of observation well sampling using low-flow techniques. A GEC representative is assigned to oversee and/or perform all observation well sampling for the project. The duties of the representative are to ensure that the scope of work is followed.

Sampling of groundwater observation wells using low-flow techniques is the primary means by which the chemical characteristics of groundwater can be determined in an accurate, representative, and repeatable manner. Therefore, it is imperative that care be taken in the development and subsequent sampling of observation wells.

Procedures for performance of groundwater observation well evacuation and sampling using low-flow techniques are outlined in the following paragraphs:

Well Evacuation and Sampling:

1) Prior to initiating any work the Health and Safety Plan, developed for the specific site activities, should be reviewed by all field personnel. The indicated measures on the Plan should be enacted prior to initiation of the sampling activities. Any concerns not addressed in the Plan are to be brought immediately to the attention of the Health and Safety Officer. Personnel participating in the sampling will dress with protective equipment appropriate for the anticipated conditions.

2) Decontaminate all equipment to be used in the performance of the activities in accordance with the protocol for decontamination. Decontamination should at least be performed by alternately rinsing all equipment with methanol and water and scrubbing the equipment with a paper towel.

3) To the extent that contamination may be known at a given site, observation wells should be sampled in an order from "least contaminated" to "most contaminated".

4) Test the well for accumulation of non-aqueous phase product (NAPL) using a pre-cleaned interface probe or transparent disposable bailer. If present, collect a sample of the NAPL and place in an appropriate sample container. This sample should be kept away from other samples.

5) Measure and record the depth to NAPL(if present) and depth to water. If NAPL is present, sampling for dissolved-phase contaminants should generally not be performed. In addition, if sampling is to be performed, appropriate measures should be taken to assure that any water removed from a contaminated well is disposed appropriately.

6) Historic measurements should be utilized to determine the total depths of wells. If a historic measurement is not available, total depth of the well should be gauged to determine the appropriate placement of the variable-speed low-flow sampling pump (pump). Gently lower the pump into the well to a point approximately half way between the top of the measured water elevation and the bottom of the well. If the water level in the well is situated above the top of the screened interval then the pump should be located half way between the top and the bottom of the screened interval. Tie the pump off at the appropriate depth to eliminate further disturbance of the water column.

7) Begin pumping the well at a rate no greater than 0.5 liters per minute (roughly 0.13 gallons or approximately two cups per minute). Provided there is ample room to measure depth to water after placement of the pump down the well, water levels should be monitored on a continuous basis. Drawdown of the water column should not exceed 0.1 meters. The pumping rate should be adjusted accordingly, based on water column drawdown. If the water level drops more than 0.1 meters, the pumping rate should be decreased.

8) Continuously monitor groundwater parameters including pH, temperature, specific conductance and dissolved oxygen (DO). In some situations it may also be appropriate to monitor turbidity. Record geochemical parameters at the onset of purging, five minutes into purging, and at roughly one-minute intervals thereafter. In

some cases longer intervals may be appropriate.

9) Purging should continue until geochemical parameters have stabilized. Stabilization shall be considered to have occurred when three consecutive measurements do not vary more than approximately 20% and visual and olfactory characteristics of the purged water do not change appreciably.

10) Record final geochemical parameters.

Well Sampling:

1) Samples at any given well will be collected in order of decreasing order of sensitivity to volatilization (i.e. VOC, total organic carbon, semi-volatile organics (BNA), ammonia, PCBs, pesticides, oil and grease, phenols, cyanide, sulfate and chloride, nitrate and ammonia, metals, and radionuclides)

2) Carefully fill sample containers directly from the pump discharge to the appropriately preserved, pre-labeled containers. Check that the sample containers seal properly and that the cap is sealed tightly. Record applicable information in the field logbook and complete all chain-of-custody documents.

Installation of Permanent Sub-Slab Soil Vapor Points
And Sampling of Sub-Slab Soil Vapor

This protocol is designed to ensure proper techniques are used, safety is considered and quality assurance is maintained. A GEC representative is assigned to perform and/or oversee all of said tasks for this activity.

Procedures and considerations for the installation and sampling of permanent SVPs stated in this SOP are consistent with the MADEP Policy #WSC-02-411 (The VPH/EPH Approach), SOP BWSC-07-01 (*Standard Operating Procedure for Indoor Air Contamination),* and the *Vapor Intrusion Guidance* document issued by MADEP in December, 2011 (WSC#-11-435).

Where to Install Probes

Generally, SVPs will be installed through the building slab. If no previous soil/groundwater data or other information regarding a possible release and/or current/historical Site activities is available SVPs will be spaced evenly throughout the building foot print. If information is available regarding a source of vapors SVPs will be installed near and in the vicinity of this area.

Care should be taken to install the SVPs in areas where short-circuiting is possible. GEC will inspect the area for cracks in the slab, seams in the slab and sub-surface utilities.

Sub Slab Soil Vapor Point Construction and Installation

Installations are typically designed to sample soil vapor immediately beneath the slab. Permanent sub-slab soil vapor sampling points are pre-fabricated by GEC personnel. Please refer to the figure "Soil Vapor Point Profile" for a diagram of the design and construction of GEC's SVPs.

Safety Considerations

Drilling through concrete produces a considerable amount of airborne concrete dust. To prevent inhalation of silica dust a vacuum should be placed near the drilling location to capture fine airborne concrete dust. In addition, the drill operator should wear eye and ear protection when running the pneumatic hammer drill.

Installation Procedures:

1) At the desired location drill a hole 1 ½" in diameter using a masonry drill bit, to a depth of about 1 ¾" deep. This ensures the top of the SVP is seated flush with the floor surface. Clean the hole with a shop vacuum to remove any debris and confirm that the top of the sample point sits even with the floor surface.
2) Using a smaller diameter masonry drill bit (not more than ½"), drill into the center of the larger diameter hole and continue until the concrete slab is breached then extend the bit a few inches into the sub slab soils to create a small void space. Note and record the thickness of the floor or foundation slab.
3) Cut a length of 1/8" polyethylene tubing that is the thickness of the slab minus the size of the SVP so that when installed the tubing ends approximately at the bottom of the slab. Insert tube into bottom of SVP. Wrap the SVP with a inert malleable material such as modeling clay or weather cauling. Place wrapped SVP into drilled hole and adjust do SVP is flush with floor. Pack malleable material to bottom of 1 ½" hole around SVP with a screwdriver or something equivalent.

4) At this time the SVP can be screened with a PID if necessary. Note: This screening may not be representative of subsurface conditions. The subsurface conditions may have been altered by drilling (raising temperature) and by the pulling of soil vapor from the subsurface into the vacuum when cleaning dust and debris.

5) Place Non-Shrinking hydraulic grout/cement mixed to a putty consistency in the annular space between the PVC and the drill hole. Add, as needed, more hydraulic cement to ensure a complete seal and finish flush with the floor.

6) Allow 1 to 7 days for steady state conditions to return at the location before collecting any samples.

Sample Collection from Permanent Soil Vapor Probes

1) Conduct tests to determine short circuiting via Helium leak detection. See diagram for He shroud construction.
    a. Attach sample tubing to SVP and run tubing through shroud.
    b. Slide shroud down tube so that it sits on the floor above the SVP.
    c. Attach He detector to sample tube (Dielectric or GasCheck) and ensure the detector is reading 0 ppm. If not at 0 ppm hit reset to zero the unit.
    d. Inject lab grade He into shroud. Not much is needed and can be turned off after a few seconds.
    e. Monitor He detector for one to two minutes. If He is detected in the sample tube short circuiting is occurring.
    f. If short circuiting observed note He concentration and then try to identify the source. Most likely the issue is resulting from cracking in the concrete around the SVP. Seal around SVP with clay or weather caulking and repeat He leak detection.
    g. At the time no He is detected take He detector out of sample tube and measure the He concentration inside the shroud to ensure that there is He in the shroud. Record this concentration. You are now ready to collect the soil vapor sample.

2) Screen the sample tube with a PID to determine the approximate sub slab VOC concentration. Allow the PID to purge the point until PID readings reach steady state conditions. This may take approximately 2-3 minutes,.

3) Attach a batch certified Summa canister fitted with a 30 minute flow controller to the sample tube. A 30 minute flow controller will ensure that the recommended flow rate of 200 ml/minute or slower is achieved.

4) Record the canister and flow controller ID numbers, the starting pressure inside the canister, and start time prior to sampling. When the canister pressure gauge reads approximately 5-7 inches of Hg close the valve and record the ending time and pressure.

5) Disconnect the tubing from the canister, remove the flow controller and replace the brass remove the tubing and modeling clay from the SVP and screw cap back onto to SVP.

Standard Operating Procedure
Sample Preservation and Chain of Custody

This protocol is designed to ensure that proper techniques are employed in the preservation and chain-of custody of samples collected for laboratory analyses or for screening. This Protocol is intended to be consistent with Massachusetts Publication #WSC-310-91 (Standard References for Monitoring Wells), and 40 CFR 136 (Guidelines Establishing Test Procedures for the Analysis of Pollutants).

The results of screening and/or laboratory analysis of solid, liquid or gaseous media constitute the basis of evaluation of the majority of the disposal sites under investigation. It is therefore imperative that the preservation of the samples be appropriate to the media being analyzed as well as the analysis which is being performed. In addition, the integrity of the sample is dependent upon the premise that a clear chain of responsibility for the sample integrity has been maintained. Without this "Chain-of-Custody", the integrity of the laboratory results may inevitably come into question.

The preservation and Chain-of-Custody (COC) protocols outlined in the following paragraphs are not intended to be all inclusive, and this protocol is written with the understanding that the sampling of certain media or analyses may require specific sample preservation. This protocol is, however, intended to cover the majority of the media and analyses performed as well as the COC procedures employed at the majority of waste disposal sites.

A COC program must be followed during sampling and handling activities from the field through laboratory operations. This program is designed to assure that each sample is accounted for at all times. Field data sheets, COC records, and sample labels must also be completed by the appropriate sampling and laboratory personnel for each sample. The objective of the sample custody identification and control system is to assure, to the extent practical, that:

- all samples are uniquely identified;
- the correct samples are analyzed for the correct parameters and are traceable through their records;
- important sample characteristics are preserved;
- samples are protected from damage or loss;
- any processing of samples (e.g., filtration, preservation) is documented; and
- client confidentially is maintained.

A sample is considered under a COC if it meets all of the following criteria:

- the sample is in your custody,
- the sample is in your view, after being in your possession,
- the sample is in your possession and then you locked it up to prevent tampering, and
- the sample is in a designated, secured area.

The following paragraphs outline GEC's preservation and COC protocol.

1) Prior to initiating any work, the Health and Safety Plan developed for the specific site activities, should be reviewed by all field personnel. The indicated measures on the Plan should be enacted prior to initiation of any sampling activities. Any concerns not addressed in the Plan are to be brought immediately to the attention of the Health and Safety Officer. Personnel participating in the excavations will dress with protective equipment appropriate for the anticipated conditions.

2) Sample integrity is assured by use of containers appropriate to both the matrix to be sampled and the analytes of interest. Sample containers must be prepared in the laboratory in a manner consistent with USEPA protocols. Unless the proper sample bottle preparation and sample preservation measures are taken in the field, sample composition can be altered by contamination, degradation, biological transformation, chemical interaction, and other factors during the time between sample collection and analysis. Prior to sampling GEC personnel will ensure that the sample containers obtained from either a laboratory or a commercial supplier have been prepared in accordance with DEP and EPA protocols. Sample containers are to be used once and discarded. Under no circumstance should a soil, water or

gaseous media which has been collected for analysis be placed in a previously used sample container unless that container has been recleaned and preserved by a certified laboratory.

As part of the COC protocol, sample containers should have prepared labels for each sample. The label should include sample identification, date and time of collection, sample parameters to be analyzed, any preservatives used, and the name of the sample collector.

Upon collection of the sample(s), documentation of chain of custody (i.e. COC form) should be initiated and should include at least the following:

- date and time of sampling;
- sampling locations;
- sample bottle identification;
- and specific sample acquisition measures.

The COC and sample description requires:

- a unique identification of each sample;
- the name(s), address(es) and telephone number(s) of the sampler(s) and the person(s) shipping the samples and all subsequent transfers of custody;
- the type and method of analyses requested;
- the date and time of sample collection and transfer of custody; and the name(s) of those responsible for receiving the samples at the laboratory.

3) In some cases, field filtration of samples may be required. Information regarding the method of filtration should be determined in advance and communicated to the laboratory. Filtering of any sample collected for organic analysis should be avoided. Decanting of a liquid media is a preferred method for the removal of particulate matter. When field filtering is required, an appropriate filter medium must be selected to avoid potential sample contamination during the filtering process.

4) Sample holding times are specified for the initiation of chemical analyses, usually beginning at the time of sample collection but occasionally beginning at the time of sample receipt at the laboratory. This determination must be made prior to sampling to allow proper logistical planning for sample shipments. Holding times also vary with the regulatory basis under sampling take place in order to properly schedule work.

5) Sample containers are most often packed in plastic, insulated "coolers" for shipment. Bottles are to be packed tightly so that only minimal motion of the sample containers is possible. Materials which are considered to be highly hazardous may require special handling and packing for shipment. Ice, or a similar heat transfer fluid, should be placed over the top of the sample containers and should be placed within a water tight plastic bag to assure that the samples are kept as dry as possible. In addition, all applicable paper work should also be enclosed within a second water-tight bag and included in the cooler. The sample cooler should then be taped shut.

6) Upon receipt of the samples at the laboratory, any laboratory identification numbers should also be included on the COC form. Finally, those responsible for receipt of the samples should be indicated on the COC form as well as the date and time of the sample drop-off.

Standard Operating Procedure
Field Sampling Protocols
Quality Assurance/Quality Control

The purpose of the GEC QA/QC program is to generate analytical data that is of known and defensible quality. These procedures apply to all projects in which sampling is involved. QA/QC from one project is not transferable to another.

Decontamination

1) Decontamination should be performed on all reusable field sampling equipment and protective gear. Sampling equipment should be decontaminated before the collection of a sample and after sampling has been completed. Protective gear should be decontaminated after the collection of a sample.

2) It is necessary to use the following decontamination solutions in the field:

- Non-phosphate detergent plus tap water wash.
- Distilled/ deionized water rinse.
- 10% Nitric Acid rinse.*
- Methanol rinse, when sampling volatiles only.
- Acetone then hexane rinse.**
- Second distilled/ deionized water rinse. **

* Only if sample is to be analyzed for metals.
** Only if sample is to be analyzed for semi-volatile organics, PCBs or pesticides.

3) Sample bottles and sampling equipment should not be stored near gasoline, solvents, or other potential sources of contamination. If storage near gasoline, etc. is unavoidable, bottles and equipment should be sealed in containers or plastic.

4) Heavy equipment, including hand tools, should be cleaned by steam cleaning or manual scrubbing prior and subsequent to use in hazardous waste investigations.

Measures or Quality Control/Quality Assurance

1) Trip Blanks

- Trip blanks are used in order to detect additional sources of contamination that might affect analytical results. The following are potential sources of additional contamination:

  a. Sample containers,
  b. Contamination during shipment to and from the site,
  c. Ambient air contact with analytical instrumentation at the laboratory during analysis, or
  d. Laboratory reagent used in analytical procedures.

- One trip blank is required for every set of samples sent to the lab regardless of job size. Generally, the trip blank should be for VOCs. If, however, VOCs are not a parameter of the sampling round, consult the laboratory as to which parameter should have an associated trip blank.

- Trip blanks are to be kept with containers used in the sampling round at all times. More specifically, they should accompany the site-specific sampling containers from the time the containers leave the laboratory until they are returned for analysis.

- Obtain containers and trip blanks prepared specifically for each job from the laboratory. Return unused containers to the laboratory upon completion of a project.

2) Field Blanks

- Field blanks are used to indicate potential contamination contracted from ambient air or from sampling equipment. It also serves as a QA/QC for decontamination procedures.

- Collect one set of field blanks for every 20 samples per project. It is not necessary to take a field blank for jobs in which less than 10 samples are collected.

- Procedure

  a. Collect two sets of sample containers to cover all sampling parameters. One set will be full of analyte free water (obtain extra analyte free water to fill two VOA vials). The other set is empty.
  b. Go to the most contaminated area and run the water from the full containers, through the decontaminated sampling equipment and into the associated empty containers.
  c. Send to the lab for analysis.

- Use containers and field blanks prepared specifically for job.

3) Duplicate Samples

- Duplicate samples are collected in order to serve as a laboratory check. Therefore, it is important that the lab does not know which samples are to serve for this purpose.

- Frequency

  a. Obtain one (1) duplicate sample for every 10 samples of each matrix. If less than ten samples are collected of a given matrix, a duplicate must be collected anyway.
  b. If a total of less than 10 samples are collected, collect one (1) duplicate of the majority medium.
  c. If a total of less than five (5) samples are collected, it is not necessary to collect a duplicate sample.

* Note that the frequency as outlined here pertains to the number of samples collected per project, not per location of a given project.

- Procedures

The idea behind the duplicate sample is to collect two samples as close to identical as possible.

a. For Water:

Alternately fill containers for the same parameter with equal amounts of liquid per bailer. Fill duplicate VOC vials from the same bailer of liquid.

b. For Soil:

- VOC samples must be taken from the discreet sampling locations.
- For all other samples, mix the applicable soil in a decontaminated stainless steel or polyethylene bowl or tray. Then fill sample containers with the soil mix.
- When confronted with the option of collecting a water sample or a soil sample, choose the water sample.

- Labeling for the laboratory

  a. Label the containers normally and give the duplicate samples different reference numbers.
  b. Indicate the quantity of duplicates in the "special instructions" or "remarks" portion of the chain of custody and laboratory services sheet, however, do not indicate the reference numbers of the duplicates.
  c. Upon receipt of analytical results, contact the laboratory and convey all data pertaining to the duplicates for their QA/QC.

4) Background samples

- Background samples are taken only if it is required for comparison of site conditions to the surrounding environment. This is to be dictated by client needs on a site to site basis.

5) Performance Evaluation Samples

- The project manger should consider the use of the following performance evaluation samples on a periodic basis. Typically, these will be reserved for larger jobs:

  a. Laboratory performance evaluation samples

  - Collect duplicate samples and send to two different laboratories for comparison. Avoid using soil samples for this procedure.
  - Send a sample of known quantity and quality to the laboratory in order to determine laboratory performance. Such samples can be prepared by any laboratory.

  b. Gas chromatograph (GC) performance evaluation samples

  - Acquire a sample of known quantity and quality from a laboratory. Analyze the sample with the gas chromatograph in order to determine the integrity of GC results.

Field Sampling QA/QC

1) When sampling a well, collect VOA samples first and samples for other analytes last.

2) Start sampling at the presumed least contaminated areas, proceeding to the more contaminated areas.

3) Preservatives

- Consult the laboratory in order to determine which sampling parameters require preservatives. The laboratory will provide sampling containers specific for each job.
- It is necessary to fill the sample container when using preserved bottles; preservative is added with this assumption
- If samples are not collected correctly, they will not pass GEC QA/QC.

4) A chain-of-custody must accompany each set of samples from the job site to the laboratory. Be sure to identify the presence of trip blanks on the chain-of-custody sheets.

5) If possible, use the numbering system outlined on the attached sheet for identifying samples.

Ordering Sample Containers

1) Pre-plan sampling strategy to determine the sample parameters, the number of sample points including QA/QC samples, and the matrix of the given sample points.

2) Call laboratory and tell them:

   - Sample parameters,
   - Number of samples to be collected,
   - The number of container sets needed for trip blanks, field blanks, and duplicates, and
   - The matrix of each sample to be collected.

3) Sample containers should be ordered specifically for each job. Any sample containers unused at the end of the job should be sent back to the laboratory.

Conclusions

1) Pre-planning is crucial.

2) Keep open communication with the laboratory on all matters.

3) If you make a mistake in sampling collection, accept it, and retake the necessary samples.

Standard Operating Procedure
Sampling with a Spade or Scoop

The simplest, most direct method of collecting soil samples for subsequent laboratory analysis, or field screening, is with the use of a spade and scoop. A normal lawn or garden spade is utilized to remove the top cover of soil to the required depth and then a smaller stainless steel scoop is used to collect the sample.

This method can be used in most soil types but is limited somewhat to sampling near the surface. Samples from depths greater than 0.5 meters become labor intensive in most soil types. Very accurate, representative samples can be collected using these procedures depending on the care and precision demonstrated by the technician. The use of a flat, pointed mason trowel to cut a block of the desired soil will be of aid when undisturbed profiles are required. A stainless scoop or lab spoon will suffice in most other applications. Care should be exercised to avoid the use of devices plated with chrome or other materials. Plating is particularly common with garden implements such as potting trowels.

Procedures:

1) Prior to initiating any work, the Health and Safety Plan developed for the specific site activities should be reviewed by the Field Technician. Any prerequisite activities identified by the Plan should be enacted prior to initiating of the sampling activities. Any concerns not addressed in the Health and Safety Plan document are to be brought immediately to the attention of the Health and Safety Officer.

2) Carefully remove the top layer of soil to the desired sample depth with a precleaned spade.

3) Using a precleaned stainless steel scoop or trowel, remove and discard a thin layer of soil from the area which comes in contact with the shovel.

4) Transfer sample into an appropriate sample bottle with a clean stainless steel lab spoon or equivalent.

5) Check that a Teflon liner is present in the cap of the sample container. Secure the cap tightly. The chemical preservation of solids is generally not recommended. Refrigeration is usually the best approach, supplemented by a minimal holding time. For specific containerization and preservation requirements consult the laboratory prior to sample collection.

6) Label the sample bottle with the appropriate sample tag. Be sure to label the tag carefully and clearly, addressing all the categories or parameters. Complete all chain-of-custody documents and record in the field logbook.

7) Decontaminate equipment after use and between sample locations.

ATTACHMENT 4

Laboratory Reports – March and June 2014

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

March 13, 2014

Mike Bradley
Goldman Environmental
60 Brooks Drive
Braintree, MA 02184

Project Location: Lowell-Boot Mills
Client Job Number:
Project Number: 911JR-3117
Laboratory Work Order Number: 14C0168

Enclosed are results of analyses for samples received by the laboratory on March 6, 2014. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

James M. Georgantas
Project Manager

con-test® ANALYTICAL LABORATORY

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

Goldman Environmental
60 Brooks Drive
Braintree, MA 02184
ATTN: Mike Bradley

REPORT DATE: 3/13/2014

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 911JR-3117

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 14C0168

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

PROJECT LOCATION: Lowell-Boot Mills

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
B49A 0-1'	14C0168-01	Soil		SM 2540G	
				SW-846 8082A	
B49A 1-2'	14C0168-02	Soil		SM 2540G	
				SW-846 8082A	
B49A 2-3'	14C0168-03	Soil		SM 2540G	
				SW-846 8082A	
B50A 0-1'	14C0168-04	Soil		SM 2540G	
				SW-846 8082A	
B50A 1-2'	14C0168-05	Soil		SM 2540G	
				SW-846 8082A	
B50A 2-3'	14C0168-06	Soil		SM 2540G	
				SW-846 8082A	
B50A 2-3' DUP	14C0168-07	Soil		SM 2540G	
				SW-846 8082A	
B50A 5-7'	14C0168-08	Soil		SM 2540G	
				SW-846 8082A	
B50A 7-9'	14C0168-09	Soil		SM 2540G	
				SW-846 8082A	
B2A 0-1'	14C0168-10	Soil		SM 2540G	
				SW-846 8082A	
B2A 1-2'	14C0168-11	Soil		SM 2540G	
				SW-846 8082A	
B2A 2-3'	14C0168-12	Soil		SM 2540G	
				SW-846 8082A	
B2A 3-4'	14C0168-13	Soil		SM 2540G	
				SW-846 8082A	
B2A 4-5'	14C0168-14	Soil		SM 2540G	
				SW-846 8082A	
B2A 4-5' DUP	14C0168-15	Soil		SM 2540G	
				SW-846 8082A	
B16A 0-1'	14C0168-16	Soil		SM 2540G	
				SW-846 8082A	
B16A 1-2'	14C0168-17	Soil		SM 2540G	
				SW-846 8082A	
B16A 2-3'	14C0168-18	Soil		SM 2540G	
				SW-846 8082A	
B16A 3-4'	14C0168-19	Soil		SM 2540G	
				SW-846 8082A	

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.

SW-846 8082A

Qualifications:

Matrix spike and matrix spike duplicate recoveries are outside of control limits. Data validation is not affected since results for this compound in this sample are "not detected", and recovery bias is on the high side.

Analyte & Samples(s) Qualified:

Aroclor-1016 [2C]

B091490-MS1, B091490-MSD1

Sample fingerprint does not match standard exactly. Sample was quantitated against the closest matching standard.

Analyte & Samples(s) Qualified:

Aroclor-1248, Aroclor-1248 [2C]

14C0168-02[B49A 1-2'], 14C0168-03[B49A 2-3'], 14C0168-05[B50A 1-2'], 14C0168-06[B50A 2-3'], 14C0168-07[B50A 2-3' DUP], 14C0168-13[B2A 3-4'], 14C0168-14[B2A 4-5'], 14C0168-15[B2A 4-5' DUP], 14C0168-18[B16A 2-3'], 14C0168-19[B16A 3-4']

A five times dilution was performed as part of the standard analytical procedure.

Analyte & Samples(s) Qualified:

14C0168-01[B49A 0-1'], 14C0168-08[B50A 5-7'], 14C0168-09[B50A 7-9'], 14C0168-10[B2A 0-1'], 14C0168-11[B2A 1-2'], 14C0168-12[B2A 2-3'], 14C0168-16[B16A 0-1'], 14C0168-17[B16A 1-2']

The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.

Analyte & Samples(s) Qualified:

Decachlorobiphenyl, Decachlorobiphenyl [2C], Tetrachloro-m-xylene, Tetrachloro-m-xylene [2C]

14C0168-06[B50A 2-3'], 14C0168-07[B50A 2-3' DUP], 14C0168-14[B2A 4-5'], 14C0168-15[B2A 4-5' DUP], 14C0168-19[B16A 3-4']

Surrogate recovery is outside of control limits on confirmatory column, but within control limits on primary column. Data validation is not affected.

Analyte & Samples(s) Qualified:

Tetrachloro-m-xylene [2C]

14C0168-16[B16A 0-1']

Sample was diluted due to sample matrix interference. Requested reporting limit was met.

Analyte & Samples(s) Qualified:

14C0168-04[B50A 0-1']

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

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.

Daren J. Damboragian
Laboratory Manager

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B49A 0-1' | Sampled: 3/4/2014 13:30

Sample ID: 14C0168-01

Sample Matrix: Soil

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 8:48	MJC
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 8:48	MJC
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 8:48	MJC
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 8:48	MJC
Aroclor-1248 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 8:48	MJC
Aroclor-1254 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 8:48	MJC
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 8:48	MJC
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 8:48	MJC
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 8:48	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	115	30-150		3/11/14 8:48
Decachlorobiphenyl [2]	109	30-150		3/11/14 8:48
Tetrachloro-m-xylene [1]	119	30-150		3/11/14 8:48
Tetrachloro-m-xylene [2]	124	30-150		3/11/14 8:48

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B49A 0-1' | Sampled: 3/4/2014 13:30

Sample ID: 14C0168-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	93.9		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B49A 1-2' | Sampled: 3/4/2014 13:30

Sample ID: 14C0168-02

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 15:47	MJC
Aroclor-1221 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 15:47	MJC
Aroclor-1232 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 15:47	MJC
Aroclor-1242 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 15:47	MJC
Aroclor-1248 [1]	0.82	0.10	mg/Kg dry	5	O-04	SW-846 8082A	3/7/14	3/10/14 15:47	MJC
Aroclor-1254 [1]	0.58	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 15:47	MJC
Aroclor-1260 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 15:47	MJC
Aroclor-1262 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 15:47	MJC
Aroclor-1268 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 15:47	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	97.2	30-150		3/10/14 15:47
Decachlorobiphenyl [2]	97.2	30-150		3/10/14 15:47
Tetrachloro-m-xylene [1]	114	30-150		3/10/14 15:47
Tetrachloro-m-xylene [2]	111	30-150		3/10/14 15:47

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B49A 1-2' | Sampled: 3/4/2014 13:30

Sample ID: 14C0168-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	92.3		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B49A 2-3' | Sampled: 3/4/2014 13:30

Sample ID: 14C0168-03

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.53	mg/Kg dry	25		SW-846 8082A	3/7/14	3/11/14 10:43	MJC
Aroclor-1221 [1]	ND	0.53	mg/Kg dry	25		SW-846 8082A	3/7/14	3/11/14 10:43	MJC
Aroclor-1232 [1]	ND	0.53	mg/Kg dry	25		SW-846 8082A	3/7/14	3/11/14 10:43	MJC
Aroclor-1242 [1]	ND	0.53	mg/Kg dry	25		SW-846 8082A	3/7/14	3/11/14 10:43	MJC
Aroclor-1248 [1]	3.8	0.53	mg/Kg dry	25	O-04	SW-846 8082A	3/7/14	3/11/14 10:43	MJC
Aroclor-1254 [1]	2.7	0.53	mg/Kg dry	25		SW-846 8082A	3/7/14	3/11/14 10:43	MJC
Aroclor-1260 [1]	ND	0.53	mg/Kg dry	25		SW-846 8082A	3/7/14	3/11/14 10:43	MJC
Aroclor-1262 [1]	ND	0.53	mg/Kg dry	25		SW-846 8082A	3/7/14	3/11/14 10:43	MJC
Aroclor-1268 [1]	ND	0.53	mg/Kg dry	25		SW-846 8082A	3/7/14	3/11/14 10:43	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	96.0	30-150		3/11/14 10:43
Decachlorobiphenyl [2]	93.2	30-150		3/11/14 10:43
Tetrachloro-m-xylene [1]	99.8	30-150		3/11/14 10:43
Tetrachloro-m-xylene [2]	93.3	30-150		3/11/14 10:43

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B49A 2-3' | Sampled: 3/4/2014 13:30

Sample ID: 14C0168-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	91.6		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B50A 0-1' | Sampled: 3/4/2014 13:40

Sample ID: 14C0168-04

Sample Matrix: Soil

Sample Flags: Z-01

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 10:56	MJC
Aroclor-1221 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 10:56	MJC
Aroclor-1232 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 10:56	MJC
Aroclor-1242 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 10:56	MJC
Aroclor-1248 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 10:56	MJC
Aroclor-1254 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 10:56	MJC
Aroclor-1260 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 10:56	MJC
Aroclor-1262 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 10:56	MJC
Aroclor-1268 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 10:56	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	110	30-150		3/11/14 10:56
Decachlorobiphenyl [2]	110	30-150		3/11/14 10:56
Tetrachloro-m-xylene [1]	118	30-150		3/11/14 10:56
Tetrachloro-m-xylene [2]	121	30-150		3/11/14 10:56

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B50A 0-1' | Sampled: 3/4/2014 13:40

Sample ID: 14C0168-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	95.6		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B50A 1-2' | Sampled: 3/4/2014 13:40

Sample ID: 14C0168-05

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 16:24	MJC
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 16:24	MJC
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 16:24	MJC
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 16:24	MJC
Aroclor-1248 [1]	0.82	0.11	mg/Kg dry	5	O-04	SW-846 8082A	3/7/14	3/10/14 16:24	MJC
Aroclor-1254 [1]	0.54	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 16:24	MJC
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 16:24	MJC
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 16:24	MJC
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 16:24	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	93.2	30-150		3/10/14 16:24
Decachlorobiphenyl [2]	97.0	30-150		3/10/14 16:24
Tetrachloro-m-xylene [1]	109	30-150		3/10/14 16:24
Tetrachloro-m-xylene [2]	107	30-150		3/10/14 16:24

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B50A 1-2' | Sampled: 3/4/2014 13:40

Sample ID: 14C0168-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.3		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B50A 2-3' | Sampled: 3/4/2014 13:40

Sample ID: 14C0168-06

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	2.2	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 11:08	MJC
Aroclor-1221 [1]	ND	2.2	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 11:08	MJC
Aroclor-1232 [1]	ND	2.2	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 11:08	MJC
Aroclor-1242 [1]	ND	2.2	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 11:08	MJC
Aroclor-1248 [1]	16	2.2	mg/Kg dry	100	O-04	SW-846 8082A	3/7/14	3/11/14 11:08	MJC
Aroclor-1254 [1]	20	2.2	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 11:08	MJC
Aroclor-1260 [1]	ND	2.2	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 11:08	MJC
Aroclor-1262 [1]	ND	2.2	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 11:08	MJC
Aroclor-1268 [1]	ND	2.2	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 11:08	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	*	30-150	S-01	3/11/14 11:08
Decachlorobiphenyl [2]	*	30-150	S-01	3/11/14 11:08
Tetrachloro-m-xylene [1]	*	30-150	S-01	3/11/14 11:08
Tetrachloro-m-xylene [2]	*	30-150	S-01	3/11/14 11:08

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B50A 2-3' | Sampled: 3/4/2014 13:40

Sample ID: 14C0168-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	89.9		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B50A 2-3' DUP | Sampled: 3/4/2014 13:40

Sample ID: 14C0168-07

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	2.2	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 11:21	MJC
Aroclor-1221 [1]	ND	2.2	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 11:21	MJC
Aroclor-1232 [1]	ND	2.2	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 11:21	MJC
Aroclor-1242 [1]	ND	2.2	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 11:21	MJC
Aroclor-1248 [1]	20	2.2	mg/Kg dry	100	O-04	SW-846 8082A	3/7/14	3/11/14 11:21	MJC
Aroclor-1254 [1]	16	2.2	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 11:21	MJC
Aroclor-1260 [1]	ND	2.2	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 11:21	MJC
Aroclor-1262 [1]	ND	2.2	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 11:21	MJC
Aroclor-1268 [1]	ND	2.2	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 11:21	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	*	30-150	S-01	3/11/14 11:21
Decachlorobiphenyl [2]	*	30-150	S-01	3/11/14 11:21
Tetrachloro-m-xylene [1]	*	30-150	S-01	3/11/14 11:21
Tetrachloro-m-xylene [2]	*	30-150	S-01	3/11/14 11:21

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B50A 2-3' DUP | Sampled: 3/4/2014 13:40

Sample ID: 14C0168-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.0		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B50A 5-7' | Sampled: 3/4/2014 13:40

Sample ID: 14C0168-08

Sample Matrix: Soil

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 17:01	MJC
Aroclor-1221 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 17:01	MJC
Aroclor-1232 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 17:01	MJC
Aroclor-1242 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 17:01	MJC
Aroclor-1248 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 17:01	MJC
Aroclor-1254 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 17:01	MJC
Aroclor-1260 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 17:01	MJC
Aroclor-1262 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 17:01	MJC
Aroclor-1268 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 17:01	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	91.3	30-150		3/10/14 17:01
Decachlorobiphenyl [2]	91.6	30-150		3/10/14 17:01
Tetrachloro-m-xylene [1]	106	30-150		3/10/14 17:01
Tetrachloro-m-xylene [2]	105	30-150		3/10/14 17:01

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B50A 5-7' | Sampled: 3/4/2014 13:40

Sample ID: 14C0168-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	92.1		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B50A 7-9' | Sampled: 3/4/2014 13:40

Sample ID: 14C0168-09

Sample Matrix: Soil

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 17:14	MJC
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 17:14	MJC
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 17:14	MJC
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 17:14	MJC
Aroclor-1248 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 17:14	MJC
Aroclor-1254 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 17:14	MJC
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 17:14	MJC
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 17:14	MJC
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 17:14	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	103	30-150		3/10/14 17:14
Decachlorobiphenyl [2]	102	30-150		3/10/14 17:14
Tetrachloro-m-xylene [1]	105	30-150		3/10/14 17:14
Tetrachloro-m-xylene [2]	107	30-150		3/10/14 17:14

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B50A 7-9' | Sampled: 3/4/2014 13:40

Sample ID: 14C0168-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	91.4		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B2A 0-1' | Sampled: 3/4/2014 10:15

Sample ID: 14C0168-10

Sample Matrix: Soil

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 17:51	MJC
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 17:51	MJC
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 17:51	MJC
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 17:51	MJC
Aroclor-1248 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 17:51	MJC
Aroclor-1254 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 17:51	MJC
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 17:51	MJC
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 17:51	MJC
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 17:51	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	92.4	30-150		3/10/14 17:51
Decachlorobiphenyl [2]	94.4	30-150		3/10/14 17:51
Tetrachloro-m-xylene [1]	113	30-150		3/10/14 17:51
Tetrachloro-m-xylene [2]	113	30-150		3/10/14 17:51

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B2A 0-1' | Sampled: 3/4/2014 10:15

Sample ID: 14C0168-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	93.3		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B2A 1-2' | Sampled: 3/4/2014 10:15

Sample ID: 14C0168-11

Sample Matrix: Soil

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 11:33	MJC
Aroclor-1221 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 11:33	MJC
Aroclor-1232 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 11:33	MJC
Aroclor-1242 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 11:33	MJC
Aroclor-1248 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 11:33	MJC
Aroclor-1254 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 11:33	MJC
Aroclor-1260 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 11:33	MJC
Aroclor-1262 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 11:33	MJC
Aroclor-1268 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 11:33	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	126	30-150		3/11/14 11:33
Decachlorobiphenyl [2]	122	30-150		3/11/14 11:33
Tetrachloro-m-xylene [1]	137	30-150		3/11/14 11:33
Tetrachloro-m-xylene [2]	140	30-150		3/11/14 11:33

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B2A 1-2' | Sampled: 3/4/2014 10:15

Sample ID: 14C0168-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	95.2		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B2A 2-3' | Sampled: 3/4/2014 10:15

Sample ID: 14C0168-12

Sample Matrix: Soil

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 11:45	MJC
Aroclor-1221 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 11:45	MJC
Aroclor-1232 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 11:45	MJC
Aroclor-1242 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 11:45	MJC
Aroclor-1248 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 11:45	MJC
Aroclor-1254 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 11:45	MJC
Aroclor-1260 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 11:45	MJC
Aroclor-1262 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 11:45	MJC
Aroclor-1268 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 11:45	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	120	30-150		3/11/14 11:45
Decachlorobiphenyl [2]	116	30-150		3/11/14 11:45
Tetrachloro-m-xylene [1]	127	30-150		3/11/14 11:45
Tetrachloro-m-xylene [2]	132	30-150		3/11/14 11:45

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B2A 2-3' | Sampled: 3/4/2014 10:15

Sample ID: 14C0168-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	94.6		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B2A 3-4' | Sampled: 3/4/2014 10:15

Sample ID: 14C0168-13

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 12:23	MJC
Aroclor-1221 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 12:23	MJC
Aroclor-1232 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 12:23	MJC
Aroclor-1242 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 12:23	MJC
Aroclor-1248 [1]	0.67	0.10	mg/Kg dry	5	O-04	SW-846 8082A	3/7/14	3/11/14 12:23	MJC
Aroclor-1254 [1]	0.97	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 12:23	MJC
Aroclor-1260 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 12:23	MJC
Aroclor-1262 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 12:23	MJC
Aroclor-1268 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 12:23	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	139	30-150		3/11/14 12:23
Decachlorobiphenyl [2]	132	30-150		3/11/14 12:23
Tetrachloro-m-xylene [1]	139	30-150		3/11/14 12:23
Tetrachloro-m-xylene [2]	143	30-150		3/11/14 12:23

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B2A 3-4' | Sampled: 3/4/2014 10:15

Sample ID: 14C0168-13

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	98.1		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B2A 4-5' | Sampled: 3/4/2014 10:15

Sample ID: 14C0168-14

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 12:35	MJC
Aroclor-1221 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 12:35	MJC
Aroclor-1232 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 12:35	MJC
Aroclor-1242 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 12:35	MJC
Aroclor-1248 [1]	6.1	1.1	mg/Kg dry	50	O-04	SW-846 8082A	3/7/14	3/11/14 12:35	MJC
Aroclor-1254 [1]	3.5	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 12:35	MJC
Aroclor-1260 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 12:35	MJC
Aroclor-1262 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 12:35	MJC
Aroclor-1268 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 12:35	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	*	30-150	S-01	3/11/14 12:35
Decachlorobiphenyl [2]	*	30-150	S-01	3/11/14 12:35
Tetrachloro-m-xylene [1]	*	30-150	S-01	3/11/14 12:35
Tetrachloro-m-xylene [2]	*	30-150	S-01	3/11/14 12:35

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B2A 4-5' | Sampled: 3/4/2014 10:15

Sample ID: 14C0168-14

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	93.6		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B2A 4-5' DUP | Sampled: 3/4/2014 10:15

Sample ID: 14C0168-15

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	5.4	mg/Kg dry	250		SW-846 8082A	3/7/14	3/11/14 12:48	MJC
Aroclor-1221 [1]	ND	5.4	mg/Kg dry	250		SW-846 8082A	3/7/14	3/11/14 12:48	MJC
Aroclor-1232 [1]	ND	5.4	mg/Kg dry	250		SW-846 8082A	3/7/14	3/11/14 12:48	MJC
Aroclor-1242 [1]	ND	5.4	mg/Kg dry	250		SW-846 8082A	3/7/14	3/11/14 12:48	MJC
Aroclor-1248 [1]	37	5.4	mg/Kg dry	250	O-04	SW-846 8082A	3/7/14	3/11/14 12:48	MJC
Aroclor-1254 [1]	24	5.4	mg/Kg dry	250		SW-846 8082A	3/7/14	3/11/14 12:48	MJC
Aroclor-1260 [1]	ND	5.4	mg/Kg dry	250		SW-846 8082A	3/7/14	3/11/14 12:48	MJC
Aroclor-1262 [1]	ND	5.4	mg/Kg dry	250		SW-846 8082A	3/7/14	3/11/14 12:48	MJC
Aroclor-1268 [1]	ND	5.4	mg/Kg dry	250		SW-846 8082A	3/7/14	3/11/14 12:48	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	*	30-150	S-01	3/11/14 12:48
Decachlorobiphenyl [2]	*	30-150	S-01	3/11/14 12:48
Tetrachloro-m-xylene [1]	*	30-150	S-01	3/11/14 12:48
Tetrachloro-m-xylene [2]	*	30-150	S-01	3/11/14 12:48

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B2A 4-5' DUP | Sampled: 3/4/2014 10:15

Sample ID: 14C0168-15

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	91.8		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B16A 0-1' | Sampled: 3/4/2014 10:40

Sample ID: 14C0168-16

Sample Matrix: Soil

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 13:00	MJC
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 13:00	MJC
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 13:00	MJC
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 13:00	MJC
Aroclor-1248 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 13:00	MJC
Aroclor-1254 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 13:00	MJC
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 13:00	MJC
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 13:00	MJC
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 13:00	MJC

Surrogates	% Recovery		Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	132		30-150		3/11/14 13:00
Decachlorobiphenyl [2]	130		30-150		3/11/14 13:00
Tetrachloro-m-xylene [1]	147		30-150		3/11/14 13:00
Tetrachloro-m-xylene [2]	**151**	*	30-150	S-12	3/11/14 13:00

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B16A 0-1' | Sampled: 3/4/2014 10:40

Sample ID: 14C0168-16

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	92.4		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B16A 1-2' | Sampled: 3/4/2014 10:40

Sample ID: 14C0168-17

Sample Matrix: Soil

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 13:13	MJC
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 13:13	MJC
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 13:13	MJC
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 13:13	MJC
Aroclor-1248 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 13:13	MJC
Aroclor-1254 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 13:13	MJC
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 13:13	MJC
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 13:13	MJC
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 13:13	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	121	30-150		3/11/14 13:13
Decachlorobiphenyl [2]	120	30-150		3/11/14 13:13
Tetrachloro-m-xylene [1]	132	30-150		3/11/14 13:13
Tetrachloro-m-xylene [2]	138	30-150		3/11/14 13:13

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B16A 1-2' | Sampled: 3/4/2014 10:40

Sample ID: 14C0168-17

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	93.2		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B16A 2-3' | Sampled: 3/4/2014 10:40

Sample ID: 14C0168-18

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 13:25	MJC
Aroclor-1221 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 13:25	MJC
Aroclor-1232 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 13:25	MJC
Aroclor-1242 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 13:25	MJC
Aroclor-1248 [1]	0.59	0.41	mg/Kg dry	20	O-04	SW-846 8082A	3/7/14	3/11/14 13:25	MJC
Aroclor-1254 [1]	0.95	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 13:25	MJC
Aroclor-1260 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 13:25	MJC
Aroclor-1262 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 13:25	MJC
Aroclor-1268 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 13:25	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	113	30-150		3/11/14 13:25
Decachlorobiphenyl [2]	111	30-150		3/11/14 13:25
Tetrachloro-m-xylene [1]	121	30-150		3/11/14 13:25
Tetrachloro-m-xylene [2]	124	30-150		3/11/14 13:25

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B16A 2-3' | Sampled: 3/4/2014 10:40

Sample ID: 14C0168-18

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	96.1		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B16A 3-4' | Sampled: 3/4/2014 10:40

Sample ID: 14C0168-19

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	2.2	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 13:38	MJC
Aroclor-1221 [1]	ND	2.2	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 13:38	MJC
Aroclor-1232 [1]	ND	2.2	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 13:38	MJC
Aroclor-1242 [1]	ND	2.2	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 13:38	MJC
Aroclor-1248 [1]	10	2.2	mg/Kg dry	100	O-04	SW-846 8082A	3/7/14	3/11/14 13:38	MJC
Aroclor-1254 [1]	7.1	2.2	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 13:38	MJC
Aroclor-1260 [1]	ND	2.2	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 13:38	MJC
Aroclor-1262 [1]	ND	2.2	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 13:38	MJC
Aroclor-1268 [1]	ND	2.2	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 13:38	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	*	30-150	S-01	3/11/14 13:38
Decachlorobiphenyl [2]	*	30-150	S-01	3/11/14 13:38
Tetrachloro-m-xylene [1]	*	30-150	S-01	3/11/14 13:38
Tetrachloro-m-xylene [2]	*	30-150	S-01	3/11/14 13:38

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0168

Date Received: 3/6/2014

Field Sample #: B16A 3-4' | Sampled: 3/4/2014 10:40

Sample ID: 14C0168-19

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	91.2		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
14C0168-01 [B49A 0-1']	B091523	03/08/14
14C0168-02 [B49A 1-2']	B091523	03/08/14
14C0168-03 [B49A 2-3']	B091523	03/08/14
14C0168-04 [B50A 0-1']	B091523	03/08/14
14C0168-05 [B50A 1-2']	B091523	03/08/14
14C0168-06 [B50A 2-3']	B091523	03/08/14
14C0168-07 [B50A 2-3' DUP]	B091523	03/08/14
14C0168-08 [B50A 5-7']	B091523	03/08/14
14C0168-09 [B50A 7-9']	B091523	03/08/14
14C0168-10 [B2A 0-1']	B091523	03/08/14
14C0168-11 [B2A 1-2']	B091523	03/08/14
14C0168-12 [B2A 2-3']	B091523	03/08/14
14C0168-13 [B2A 3-4']	B091523	03/08/14
14C0168-14 [B2A 4-5']	B091523	03/08/14
14C0168-15 [B2A 4-5' DUP]	B091523	03/08/14
14C0168-16 [B16A 0-1']	B091523	03/08/14
14C0168-17 [B16A 1-2']	B091523	03/08/14
14C0168-18 [B16A 2-3']	B091523	03/08/14
14C0168-19 [B16A 3-4']	B091523	03/08/14

Prep Method: SW-846 3540C-SW-846 8082A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
14C0168-01 [B49A 0-1']	B091490	10.0	10.0	03/07/14
14C0168-02 [B49A 1-2']	B091490	10.4	10.0	03/07/14
14C0168-03 [B49A 2-3']	B091490	10.3	10.0	03/07/14
14C0168-04 [B50A 0-1']	B091490	10.2	10.0	03/07/14
14C0168-05 [B50A 1-2']	B091490	10.4	10.0	03/07/14
14C0168-06 [B50A 2-3']	B091490	10.2	10.0	03/07/14
14C0168-07 [B50A 2-3' DUP]	B091490	10.0	10.0	03/07/14
14C0168-08 [B50A 5-7']	B091490	10.4	10.0	03/07/14
14C0168-09 [B50A 7-9']	B091490	10.3	10.0	03/07/14
14C0168-10 [B2A 0-1']	B091490	10.1	10.0	03/07/14
14C0168-11 [B2A 1-2']	B091490	10.3	10.0	03/07/14
14C0168-12 [B2A 2-3']	B091490	10.4	10.0	03/07/14
14C0168-13 [B2A 3-4']	B091490	10.2	10.0	03/07/14
14C0168-14 [B2A 4-5']	B091490	10.0	10.0	03/07/14
14C0168-15 [B2A 4-5' DUP]	B091490	10.1	10.0	03/07/14
14C0168-16 [B16A 0-1']	B091490	10.1	10.0	03/07/14
14C0168-17 [B16A 1-2']	B091490	10.1	10.0	03/07/14
14C0168-18 [B16A 2-3']	B091490	10.2	10.0	03/07/14
14C0168-19 [B16A 3-4']	B091490	10.0	10.0	03/07/14

con-test® ANALYTICAL LABORATORY

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

QUALITY CONTROL

Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B091490 - SW-846 3540C										
Blank (B091490-BLK1)				Prepared: 03/07/14 Analyzed: 03/10/14						
Aroclor-1016	ND	0.020	mg/Kg wet							
Aroclor-1016 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1221	ND	0.020	mg/Kg wet							
Aroclor-1221 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1232	ND	0.020	mg/Kg wet							
Aroclor-1232 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1242	ND	0.020	mg/Kg wet							
Aroclor-1242 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1248	ND	0.020	mg/Kg wet							
Aroclor-1248 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1254	ND	0.020	mg/Kg wet							
Aroclor-1254 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1260	ND	0.020	mg/Kg wet							
Aroclor-1260 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1262	ND	0.020	mg/Kg wet							
Aroclor-1262 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1268	ND	0.020	mg/Kg wet							
Aroclor-1268 [2C]	ND	0.020	mg/Kg wet							
Surrogate: Decachlorobiphenyl	*0.226*		mg/Kg wet	0.200		113	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.227*		mg/Kg wet	0.200		114	30-150			
Surrogate: Tetrachloro-m-xylene	*0.230*		mg/Kg wet	0.200		115	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.220*		mg/Kg wet	0.200		110	30-150			
LCS (B091490-BS1)				Prepared: 03/07/14 Analyzed: 03/10/14						
Aroclor-1016	0.22	0.10	mg/Kg wet	0.200		111	40-140			
Aroclor-1016 [2C]	0.24	0.10	mg/Kg wet	0.200		118	40-140			
Aroclor-1260	0.21	0.10	mg/Kg wet	0.200		105	40-140			
Aroclor-1260 [2C]	0.19	0.10	mg/Kg wet	0.200		93.7	40-140			
Surrogate: Decachlorobiphenyl	*0.194*		mg/Kg wet	0.200		97.0	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.198*		mg/Kg wet	0.200		99.0	30-150			
Surrogate: Tetrachloro-m-xylene	*0.211*		mg/Kg wet	0.200		105	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.212*		mg/Kg wet	0.200		106	30-150			
LCS Dup (B091490-BSD1)				Prepared: 03/07/14 Analyzed: 03/10/14						
Aroclor-1016	0.22	0.10	mg/Kg wet	0.200		109	40-140	2.34	30	
Aroclor-1016 [2C]	0.23	0.10	mg/Kg wet	0.200		113	40-140	3.96	30	
Aroclor-1260	0.21	0.10	mg/Kg wet	0.200		103	40-140	1.80	30	
Aroclor-1260 [2C]	0.19	0.10	mg/Kg wet	0.200		93.1	40-140	0.619	30	
Surrogate: Decachlorobiphenyl	*0.193*		mg/Kg wet	0.200		96.6	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.197*		mg/Kg wet	0.200		98.4	30-150			
Surrogate: Tetrachloro-m-xylene	*0.216*		mg/Kg wet	0.200		108	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.217*		mg/Kg wet	0.200		108	30-150			

con-test® ANALYTICAL LABORATORY

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

QUALITY CONTROL

Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B091490 - SW-846 3540C											
Matrix Spike (B091490-MS1)	**Source: 14C0168-01**			Prepared: 03/07/14 Analyzed: 03/11/14							
Aroclor-1016	0.24	0.11	mg/Kg dry	0.213	0.0	113		40-140			
Aroclor-1016 [2C]	0.33	0.11	mg/Kg dry	0.213	0.0	**154**	*	40-140			MS-15
Aroclor-1260	0.28	0.11	mg/Kg dry	0.213	0.0	131		40-140			
Aroclor-1260 [2C]	0.25	0.11	mg/Kg dry	0.213	0.0	119		40-140			
Surrogate: Decachlorobiphenyl	*0.263*		mg/Kg dry	0.213		123		30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.250*		mg/Kg dry	0.213		117		30-150			
Surrogate: Tetrachloro-m-xylene	*0.275*		mg/Kg dry	0.213		129		30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.283*		mg/Kg dry	0.213		133		30-150			
Matrix Spike Dup (B091490-MSD1)	**Source: 14C0168-01**			Prepared: 03/07/14 Analyzed: 03/11/14							
Aroclor-1016	0.23	0.11	mg/Kg dry	0.213	0.0	109		40-140	3.64	50	
Aroclor-1016 [2C]	0.34	0.11	mg/Kg dry	0.213	0.0	**161**	*	40-140	4.50	50	MS-15
Aroclor-1260	0.29	0.11	mg/Kg dry	0.213	0.0	135		40-140	3.18	50	
Aroclor-1260 [2C]	0.27	0.11	mg/Kg dry	0.213	0.0	129		40-140	8.49	50	
Surrogate: Decachlorobiphenyl	*0.281*		mg/Kg dry	0.213		132		30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.279*		mg/Kg dry	0.213		131		30-150			
Surrogate: Tetrachloro-m-xylene	*0.286*		mg/Kg dry	0.213		134		30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.292*		mg/Kg dry	0.213		137		30-150			

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

QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B091523 - % Solids										
Duplicate (B091523-DUP3)	**Source: 14C0168-01**			Prepared: 03/08/14 Analyzed: 03/10/14						
% Solids	93.5		% Wt		93.9			0.427	20	
Duplicate (B091523-DUP4)	**Source: 14C0168-10**			Prepared: 03/08/14 Analyzed: 03/10/14						
% Solids	91.6		% Wt		93.3			1.84	20	
Duplicate (B091523-DUP5)	**Source: 14C0168-19**			Prepared: 03/08/14 Analyzed: 03/10/14						
% Solids	91.8		% Wt		91.2			0.656	20	

con-test® ANALYTICAL LABORATORY

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
	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.
MS-15	Matrix spike and matrix spike duplicate recoveries are outside of control limits. Data validation is not affected since results for this compound in this sample are "not detected", and recovery bias is on the high side.
O-04	Sample fingerprint does not match standard exactly. Sample was quantitated against the closest matching standard.
O-32	A five times dilution was performed as part of the standard analytical procedure.
S-01	The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.
S-12	Surrogate recovery is outside of control limits on confirmatory column, but within control limits on primary column. Data validation is not affected.
Z-01	Sample was diluted due to sample matrix interference. Requested reporting limit was met.

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

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8082A in Soil	
Aroclor-1016	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1016 [2C]	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1221	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1221 [2C]	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1232	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1232 [2C]	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1242	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1242 [2C]	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1248	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1248 [2C]	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1254	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1254 [2C]	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1260	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1260 [2C]	CT,NH,NY,ME,NC,VA,NJ

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

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2016
MA	Massachusetts DEP	M-MA100	06/30/2014
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2015
NY	New York State Department of Health	10899 NELAP	04/1/2014
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2015
RI	Rhode Island Department of Health	LAO00112	12/30/2014
NC	North Carolina Div. of Water Quality	652	12/31/2014
NJ	New Jersey DEP	MA007 NELAP	06/30/2014
FL	Florida Department of Health	E871027 NELAP	06/30/2014
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2014
WA	State of Washington Department of Ecology	C2065	02/23/2015
ME	State of Maine	2011028	06/9/2015
VA	Commonwealth of Virginia	460217	12/14/2014
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2014

CHAIN OF CUSTODY RECORD

14C0168

Rev 04.05.12

con-test ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

Page 1 of 6

Company Name: GEC
Address: 60 BROOKS DRIVE
BRAINTREE, MA 02184
Attention:
Project Location: BOOTT MILLS, LOWELL
Sampled By: MB RADLEY

Telephone:
Project # 911JR-3117
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ◉ EMAIL ○ WEBSITE
Fax #
Email:
Format: ◉ PDF ◉ EXCEL ○ GIS ○ OTHER ○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	EPA METHOD 3550	ANALYSIS REQUESTED	# of Containers	** Preservation	***Container Code
-01	B49A 0-1'	3-4-14	1350		X	S	U	X	X	9	I	A
-02	B49A 1-2'	3-4-14	1330		X	S	U	X				
-03	B-49A 2-3'	3-4-14	1330		X	S	U	X				
-04	B-50A 0-1'	3-4-14	1340		X	S	U	X	X			
-05	B-50A 1-2'	3-4-14	1340		X	S	U	X				
-06	B-50 2-3'	3-4-14	1310		X	S	U	X				
-07	B-50A 2-3' DUP	3-4-14	1340		X	S	U	X				
-08	B50A 5-7'	3-4-14	1310		X	S	U	X				
-09	B-50A 7-9'	3-4-14	1340		X	S	U	X				
						~~S~~	~~U~~					

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other

Comments:
METHOD AS REQUIRED BY TSCA L USEPA REGION 1
SOXHELT EXTRACTION EPA METHOD 3550

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time: 3/6/14 1316
Relinquished by: (signature)	Date/Time: 3/6/14 2020
Received by: (signature) 3.9°C	Date/Time: 3/6/14 2030

Turnaround ††
☐ 7-Day
☐ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
◉ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

Page 49 of 57 14C0168_1 Contest_Final 03 13 14 1339

con-test ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com

CHAIN OF CUSTODY RECORD

14C0168

Rev 04.05.12

39 Spruce Street
East longmeadow, MA 01028

Company Name: GEC
Address:
Attention:
Project Location: BOOTT MILLS, LOWELL
Sampled By: MBRADLEY

Telephone: 781-356-9140
Project # 911JR-3117
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ◉ EMAIL ○ WEBSITE
Fax #
Email:
Format ◉ PDF ◉ EXCEL ○ GIS
○ OTHER
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

ANALYSIS REQUESTED

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	EPA METHOD 3450	
-10	B-2A 0-1'	3-4-14	1015		X	S	U	X	X
-11	B-2A 1-2'	3-4-14	1015		X	S	U	X	
-12	B-2A 2-3'	3-4-14	1015		X	S	U	X	
-13	B-2A 3-4'	3-4-14	1015		X	S	U	X	
-14	B-2A 4-5'	3-4-14	1015		X	S	U	X	
-15	B-2A 4-5' DUP	3-4-14	1015		X	S	U	X	
-16	B-16A 0-1'	3-4-14	1040		X	S	U	X	X
-17	B-16A 1-2'	3-4-14	1040		X	S	U	X	
-18	B-16A 2-3	3-4-14	1040		X	S	U	X	
-19	B-16A 3-4'	3-4-14	1040			S	U	X	

# of Containers: 10
** Preservation: —
***Container Code: A

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
[signature]	
Received by: (signature) [signature] 3/6/14	Date/Time: 1310
Relinquished by: (signature) [signature] 3/6/14	Date/Time: 2030
Received by: (signature) [signature] 3/6/14 3.9°C	Date/Time: 2030

Turnaround ††
☐ 7-Day
☐ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
◉ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

CHAIN OF CUSTODY RECORD

con-test® ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

Rev 04.05.12

Company Name: GEC
Address: 60 BROOKS DRIVE
Attention:
Project Location: BOOT MILLS, LOWELL
Sampled By: MBRADLEY

Telephone:
Project # 91152-3117
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ● EMAIL ○ WEBSITE
Fax #
Email:
Format: ● PDF ● EXCEL ○ GIS
○ OTHER
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Cont. Code	EDD METHOD 3	ANALYSIS REQUESTED										# of Containers	** Preservation	***Container Code
																			9	I	
																			1	1	
																			4	A	
	B-16A 4-5'				X	S	U	X													
	B-10A 0-0.5'	3-4-14	1155		X	S	U	X													
	B-10A 0.5'-1	3-4-14	1155		X	S	U	X													
	B-10A 1-2'	3-4-14	1155		X	S	U	X													
	B-10A 2-3'	3-4-14	1155		X	S	U	X													
	B-10A 2-3' DUP	3-4-14	1155		X	S	U	X													
	B-11A 0-0.5'	3-4-14	1130		X	S	U	X	X												
	B-11A ~~0.5'-1'~~ 0-0.5' DUP	3-4-14	1130		X	S	U		X												
	B-11A 0.5'-1	3-4-14	1130		X	S	U	X													
	B-11A 1-2'	3-4-14	1130		X	S	U	X													

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

H - High: M - Medium: L - Low: C - Clean: U - Unknown

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

****Preservation**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Relinquished by: (signature)	Date/Time:
Received by: (signature) 3/6/14	Date/Time: 1310
Relinquished by: (signature) 3/6/14	Date/Time: 2020
Received by: (signature) 3/6/14	Date/Time: 2030

Turnaround ††
☐ 7-Day
☐ 10-Day
☒ Other 5
RUSH
☐ 24-Hr ☐ 48-Hr
☐ 72-Hr ☐ 4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
● MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID #

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

Page 51 of 57 14C0168_1 Contest_Final 03 13 14 1339

con-test® ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

CHAIN OF CUSTODY RECORD

Rev 04.05.12

Company Name: CEC
Address:
Attention:
Project Location: BOOTT MILLS, LOWELL
Sampled By: MBRADLEY

Telephone:
Project # 911JL-3117
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ○ EMAIL ○ WEBSITE
Fax #
Email:
Format: ○ PDF ○ EXCEL ○ GIS ○ OTHER ○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Cont. Code	A	1	10	EPH Method 8330	ANALYSIS REQUESTED
	B-11A 2-3'	3-4-14	1130		X	S	G	X				
	B-20A 0-0.5'	3-4-14	1215		X	S	G	X				
	B-20A 0.5'-1	3-4-14	1215		X	S	G	X				
	B-20A 1-2'	3-4-14	1215		X	S	G	X				
	B-20A 1-2' DUP	3-4-14	1215		X	S	G	X				
	B-20A 2-3'	3-4-14	1245		X	S	G	X				
	B-21A 0-0.5'	3-5-14	0930		X	S	G	X	X			
	B-21A 0.5'-1	3-5-14	0930		X	S	G	X				
	B-21A 1-2'	3-5-14	0930		X	S	G	X				
	B-21A 2-3'	3-5-14	0930		X	S	G	X				

# of Containers
** Preservation
***Container Code

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL= sludge
O = other_____

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High: M - Medium: L - Low: C - Clean: U - Unknown

Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time: 3/6/14 1316
Relinquished by: (signature)	Date/Time: 3/6/14 1830
Received by: (signature)	Date/Time: 3/6/14 2030

Turnaround ††
☐ 7-Day
☐ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
◉ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

Page 52 of 57 14C0168_1 Contest_Final 03 13 14 1339

con-test ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com

CHAIN OF CUSTODY RECORD

39 Spruce Street
East longmeadow, MA 01028

Rev 04.05.12

Company Name: GEC
Address: 60 BROOKS DRIVE
Attention:
Project Location: BOOTT MILLS, LOWELL
Sampled By: MBRADLEY

Telephone:
Project # 911JR-3117
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ○ EMAIL ○ WEBSITE
Fax #
Email:
Format ○ PDF ○ EXCEL ○ GIS
○ OTHER
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

ANALYSIS REQUESTED

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection: Beginning Date/Time	Collection: Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	EPA Method 3950										
	B-48A 0-0.5'	3-4-14	1230		X			X										
	B-48A 0-0.5' DUP	3-4-14	1230		X			X										
	B-48A 0.5-1'	3-4-14	1230		X			X										
	B-48A 1-2'	3-4-14	1230		X			X										
	B48A 2-3'	3-4-14	1230		X			X										
	~~B-48A~~ COMP 1A 0-0.5	3-5-14	0900	X				X										
	COMP 1A 0.5'-1	3-5-14	0900	X				X										
	COMP 1A 1-2'	3-5-14	0900	X				X										
	COMP 1A 2-3'	3-5-14	0900	X				X										
	COMP 1A 3-4'	3-5-14	0900	X				X										

# of Containers
** Preservation
***Container Code

Dissolved Metal
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

H - High: M - Medium: L - Low: C - Clean: U - Unknown

Relinquished by: (signature)	Date/Time:
[signature]	
Received by: (signature) [signature] 3/6/14	Date/Time: 1316
Relinquished by: (signature) [signature] 3/6/14	Date/Time: 2030
Received by: (signature) [signature] 3/6/14	Date/Time: 2030

Turnaround ††
☐ 7-Day
☐ 10-Day
☐ Other
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID #

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT. TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

con-test ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com

CHAIN OF CUSTODY RECORD

39 Spruce Street
East longmeadow, MA 01028

Rev 04.05.12

Company Name: GEC
Address:
Attention:
Project Location: BOOTT MILLS, LOWELL
Sampled By: MBRADLEY

Telephone:
Project # 911JR-3117
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ○ EMAIL ○ WEBSITE
Fax #
Email:
Format: ● PDF ● EXCEL ○ GIS ○ OTHER ○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

ANALYSIS REQUESTED

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	EPC MEHOD 3450										
	COMP 1A 4-5'	3-5-14	0900	X		S	U	X										
	COMP 2A ~~0.5-1~~ 0-0.5'	3-5-14	0945	X		S	U	X										
	COMP 2A ~~0-0.5~~ 0.5'-1'		0945	X		S	U	X										
	COMP 5A 0-0.5'	3-5-14	0945	X		S	U	X										
	COMP 5A 0.5-1	3-5-14	0945	X		S	U	X										
	COMP 5A 1-2'	3-5-14	0945	X		S	U	X										
	COMP 5A 2-3'	3-5-14	0945	X		S	U	X										
	COMP 6A 0-0.5'	3-5-14	1130	X		S	U	X	X									
	COMP 6A 0.5-1'	3-5-14	1130	X		S	U	X										
	COMP 6A 1-2'	3-5-14	1130	X		S	U	X										
	COMP 6A 2-3'	3-5-14	1130	X		S	U	X										

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

H - High: M - Medium: L - Low: C - Clean: U - Unknown

# of Containers
** Preservation
***Container Code

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other

Relinquished by: (signature)	Date/Time:
[signature]	
Received by: (signature) [signature] 3/6/14	Date/Time: 1310
Relinquished by: (signature) [signature] 3/6/14	Date/Time: 2030
Received by: (signature) [signature] 3/6/14	Date/Time: 2030

Turnaround ††
☐ 7-Day
☐ 10-Day
☐ Other
RUSH†
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
● MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID #

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

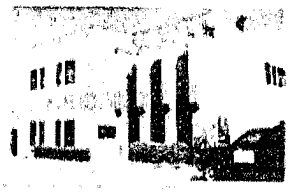
†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

39 Spruce St.
East Longmeadow, MA. 01028
P: 413-525-2332
F: 413-525-6405
www.contestlabs.com

con-test ANALYTICAL LABORATORY

Sample Receipt Checklist



CLIENT NAME: GEC RECEIVED BY: MJ DATE: 03/06/14

1) **Was the chain(s) of custody relinquished and signed?** (Yes) No No CoC Included
2) **Does the chain agree with the samples?** (Yes) No
   If not, explain:
3) **Are all the samples in good condition?** (Yes) No
   If not, explain:
4) **How were the samples received:**
   On Ice ☑ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☑
   Were the samples received in Temperature Compliance of (2-6°C)? (Yes) No N/A
   Temperature °C by Temp blank _____ Temperature °C by Temp gun 3.9°C
5) **Are there Dissolved samples for the lab to filter?** Yes (No)
   Who was notified _____ Date _____ Time _____
6) **Are there any RUSH or SHORT HOLDING TIME samples?** Yes (No)
   Who was notified _____ Date _____ Time _____
7) **Location where samples are stored:** 19

Permission to subcontract samples? Yes No
(Walk-in clients only) if not already approved
Client Signature: _____

8) **Do all samples have the proper Acid pH:** Yes No (N/A) _____
9) **Do all samples have the proper Base pH:** Yes No (N/A) _____
10) **Was the PC notified of any discrepancies with the CoC vs the samples:** Yes No (N/A)

Containers received at Con-Test

	# of containers			# of containers
1 Liter Amber			8 oz amber/clear jar	4 A
500 mL Amber			4 oz amber/clear jar	16 A
250 mL Amber (8oz amber)			2 oz amber/clear jar	
1 Liter Plastic			Plastic Bag / Ziploc	
500 mL Plastic			SOC Kit	
250 mL plastic			Non-ConTest Container	
40 mL Vial - type listed below			Perchlorate Kit	
Colisure / bacteria bottle			Flashpoint bottle	
Dissolved Oxygen bottle			Other glass jar	
Encore			Other	

Laboratory Comments:

40 mL vials: # HCl _____ # Methanol _____
Bisulfate _____ # DI Water _____
Thiosulfate _____ Unpreserved

Time and Date Frozen:

Login Sample Receipt Checklist

(Rejection Criteria Listing - Using Sample Acceptance Policy)
Any False statement will be brought to the attention of Client

Question	Answer (True/False) T/F/NA	Comment
1) The cooler's custody seal, if present, is intact.	T	
2) The cooler or samples do not appear to have been compromised or tampered with.	T	
3) Samples were received on ice.	T	
4) Cooler Temperature is acceptable.	T	
5) Cooler Temperature is recorded.	T	
6) COC is filled out in ink and legible.	T	
7) COC is filled out with all pertinent information.	T	
8) Field Sampler's name present on COC.	T	
9) There are no discrepancies between the sample IDs on the container and the COC.	T	
10) Samples are received within Holding Time.	T	
11) Sample containers have legible labels.	T	
12) Containers are not broken or leaking.	T	
13) Air Cassettes are not broken/open.	NA	
14) Sample collection date/times are provided.	T	
15) Appropriate sample containers are used.	T	
16) Proper collection media used.	T	
17) No headspace sample bottles are completely filled.	T	
18) There is sufficient volume for all requsted analyses, including any requested MS/MSDs.	T	
19) Trip blanks provided if applicable.	T	
20) VOA sample vials do not have head space or bubble is <6mm (1/4") in diameter.	NA	
21) Samples do not require splitting or compositing.	T	

Who notified of False statements? **Date/Time:**

Doc #277 Rev. 4 August 2013 **Log-In Technician Initials:** **Date/Time:**

MJ 03/06/14 2030

MADEP MCP Analytical Method Report Certification Form

Laboratory Name: Con-Test Analytical Laboratory	Project #: 14C0168
Project Location: Lowell-Boot Mills	RTN:

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

14C0168-01 thru 14C0168-19

Matrices: Soil

CAM Protocol (check all that below)

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

Printed Name: Daren J. Damboragian Date: 03/13/14

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

March 13, 2014

Mike Bradley
Goldman Environmental
60 Brooks Drive
Braintree, MA 02184

Project Location: Lowell-Boot Mills
Client Job Number:
Project Number: 911JR-3117
Laboratory Work Order Number: 14C0169

Enclosed are results of analyses for samples received by the laboratory on March 6, 2014. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

James M. Georgantas
Project Manager

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

Goldman Environmental
60 Brooks Drive
Braintree, MA 02184
ATTN: Mike Bradley

REPORT DATE: 3/13/2014

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 911JR-3117

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 14C0169

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

PROJECT LOCATION: Lowell-Boot Mills

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
B16A 4-5'	14C0169-01	Soil		SM 2540G	
				SW-846 8082A	
B10A 0-0.5'	14C0169-02	Soil		SM 2540G	
				SW-846 8082A	
B10A 0.5-1'	14C0169-03	Soil		SM 2540G	
				SW-846 8082A	
B10A 1-2'	14C0169-04	Soil		SM 2540G	
				SW-846 8082A	
B10A 2-3'	14C0169-05	Soil		SM 2540G	
				SW-846 8082A	
B10A 2-3' DUP	14C0169-06	Soil		SM 2540G	
				SW-846 8082A	
B11A 0-0.5	14C0169-07	Soil		SM 2540G	
				SW-846 8082A	
B11A 0-0.5 DUP	14C0169-08	Soil		SM 2540G	
				SW-846 8082A	
B11A 0.5-1	14C0169-09	Soil		SM 2540G	
				SW-846 8082A	
B11A 1-2'	14C0169-10	Soil		SM 2540G	
				SW-846 8082A	
B11A 2-3'	14C0169-11	Soil		SM 2540G	
				SW-846 8082A	
B20A 0-0.5	14C0169-12	Soil		SM 2540G	
				SW-846 8082A	
B20A 0.5-1'	14C0169-13	Soil		SM 2540G	
				SW-846 8082A	
B20A 1-2'	14C0169-14	Soil		SM 2540G	
				SW-846 8082A	
B20A 1-2' DUP	14C0169-15	Soil		SM 2540G	
				SW-846 8082A	
B20A 2-3'	14C0169-16	Soil		SM 2540G	
				SW-846 8082A	
B21A 0-0.5	14C0169-17	Soil		SM 2540G	
				SW-846 8082A	
B21A 0.5-1'	14C0169-18	Soil		SM 2540G	
				SW-846 8082A	
B21A 1-2'	14C0169-19	Soil		SM 2540G	
				SW-846 8082A	
B21A 2-3'	14C0169-20	Soil		SM 2540G	
				SW-846 8082A	

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.

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

SW-846 8082A

Qualifications:

Matrix spike and/or spike duplicate recovery bias high due to contribution of other Aroclors present in the source sample.

Analyte & Samples(s) Qualified:

Aroclor-1016, Aroclor-1016 [2C], Aroclor-1260, Aroclor-1260 [2C]

B091492-MS1, B091492-MSD1

Sample contains two incompletely resolved aroclors. Aroclor with the closest matching pattern is reported.

Analyte & Samples(s) Qualified:

Aroclor-1248, Aroclor-1248 [2C]

14C0169-10[B11A 1-2']

Sample fingerprint does not match standard exactly. Sample was quantitated against the closest matching standard.

Analyte & Samples(s) Qualified:

Aroclor-1248, Aroclor-1248 [2C]

14C0169-07[B11A 0-0.5], 14C0169-08[B11A 0-0.5 DUP], 14C0169-09[B11A 0.5-1], 14C0169-14[B20A 1-2'], 14C0169-15[B20A 1-2' DUP], 14C0169-19[B21A 1-2'], 14C0169-20[B21A 2-3']

A five times dilution was performed as part of the standard analytical procedure.

Analyte & Samples(s) Qualified:

14C0169-02[B10A 0-0.5'], 14C0169-12[B20A 0-0.5], 14C0169-13[B20A 0.5-1']

Matrix spike duplicate RPD is outside of control limits. Reduced precision is anticipated for reported result for this compound in this sample.

Analyte & Samples(s) Qualified:

Aroclor-1016

14C0169-02[B10A 0-0.5'], B091492-MSD1

The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.

Analyte & Samples(s) Qualified:

Decachlorobiphenyl, Decachlorobiphenyl [2C], Tetrachloro-m-xylene, Tetrachloro-m-xylene [2C]

14C0169-05[B10A 2-3'], 14C0169-06[B10A 2-3' DUP], 14C0169-16[B20A 2-3'], 14C0169-20[B21A 2-3']

Sample was diluted due to sample matrix interference. Requested reporting limit was met.

Analyte & Samples(s) Qualified:

14C0169-17[B21A 0-0.5], 14C0169-18[B21A 0.5-1']

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

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.

Daren J. Damboragian
Laboratory Manager

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B16A 4-5' | Sampled: 3/4/2014 00:00

Sample ID: 14C0169-01

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 23:55	KAL
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 23:55	KAL
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 23:55	KAL
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 23:55	KAL
Aroclor-1248 [2]	0.91	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 23:55	KAL
Aroclor-1254 [2]	0.65	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 23:55	KAL
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 23:55	KAL
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 23:55	KAL
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/10/14 23:55	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	79.8	30-150		3/10/14 23:55
Decachlorobiphenyl [2]	90.9	30-150		3/10/14 23:55
Tetrachloro-m-xylene [1]	76.3	30-150		3/10/14 23:55
Tetrachloro-m-xylene [2]	89.0	30-150		3/10/14 23:55

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B16A 4-5' | Sampled: 3/4/2014 00:00

Sample ID: 14C0169-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	88.6		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B10A 0-0.5' | Sampled: 3/4/2014 11:55

Sample ID: 14C0169-02

Sample Matrix: Soil

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.10	mg/Kg dry	5	R-06	SW-846 8082A	3/7/14	3/11/14 15:06	KAL
Aroclor-1221 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 15:06	KAL
Aroclor-1232 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 15:06	KAL
Aroclor-1242 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 15:06	KAL
Aroclor-1248 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 15:06	KAL
Aroclor-1254 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 15:06	KAL
Aroclor-1260 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 15:06	KAL
Aroclor-1262 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 15:06	KAL
Aroclor-1268 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 15:06	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	74.1	30-150		3/11/14 15:06
Decachlorobiphenyl [2]	89.6	30-150		3/11/14 15:06
Tetrachloro-m-xylene [1]	83.8	30-150		3/11/14 15:06
Tetrachloro-m-xylene [2]	90.8	30-150		3/11/14 15:06

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B10A 0-0.5' | Sampled: 3/4/2014 11:55

Sample ID: 14C0169-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	94.2		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B10A 0.5-1' | Sampled: 3/4/2014 11:55

Sample ID: 14C0169-03

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 0:21	KAL
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 0:21	KAL
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 0:21	KAL
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 0:21	KAL
Aroclor-1248 [2]	0.15	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 0:21	KAL
Aroclor-1254 [2]	0.32	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 0:21	KAL
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 0:21	KAL
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 0:21	KAL
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 0:21	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	69.4	30-150		3/11/14 0:21
Decachlorobiphenyl [2]	77.0	30-150		3/11/14 0:21
Tetrachloro-m-xylene [1]	74.0	30-150		3/11/14 0:21
Tetrachloro-m-xylene [2]	94.0	30-150		3/11/14 0:21

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B10A 0.5-1' | Sampled: 3/4/2014 11:55

Sample ID: 14C0169-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	93.8		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B10A 1-2' | Sampled: 3/4/2014 11:55

Sample ID: 14C0169-04

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 15:19	KAL
Aroclor-1221 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 15:19	KAL
Aroclor-1232 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 15:19	KAL
Aroclor-1242 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 15:19	KAL
Aroclor-1248 [1]	2.0	0.43	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 15:19	KAL
Aroclor-1254 [2]	1.5	0.43	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 15:19	KAL
Aroclor-1260 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 15:19	KAL
Aroclor-1262 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 15:19	KAL
Aroclor-1268 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 15:19	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	91.8	30-150		3/11/14 15:19
Decachlorobiphenyl [2]	123	30-150		3/11/14 15:19
Tetrachloro-m-xylene [1]	108	30-150		3/11/14 15:19
Tetrachloro-m-xylene [2]	110	30-150		3/11/14 15:19

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B10A 1-2' | Sampled: 3/4/2014 11:55

Sample ID: 14C0169-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	92.4		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B10A 2-3' | Sampled: 3/4/2014 11:55

Sample ID: 14C0169-05

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	11	mg/Kg dry	500		SW-846 8082A	3/7/14	3/11/14 15:32	KAL
Aroclor-1221 [1]	ND	11	mg/Kg dry	500		SW-846 8082A	3/7/14	3/11/14 15:32	KAL
Aroclor-1232 [1]	ND	11	mg/Kg dry	500		SW-846 8082A	3/7/14	3/11/14 15:32	KAL
Aroclor-1242 [1]	ND	11	mg/Kg dry	500		SW-846 8082A	3/7/14	3/11/14 15:32	KAL
Aroclor-1248 [1]	ND	11	mg/Kg dry	500		SW-846 8082A	3/7/14	3/11/14 15:32	KAL
Aroclor-1254 [2]	110	11	mg/Kg dry	500		SW-846 8082A	3/7/14	3/11/14 15:32	KAL
Aroclor-1260 [1]	ND	11	mg/Kg dry	500		SW-846 8082A	3/7/14	3/11/14 15:32	KAL
Aroclor-1262 [1]	ND	11	mg/Kg dry	500		SW-846 8082A	3/7/14	3/11/14 15:32	KAL
Aroclor-1268 [1]	ND	11	mg/Kg dry	500		SW-846 8082A	3/7/14	3/11/14 15:32	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	*	30-150	S-01	3/11/14 15:32
Decachlorobiphenyl [2]	*	30-150	S-01	3/11/14 15:32
Tetrachloro-m-xylene [1]	*	30-150	S-01	3/11/14 15:32
Tetrachloro-m-xylene [2]	*	30-150	S-01	3/11/14 15:32

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B10A 2-3' | Sampled: 3/4/2014 11:55

Sample ID: 14C0169-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	88.7		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B10A 2-3' DUP | Sampled: 3/4/2014 11:55

Sample ID: 14C0169-06

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	11	mg/Kg dry	500		SW-846 8082A	3/7/14	3/11/14 15:45	KAL
Aroclor-1221 [1]	ND	11	mg/Kg dry	500		SW-846 8082A	3/7/14	3/11/14 15:45	KAL
Aroclor-1232 [1]	ND	11	mg/Kg dry	500		SW-846 8082A	3/7/14	3/11/14 15:45	KAL
Aroclor-1242 [1]	ND	11	mg/Kg dry	500		SW-846 8082A	3/7/14	3/11/14 15:45	KAL
Aroclor-1248 [2]	ND	11	mg/Kg dry	500		SW-846 8082A	3/7/14	3/11/14 15:45	KAL
Aroclor-1254 [2]	91	11	mg/Kg dry	500		SW-846 8082A	3/7/14	3/11/14 15:45	KAL
Aroclor-1260 [1]	ND	11	mg/Kg dry	500		SW-846 8082A	3/7/14	3/11/14 15:45	KAL
Aroclor-1262 [1]	ND	11	mg/Kg dry	500		SW-846 8082A	3/7/14	3/11/14 15:45	KAL
Aroclor-1268 [1]	ND	11	mg/Kg dry	500		SW-846 8082A	3/7/14	3/11/14 15:45	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	*	30-150	S-01	3/11/14 15:45
Decachlorobiphenyl [2]	*	30-150	S-01	3/11/14 15:45
Tetrachloro-m-xylene [1]	*	30-150	S-01	3/11/14 15:45
Tetrachloro-m-xylene [2]	*	30-150	S-01	3/11/14 15:45

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B10A 2-3' DUP | Sampled: 3/4/2014 11:55

Sample ID: 14C0169-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	87.3		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B11A 0-0.5 | Sampled: 3/4/2014 11:30

Sample ID: 14C0169-07

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 15:58	KAL
Aroclor-1221 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 15:58	KAL
Aroclor-1232 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 15:58	KAL
Aroclor-1242 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 15:58	KAL
Aroclor-1248 [2]	0.69	0.10	mg/Kg dry	5	O-04	SW-846 8082A	3/7/14	3/11/14 15:58	KAL
Aroclor-1254 [2]	0.56	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 15:58	KAL
Aroclor-1260 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 15:58	KAL
Aroclor-1262 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 15:58	KAL
Aroclor-1268 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 15:58	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	85.8	30-150		3/11/14 15:58
Decachlorobiphenyl [2]	109	30-150		3/11/14 15:58
Tetrachloro-m-xylene [1]	99.5	30-150		3/11/14 15:58
Tetrachloro-m-xylene [2]	107	30-150		3/11/14 15:58

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B11A 0-0.5 | Sampled: 3/4/2014 11:30

Sample ID: 14C0169-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	94.8		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B11A 0-0.5 DUP | Sampled: 3/4/2014 11:30

Sample ID: 14C0169-08

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 16:11	KAL
Aroclor-1221 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 16:11	KAL
Aroclor-1232 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 16:11	KAL
Aroclor-1242 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 16:11	KAL
Aroclor-1248 [1]	0.68	0.10	mg/Kg dry	5	O-04	SW-846 8082A	3/7/14	3/11/14 16:11	KAL
Aroclor-1254 [2]	0.67	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 16:11	KAL
Aroclor-1260 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 16:11	KAL
Aroclor-1262 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 16:11	KAL
Aroclor-1268 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 16:11	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	74.6	30-150		3/11/14 16:11
Decachlorobiphenyl [2]	101	30-150		3/11/14 16:11
Tetrachloro-m-xylene [1]	96.1	30-150		3/11/14 16:11
Tetrachloro-m-xylene [2]	104	30-150		3/11/14 16:11

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B11A 0-0.5 DUP | Sampled: 3/4/2014 11:30

Sample ID: 14C0169-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	93.6		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B11A 0.5-1 | Sampled: 3/4/2014 11:30

Sample ID: 14C0169-09

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	3/7/14	3/13/14 11:21	KAL
Aroclor-1221 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	3/7/14	3/13/14 11:21	KAL
Aroclor-1232 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	3/7/14	3/13/14 11:21	KAL
Aroclor-1242 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	3/7/14	3/13/14 11:21	KAL
Aroclor-1248 [1]	2.1	0.43	mg/Kg dry	20	O-04	SW-846 8082A	3/7/14	3/13/14 11:21	KAL
Aroclor-1254 [2]	1.5	0.43	mg/Kg dry	20		SW-846 8082A	3/7/14	3/13/14 11:21	KAL
Aroclor-1260 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	3/7/14	3/13/14 11:21	KAL
Aroclor-1262 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	3/7/14	3/13/14 11:21	KAL
Aroclor-1268 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	3/7/14	3/13/14 11:21	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	110	30-150		3/13/14 11:21
Decachlorobiphenyl [2]	112	30-150		3/13/14 11:21
Tetrachloro-m-xylene [1]	107	30-150		3/13/14 11:21
Tetrachloro-m-xylene [2]	109	30-150		3/13/14 11:21

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B11A 0.5-1 | Sampled: 3/4/2014 11:30

Sample ID: 14C0169-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	92.2		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B11A 1-2' | Sampled: 3/4/2014 11:30

Sample ID: 14C0169-10

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:51	KAL
Aroclor-1221 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:51	KAL
Aroclor-1232 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:51	KAL
Aroclor-1242 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:51	KAL
Aroclor-1248 [2]	0.14	0.12	mg/Kg dry	5	O-03	SW-846 8082A	3/7/14	3/11/14 1:51	KAL
Aroclor-1254 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:51	KAL
Aroclor-1260 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:51	KAL
Aroclor-1262 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:51	KAL
Aroclor-1268 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:51	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	79.0	30-150		3/11/14 1:51
Decachlorobiphenyl [2]	90.9	30-150		3/11/14 1:51
Tetrachloro-m-xylene [1]	57.0	30-150		3/11/14 1:51
Tetrachloro-m-xylene [2]	66.1	30-150		3/11/14 1:51

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B11A 1-2' | Sampled: 3/4/2014 11:30

Sample ID: 14C0169-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	84.1		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B11A 2-3' | Sampled: 3/4/2014 11:30

Sample ID: 14C0169-11

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 2:04	KAL
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 2:04	KAL
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 2:04	KAL
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 2:04	KAL
Aroclor-1248 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 2:04	KAL
Aroclor-1254 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 2:04	KAL
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 2:04	KAL
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 2:04	KAL
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 2:04	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	88.6	30-150		3/11/14 2:04
Decachlorobiphenyl [2]	94.2	30-150		3/11/14 2:04
Tetrachloro-m-xylene [1]	77.7	30-150		3/11/14 2:04
Tetrachloro-m-xylene [2]	93.4	30-150		3/11/14 2:04

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B11A 2-3' | Sampled: 3/4/2014 11:30

Sample ID: 14C0169-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	85.6		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B20A 0-0.5 | Sampled: 3/4/2014 12:15

Sample ID: 14C0169-12

Sample Matrix: Soil

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:02	KAL
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:02	KAL
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:02	KAL
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:02	KAL
Aroclor-1248 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:02	KAL
Aroclor-1254 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:02	KAL
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:02	KAL
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:02	KAL
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:02	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	82.5	30-150		3/11/14 17:02
Decachlorobiphenyl [2]	108	30-150		3/11/14 17:02
Tetrachloro-m-xylene [1]	96.3	30-150		3/11/14 17:02
Tetrachloro-m-xylene [2]	107	30-150		3/11/14 17:02

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B20A 0-0.5 | Sampled: 3/4/2014 12:15

Sample ID: 14C0169-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	93.3		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B20A 0.5-1' | Sampled: 3/4/2014 12:15

Sample ID: 14C0169-13

Sample Matrix: Soil

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:15	KAL
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:15	KAL
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:15	KAL
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:15	KAL
Aroclor-1248 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:15	KAL
Aroclor-1254 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:15	KAL
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:15	KAL
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:15	KAL
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:15	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	84.0	30-150		3/11/14 17:15
Decachlorobiphenyl [2]	110	30-150		3/11/14 17:15
Tetrachloro-m-xylene [1]	97.3	30-150		3/11/14 17:15
Tetrachloro-m-xylene [2]	110	30-150		3/11/14 17:15

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B20A 0.5-1' | Sampled: 3/4/2014 12:15

Sample ID: 14C0169-13

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	91.8		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B20A 1-2' | Sampled: 3/4/2014 12:15

Sample ID: 14C0169-14

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:28	KAL
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:28	KAL
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:28	KAL
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:28	KAL
Aroclor-1248 [2]	0.26	0.11	mg/Kg dry	5	O-04	SW-846 8082A	3/7/14	3/11/14 17:28	KAL
Aroclor-1254 [2]	0.20	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:28	KAL
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:28	KAL
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:28	KAL
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:28	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	41.3	30-150		3/11/14 17:28
Decachlorobiphenyl [2]	98.5	30-150		3/11/14 17:28
Tetrachloro-m-xylene [1]	45.0	30-150		3/11/14 17:28
Tetrachloro-m-xylene [2]	48.5	30-150		3/11/14 17:28

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B20A 1-2' | Sampled: 3/4/2014 12:15

Sample ID: 14C0169-14

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	91.9		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B20A 1-2' DUP | Sampled: 3/4/2014 12:15

Sample ID: 14C0169-15

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:41	KAL
Aroclor-1221 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:41	KAL
Aroclor-1232 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:41	KAL
Aroclor-1242 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:41	KAL
Aroclor-1248 [1]	0.27	0.10	mg/Kg dry	5	O-04	SW-846 8082A	3/7/14	3/11/14 17:41	KAL
Aroclor-1254 [2]	0.21	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:41	KAL
Aroclor-1260 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:41	KAL
Aroclor-1262 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:41	KAL
Aroclor-1268 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 17:41	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	64.0	30-150		3/11/14 17:41
Decachlorobiphenyl [2]	99.6	30-150		3/11/14 17:41
Tetrachloro-m-xylene [1]	72.9	30-150		3/11/14 17:41
Tetrachloro-m-xylene [2]	78.7	30-150		3/11/14 17:41

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B20A 1-2' DUP | Sampled: 3/4/2014 12:15

Sample ID: 14C0169-15

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	94.1		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B20A 2-3' | Sampled: 3/4/2014 12:15

Sample ID: 14C0169-16

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	5.4	mg/Kg dry	250		SW-846 8082A	3/7/14	3/11/14 17:54	KAL
Aroclor-1221 [1]	ND	5.4	mg/Kg dry	250		SW-846 8082A	3/7/14	3/11/14 17:54	KAL
Aroclor-1232 [1]	ND	5.4	mg/Kg dry	250		SW-846 8082A	3/7/14	3/11/14 17:54	KAL
Aroclor-1242 [1]	ND	5.4	mg/Kg dry	250		SW-846 8082A	3/7/14	3/11/14 17:54	KAL
Aroclor-1248 [1]	40	5.4	mg/Kg dry	250		SW-846 8082A	3/7/14	3/11/14 17:54	KAL
Aroclor-1254 [2]	20	5.4	mg/Kg dry	250		SW-846 8082A	3/7/14	3/11/14 17:54	KAL
Aroclor-1260 [1]	ND	5.4	mg/Kg dry	250		SW-846 8082A	3/7/14	3/11/14 17:54	KAL
Aroclor-1262 [1]	ND	5.4	mg/Kg dry	250		SW-846 8082A	3/7/14	3/11/14 17:54	KAL
Aroclor-1268 [1]	ND	5.4	mg/Kg dry	250		SW-846 8082A	3/7/14	3/11/14 17:54	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	*	30-150	S-01	3/11/14 17:54
Decachlorobiphenyl [2]	*	30-150	S-01	3/11/14 17:54
Tetrachloro-m-xylene [1]	*	30-150	S-01	3/11/14 17:54
Tetrachloro-m-xylene [2]	*	30-150	S-01	3/11/14 17:54

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B20A 2-3' | Sampled: 3/4/2014 12:15

Sample ID: 14C0169-16

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	91.0		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B21A 0-0.5 | Sampled: 3/4/2014 09:30

Sample ID: 14C0169-17

Sample Matrix: Soil

Sample Flags: Z-01

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 18:07	KAL
Aroclor-1221 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 18:07	KAL
Aroclor-1232 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 18:07	KAL
Aroclor-1242 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 18:07	KAL
Aroclor-1248 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 18:07	KAL
Aroclor-1254 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 18:07	KAL
Aroclor-1260 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 18:07	KAL
Aroclor-1262 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 18:07	KAL
Aroclor-1268 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 18:07	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	90.2	30-150		3/11/14 18:07
Decachlorobiphenyl [2]	107	30-150		3/11/14 18:07
Tetrachloro-m-xylene [1]	96.6	30-150		3/11/14 18:07
Tetrachloro-m-xylene [2]	106	30-150		3/11/14 18:07

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B21A 0-0.5 | Sampled: 3/4/2014 09:30

Sample ID: 14C0169-17

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	94.7		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B21A 0.5-1' | Sampled: 3/4/2014 09:30

Sample ID: 14C0169-18

Sample Matrix: Soil

Sample Flags: Z-01

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 18:19	KAL
Aroclor-1221 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 18:19	KAL
Aroclor-1232 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 18:19	KAL
Aroclor-1242 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 18:19	KAL
Aroclor-1248 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 18:19	KAL
Aroclor-1254 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 18:19	KAL
Aroclor-1260 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 18:19	KAL
Aroclor-1262 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 18:19	KAL
Aroclor-1268 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 18:19	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	96.0	30-150		3/11/14 18:19
Decachlorobiphenyl [2]	118	30-150		3/11/14 18:19
Tetrachloro-m-xylene [1]	99.6	30-150		3/11/14 18:19
Tetrachloro-m-xylene [2]	106	30-150		3/11/14 18:19

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B21A 0.5-1' | Sampled: 3/4/2014 09:30

Sample ID: 14C0169-18

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	93.2		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B21A 1-2' | Sampled: 3/4/2014 09:30

Sample ID: 14C0169-19

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/13/14 11:34	KAL
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/13/14 11:34	KAL
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/13/14 11:34	KAL
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/13/14 11:34	KAL
Aroclor-1248 [1]	0.38	0.11	mg/Kg dry	5	O-04	SW-846 8082A	3/7/14	3/13/14 11:34	KAL
Aroclor-1254 [2]	0.27	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/13/14 11:34	KAL
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/13/14 11:34	KAL
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/13/14 11:34	KAL
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/13/14 11:34	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	88.8	30-150		3/13/14 11:34
Decachlorobiphenyl [2]	105	30-150		3/13/14 11:34
Tetrachloro-m-xylene [1]	86.9	30-150		3/13/14 11:34
Tetrachloro-m-xylene [2]	89.7	30-150		3/13/14 11:34

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B21A 1-2' | Sampled: 3/4/2014 09:30

Sample ID: 14C0169-19

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	92.4		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B21A 2-3' | Sampled: 3/4/2014 09:30

Sample ID: 14C0169-20

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 18:32	KAL
Aroclor-1221 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 18:32	KAL
Aroclor-1232 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 18:32	KAL
Aroclor-1242 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 18:32	KAL
Aroclor-1248 [1]	4.0	1.1	mg/Kg dry	50	O-04	SW-846 8082A	3/7/14	3/11/14 18:32	KAL
Aroclor-1254 [2]	7.5	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 18:32	KAL
Aroclor-1260 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 18:32	KAL
Aroclor-1262 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 18:32	KAL
Aroclor-1268 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 18:32	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	*	30-150	S-01	3/11/14 18:32
Decachlorobiphenyl [2]	*	30-150	S-01	3/11/14 18:32
Tetrachloro-m-xylene [1]	*	30-150	S-01	3/11/14 18:32
Tetrachloro-m-xylene [2]	*	30-150	S-01	3/11/14 18:32

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0169

Date Received: 3/6/2014

Field Sample #: B21A 2-3' | Sampled: 3/4/2014 09:30

Sample ID: 14C0169-20

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	91.7		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
14C0169-01 [B16A 4-5']	B091523	03/08/14
14C0169-02 [B10A 0-0.5']	B091523	03/08/14
14C0169-03 [B10A 0.5-1']	B091523	03/08/14
14C0169-04 [B10A 1-2']	B091523	03/08/14
14C0169-05 [B10A 2-3']	B091523	03/08/14
14C0169-06 [B10A 2-3' DUP]	B091523	03/08/14
14C0169-07 [B11A 0-0.5]	B091523	03/08/14
14C0169-08 [B11A 0-0.5 DUP]	B091523	03/08/14
14C0169-09 [B11A 0.5-1]	B091523	03/08/14
14C0169-10 [B11A 1-2']	B091523	03/08/14
14C0169-11 [B11A 2-3']	B091523	03/08/14
14C0169-12 [B20A 0-0.5]	B091523	03/08/14
14C0169-13 [B20A 0.5-1']	B091523	03/08/14
14C0169-14 [B20A 1-2']	B091523	03/08/14
14C0169-15 [B20A 1-2' DUP]	B091523	03/08/14
14C0169-16 [B20A 2-3']	B091523	03/08/14
14C0169-17 [B21A 0-0.5]	B091523	03/08/14
14C0169-18 [B21A 0.5-1']	B091523	03/08/14
14C0169-19 [B21A 1-2']	B091523	03/08/14
14C0169-20 [B21A 2-3']	B091523	03/08/14

Prep Method: SW-846 3540C-SW-846 8082A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
14C0169-01 [B16A 4-5']	B091492	10.0	10.0	03/07/14
14C0169-02 [B10A 0-0.5']	B091492	10.2	10.0	03/07/14
14C0169-03 [B10A 0.5-1']	B091492	10.1	10.0	03/07/14
14C0169-04 [B10A 1-2']	B091492	10.1	10.0	03/07/14
14C0169-05 [B10A 2-3']	B091492	10.4	10.0	03/07/14
14C0169-06 [B10A 2-3' DUP]	B091492	10.3	10.0	03/07/14
14C0169-07 [B11A 0-0.5]	B091492	10.1	10.0	03/07/14
14C0169-08 [B11A 0-0.5 DUP]	B091492	10.3	10.0	03/07/14
14C0169-09 [B11A 0.5-1]	B091492	10.1	10.0	03/07/14
14C0169-10 [B11A 1-2']	B091492	10.1	10.0	03/07/14
14C0169-11 [B11A 2-3']	B091492	10.5	10.0	03/07/14
14C0169-12 [B20A 0-0.5]	B091492	10.1	10.0	03/07/14
14C0169-13 [B20A 0.5-1']	B091492	10.3	10.0	03/07/14
14C0169-14 [B20A 1-2']	B091492	10.1	10.0	03/07/14
14C0169-15 [B20A 1-2' DUP]	B091492	10.2	10.0	03/07/14
14C0169-16 [B20A 2-3']	B091492	10.2	10.0	03/07/14
14C0169-17 [B21A 0-0.5]	B091492	10.4	10.0	03/07/14
14C0169-18 [B21A 0.5-1']	B091492	10.4	10.0	03/07/14
14C0169-19 [B21A 1-2']	B091492	10.1	10.0	03/07/14
14C0169-20 [B21A 2-3']	B091492	10.2	10.0	03/07/14

con-test® ANALYTICAL LABORATORY

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

QUALITY CONTROL

Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B091492 - SW-846 3540C										
Blank (B091492-BLK1)				Prepared: 03/07/14 Analyzed: 03/10/14						
Aroclor-1016	ND	0.020	mg/Kg wet							
Aroclor-1016 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1221	ND	0.020	mg/Kg wet							
Aroclor-1221 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1232	ND	0.020	mg/Kg wet							
Aroclor-1232 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1242	ND	0.020	mg/Kg wet							
Aroclor-1242 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1248	ND	0.020	mg/Kg wet							
Aroclor-1248 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1254	ND	0.020	mg/Kg wet							
Aroclor-1254 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1260	ND	0.020	mg/Kg wet							
Aroclor-1260 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1262	ND	0.020	mg/Kg wet							
Aroclor-1262 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1268	ND	0.020	mg/Kg wet							
Aroclor-1268 [2C]	ND	0.020	mg/Kg wet							
Surrogate: Decachlorobiphenyl	*0.145*		mg/Kg wet	0.200		72.3	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.146*		mg/Kg wet	0.200		73.2	30-150			
Surrogate: Tetrachloro-m-xylene	*0.148*		mg/Kg wet	0.200		74.0	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.176*		mg/Kg wet	0.200		88.1	30-150			
LCS (B091492-BS1)				Prepared: 03/07/14 Analyzed: 03/10/14						
Aroclor-1016	0.15	0.10	mg/Kg wet	0.200		73.8	40-140			
Aroclor-1016 [2C]	0.18	0.10	mg/Kg wet	0.200		88.8	40-140			
Aroclor-1260	0.15	0.10	mg/Kg wet	0.200		76.0	40-140			
Aroclor-1260 [2C]	0.17	0.10	mg/Kg wet	0.200		87.4	40-140			
Surrogate: Decachlorobiphenyl	*0.157*		mg/Kg wet	0.200		78.4	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.159*		mg/Kg wet	0.200		79.3	30-150			
Surrogate: Tetrachloro-m-xylene	*0.136*		mg/Kg wet	0.200		68.0	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.163*		mg/Kg wet	0.200		81.4	30-150			
LCS Dup (B091492-BSD1)				Prepared: 03/07/14 Analyzed: 03/10/14						
Aroclor-1016	0.16	0.10	mg/Kg wet	0.200		78.6	40-140	6.32	30	
Aroclor-1016 [2C]	0.19	0.10	mg/Kg wet	0.200		95.2	40-140	7.00	30	
Aroclor-1260	0.16	0.10	mg/Kg wet	0.200		79.7	40-140	4.75	30	
Aroclor-1260 [2C]	0.18	0.10	mg/Kg wet	0.200		90.8	40-140	3.85	30	
Surrogate: Decachlorobiphenyl	*0.159*		mg/Kg wet	0.200		79.4	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.158*		mg/Kg wet	0.200		79.1	30-150			
Surrogate: Tetrachloro-m-xylene	*0.150*		mg/Kg wet	0.200		75.2	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.180*		mg/Kg wet	0.200		90.0	30-150			

con-test® ANALYTICAL LABORATORY

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

QUALITY CONTROL

Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD		RPD Limit	Notes
Batch B091492 - SW-846 3540C												
Matrix Spike (B091492-MS1)	**Source: 14C0169-01**			Prepared: 03/07/14 Analyzed: 03/11/14								
Aroclor-1016	0.44	0.11	mg/Kg dry	0.226	0.0	**193**	*	40-140				MS-21
Aroclor-1016 [2C]	0.55	0.11	mg/Kg dry	0.226	0.0	**243**	*	40-140				MS-21
Aroclor-1260	0.23	0.11	mg/Kg dry	0.226	0.0	101		40-140				
Aroclor-1260 [2C]	0.24	0.11	mg/Kg dry	0.226	0.0	106		40-140				
Surrogate: Decachlorobiphenyl	*0.198*		mg/Kg dry	0.226		87.9		30-150				
Surrogate: Decachlorobiphenyl [2C]	*0.217*		mg/Kg dry	0.226		96.3		30-150				
Surrogate: Tetrachloro-m-xylene	*0.102*		mg/Kg dry	0.226		45.0		30-150				
Surrogate: Tetrachloro-m-xylene [2C]	*0.117*		mg/Kg dry	0.226		51.8		30-150				
Matrix Spike Dup (B091492-MSD1)	**Source: 14C0169-01**			Prepared: 03/07/14 Analyzed: 03/11/14								
Aroclor-1016	0.73	0.11	mg/Kg dry	0.226	0.0	**322**	*	40-140	**50.1**	*	50	MS-21, R-06
Aroclor-1016 [2C]	0.90	0.11	mg/Kg dry	0.226	0.0	**399**	*	40-140	48.6		50	MS-21
Aroclor-1260	0.34	0.11	mg/Kg dry	0.226	0.0	**153**	*	40-140	40.7		50	MS-21
Aroclor-1260 [2C]	0.37	0.11	mg/Kg dry	0.226	0.0	**162**	*	40-140	42.2		50	MS-21
Surrogate: Decachlorobiphenyl	*0.186*		mg/Kg dry	0.226		82.6		30-150				
Surrogate: Decachlorobiphenyl [2C]	*0.221*		mg/Kg dry	0.226		98.1		30-150				
Surrogate: Tetrachloro-m-xylene	*0.180*		mg/Kg dry	0.226		79.8		30-150				
Surrogate: Tetrachloro-m-xylene [2C]	*0.212*		mg/Kg dry	0.226		94.0		30-150				

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

QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B091523 - % Solids										
Duplicate (B091523-DUP6)	**Source: 14C0169-10**			Prepared: 03/08/14 Analyzed: 03/10/14						
% Solids	88.0		% Wt		84.1			4.53	20	
Duplicate (B091523-DUP7)	**Source: 14C0169-12**			Prepared: 03/08/14 Analyzed: 03/10/14						
% Solids	93.3		% Wt		93.3			0.00	20	
Duplicate (B091523-DUP8)	**Source: 14C0169-20**			Prepared: 03/08/14 Analyzed: 03/10/14						
% Solids	92.4		% Wt		91.7			0.760	20	

con-test® ANALYTICAL LABORATORY
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
	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.
MS-21	Matrix spike and/or spike duplicate recovery bias high due to contribution of other Aroclors present in the source sample.
O-03	Sample contains two incompletely resolved aroclors. Aroclor with the closest matching pattern is reported.
O-04	Sample fingerprint does not match standard exactly. Sample was quantitated against the closest matching standard.
O-32	A five times dilution was performed as part of the standard analytical procedure.
R-06	Matrix spike duplicate RPD is outside of control limits. Reduced precision is anticipated for reported result for this compound in this sample.
S-01	The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.
Z-01	Sample was diluted due to sample matrix interference. Requested reporting limit was met.

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

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8082A in Soil	
Aroclor-1016	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1016 [2C]	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1221	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1221 [2C]	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1232	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1232 [2C]	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1242	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1242 [2C]	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1248	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1248 [2C]	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1254	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1254 [2C]	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1260	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1260 [2C]	CT,NH,NY,ME,NC,VA,NJ

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

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2016
MA	Massachusetts DEP	M-MA100	06/30/2014
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2015
NY	New York State Department of Health	10899 NELAP	04/1/2014
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2015
RI	Rhode Island Department of Health	LAO00112	12/30/2014
NC	North Carolina Div. of Water Quality	652	12/31/2014
NJ	New Jersey DEP	MA007 NELAP	06/30/2014
FL	Florida Department of Health	E871027 NELAP	06/30/2014
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2014
WA	State of Washington Department of Ecology	C2065	02/23/2015
ME	State of Maine	2011028	06/9/2015
VA	Commonwealth of Virginia	460217	12/14/2014
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2014

con-test® ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com

CHAIN OF CUSTODY RECORD

14C0169
Rev 04.05.12

39 Spruce Street
East longmeadow, MA 01028

Company Name: GEC
Telephone:
Address: 60 BROOKS DRIVE
Project # 911JR-3117
Client PO#
Attention:
Project Location: BOOT MILLS, LOWELL
Sampled By: MBRADLEY

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

DATA DELIVERY (check all that apply)
○ FAX ◉ EMAIL ○ WEBSITE
Fax #
Email:
Format: ◉ PDF ◉ EXCEL ○ GIS
○ OTHER
○ "Enhanced Data Package"

ANALYSIS REQUESTED

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	EPA METHOD 3/4										
								9	1									
								—	—									
								A	A									
-01	B-16A 4-5'				X	S	U	X										
-02	B-10A 0-0.5'	3-4-14	1155		X	S	U	X										
-03	B-10A 0.5'-1	3-4-14	1155		X	S	U	X										
-04	B-10A 1-2'	3-4-14	1155		X	S	U	X										
-05	B-10A 2-3'	3-4-14	1155		X	S	U	X										
-06	B-10A 2-3' DUP	3-4-14	1155		X	S	U	X										
-07	B-11A 0-0.5'	3-4-14	1130		X	S	U	X	X									
-08	B-11A ~~0.5'-1~~ 0-0.5' DUP	3-4-14	1130		X	S	U		X									
-09	B-11A 0.5'-1	3-4-14	1130		X	S	U	X										
-10	B-11A 1-2'	3-4-14	1130		X	S	U	X										

# of Containers
** Preservation
***Container Code

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
[signature]	
Received by: (signature) [signature] 3/6/14	Date/Time: 1310
Relinquished by: (signature) [signature] 3/6/14	Date/Time: 2030
Received by: (signature) [signature] 3/6/14	Date/Time: 2030

Turnaround ††
☐ 7-Day
☐ 10-Day
☒ Other 5

RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
◉ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID #

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

con-test ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com

CHAIN OF CUSTODY RECORD

14C0169

Rev 04.05.12

39 Spruce Street
East longmeadow, MA 01028

Company Name: GEC

Address:

Attention:

Project Location: BOOTT MILLS, LOWELL

Sampled By: MBRADLEY

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Telephone:

Project # 911JR-3117

Client PO#

DATA DELIVERY (check all that apply)
○ FAX ○ EMAIL ○ WEBSITE
Fax #
Email:
Format: ○ PDF ○ EXCEL ○ GIS
○ OTHER
○ "Enhanced Data Package"

ANALYSIS REQUESTED

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	RPA METHOD 3450										
-11	B-11A 2-3'	3-4-14	1130		X	S	U	X										
-12	B-20A 0-0.5'	3-4-14	1215		X	S	U	X										
-13	B-20A 0.5'-1	3-4-14	1215		X	S	U	X										
-14	B-20A 1-2'	3-4-14	1215		X	S	U	X										
-15	B-20A 1-2' DUP	3-4-14	1215		X	S	U	X										
-16	B-20A 2-3'	3-4-14	1215		X	S	U	X										
-17	B-21A 0-0.5'	3-5-14	0930		X	S	U	X	X									
-18	B-21A 0.5'-1	3-5-14	0930		X	S	U	X										
-19	B-21A 1-2'	3-5-14	0930		X	S	U	X										
-20	B-21A 2-3'	3-5-14	0930		X	S	U	X										

# of Containers
** Preservation
***Container Code

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
[signature]	
Received by: (signature) [signature] 3/6/14	Date/Time: 1310
Relinquished by: (signature) [signature] 3/6/14	Date/Time: 7030
Received by: (signature) [signature] 3/6/14	Date/Time: 2030

Turnaround ††
☐ 7-Day
☐ 10-Day
☐ Other ____

RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
◉ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

Page 53 of 60 14C0169_2 Contest_Final 03 13 14 1821 03/13/14 18:21:39

con-test ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com

CHAIN OF CUSTODY RECORD

39 Spruce Street
East longmeadow, MA 01028

Rev 04.05.12

Company Name: GEC
Address: 60 BROOKS DRIVE
BRAINTREE, MA 02184
Attention:
Project Location: BOOTT MILLS, LOWELL
Sampled By: MR BRADLEY

Telephone:
Project # 911JR-3117
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ● EMAIL ○ WEBSITE
Fax #
Email:
Format ● PDF ● EXCEL ○ GIS
○ OTHER
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Cons Code	ANALYSIS REQUESTED: CT-A Method 3150	CT-A Method 3550	# of Containers	** Preservation	*** Container Code
	B-49A 0-1'	3-4-14	1350		X	S	U	X	X			
	B-49A 1-2'	3-4-14	1330		X	S	U	X				
	B-49A 2-3'	3-4-14	1330		X	S	U	X				
	B-50A 0-1'	3-4-14	1310		X	S	U	X	X			
	B-50A 1-2'	3-4-14	1340		X	S	U	X				
	B-50 2-3'	3-4-14	1310		X	S	U	X				
	B-50A 2-3' DUP	3-4-14	1340		X	S	U	X				
	B50A 5-7'	3-4-14	1310		X	S	U	X				
	B-50A 7-9'	3-4-14	1340		X	S	U	X				
						~~S~~	~~U~~					

Comments:
METHOD AS REQUIRED BY TSCA & USEPA REGION 1
SOXHLET EXTRACTION EPA METHOD 3150

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High: M - Medium: L - Low: C - Clean: U - Unknown

Dissolved Metal
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V=vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfa
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other

		Date/Time:
Relinquished by: (signature)		
Received by: (signature)		Date/Time: 3/6/14 1310
Relinquished by: (signature)		Date/Time: 3/6/14 2080
Received by: (signature)	3.9°C	Date/Time: 3/6/14 2080

Turnaround ††
☐ 7-Day
☐ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
● MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # ____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

Page 54 of 60 14C0169_2 Contest_Final 03 13 14 1821 03/13/14 18:21:39

CHAIN OF CUSTODY RECORD

con-test® ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

Rev 04.05.12

Company Name: GEC
Address:
Attention:
Project Location: BOOTT MILLS, LOWELL
Sampled By: MBRADLEY

Telephone: 781-356-9140
Project #: 911JL-3117
Client PO#:

DATA DELIVERY (check all that apply)
○ FAX ◉ EMAIL ○ WEBSITE
Fax #:
Email:
Format: ◉ PDF ◉ EXCEL ○ GIS ○ OTHER ○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Cont. Code	# of Containers: 10	** Preservation: 1	***Container Code: A	ANALYSIS REQUESTED: Cd, Cr, Pb, Ni, As, Se, Ag, Hg, Sb, Cu, Be, Tl, Zn, Mn, Co, V, Sn, Mo, Ba, Fe, Al, Ca, Mg, K, Na, Dissolved Metals (○ Field Filtered ○ Lab to Filter)
	B-2A 0-1'	3-4-14	1015		X	S	U	X	X		
	B-2A 1-2'	3-4-14	1015		X	S	U	X			
	B-2A 2-3'	3-4-14	1015		X	S	U	X			
	B-2A 3-4'	3-4-14	1015		X	S	U	X			
	B-2A 4-5'	3-4-14	1015		X	S	U	X			
	B-2A 4-5' DUP	3-4-14	1015		X	S	U	X			
	B-16A 0-1'	3-4-14	1040		X	S	U	X	X		
	B-16A 1-2'	3-4-14	1040		X	S	U	X			
	B-16A 2-3	3-4-14	1040		X	S	U	X			
	B-16A 3-4'	3-4-14	1040			S	U	X			

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfa
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High: M - Medium: L - Low: C - Clean: U - Unknown

Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time: 3/6/14 1310
Relinquished by: (signature)	Date/Time: 3/6/14 2030
Received by: (signature) 3.9°C	Date/Time: 3/6/14 2030

Turnaround ††
☐ 7-Day
☐ 10-Day
☐ Other
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
◉ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

Page 55 of 60 14C0169_2 Contest_Final 03 13 14 1821 03/13/14 18:21:39

con-test ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com

CHAIN OF CUSTODY RECORD

39 Spruce Street
East longmeadow, MA 01028

Rev 04.05.12

Company Name: GEC
Address: 60 BROOKS DRIVE
Attention:
Project Location: BOOTT MILLS, LOWELL
Sampled By: MBRADLEY

Telephone:
Project # 911JR-3117
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ○ EMAIL ○ WEBSITE
Fax #
Email:
Format ○ PDF ○ EXCEL ○ GIS
○ OTHER
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

ANALYSIS REQUESTED

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	EPA Method 3450										
	B-48A 0-0.5'	3-4-14	1230		X			X										
	B-48A 0-0.5' DUP	3-4-14	1230		X			X										
	B-48A 0.5-1'	3-4-14	1230		X			X										
	B-48A 1-2'	3-4-14	1230		X			X										
	B48A 2-3'	3-4-14	1230		X			X										
	~~B-48A~~ COMP 1A 0-0.5'	3-5-14	0900	X				X										
	COMP 1A 0.5'-1	3-5-14	0900	X				X										
	COMP 1A 1-2'	3-5-14	0900	X				X										
	COMP 1A 2-3'	3-5-14	0900	X				X										
	COMP 1A 3-4'	3-5-14	0900	X				X										

# of Containers
** Preservation
***Container Code

Dissolved Metal
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfa
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

H - High: M - Medium: L - Low: C - Clean: U - Unknown

Relinquished by: (signature)	Date/Time:
[signature]	
Received by: (signature) [signature] 3/6/14	Date/Time: 1316
Relinquished by: (signature) [signature] 3/6/14	Date/Time: 2030
Received by: (signature) [signature] 3/6/14	Date/Time: 2030

Turnaround ††
☐ 7-Day
☐ 10-Day
☐ Other
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID #

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

Page 56 of 60 14C0169_2 Contest_Final 03 13 14 1821 03/13/14 18:21:39

con-test® ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com

CHAIN OF CUSTODY RECORD

39 Spruce Street
East longmeadow, MA 01028

Rev 04.05.12

Company Name: GEC
Address:
Attention:
Project Location: BOOTT MILLS, LOWELL
Sampled By: MBRADLEY

Telephone:
Project # 911JR-3117
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ○ EMAIL ○ WEBSITE
Fax #
Email:
Format: ● PDF ● EXCEL ○ GIS
○ OTHER
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

ANALYSIS REQUESTED

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	EPC MEHOD 3450										
	COMP 1A 4-5'	3-5-14	0900	X		S	U	X										
	COMP 2A ~~0.5-1~~ 0-0.5'	3-5-14	0945	X		S	U	X										
	COMP 2A ~~0-0.5~~ 0.5'-1'		0945	X		S	U	X										
	COMP 5A 0-0.5'	3-5-14	0945	X		S	U	X										
	COMP 5A 0.5-1	3-5-14	0945	X		S	U	X										
	COMP 5A 1-2'	3-5-14	0945	X		S	U	X										
	COMP 5A 2-3'	3-5-14	0945	X		S	U	X										
	COMP 6A 0-0.5'	3-5-14	1130	X		S	U	X	X									
	COMP 6A 0.5-1'	3-5-14	1130	X		S	U	X										
	COMP 6A 1-2'	3-5-14	1130	X		S	U	X										
	COMP 6A 2-3'	3-5-14	1130	X		S	U	X										

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

H - High: M - Medium: L - Low: C - Clean: U - Unknown

# of Containers
** Preservation
***Container Code

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfa
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other

Relinquished by: (signature)	Date/Time:
[signature]	
Received by: (signature) [signature] 3/6/14	Date/Time: 1310
Relinquished by: (signature) [signature] 3/6/14	Date/Time: 2030
Received by: (signature) [signature] 3/6/14	Date/Time: 2030

Turnaround ††
☐ 7-Day
☐ 10-Day
☐ Other
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
● MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID #

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT. TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

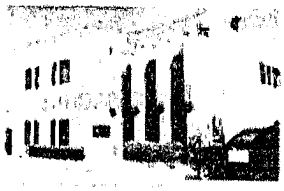
PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

Page 57 of 60 14C0169_2 Contest_Final 03 13 14 1821 03/13/14 18:21:39

39 Spruce St.
East Longmeadow, MA. 01028
P: 413-525-2332
F: 413-525-6405
www.contestlabs.com

con-test ANALYTICAL LABORATORY

Sample Receipt Checklist



CLIENT NAME: GEC RECEIVED BY: MJ DATE: 03/06/14

1) **Was the chain(s) of custody relinquished and signed?** (Yes) No No CoC Included

2) **Does the chain agree with the samples?** (Yes) No
If not, explain:

3) **Are all the samples in good condition?** (Yes) No
If not, explain:

4) **How were the samples received:**
On Ice ☑ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☑

Were the samples received in Temperature Compliance of (2-6°C)? (Yes) No N/A

Temperature °C by Temp blank _____ Temperature °C by Temp gun 3.9°C

5) **Are there Dissolved samples for the lab to filter?** Yes (No)
Who was notified _____ Date _____ Time _____

6) **Are there any RUSH or SHORT HOLDING TIME samples?** Yes (No)
Who was notified _____ Date _____ Time _____

7) **Location where samples are stored:** 19

Permission to subcontract samples? Yes No
(Walk-in clients only) if not already approved
Client Signature: _____

8) **Do all samples have the proper Acid pH:** Yes No (N/A) _____

9) **Do all samples have the proper Base pH:** Yes No (N/A) _____

10) **Was the PC notified of any discrepancies with the CoC vs the samples:** Yes No (N/A)

Containers received at Con-Test

	# of containers			# of containers
1 Liter Amber			8 oz amber/clear jar	4 A
500 mL Amber			4 oz amber/clear jar	16 A
250 mL Amber (8oz amber)			2 oz amber/clear jar	
1 Liter Plastic			Plastic Bag / Ziploc	
500 mL Plastic			SOC Kit	
250 mL plastic			Non-ConTest Container	
40 mL Vial - type listed below			Perchlorate Kit	
Colisure / bacteria bottle			Flashpoint bottle	
Dissolved Oxygen bottle			Other glass jar	
Encore			Other	

Laboratory Comments:

40 mL vials: # HCl _____ # Methanol _____
Bisulfate _____ # DI Water _____
Thiosulfate _____ Unpreserved

Time and Date Frozen:

Login Sample Receipt Checklist

(Rejection Criteria Listing - Using Sample Acceptance Policy)

Any False statement will be brought to the attention of Client

Question	Answer (True/False) T/F/NA	Comment
1) The cooler's custody seal, if present, is intact.	T	
2) The cooler or samples do not appear to have been compromised or tampered with.	T	
3) Samples were received on ice.	T	
4) Cooler Temperature is acceptable.	T	
5) Cooler Temperature is recorded.	T	
6) COC is filled out in ink and legible.	T	
7) COC is filled out with all pertinent information.	T	
8) Field Sampler's name present on COC.	T	
9) There are no discrepancies between the sample IDs on the container and the COC.	T	
10) Samples are received within Holding Time.	T	
11) Sample containers have legible labels.	T	
12) Containers are not broken or leaking.	T	
13) Air Cassettes are not broken/open.	NA	
14) Sample collection date/times are provided.	T	
15) Appropriate sample containers are used.	T	
16) Proper collection media used.	T	
17) No headspace sample bottles are completely filled.	T	
18) There is sufficient volume for all requsted analyses, including any requested MS/MSDs.	T	
19) Trip blanks provided if applicable.	T	
20) VOA sample vials do not have head space or bubble is <6mm (1/4") in diameter.	NA	
21) Samples do not require splitting or compositing.	T	

Who notified of False statements? **Date/Time:**

Doc #277 Rev. 4 August 2013 **Log-In Technician Initials:** **Date/Time:**

MJ 03/06/14 2030

MADEP MCP Analytical Method Report Certification Form

Laboratory Name: Con-Test Analytical Laboratory	Project #: 14C0169
Project Location: Lowell-Boot Mills	RTN:

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

14C0169-01 thru 14C0169-20

Matrices: Soil

CAM Protocol (check all that below)

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

Printed Name: Daren J. Damboragian Date: 03/13/14

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

March 13, 2014

Mike Bradley
Goldman Environmental
60 Brooks Drive
Braintree, MA 02184

Project Location: Lowell-Boot Mills
Client Job Number:
Project Number: 911JR-3117
Laboratory Work Order Number: 14C0170

Enclosed are results of analyses for samples received by the laboratory on March 6, 2014. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

James M. Georgantas
Project Manager

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

Goldman Environmental
60 Brooks Drive
Braintree, MA 02184
ATTN: Mike Bradley

REPORT DATE: 3/13/2014

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 911JR-3117

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 14C0170

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

PROJECT LOCATION: Lowell-Boot Mills

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
B48A 0-0.5'	14C0170-01	Soil		SM 2540G	
				SW-846 8082A	
B48A 0-0.5' DUP	14C0170-02	Soil		SM 2540G	
				SW-846 8082A	
B48A 0.5-1'	14C0170-03	Soil		SM 2540G	
				SW-846 8082A	
B48A 1-2'	14C0170-04	Soil		SM 2540G	
				SW-846 8082A	
B48A 2-3'	14C0170-05	Soil		SM 2540G	
				SW-846 8082A	
Comp 1A 0-0.5'	14C0170-06	Soil		SM 2540G	
				SW-846 8082A	
Comp 1A 0.5-1'	14C0170-07	Soil		SM 2540G	
				SW-846 8082A	
Comp 1A 1-2'	14C0170-08	Soil		SM 2540G	
				SW-846 8082A	
Comp 1A 2-3'	14C0170-09	Soil		SM 2540G	
				SW-846 8082A	
Comp 1A 3-4'	14C0170-10	Soil		SM 2540G	
				SW-846 8082A	
Comp 1A 4-5'	14C0170-11	Soil		SM 2540G	
				SW-846 8082A	
Comp 2A 0-0.5'	14C0170-12	Soil		SM 2540G	
				SW-846 8082A	
Comp 2A 0.5-1'	14C0170-13	Soil		SM 2540G	
				SW-846 8082A	
Comp 5A 0-0.5'	14C0170-14	Soil		SM 2540G	
				SW-846 8082A	
Comp 5A 0.5-1'	14C0170-15	Soil		SM 2540G	
				SW-846 8082A	
Comp 5A 1-2'	14C0170-16	Soil		SM 2540G	
				SW-846 8082A	
Comp 5A 2-3'	14C0170-17	Soil		SM 2540G	
				SW-846 8082A	
Comp 6A 0-0.5'	14C0170-18	Soil		SM 2540G	
				SW-846 8082A	
Comp 6A 0.5-1'	14C0170-19	Soil		SM 2540G	
				SW-846 8082A	
Comp 6A 1-2'	14C0170-20	Soil		SM 2540G	
				SW-846 8082A	

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

Goldman Environmental
60 Brooks Drive
Braintree, MA 02184
ATTN: Mike Bradley

REPORT DATE: 3/13/2014

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 911JR-3117

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 14C0170

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

PROJECT LOCATION: Lowell-Boot Mills

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
Comp 6A 2-3'	14C0170-21	Soil		SM 2540G SW-846 8082A	

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.

SW-846 8082A

Qualifications:

Sample fingerprint does not match standard exactly. Sample was quantitated against the closest matching standard.

Analyte & Samples(s) Qualified:

Aroclor-1248, Aroclor-1248 [2C], Aroclor-1254, Aroclor-1254 [2C]

14C0170-04[B48A 1-2'], 14C0170-05[B48A 2-3'], 14C0170-08[Comp 1A 1-2'], 14C0170-09[Comp 1A 2-3'], 14C0170-11[Comp 1A 4-5'], 14C0170-14[Comp 5A 0-0.5'], 14C0170-15[Comp 5A 0.5-1'], 14C0170-18[Comp 6A 0-0.5'], 14C0170-19[Comp 6A 0.5-1'], 14C0170-21[Comp 6A 2-3'], 14C0170-12[Comp 2A 0-0.5']

A five times dilution was performed as part of the standard analytical procedure.

Analyte & Samples(s) Qualified:

14C0170-16[Comp 5A 1-2'], 14C0170-17[Comp 5A 2-3']

Result was confirmed using a dissimilar column. Relative percent difference between the two results was >40%. In accordance with the method, the higher result was reported.

Analyte & Samples(s) Qualified:

Aroclor-1248 [2C]

14C0170-14[Comp 5A 0-0.5']

The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.

Analyte & Samples(s) Qualified:

Decachlorobiphenyl, Decachlorobiphenyl [2C], Tetrachloro-m-xylene, Tetrachloro-m-xylene [2C]

14C0170-09[Comp 1A 2-3'], 14C0170-10[Comp 1A 3-4'], 14C0170-13[Comp 2A 0.5-1'], 14C0170-21[Comp 6A 2-3']

Sample was diluted due to sample matrix interference. Requested reporting limit was met.

Analyte & Samples(s) Qualified:

14C0170-01[B48A 0-0.5'], 14C0170-02[B48A 0-0.5' DUP], 14C0170-03[B48A 0.5-1'], 14C0170-06[Comp 1A 0-0.5'], 14C0170-07[Comp 1A 0.5-1']

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

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.

Daren J. Damboragian
Laboratory Manager

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: B48A 0-0.5' | Sampled: 3/4/2014 12:30

Sample ID: 14C0170-01

Sample Matrix: Soil

Sample Flags: Z-01

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 10:40	MJC
Aroclor-1221 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 10:40	MJC
Aroclor-1232 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 10:40	MJC
Aroclor-1242 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 10:40	MJC
Aroclor-1248 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 10:40	MJC
Aroclor-1254 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 10:40	MJC
Aroclor-1260 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 10:40	MJC
Aroclor-1262 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 10:40	MJC
Aroclor-1268 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 10:40	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	91.8	30-150		3/11/14 10:40
Decachlorobiphenyl [2]	95.4	30-150		3/11/14 10:40
Tetrachloro-m-xylene [1]	100	30-150		3/11/14 10:40
Tetrachloro-m-xylene [2]	105	30-150		3/11/14 10:40

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: B48A 0-0.5' | Sampled: 3/4/2014 12:30

Sample ID: 14C0170-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	94.1		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: B48A 0-0.5' DUP | Sampled: 3/4/2014 12:30

Sample ID: 14C0170-02

Sample Matrix: Soil

Sample Flags: Z-01

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 10:53	MJC
Aroclor-1221 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 10:53	MJC
Aroclor-1232 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 10:53	MJC
Aroclor-1242 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 10:53	MJC
Aroclor-1248 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 10:53	MJC
Aroclor-1254 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 10:53	MJC
Aroclor-1260 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 10:53	MJC
Aroclor-1262 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 10:53	MJC
Aroclor-1268 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 10:53	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	88.0	30-150		3/11/14 10:53
Decachlorobiphenyl [2]	93.7	30-150		3/11/14 10:53
Tetrachloro-m-xylene [1]	97.4	30-150		3/11/14 10:53
Tetrachloro-m-xylene [2]	102	30-150		3/11/14 10:53

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: B48A 0-0.5' DUP | Sampled: 3/4/2014 12:30

Sample ID: 14C0170-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	93.8		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: B48A 0.5-1' | Sampled: 3/4/2014 12:30

Sample ID: 14C0170-03

Sample Matrix: Soil

Sample Flags: Z-01

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:06	MJC
Aroclor-1221 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:06	MJC
Aroclor-1232 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:06	MJC
Aroclor-1242 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:06	MJC
Aroclor-1248 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:06	MJC
Aroclor-1254 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:06	MJC
Aroclor-1260 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:06	MJC
Aroclor-1262 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:06	MJC
Aroclor-1268 [1]	ND	0.41	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:06	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	86.4	30-150		3/11/14 11:06
Decachlorobiphenyl [2]	91.2	30-150		3/11/14 11:06
Tetrachloro-m-xylene [1]	92.9	30-150		3/11/14 11:06
Tetrachloro-m-xylene [2]	98.4	30-150		3/11/14 11:06

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: B48A 0.5-1' | Sampled: 3/4/2014 12:30

Sample ID: 14C0170-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	94.6		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: B48A 1-2' | Sampled: 3/4/2014 12:30

Sample ID: 14C0170-04

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.45	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:19	MJC
Aroclor-1221 [1]	ND	0.45	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:19	MJC
Aroclor-1232 [1]	ND	0.45	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:19	MJC
Aroclor-1242 [1]	ND	0.45	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:19	MJC
Aroclor-1248 [2]	2.5	0.45	mg/Kg dry	20	O-04	SW-846 8082A	3/7/14	3/11/14 11:19	MJC
Aroclor-1254 [2]	2.6	0.45	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:19	MJC
Aroclor-1260 [1]	ND	0.45	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:19	MJC
Aroclor-1262 [1]	ND	0.45	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:19	MJC
Aroclor-1268 [1]	ND	0.45	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:19	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	88.5	30-150		3/11/14 11:19
Decachlorobiphenyl [2]	91.6	30-150		3/11/14 11:19
Tetrachloro-m-xylene [1]	98.5	30-150		3/11/14 11:19
Tetrachloro-m-xylene [2]	100	30-150		3/11/14 11:19

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: B48A 1-2' | Sampled: 3/4/2014 12:30

Sample ID: 14C0170-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	87.9		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: B48A 2-3' | Sampled: 3/4/2014 12:30

Sample ID: 14C0170-05

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.44	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:32	MJC
Aroclor-1221 [1]	ND	0.44	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:32	MJC
Aroclor-1232 [1]	ND	0.44	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:32	MJC
Aroclor-1242 [1]	ND	0.44	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:32	MJC
Aroclor-1248 [2]	1.5	0.44	mg/Kg dry	20	O-04	SW-846 8082A	3/7/14	3/11/14 11:32	MJC
Aroclor-1254 [2]	1.2	0.44	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:32	MJC
Aroclor-1260 [1]	ND	0.44	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:32	MJC
Aroclor-1262 [1]	ND	0.44	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:32	MJC
Aroclor-1268 [1]	ND	0.44	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:32	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	89.0	30-150		3/11/14 11:32
Decachlorobiphenyl [2]	91.7	30-150		3/11/14 11:32
Tetrachloro-m-xylene [1]	97.9	30-150		3/11/14 11:32
Tetrachloro-m-xylene [2]	101	30-150		3/11/14 11:32

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: B48A 2-3' | Sampled: 3/4/2014 12:30

Sample ID: 14C0170-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	87.8		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 1A 0-0.5' | Sampled: 3/5/2014 09:00

Sample ID: 14C0170-06

Sample Matrix: Soil

Sample Flags: Z-01

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.42	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:45	MJC
Aroclor-1221 [1]	ND	0.42	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:45	MJC
Aroclor-1232 [1]	ND	0.42	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:45	MJC
Aroclor-1242 [1]	ND	0.42	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:45	MJC
Aroclor-1248 [1]	ND	0.42	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:45	MJC
Aroclor-1254 [1]	ND	0.42	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:45	MJC
Aroclor-1260 [1]	ND	0.42	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:45	MJC
Aroclor-1262 [1]	ND	0.42	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:45	MJC
Aroclor-1268 [1]	ND	0.42	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:45	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	84.6	30-150		3/11/14 11:45
Decachlorobiphenyl [2]	87.6	30-150		3/11/14 11:45
Tetrachloro-m-xylene [1]	96.7	30-150		3/11/14 11:45
Tetrachloro-m-xylene [2]	95.9	30-150		3/11/14 11:45

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 1A 0-0.5' | Sampled: 3/5/2014 09:00

Sample ID: 14C0170-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	93.6		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 1A 0.5-1' | Sampled: 3/5/2014 09:00

Sample ID: 14C0170-07

Sample Matrix: Soil

Sample Flags: Z-01

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.42	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:58	MJC
Aroclor-1221 [1]	ND	0.42	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:58	MJC
Aroclor-1232 [1]	ND	0.42	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:58	MJC
Aroclor-1242 [1]	ND	0.42	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:58	MJC
Aroclor-1248 [1]	ND	0.42	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:58	MJC
Aroclor-1254 [1]	ND	0.42	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:58	MJC
Aroclor-1260 [1]	ND	0.42	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:58	MJC
Aroclor-1262 [1]	ND	0.42	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:58	MJC
Aroclor-1268 [1]	ND	0.42	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 11:58	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	79.5	30-150		3/11/14 11:58
Decachlorobiphenyl [2]	83.6	30-150		3/11/14 11:58
Tetrachloro-m-xylene [1]	71.9	30-150		3/11/14 11:58
Tetrachloro-m-xylene [2]	75.0	30-150		3/11/14 11:58

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 1A 0.5-1' | Sampled: 3/5/2014 09:00

Sample ID: 14C0170-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	92.7		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 1A 1-2' | Sampled: 3/5/2014 09:00

Sample ID: 14C0170-08

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.44	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 12:11	MJC
Aroclor-1221 [1]	ND	0.44	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 12:11	MJC
Aroclor-1232 [1]	ND	0.44	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 12:11	MJC
Aroclor-1242 [1]	ND	0.44	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 12:11	MJC
Aroclor-1248 [2]	0.67	0.44	mg/Kg dry	20	O-04	SW-846 8082A	3/7/14	3/11/14 12:11	MJC
Aroclor-1254 [2]	0.77	0.44	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 12:11	MJC
Aroclor-1260 [1]	ND	0.44	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 12:11	MJC
Aroclor-1262 [1]	ND	0.44	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 12:11	MJC
Aroclor-1268 [1]	ND	0.44	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 12:11	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	84.0	30-150		3/11/14 12:11
Decachlorobiphenyl [2]	82.2	30-150		3/11/14 12:11
Tetrachloro-m-xylene [1]	81.4	30-150		3/11/14 12:11
Tetrachloro-m-xylene [2]	85.1	30-150		3/11/14 12:11

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 1A 1-2' | Sampled: 3/5/2014 09:00

Sample ID: 14C0170-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.0		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 1A 2-3' | Sampled: 3/5/2014 09:00

Sample ID: 14C0170-09

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 12:24	MJC
Aroclor-1221 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 12:24	MJC
Aroclor-1232 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 12:24	MJC
Aroclor-1242 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 12:24	MJC
Aroclor-1248 [2]	8.6	1.1	mg/Kg dry	50	O-04	SW-846 8082A	3/7/14	3/11/14 12:24	MJC
Aroclor-1254 [2]	6.3	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 12:24	MJC
Aroclor-1260 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 12:24	MJC
Aroclor-1262 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 12:24	MJC
Aroclor-1268 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 12:24	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	*	30-150	S-01	3/11/14 12:24
Decachlorobiphenyl [2]	*	30-150	S-01	3/11/14 12:24
Tetrachloro-m-xylene [1]	*	30-150	S-01	3/11/14 12:24
Tetrachloro-m-xylene [2]	*	30-150	S-01	3/11/14 12:24

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 1A 2-3' | Sampled: 3/5/2014 09:00

Sample ID: 14C0170-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	87.8		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 1A 3-4' | Sampled: 3/5/2014 09:00

Sample ID: 14C0170-10

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 12:37	MJC
Aroclor-1221 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 12:37	MJC
Aroclor-1232 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 12:37	MJC
Aroclor-1242 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 12:37	MJC
Aroclor-1248 [2]	10	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 12:37	MJC
Aroclor-1254 [2]	6.5	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 12:37	MJC
Aroclor-1260 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 12:37	MJC
Aroclor-1262 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 12:37	MJC
Aroclor-1268 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	3/7/14	3/11/14 12:37	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	*	30-150	S-01	3/11/14 12:37
Decachlorobiphenyl [2]	*	30-150	S-01	3/11/14 12:37
Tetrachloro-m-xylene [1]	*	30-150	S-01	3/11/14 12:37
Tetrachloro-m-xylene [2]	*	30-150	S-01	3/11/14 12:37

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 1A 3-4' | Sampled: 3/5/2014 09:00

Sample ID: 14C0170-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	88.5		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 1A 4-5' | Sampled: 3/5/2014 09:00

Sample ID: 14C0170-11

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.53	mg/Kg dry	25		SW-846 8082A	3/7/14	3/11/14 13:21	JMB
Aroclor-1221 [1]	ND	0.53	mg/Kg dry	25		SW-846 8082A	3/7/14	3/11/14 13:21	JMB
Aroclor-1232 [1]	ND	0.53	mg/Kg dry	25		SW-846 8082A	3/7/14	3/11/14 13:21	JMB
Aroclor-1242 [1]	ND	0.53	mg/Kg dry	25		SW-846 8082A	3/7/14	3/11/14 13:21	JMB
Aroclor-1248 [2]	3.0	0.53	mg/Kg dry	25	O-04	SW-846 8082A	3/7/14	3/11/14 13:21	JMB
Aroclor-1254 [2]	3.9	0.53	mg/Kg dry	25		SW-846 8082A	3/7/14	3/11/14 13:21	JMB
Aroclor-1260 [1]	ND	0.53	mg/Kg dry	25		SW-846 8082A	3/7/14	3/11/14 13:21	JMB
Aroclor-1262 [1]	ND	0.53	mg/Kg dry	25		SW-846 8082A	3/7/14	3/11/14 13:21	JMB
Aroclor-1268 [1]	ND	0.53	mg/Kg dry	25		SW-846 8082A	3/7/14	3/11/14 13:21	JMB

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	92.9	30-150		3/11/14 13:21
Decachlorobiphenyl [2]	91.1	30-150		3/11/14 13:21
Tetrachloro-m-xylene [1]	95.0	30-150		3/11/14 13:21
Tetrachloro-m-xylene [2]	97.5	30-150		3/11/14 13:21

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 1A 4-5' | Sampled: 3/5/2014 09:00

Sample ID: 14C0170-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	91.3		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 2A 0-0.5' | Sampled: 3/5/2014 09:45

Sample ID: 14C0170-12

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.42	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 13:34	JMB
Aroclor-1221 [1]	ND	0.42	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 13:34	JMB
Aroclor-1232 [1]	ND	0.42	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 13:34	JMB
Aroclor-1242 [1]	ND	0.42	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 13:34	JMB
Aroclor-1248 [2]	0.57	0.42	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 13:34	JMB
Aroclor-1254 [2]	0.64	0.42	mg/Kg dry	20	O-04	SW-846 8082A	3/7/14	3/11/14 13:34	JMB
Aroclor-1260 [1]	ND	0.42	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 13:34	JMB
Aroclor-1262 [1]	ND	0.42	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 13:34	JMB
Aroclor-1268 [1]	ND	0.42	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 13:34	JMB

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	92.5	30-150		3/11/14 13:34
Decachlorobiphenyl [2]	92.8	30-150		3/11/14 13:34
Tetrachloro-m-xylene [1]	94.2	30-150		3/11/14 13:34
Tetrachloro-m-xylene [2]	98.0	30-150		3/11/14 13:34

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 2A 0-0.5' | Sampled: 3/5/2014 09:45

Sample ID: 14C0170-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	93.2		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 2A 0.5-1' | Sampled: 3/5/2014 09:45

Sample ID: 14C0170-13

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	2.1	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 15:31	JMB
Aroclor-1221 [1]	ND	2.1	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 15:31	JMB
Aroclor-1232 [1]	ND	2.1	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 15:31	JMB
Aroclor-1242 [1]	ND	2.1	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 15:31	JMB
Aroclor-1248 [1]	ND	2.1	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 15:31	JMB
Aroclor-1254 [2]	6.8	2.1	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 15:31	JMB
Aroclor-1260 [1]	ND	2.1	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 15:31	JMB
Aroclor-1262 [1]	ND	2.1	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 15:31	JMB
Aroclor-1268 [1]	ND	2.1	mg/Kg dry	100		SW-846 8082A	3/7/14	3/11/14 15:31	JMB

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	*	30-150	S-01	3/11/14 15:31
Decachlorobiphenyl [2]	*	30-150	S-01	3/11/14 15:31
Tetrachloro-m-xylene [1]	*	30-150	S-01	3/11/14 15:31
Tetrachloro-m-xylene [2]	*	30-150	S-01	3/11/14 15:31

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 2A 0.5-1' | Sampled: 3/5/2014 09:45

Sample ID: 14C0170-13

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	91.4		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 5A 0-0.5' | Sampled: 3/5/2014 09:45

Sample ID: 14C0170-14

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 14:00	JMB
Aroclor-1221 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 14:00	JMB
Aroclor-1232 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 14:00	JMB
Aroclor-1242 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 14:00	JMB
Aroclor-1248 [2]	0.12	0.10	mg/Kg dry	5	O-04, P-01	SW-846 8082A	3/7/14	3/11/14 14:00	JMB
Aroclor-1254 [2]	0.12	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 14:00	JMB
Aroclor-1260 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 14:00	JMB
Aroclor-1262 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 14:00	JMB
Aroclor-1268 [1]	ND	0.10	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 14:00	JMB

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	80.1	30-150		3/11/14 14:00
Decachlorobiphenyl [2]	84.7	30-150		3/11/14 14:00
Tetrachloro-m-xylene [1]	92.3	30-150		3/11/14 14:00
Tetrachloro-m-xylene [2]	96.4	30-150		3/11/14 14:00

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 5A 0-0.5' | Sampled: 3/5/2014 09:45

Sample ID: 14C0170-14

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	94.0		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 5A 0.5-1' | Sampled: 3/5/2014 09:45

Sample ID: 14C0170-15

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 14:13	JMB
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 14:13	JMB
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 14:13	JMB
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 14:13	JMB
Aroclor-1248 [2]	0.34	0.11	mg/Kg dry	5	O-04	SW-846 8082A	3/7/14	3/11/14 14:13	JMB
Aroclor-1254 [2]	0.85	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 14:13	JMB
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 14:13	JMB
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 14:13	JMB
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 14:13	JMB

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	68.7	30-150		3/11/14 14:13
Decachlorobiphenyl [2]	75.1	30-150		3/11/14 14:13
Tetrachloro-m-xylene [1]	79.1	30-150		3/11/14 14:13
Tetrachloro-m-xylene [2]	81.6	30-150		3/11/14 14:13

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 5A 0.5-1' | Sampled: 3/5/2014 09:45

Sample ID: 14C0170-15

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	89.2		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 5A 1-2' | Sampled: 3/5/2014 09:45

Sample ID: 14C0170-16

Sample Matrix: Soil

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:02	JMB
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:02	JMB
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:02	JMB
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:02	JMB
Aroclor-1248 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:02	JMB
Aroclor-1254 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:02	JMB
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:02	JMB
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:02	JMB
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:02	JMB

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	71.8	30-150		3/11/14 1:02
Decachlorobiphenyl [2]	75.8	30-150		3/11/14 1:02
Tetrachloro-m-xylene [1]	83.6	30-150		3/11/14 1:02
Tetrachloro-m-xylene [2]	83.4	30-150		3/11/14 1:02

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 5A 1-2' | Sampled: 3/5/2014 09:45

Sample ID: 14C0170-16

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	84.6		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 5A 2-3' | Sampled: 3/5/2014 09:45

Sample ID: 14C0170-17

Sample Matrix: Soil

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:15	JMB
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:15	JMB
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:15	JMB
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:15	JMB
Aroclor-1248 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:15	JMB
Aroclor-1254 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:15	JMB
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:15	JMB
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:15	JMB
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:15	JMB

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	70.2	30-150		3/11/14 1:15
Decachlorobiphenyl [2]	75.8	30-150		3/11/14 1:15
Tetrachloro-m-xylene [1]	80.7	30-150		3/11/14 1:15
Tetrachloro-m-xylene [2]	79.7	30-150		3/11/14 1:15

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 5A 2-3' | Sampled: 3/5/2014 09:45

Sample ID: 14C0170-17

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	86.4		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 6A 0-0.5' | Sampled: 3/5/2014 11:30

Sample ID: 14C0170-18

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 14:26	JMB
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 14:26	JMB
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 14:26	JMB
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 14:26	JMB
Aroclor-1248 [2]	0.35	0.11	mg/Kg dry	5	O-04	SW-846 8082A	3/7/14	3/11/14 14:26	JMB
Aroclor-1254 [2]	0.63	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 14:26	JMB
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 14:26	JMB
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 14:26	JMB
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 14:26	JMB

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	86.9	30-150		3/11/14 14:26
Decachlorobiphenyl [2]	91.2	30-150		3/11/14 14:26
Tetrachloro-m-xylene [1]	98.2	30-150		3/11/14 14:26
Tetrachloro-m-xylene [2]	107	30-150		3/11/14 14:26

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 6A 0-0.5' | Sampled: 3/5/2014 11:30

Sample ID: 14C0170-18

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	92.9		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 6A 0.5-1' | Sampled: 3/5/2014 11:30

Sample ID: 14C0170-19

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:41	JMB
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:41	JMB
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:41	JMB
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:41	JMB
Aroclor-1248 [2]	0.18	0.11	mg/Kg dry	5	O-04	SW-846 8082A	3/7/14	3/11/14 1:41	JMB
Aroclor-1254 [2]	0.21	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:41	JMB
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:41	JMB
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:41	JMB
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	3/7/14	3/11/14 1:41	JMB

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	84.9	30-150		3/11/14 1:41
Decachlorobiphenyl [2]	88.4	30-150		3/11/14 1:41
Tetrachloro-m-xylene [1]	102	30-150		3/11/14 1:41
Tetrachloro-m-xylene [2]	106	30-150		3/11/14 1:41

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 6A 0.5-1' | Sampled: 3/5/2014 11:30

Sample ID: 14C0170-19

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	92.8		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 6A 1-2' | Sampled: 3/5/2014 11:30

Sample ID: 14C0170-20

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.45	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 14:52	JMB
Aroclor-1221 [1]	ND	0.45	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 14:52	JMB
Aroclor-1232 [1]	ND	0.45	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 14:52	JMB
Aroclor-1242 [1]	ND	0.45	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 14:52	JMB
Aroclor-1248 [2]	2.0	0.45	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 14:52	JMB
Aroclor-1254 [2]	2.1	0.45	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 14:52	JMB
Aroclor-1260 [1]	ND	0.45	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 14:52	JMB
Aroclor-1262 [1]	ND	0.45	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 14:52	JMB
Aroclor-1268 [1]	ND	0.45	mg/Kg dry	20		SW-846 8082A	3/7/14	3/11/14 14:52	JMB

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	82.8	30-150		3/11/14 14:52
Decachlorobiphenyl [2]	85.7	30-150		3/11/14 14:52
Tetrachloro-m-xylene [1]	97.2	30-150		3/11/14 14:52
Tetrachloro-m-xylene [2]	99.7	30-150		3/11/14 14:52

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 6A 1-2' | Sampled: 3/5/2014 11:30

Sample ID: 14C0170-20

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	87.4		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 6A 2-3' | Sampled: 3/5/2014 11:30

Sample ID: 14C0170-21

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	11	mg/Kg dry	500		SW-846 8082A	3/7/14	3/11/14 13:50	MJC
Aroclor-1221 [1]	ND	11	mg/Kg dry	500		SW-846 8082A	3/7/14	3/11/14 13:50	MJC
Aroclor-1232 [1]	ND	11	mg/Kg dry	500		SW-846 8082A	3/7/14	3/11/14 13:50	MJC
Aroclor-1242 [1]	ND	11	mg/Kg dry	500		SW-846 8082A	3/7/14	3/11/14 13:50	MJC
Aroclor-1248 [2]	26	11	mg/Kg dry	500	O-04	SW-846 8082A	3/7/14	3/11/14 13:50	MJC
Aroclor-1254 [1]	61	11	mg/Kg dry	500		SW-846 8082A	3/7/14	3/11/14 13:50	MJC
Aroclor-1260 [1]	ND	11	mg/Kg dry	500		SW-846 8082A	3/7/14	3/11/14 13:50	MJC
Aroclor-1262 [1]	ND	11	mg/Kg dry	500		SW-846 8082A	3/7/14	3/11/14 13:50	MJC
Aroclor-1268 [1]	ND	11	mg/Kg dry	500		SW-846 8082A	3/7/14	3/11/14 13:50	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	*	30-150	S-01	3/11/14 13:50
Decachlorobiphenyl [2]	*	30-150	S-01	3/11/14 13:50
Tetrachloro-m-xylene [1]	*	30-150	S-01	3/11/14 13:50
Tetrachloro-m-xylene [2]	*	30-150	S-01	3/11/14 13:50

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0170

Date Received: 3/6/2014

Field Sample #: Comp 6A 2-3' | Sampled: 3/5/2014 11:30

Sample ID: 14C0170-21

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	87.5		% Wt	1		SM 2540G	3/8/14	3/10/14 9:48	MXG

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

Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
14C0170-01 [B48A 0-0.5']	B091523	03/08/14
14C0170-02 [B48A 0-0.5' DUP]	B091523	03/08/14
14C0170-03 [B48A 0.5-1']	B091523	03/08/14
14C0170-04 [B48A 1-2']	B091523	03/08/14
14C0170-05 [B48A 2-3']	B091523	03/08/14
14C0170-06 [Comp 1A 0-0.5']	B091523	03/08/14
14C0170-07 [Comp 1A 0.5-1']	B091523	03/08/14
14C0170-08 [Comp 1A 1-2']	B091523	03/08/14
14C0170-09 [Comp 1A 2-3']	B091523	03/08/14
14C0170-10 [Comp 1A 3-4']	B091523	03/08/14
14C0170-11 [Comp 1A 4-5']	B091523	03/08/14
14C0170-12 [Comp 2A 0-0.5']	B091523	03/08/14
14C0170-13 [Comp 2A 0.5-1']	B091523	03/08/14
14C0170-14 [Comp 5A 0-0.5']	B091523	03/08/14
14C0170-15 [Comp 5A 0.5-1']	B091523	03/08/14
14C0170-16 [Comp 5A 1-2']	B091523	03/08/14
14C0170-17 [Comp 5A 2-3']	B091523	03/08/14
14C0170-18 [Comp 6A 0-0.5']	B091523	03/08/14
14C0170-19 [Comp 6A 0.5-1']	B091523	03/08/14
14C0170-20 [Comp 6A 1-2']	B091523	03/08/14
14C0170-21 [Comp 6A 2-3']	B091523	03/08/14

Prep Method: SW-846 3540C-SW-846 8082A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
14C0170-21 [Comp 6A 2-3']	B091490	10.0	10.0	03/07/14

Prep Method: SW-846 3540C-SW-846 8082A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
14C0170-01 [B48A 0-0.5']	B091493	10.0	10.0	03/07/14
14C0170-02 [B48A 0-0.5' DUP]	B091493	10.3	10.0	03/07/14
14C0170-03 [B48A 0.5-1']	B091493	10.2	10.0	03/07/14
14C0170-04 [B48A 1-2']	B091493	10.1	10.0	03/07/14
14C0170-05 [B48A 2-3']	B091493	10.4	10.0	03/07/14
14C0170-06 [Comp 1A 0-0.5']	B091493	10.2	10.0	03/07/14
14C0170-07 [Comp 1A 0.5-1']	B091493	10.3	10.0	03/07/14
14C0170-08 [Comp 1A 1-2']	B091493	10.1	10.0	03/07/14
14C0170-09 [Comp 1A 2-3']	B091493	10.1	10.0	03/07/14
14C0170-10 [Comp 1A 3-4']	B091493	10.0	10.0	03/07/14
14C0170-11 [Comp 1A 4-5']	B091493	10.4	10.0	03/07/14
14C0170-12 [Comp 2A 0-0.5']	B091493	10.2	10.0	03/07/14
14C0170-13 [Comp 2A 0.5-1']	B091493	10.5	10.0	03/07/14
14C0170-14 [Comp 5A 0-0.5']	B091493	10.2	10.0	03/07/14
14C0170-15 [Comp 5A 0.5-1']	B091493	10.0	10.0	03/07/14
14C0170-16 [Comp 5A 1-2']	B091493	10.3	10.0	03/07/14
14C0170-17 [Comp 5A 2-3']	B091493	10.3	10.0	03/07/14
14C0170-18 [Comp 6A 0-0.5']	B091493	10.1	10.0	03/07/14
14C0170-19 [Comp 6A 0.5-1']	B091493	10.1	10.0	03/07/14
14C0170-20 [Comp 6A 1-2']	B091493	10.2	10.0	03/07/14

con-test® ANALYTICAL LABORATORY

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

QUALITY CONTROL

Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B091490 - SW-846 3540C										
Blank (B091490-BLK1)				Prepared: 03/07/14 Analyzed: 03/10/14						
Aroclor-1016	ND	0.020	mg/Kg wet							
Aroclor-1016 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1221	ND	0.020	mg/Kg wet							
Aroclor-1221 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1232	ND	0.020	mg/Kg wet							
Aroclor-1232 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1242	ND	0.020	mg/Kg wet							
Aroclor-1242 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1248	ND	0.020	mg/Kg wet							
Aroclor-1248 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1254	ND	0.020	mg/Kg wet							
Aroclor-1254 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1260	ND	0.020	mg/Kg wet							
Aroclor-1260 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1262	ND	0.020	mg/Kg wet							
Aroclor-1262 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1268	ND	0.020	mg/Kg wet							
Aroclor-1268 [2C]	ND	0.020	mg/Kg wet							
Surrogate: Decachlorobiphenyl	*0.226*		mg/Kg wet	0.200		113	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.227*		mg/Kg wet	0.200		114	30-150			
Surrogate: Tetrachloro-m-xylene	*0.230*		mg/Kg wet	0.200		115	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.220*		mg/Kg wet	0.200		110	30-150			
LCS (B091490-BS1)				Prepared: 03/07/14 Analyzed: 03/10/14						
Aroclor-1016	0.22	0.10	mg/Kg wet	0.200		111	40-140			
Aroclor-1016 [2C]	0.24	0.10	mg/Kg wet	0.200		118	40-140			
Aroclor-1260	0.21	0.10	mg/Kg wet	0.200		105	40-140			
Aroclor-1260 [2C]	0.19	0.10	mg/Kg wet	0.200		93.7	40-140			
Surrogate: Decachlorobiphenyl	*0.194*		mg/Kg wet	0.200		97.0	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.198*		mg/Kg wet	0.200		99.0	30-150			
Surrogate: Tetrachloro-m-xylene	*0.211*		mg/Kg wet	0.200		105	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.212*		mg/Kg wet	0.200		106	30-150			
LCS Dup (B091490-BSD1)				Prepared: 03/07/14 Analyzed: 03/10/14						
Aroclor-1016	0.22	0.10	mg/Kg wet	0.200		109	40-140	2.34	30	
Aroclor-1016 [2C]	0.23	0.10	mg/Kg wet	0.200		113	40-140	3.96	30	
Aroclor-1260	0.21	0.10	mg/Kg wet	0.200		103	40-140	1.80	30	
Aroclor-1260 [2C]	0.19	0.10	mg/Kg wet	0.200		93.1	40-140	0.619	30	
Surrogate: Decachlorobiphenyl	*0.193*		mg/Kg wet	0.200		96.6	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.197*		mg/Kg wet	0.200		98.4	30-150			
Surrogate: Tetrachloro-m-xylene	*0.216*		mg/Kg wet	0.200		108	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.217*		mg/Kg wet	0.200		108	30-150			

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

QUALITY CONTROL

Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B091493 - SW-846 3540C										
Blank (B091493-BLK1)				Prepared: 03/07/14 Analyzed: 03/10/14						
Aroclor-1016	ND	0.020	mg/Kg wet							
Aroclor-1016 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1221	ND	0.020	mg/Kg wet							
Aroclor-1221 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1232	ND	0.020	mg/Kg wet							
Aroclor-1232 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1242	ND	0.020	mg/Kg wet							
Aroclor-1242 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1248	ND	0.020	mg/Kg wet							
Aroclor-1248 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1254	ND	0.020	mg/Kg wet							
Aroclor-1254 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1260	ND	0.020	mg/Kg wet							
Aroclor-1260 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1262	ND	0.020	mg/Kg wet							
Aroclor-1262 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1268	ND	0.020	mg/Kg wet							
Aroclor-1268 [2C]	ND	0.020	mg/Kg wet							
Surrogate: Decachlorobiphenyl	*0.169*		mg/Kg wet	0.200		84.4	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.170*		mg/Kg wet	0.200		84.8	30-150			
Surrogate: Tetrachloro-m-xylene	*0.177*		mg/Kg wet	0.200		88.3	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.185*		mg/Kg wet	0.200		92.7	30-150			
LCS (B091493-BS1)				Prepared: 03/07/14 Analyzed: 03/10/14						
Aroclor-1016	0.20	0.10	mg/Kg wet	0.200		98.8	40-140			
Aroclor-1016 [2C]	0.21	0.10	mg/Kg wet	0.200		105	40-140			
Aroclor-1260	0.19	0.10	mg/Kg wet	0.200		96.1	40-140			
Aroclor-1260 [2C]	0.20	0.10	mg/Kg wet	0.200		99.0	40-140			
Surrogate: Decachlorobiphenyl	*0.178*		mg/Kg wet	0.200		88.8	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.174*		mg/Kg wet	0.200		86.8	30-150			
Surrogate: Tetrachloro-m-xylene	*0.186*		mg/Kg wet	0.200		92.9	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.189*		mg/Kg wet	0.200		94.4	30-150			
LCS Dup (B091493-BSD1)				Prepared: 03/07/14 Analyzed: 03/10/14						
Aroclor-1016	0.19	0.10	mg/Kg wet	0.200		93.2	40-140	5.81	30	
Aroclor-1016 [2C]	0.20	0.10	mg/Kg wet	0.200		101	40-140	4.05	30	
Aroclor-1260	0.19	0.10	mg/Kg wet	0.200		93.4	40-140	2.87	30	
Aroclor-1260 [2C]	0.19	0.10	mg/Kg wet	0.200		96.1	40-140	2.90	30	
Surrogate: Decachlorobiphenyl	*0.169*		mg/Kg wet	0.200		84.7	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.167*		mg/Kg wet	0.200		83.3	30-150			
Surrogate: Tetrachloro-m-xylene	*0.176*		mg/Kg wet	0.200		88.1	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.179*		mg/Kg wet	0.200		89.5	30-150			

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

QUALITY CONTROL

Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B091493 - SW-846 3540C										
Matrix Spike (B091493-MS1)	**Source: 14C0170-01**			Prepared: 03/07/14 Analyzed: 03/11/14						
Aroclor-1016	0.23	0.11	mg/Kg dry	0.213	0.0	106	40-140			
Aroclor-1016 [2C]	0.27	0.11	mg/Kg dry	0.213	0.0	129	40-140			
Aroclor-1260	0.20	0.11	mg/Kg dry	0.213	0.0	93.5	40-140			
Aroclor-1260 [2C]	0.20	0.11	mg/Kg dry	0.213	0.0	95.8	40-140			
Surrogate: Decachlorobiphenyl	*0.171*		mg/Kg dry	0.213		80.7	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.182*		mg/Kg dry	0.213		85.7	30-150			
Surrogate: Tetrachloro-m-xylene	*0.220*		mg/Kg dry	0.213		104	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.219*		mg/Kg dry	0.213		103	30-150			
Matrix Spike Dup (B091493-MSD1)	**Source: 14C0170-01**			Prepared: 03/07/14 Analyzed: 03/11/14						
Aroclor-1016	0.22	0.11	mg/Kg dry	0.213	0.0	103	40-140	2.46	50	
Aroclor-1016 [2C]	0.24	0.11	mg/Kg dry	0.213	0.0	115	40-140	11.5	50	
Aroclor-1260	0.19	0.11	mg/Kg dry	0.213	0.0	89.5	40-140	4.40	50	
Aroclor-1260 [2C]	0.20	0.11	mg/Kg dry	0.213	0.0	94.5	40-140	1.43	50	
Surrogate: Decachlorobiphenyl	*0.169*		mg/Kg dry	0.213		79.5	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.181*		mg/Kg dry	0.213		85.4	30-150			
Surrogate: Tetrachloro-m-xylene	*0.215*		mg/Kg dry	0.213		101	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.209*		mg/Kg dry	0.213		98.5	30-150			

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

QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B091523 - % Solids										
Duplicate (B091523-DUP9)	**Source: 14C0170-11**			Prepared: 03/08/14 Analyzed: 03/10/14						
% Solids	90.2		% Wt		91.3			1.21	20	

con-test® ANALYTICAL LABORATORY
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
	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.
O-04	Sample fingerprint does not match standard exactly. Sample was quantitated against the closest matching standard.
O-32	A five times dilution was performed as part of the standard analytical procedure.
P-01	Result was confirmed using a dissimilar column. Relative percent difference between the two results was >40%. In accordance with the method, the higher result was reported.
S-01	The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.
Z-01	Sample was diluted due to sample matrix interference. Requested reporting limit was met.

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

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8082A in Soil	
Aroclor-1016	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1016 [2C]	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1221	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1221 [2C]	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1232	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1232 [2C]	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1242	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1242 [2C]	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1248	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1248 [2C]	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1254	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1254 [2C]	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1260	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1260 [2C]	CT,NH,NY,ME,NC,VA,NJ

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

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2016
MA	Massachusetts DEP	M-MA100	06/30/2014
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2015
NY	New York State Department of Health	10899 NELAP	04/1/2014
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2015
RI	Rhode Island Department of Health	LAO00112	12/30/2014
NC	North Carolina Div. of Water Quality	652	12/31/2014
NJ	New Jersey DEP	MA007 NELAP	06/30/2014
FL	Florida Department of Health	E871027 NELAP	06/30/2014
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2014
WA	State of Washington Department of Ecology	C2065	02/23/2015
ME	State of Maine	2011028	06/9/2015
VA	Commonwealth of Virginia	460217	12/14/2014
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2014

con-test® ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com

CHAIN OF CUSTODY RECORD

14C0170

Rev 04.05.12

39 Spruce Street
East longmeadow, MA 01028

Company Name: CEC
Address: 60 BROOKS DRIVE
Attention:
Project Location: BOOTT MILLS, LOWELL
Sampled By: MBRADLEY

Telephone:
Project # 911JR-3117
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ○ EMAIL ○ WEBSITE
Fax #
Email:
Format: ○ PDF ○ EXCEL ○ GIS ○ OTHER ○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

ANALYSIS REQUESTED

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	EPA Method 3950										
-01	B-48A 0-0.5'	3-4-14	1230		X			X										
-02	B-48A 0-0.5' DUP	3-4-14	1230		X			X										
-03	B-48A 0.5-1'	3-4-14	1230		X			X										
-04	B-48A 1-2'	3-4-14	1230		X			X										
-05	B48A 2-3'	3-4-14	1230		X			X										
-06	~~B-48A~~ COMP 1A 0-0.5	3-5-14	0900	X				X										
-07	COMP 1A 0.5'-1	3-5-14	0900	X				X										
-08	COMP 1A 1-2'	3-5-14	0900	X				X										
-04	COMP 1A 2-3'	3-5-14	0900	X				X										
-10	COMP 1A 3-4'	3-5-14	0900	X				X										

# of Containers
** Preservation
***Container Code

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V=vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
[signature]	
Received by: (signature) [signature] 3/6/14	Date/Time: 1316
Relinquished by: (signature) [signature] 3/6/14	Date/Time: 2030
Received by: (signature) [signature] 3/6/14	Date/Time: 2030

Turnaround ††
☐ 7-Day
☐ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

Page 55 of 63 14C0170_2 Contest_Final 03 13 14 1812 03/13/14 18:13:11

CHAIN OF CUSTODY RECORD

con-test ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

14C0170

Rev 04.05.12

Company Name: CEC
Address:
Attention:
Project Location: BOOTT MILLS, LOWELL
Sampled By: MBRADLEY

Telephone:
Project # 911JR-3117
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ○ EMAIL ○ WEBSITE
Fax #
Email:
Format: ● PDF ● EXCEL ○ GIS
○ OTHER
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	***Container Code
-11	COMP 1A 4-5'	3-5-14	0900	X		S	U	X		
-12	COMP 2A ~~0-0.5~~ 0-0.5'	3-5-14	0945	X		S	U	X		
-13	COMP 2A ~~0-0.5~~ 0.5'-1'		0945	X		S	U	X		
-14	COMP 5A 0-0.5'	3-5-14	0945	X		S	U	X		
-15	COMP 5A 0.5-1	3-5-14	0945	X		S	U	X		
-16	COMP 5A 1-2'	3-5-14	0945	X		S	U	X		
-17	COMP 5A 2-3'	3-5-14	0945	X		S	U	X		
-18	COMP 6A 0-0.5'	3-5-14	1130	X		S	U	X		
-19	COMP 6A 0.5-1'	3-5-14	1130	X		S	U	X		
-20	COMP 6A 1-2'	3-5-14	1130	X		S	U	X		
-21	COMP 6A 2-3'	3-5-14	1130	X		S	U	X		

ANALYSIS REQUESTED
8260 VOC's with MTBE
EPH with TPH
Dissolved Metals

Dissolved Metal
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V=vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfa
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL= sludge
O = other

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Comments:

Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time: 13/6
Relinquished by: (signature)	Date/Time: 2030
Received by: (signature)	Date/Time: 2030

Turnaround ††
☐ 7-Day
☐ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
● MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

Page 56 of 63 14C0170_2 Contest_Final 03 13 14 1812 03/13/14 18:13:11

con-test ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com

CHAIN OF CUSTODY RECORD

39 Spruce Street
East longmeadow, MA 01028

Rev 04.05.12

Company Name: GEC
Address: 60 BROOKS DRIVE
BRAINTREE, MA 02184
Attention:
Project Location: BOOTT MILLS, LOWELL
Sampled By: MBRADLEY

Telephone:
Project # 911JR-3117
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ● EMAIL ○ WEBSITE
Fax #
Email:
Format ● PDF ● EXCEL ○ GIS
○ OTHER
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

ANALYSIS REQUESTED

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	EPA METHOD 3450	
	B49A 0-1'	3-4-14	1330		X	S	U	X	X
	B49A 1-2'	3-4-14	1330		X	S	U	X	
	B-49A 2-3'	3-4-14	1330		X	S	U	X	
	B-50A 0-1'	3-4-14	1340		X	S	U	X	X
	B-50A 1-2'	3-4-14	1340		X	S	U	X	
	B-50 2-3'	3-4-14	1340		X	S	U	X	
	B-50A 2-3' DUP	3-4-14	1340		X	S	U	X	
	B50A 5-7'	3-4-14	1340		X	S	U	X	
	B-50A 7-9'	3-4-14	1340		X	S	U	X	
						~~S~~	~~U~~		

# of Containers
** Preservation
***Container Code

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V=vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfa
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other

Comments:
METHOD AS REQUIRED BY TSCA + USEPA REGION 1
SOXHELT EXTRACTION EPA METHOD 3450

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High: M - Medium: L - Low: C - Clean: U - Unknown

Relinquished by: (signature)	Date/Time:
[signature]	
Received by: (signature) [signature] 3/6/14	Date/Time: 1316
Relinquished by: (signature) [signature] 3/6/14	Date/Time: 2080
Received by: (signature) [signature] 3/6/14 3.9°C	Date/Time: 2080

Turnaround ††
☐ 7-Day
☐ 10-Day
☐ Other
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
● MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID #

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT. TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

con-test ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com

CHAIN OF CUSTODY RECORD

39 Spruce Street
East longmeadow, MA 01028

Rev 04.05.12

Company Name: GEC
Address:
Attention:
Project Location: BOOTT MILLS, LOWELL
Sampled By: MBRADLEY

Telephone: 781-356-9140
Project # 911JR-3117
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ◉ EMAIL ○ WEBSITE
Fax #
Email:
Format ◉ PDF ◉ EXCEL ○ GIS
○ OTHER
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

ANALYSIS REQUESTED

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	EPA Method 3450										
	B-2A 0-1'	3-4-14	1015		X	S	U	X	X									
	B-2A 1-2'	3-4-14	1015		X	S	U	X										
	B-2A 2-3'	3-4-14	1015		X	S	U	X										
	B-2A 3-4'	3-4-14	1015		X	S	U	X										
	B-2A 4-5'	3-4-14	1015		X	S	U	X										
	B-2A 4-5' DUP	3-4-14	1015		X	S	U	X										
	B-16A 0-1'	3-4-14	1040		X	S	U	X	X									
	B-16A 1-2'	3-4-14	1040		X	S	U	X										
	B-16A 2-3	3-4-14	1040		X	S	U	X										
	B-16A 3-4'	3-4-14	1040			S	U	X										

# of Containers
** Preservation
***Container Code

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V=vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfa
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc Code Box:
H - High: M - Medium: L - Low: C - Clean: U - Unknown

Relinquished by: (signature)	Date/Time:
[signature]	
Received by: (signature) [signature] 3/6/14	Date/Time: 1310
Relinquished by: (signature) [signature] 3/6/14	Date/Time: 2030
Received by: (signature) [signature] 3/6/14 3.9°C	Date/Time: 2030

Turnaround ††
☐ 7-Day
☐ 10-Day
☐ Other
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
◉ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID #

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

Page 58 of 63 14C0170_2 Contest_Final 03 13 14 1812 03/13/14 18:13:11

con-test® ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com

CHAIN OF CUSTODY RECORD

39 Spruce Street
East longmeadow, MA 01028

Rev 04.05.12

Company Name: GEC
Address: 60 BROOKS DRIVE
Attention:
Project Location: BOOT MILLS, LOWELL
Sampled By: MBRADLEY

Telephone:
Project # 911JR-3117
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ● EMAIL ○ WEBSITE
Fax #
Email:
Format: ● PDF ● EXCEL ○ GIS
○ OTHER
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

ANALYSIS REQUESTED

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	EPC METHOD 3/4										
	B-16A 4-5'				X	S	U	X										
	B-10A 0-0.5'	3-4-14	1155		X	S	U	X										
	B-10A 0.5'-1	3-4-14	1155		X	S	U	X										
	B-10A 1-2'	3-4-14	1155		X	S	U	X										
	B-10A 2-3'	3-4-14	1155		X	S	U	X										
	B-10A 2-3' DUP	3-4-14	1155		X	S	U	X										
	B-11A 0-0.5'	3-4-14	1130		X	S	U	X	X									
	B-11A ~~0.5'-1~~ 0-0.5'	3-4-14 DUP	1130		X	S	U		X									
	B-11A 0.5'-1	3-4-14	1130		X	S	U	X										
	B-11A 1-2'	3-4-14	1130		X	S	U	X										

# of Containers: 9 | 1
** Preservation: — | —
***Container Code: A | A

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfat
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

H - High: M - Medium: L - Low: C - Clean: U - Unknown

Relinquished by: (signature)	Date/Time:
[signature]	
Received by: (signature) [signature] 3/6/14	Date/Time: 1310
Relinquished by: (signature) [signature] 3/6/14	Date/Time: 2020
Received by: (signature) [signature] 3/6/14	Date/Time: 2030

Turnaround ††
☐ 7-Day
☐ 10-Day
☒ Other 5
RUSH ¯
☐ ¯24-Hr ☐ ¯48-Hr
☐ ¯72-Hr ☐ ¯4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
● MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID #

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

¯ TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

CHAIN OF CUSTODY RECORD

con-test ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

Rev 04.05.12

Company Name: C.E.C
Address:
Attention:
Project Location: BOOTT MILLS, LOWELL
Sampled By: M BRADLEY

Telephone:
Project # 91JR-3117
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ○ EMAIL ○ WEBSITE
Fax #
Email:
Format: ○ PDF ○ EXCEL ○ GIS
○ OTHER
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Cont. Code	ANALYSIS REQUESTED: A	1	10	# of Containers	** Preservation	***Container Code
	B-11A 2-3'	3-4-14	1130		x	S	U	x					
	B-20A 0-0.5'	3-4-14	1215		x	S	U	x					
	B-20A 0.5'-1	3-4-14	1215		x	S	U	x					
	B-20A 1-2'	3-4-14	1215		x	S	U	x					
	B-20A 1-2' DUP	3-4-14	1215		x	S	U	x					
	B-20A 2-3'	3-4-14	1245		x	S	U	x					
	B-21A 0-0.5'	3-5-14	0930		x	S	U	x	&				
	B-21A 0.5'-1	3-5-14	0930		x	S	U	x					
	B-21A 1-2'	3-5-14	0930		x	S	U	x					
	B-21A 2-3'	3-5-14	0930		x	S	U	x					

(ANALYSIS REQUESTED: EPH with MassDEP APH)

Dissolved Metal
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfa
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High: M - Medium: L - Low: C - Clean: U - Unknown

Relinquished by: (signature)	Date/Time:
Received by: (signature) 3/6/14	Date/Time: 1316
Relinquished by: (signature) 3/6/14	Date/Time: 2030
Received by: (signature) 3/6/14	Date/Time: 2030

Turnaround ††
☐ 7-Day
☐ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
◉ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

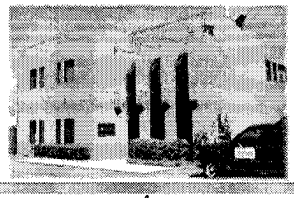
†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

Page 60 of 63 14C0170_2 Contest_Final 03 13 14 1812 03/13/14 18:13:11

39 Spruce St.
East Longmeadow, MA. 01028
P: 413-525-2332
F: 413-525-6405
www.contestlabs.com

con-test® ANALYTICAL LABORATORY



Sample Receipt Checklist

CLIENT NAME: GEC RECEIVED BY: MJ DATE: 03/06/14

1) **Was the chain(s) of custody relinquished and signed?** (Yes) No **No CoC Included**

2) **Does the chain agree with the samples?** (Yes) No

If not, explain:

3) **Are all the samples in good condition?** (Yes) No

If not, explain:

4) **How were the samples received:**

On Ice ☑ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☑

Were the samples received in Temperature Compliance of (2-6°C)? (Yes) No N/A

Temperature °C by Temp blank _____ Temperature °C by Temp gun 3.9°C

5) **Are there Dissolved samples for the lab to filter?** Yes (No)

Who was notified _____ Date _____ Time _____

6) **Are there any RUSH or SHORT HOLDING TIME samples?** Yes (No)

Who was notified _____ Date _____ Time _____

7) **Location where samples are stored:** 19

Permission to subcontract samples? Yes No
(Walk-in clients only) if not already approved
Client Signature: _____

8) **Do all samples have the proper Acid pH:** Yes No (N/A) _____

9) **Do all samples have the proper Base pH:** Yes No (N/A) _____

10) **Was the PC notified of any discrepancies with the CoC vs the samples:** Yes No (N/A)

Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		8 oz amber/clear jar	44A
500 mL Amber		4 oz amber/clear jar	16 A
250 mL Amber (8oz amber)		2 oz amber/clear jar	
1 Liter Plastic		Plastic Bag / Ziploc	
500 mL Plastic		SOC Kit	
250 mL plastic		Non-ConTest Container	
40 mL Vial - type listed below		Perchlorate Kit	
Colisure / bacteria bottle		Flashpoint bottle	
Dissolved Oxygen bottle		Other glass jar	
Encore		Other	

Laboratory Comments:

40 mL vials: # HCl _____ # Methanol _____

Bisulfate _____ # DI Water _____

Thiosulfate _____ Unpreserved

Time and Date Frozen:

Login Sample Receipt Checklist

(Rejection Criteria Listing - Using Sample Acceptance Policy)

Any False statement will be brought to the attention of Client

Question	Answer (True/False) T/F/NA	Comment
1) The cooler's custody seal, if present, is intact.	T	
2) The cooler or samples do not appear to have been compromised or tampered with.	T	
3) Samples were received on ice.	T	
4) Cooler Temperature is acceptable.	T	
5) Cooler Temperature is recorded.	T	
6) COC is filled out in ink and legible.	T	
7) COC is filled out with all pertinent information.	T	
8) Field Sampler's name present on COC.	T	
9) There are no discrepancies between the sample IDs on the container and the COC.	T	
10) Samples are received within Holding Time.	T	
11) Sample containers have legible labels.	T	
12) Containers are not broken or leaking.	T	
13) Air Cassettes are not broken/open.	NA	
14) Sample collection date/times are provided.	T	
15) Appropriate sample containers are used.	T	
16) Proper collection media used.	T	
17) No headspace sample bottles are completely filled.	T	
18) There is sufficient volume for all requsted analyses, including any requested MS/MSDs.	T	
19) Trip blanks provided if applicable.	T	
20) VOA sample vials do not have head space or bubble is <6mm (1/4") in diameter.	NA	
21) Samples do not require splitting or compositing.	T	

Who notified of False statements? **Date/Time:**

Doc #277 Rev. 4 August 2013 **Log-In Technician Initials:** **Date/Time:**

MJ 03/06/14 2030

MADEP MCP Analytical Method Report Certification Form

Laboratory Name: Con-Test Analytical Laboratory	Project #: 14C0170
Project Location: Lowell-Boot Mills	RTN:

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

14C0170-01 thru 14C0170-21

Matrices: Soil

CAM Protocol (check all that below)

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

Printed Name: Daren J. Damboragian Date: 03/13/14

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

March 27, 2014

Mike Bradley
Goldman Environmental
60 Brooks Drive
Braintree, MA 02184

Project Location: Lowell-Boot Mills
Client Job Number:
Project Number: 911JR-3117
Laboratory Work Order Number: 14C0171

Enclosed are results of analyses for samples received by the laboratory on March 6, 2014. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

James M. Georgantas
Project Manager

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

Goldman Environmental
60 Brooks Drive
Braintree, MA 02184
ATTN: Mike Bradley

REPORT DATE: 3/27/2014

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 911JR-3117

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 14C0171

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

PROJECT LOCATION: Lowell-Boot Mills

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
B-49A 0-1'	14C0171-01	Soil		SM 2540G	
				SW846-8270M	
B-50A 0-1'	14C0171-02	Soil		SM 2540G	
				SW846-8270M	
B-2A 0-1'	14C0171-03	Soil		SM 2540G	
				SW846-8270M	
B-16A 0-1'	14C0171-04	Soil		SM 2540G	
				SW846-8270M	
B-11A 0-0.5'	14C0171-05	Soil		SM 2540G	
				SW846-8270M	
B-11A 0-0.5' DUP	14C0171-06	Soil		SM 2540G	
				SW846-8270M	
B-21A 0-0.5	14C0171-07	Soil		SM 2540G	
				SW846-8270M	
Comp 6A 0-0.5'	14C0171-08	Soil		SM 2540G	
				SW846-8270M	

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.

SW846-8270M

Qualifications:

Matrix spike recovery and matrix spike duplicate recovery outside of control limits. Possibility of sample matrix effects that lead to a high bias for reported result or non-homogeneous sample aliquots cannot be eliminated.

Analyte & Samples(s) Qualified:

Cl5-BZ#105, Cl5-BZ#118

14C0171-08RE1[Comp 6A 0-0.5'], B092337-MS1, B092337-MSD1

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.

Daren J. Damboragian
Laboratory Manager

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0171

Date Received: 3/6/2014

Field Sample #: B-49A 0-1' | Sampled: 3/4/2014 13:30

Sample ID: 14C0171-01

Sample Matrix: Soil

PCB Congeners in Soil by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cl4-BZ#81	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 13:45	CJM
Cl4-BZ#77	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 13:45	CJM
Cl5-BZ#123/#107	ND	0.56	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 13:45	CJM
Cl5-BZ#118	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 13:45	CJM
Cl5-BZ#114	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 13:45	CJM
Cl5-BZ#105	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 13:45	CJM
Cl5-BZ#126	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 13:45	CJM
Cl6-BZ#167	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 13:45	CJM
Cl6-BZ#156	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 13:45	CJM
Cl6-BZ#157	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 13:45	CJM
Cl6-BZ#169	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 13:45	CJM
Cl7-BZ#189	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 13:45	CJM

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Tetrachloro-m-xylene	76.4	40-140		3/25/14 13:45

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0171

Date Received: 3/6/2014

Field Sample #: B-49A 0-1' | Sampled: 3/4/2014 13:30

Sample ID: 14C0171-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	93.9		% Wt	1		SM 2540G	3/10/14	3/11/14 8:34	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0171

Date Received: 3/6/2014

Field Sample #: B-50A 0-1' | Sampled: 3/4/2014 13:40

Sample ID: 14C0171-02

Sample Matrix: Soil

PCB Congeners in Soil by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cl4-BZ#81	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 15:32	CJM
Cl4-BZ#77	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 15:32	CJM
Cl5-BZ#123/#107	ND	0.56	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 15:32	CJM
Cl5-BZ#118	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 15:32	CJM
Cl5-BZ#114	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 15:32	CJM
Cl5-BZ#105	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 15:32	CJM
Cl5-BZ#126	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 15:32	CJM
Cl6-BZ#167	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 15:32	CJM
Cl6-BZ#156	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 15:32	CJM
Cl6-BZ#157	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 15:32	CJM
Cl6-BZ#169	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 15:32	CJM
Cl7-BZ#189	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 15:32	CJM

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Tetrachloro-m-xylene	75.4	40-140		3/25/14 15:32

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0171

Date Received: 3/6/2014

Field Sample #: B-50A 0-1' | Sampled: 3/4/2014 13:40

Sample ID: 14C0171-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	95.6		% Wt	1		SM 2540G	3/10/14	3/11/14 8:34	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0171

Date Received: 3/6/2014

Field Sample #: B-2A 0-1' | Sampled: 3/4/2014 10:15

Sample ID: 14C0171-03

Sample Matrix: Soil

PCB Congeners in Soil by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cl4-BZ#81	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 17:19	CJM
Cl4-BZ#77	0.64	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 17:19	CJM
Cl5-BZ#123/#107	ND	0.56	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 17:19	CJM
Cl5-BZ#118	4.3	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 17:19	CJM
Cl5-BZ#114	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 17:19	CJM
Cl5-BZ#105	1.6	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 17:19	CJM
Cl5-BZ#126	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 17:19	CJM
Cl6-BZ#167	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 17:19	CJM
Cl6-BZ#156	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 17:19	CJM
Cl6-BZ#157	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 17:19	CJM
Cl6-BZ#169	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 17:19	CJM
Cl7-BZ#189	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 17:19	CJM

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Tetrachloro-m-xylene	81.6	40-140		3/25/14 17:19

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0171

Date Received: 3/6/2014

Field Sample #: B-2A 0-1' | Sampled: 3/4/2014 10:15

Sample ID: 14C0171-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	93.3		% Wt	1		SM 2540G	3/10/14	3/11/14 8:34	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0171

Date Received: 3/6/2014

Field Sample #: B-16A 0-1' | Sampled: 3/4/2014 10:40

Sample ID: 14C0171-04

Sample Matrix: Soil

PCB Congeners in Soil by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cl4-BZ#81	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 19:06	CJM
Cl4-BZ#77	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 19:06	CJM
Cl5-BZ#123/#107	ND	0.56	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 19:06	CJM
Cl5-BZ#118	1.3	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 19:06	CJM
Cl5-BZ#114	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 19:06	CJM
Cl5-BZ#105	0.40	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 19:06	CJM
Cl5-BZ#126	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 19:06	CJM
Cl6-BZ#167	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 19:06	CJM
Cl6-BZ#156	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 19:06	CJM
Cl6-BZ#157	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 19:06	CJM
Cl6-BZ#169	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 19:06	CJM
Cl7-BZ#189	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 19:06	CJM

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Tetrachloro-m-xylene	69.9	40-140		3/25/14 19:06

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0171

Date Received: 3/6/2014

Field Sample #: B-16A 0-1' | Sampled: 3/4/2014 10:40

Sample ID: 14C0171-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	92.4		% Wt	1		SM 2540G	3/10/14	3/11/14 8:34	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0171

Date Received: 3/6/2014

Field Sample #: B-11A 0-0.5' | Sampled: 3/4/2014 11:30

Sample ID: 14C0171-05

Sample Matrix: Soil

PCB Congeners in Soil by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cl4-BZ#81	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 20:53	CJM
Cl4-BZ#77	3.1	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 20:53	CJM
Cl5-BZ#123/#107	1.4	0.56	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 20:53	CJM
Cl5-BZ#118	19	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 20:53	CJM
Cl5-BZ#114	0.46	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 20:53	CJM
Cl5-BZ#105	8.1	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 20:53	CJM
Cl5-BZ#126	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 20:53	CJM
Cl6-BZ#167	0.82	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 20:53	CJM
Cl6-BZ#156	2.4	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 20:53	CJM
Cl6-BZ#157	0.53	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 20:53	CJM
Cl6-BZ#169	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 20:53	CJM
Cl7-BZ#189	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 20:53	CJM

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Tetrachloro-m-xylene	66.0	40-140		3/25/14 20:53

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0171

Date Received: 3/6/2014

Field Sample #: B-11A 0-0.5' | Sampled: 3/4/2014 11:30

Sample ID: 14C0171-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	94.8		% Wt	1		SM 2540G	3/10/14	3/11/14 8:34	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0171

Date Received: 3/6/2014

Field Sample #: B-11A 0-0.5' DUP | Sampled: 3/4/2014 11:30

Sample ID: 14C0171-06

Sample Matrix: Soil

PCB Congeners in Soil by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cl4-BZ#81	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 22:40	CJM
Cl4-BZ#77	3.9	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 22:40	CJM
Cl5-BZ#123/#107	1.8	0.56	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 22:40	CJM
Cl5-BZ#118	25	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 22:40	CJM
Cl5-BZ#114	0.58	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 22:40	CJM
Cl5-BZ#105	9.9	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 22:40	CJM
Cl5-BZ#126	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 22:40	CJM
Cl6-BZ#167	1.1	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 22:40	CJM
Cl6-BZ#156	3.0	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 22:40	CJM
Cl6-BZ#157	0.71	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 22:40	CJM
Cl6-BZ#169	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 22:40	CJM
Cl7-BZ#189	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/25/14 22:40	CJM

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Tetrachloro-m-xylene	67.1	40-140		3/25/14 22:40

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0171

Date Received: 3/6/2014

Field Sample #: B-11A 0-0.5' DUP | Sampled: 3/4/2014 11:30

Sample ID: 14C0171-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	93.6		% Wt	1		SM 2540G	3/10/14	3/11/14 8:34	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0171

Date Received: 3/6/2014

Field Sample #: B-21A 0-0.5 | Sampled: 3/5/2014 09:30

Sample ID: 14C0171-07

Sample Matrix: Soil

PCB Congeners in Soil by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cl4-BZ#81	ND	0.27	µg/kg dry	1		SW846-8270M	3/21/14	3/26/14 0:26	CJM
Cl4-BZ#77	0.36	0.27	µg/kg dry	1		SW846-8270M	3/21/14	3/26/14 0:26	CJM
Cl5-BZ#123/#107	ND	0.55	µg/kg dry	1		SW846-8270M	3/21/14	3/26/14 0:26	CJM
Cl5-BZ#118	2.7	0.27	µg/kg dry	1		SW846-8270M	3/21/14	3/26/14 0:26	CJM
Cl5-BZ#114	ND	0.27	µg/kg dry	1		SW846-8270M	3/21/14	3/26/14 0:26	CJM
Cl5-BZ#105	0.91	0.27	µg/kg dry	1		SW846-8270M	3/21/14	3/26/14 0:26	CJM
Cl5-BZ#126	ND	0.27	µg/kg dry	1		SW846-8270M	3/21/14	3/26/14 0:26	CJM
Cl6-BZ#167	ND	0.27	µg/kg dry	1		SW846-8270M	3/21/14	3/26/14 0:26	CJM
Cl6-BZ#156	ND	0.27	µg/kg dry	1		SW846-8270M	3/21/14	3/26/14 0:26	CJM
Cl6-BZ#157	ND	0.27	µg/kg dry	1		SW846-8270M	3/21/14	3/26/14 0:26	CJM
Cl6-BZ#169	ND	0.27	µg/kg dry	1		SW846-8270M	3/21/14	3/26/14 0:26	CJM
Cl7-BZ#189	ND	0.27	µg/kg dry	1		SW846-8270M	3/21/14	3/26/14 0:26	CJM

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
Tetrachloro-m-xylene	81.3	40-140			3/26/14 0:26

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0171

Date Received: 3/6/2014

Field Sample #: B-21A 0-0.5 | Sampled: 3/5/2014 09:30

Sample ID: 14C0171-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	94.7		% Wt	1		SM 2540G	3/10/14	3/11/14 8:34	MXG

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0171

Date Received: 3/6/2014

Field Sample #: Comp 6A 0-0.5' | Sampled: 3/5/2014 11:30

Sample ID: 14C0171-08

Sample Matrix: Soil

PCB Congeners in Soil by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cl4-BZ#81	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/26/14 2:13	CJM
Cl4-BZ#77	0.63	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/26/14 2:13	CJM
Cl5-BZ#123/#107	ND	0.56	µg/kg dry	1		SW846-8270M	3/21/14	3/26/14 2:13	CJM
Cl5-BZ#118	5.1	0.28	µg/kg dry	1	MS-12	SW846-8270M	3/21/14	3/26/14 2:13	CJM
Cl5-BZ#114	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/26/14 2:13	CJM
Cl5-BZ#105	1.8	0.28	µg/kg dry	1	MS-12	SW846-8270M	3/21/14	3/26/14 2:13	CJM
Cl5-BZ#126	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/26/14 2:13	CJM
Cl6-BZ#167	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/26/14 2:13	CJM
Cl6-BZ#156	0.63	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/26/14 2:13	CJM
Cl6-BZ#157	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/26/14 2:13	CJM
Cl6-BZ#169	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/26/14 2:13	CJM
Cl7-BZ#189	ND	0.28	µg/kg dry	1		SW846-8270M	3/21/14	3/26/14 2:13	CJM

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
Tetrachloro-m-xylene	88.7	40-140		3/26/14 2:13	

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

Project Location: Lowell-Boot Mills | Sample Description: | Work Order: 14C0171

Date Received: 3/6/2014

Field Sample #: Comp 6A 0-0.5' | Sampled: 3/5/2014 11:30

Sample ID: 14C0171-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	92.7		% Wt	1		SM 2540G	3/10/14	3/11/14 8:36	MXG

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

Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
14C0171-01 [B-49A 0-1']	B091560	03/10/14
14C0171-02 [B-50A 0-1']	B091560	03/10/14
14C0171-03 [B-2A 0-1']	B091560	03/10/14
14C0171-04 [B-16A 0-1']	B091560	03/10/14
14C0171-05 [B-11A 0-0.5']	B091560	03/10/14
14C0171-06 [B-11A 0-0.5' DUP]	B091560	03/10/14
14C0171-07 [B-21A 0-0.5]	B091560	03/10/14
14C0171-08 [Comp 6A 0-0.5']	B091560	03/10/14

Prep Method: SW-846 3540C-SW846-8270M

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
14C0171-01RE1 [B-49A 0-1']	B092337	15.1	2.00	03/21/14
14C0171-02RE1 [B-50A 0-1']	B092337	15.0	2.00	03/21/14
14C0171-03RE1 [B-2A 0-1']	B092337	15.3	2.00	03/21/14
14C0171-04RE1 [B-16A 0-1']	B092337	15.3	2.00	03/21/14
14C0171-05RE1 [B-11A 0-0.5']	B092337	15.1	2.00	03/21/14
14C0171-06RE1 [B-11A 0-0.5' DUP]	B092337	15.2	2.00	03/21/14
14C0171-07RE1 [B-21A 0-0.5]	B092337	15.4	2.00	03/21/14
14C0171-08RE1 [Comp 6A 0-0.5']	B092337	15.3	2.00	03/21/14

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

QUALITY CONTROL

PCB Congeners in Soil by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B092337 - SW-846 3540C											
Blank (B092337-BLK1)				Prepared: 03/21/14 Analyzed: 03/25/14							
Cl4-BZ#81	ND	0.27	µg/kg wet								
Cl4-BZ#77	ND	0.27	µg/kg wet								
Cl5-BZ#123/#107	ND	0.53	µg/kg wet								
Cl5-BZ#118	ND	0.27	µg/kg wet								
Cl5-BZ#114	ND	0.27	µg/kg wet								
Cl5-BZ#105	ND	0.27	µg/kg wet								
Cl5-BZ#126	ND	0.27	µg/kg wet								
Cl6-BZ#167	ND	0.27	µg/kg wet								
Cl6-BZ#156	ND	0.27	µg/kg wet								
Cl6-BZ#157	ND	0.27	µg/kg wet								
Cl6-BZ#169	ND	0.27	µg/kg wet								
Cl7-BZ#189	ND	0.27	µg/kg wet								
Surrogate: Tetrachloro-m-xylene	*2.15*		µg/kg wet	3.33		64.5		40-140			
LCS (B092337-BS1)				Prepared: 03/21/14 Analyzed: 03/25/14							
Cl4-BZ#81	2.26	0.27	µg/kg wet	3.33		67.9		40-140			
Cl5-BZ#123/#107	1.80	0.53	µg/kg wet	3.33		54.1		40-140			
Cl5-BZ#118	2.25	0.27	µg/kg wet	3.33		67.5		40-140			
Cl5-BZ#114	2.10	0.27	µg/kg wet	3.33		63.0		40-140			
Cl5-BZ#105	1.89	0.27	µg/kg wet	3.33		56.6		40-140			
Cl5-BZ#126	1.84	0.27	µg/kg wet	3.33		55.1		40-140			
Cl6-BZ#167	2.29	0.27	µg/kg wet	3.33		68.7		40-140			
Cl6-BZ#156	2.33	0.27	µg/kg wet	3.33		69.8		40-140			
Cl6-BZ#157	2.21	0.27	µg/kg wet	3.33		66.2		40-140			
Cl6-BZ#169	2.44	0.27	µg/kg wet	3.33		73.2		40-140			
Cl7-BZ#189	2.23	0.27	µg/kg wet	3.33		66.9		40-140			
Surrogate: Tetrachloro-m-xylene	*2.23*		µg/kg wet	3.33		66.9		40-140			
LCS Dup (B092337-BSD1)				Prepared: 03/21/14 Analyzed: 03/25/14							
Cl4-BZ#81	2.54	0.27	µg/kg wet	3.33		76.2		40-140	11.6	30	
Cl5-BZ#123/#107	2.00	0.53	µg/kg wet	3.33		59.9		40-140	10.1	30	
Cl5-BZ#118	2.50	0.27	µg/kg wet	3.33		75.0		40-140	10.5	30	
Cl5-BZ#114	2.34	0.27	µg/kg wet	3.33		70.3		40-140	11.0	30	
Cl5-BZ#105	2.13	0.27	µg/kg wet	3.33		63.9		40-140	12.2	30	
Cl5-BZ#126	2.03	0.27	µg/kg wet	3.33		60.9		40-140	10.0	30	
Cl6-BZ#167	2.53	0.27	µg/kg wet	3.33		75.9		40-140	9.93	30	
Cl6-BZ#156	2.56	0.27	µg/kg wet	3.33		76.7		40-140	9.45	30	
Cl6-BZ#157	2.41	0.27	µg/kg wet	3.33		72.4		40-140	8.92	30	
Cl6-BZ#169	2.68	0.27	µg/kg wet	3.33		80.4		40-140	9.40	30	
Cl7-BZ#189	2.40	0.27	µg/kg wet	3.33		72.1		40-140	7.37	30	
Surrogate: Tetrachloro-m-xylene	*2.44*		µg/kg wet	3.33		73.2		40-140			
Matrix Spike (B092337-MS1)	**Source: 14C0171-08RE1**			Prepared: 03/21/14 Analyzed: 03/25/14							
Cl4-BZ#81	2.58	0.28	µg/kg dry	3.53	ND	73.3		40-140			
Cl5-BZ#123/#107	3.03	0.56	µg/kg dry	3.53	0.289	77.8		40-140			
Cl5-BZ#118	23.0	0.28	µg/kg dry	3.53	5.09	**509**	*	40-140			MS-12
Cl5-BZ#114	2.76	0.28	µg/kg dry	3.53	ND	78.2		40-140			
Cl5-BZ#105	9.43	0.28	µg/kg dry	3.53	1.76	**217**	*	40-140			MS-12
Cl5-BZ#126	2.21	0.28	µg/kg dry	3.53	ND	62.6		40-140			
Cl6-BZ#167	3.67	0.28	µg/kg dry	3.53	0.208	98.2		40-140			
Cl6-BZ#156	5.57	0.28	µg/kg dry	3.53	0.629	140		40-140			
Cl6-BZ#157	3.24	0.28	µg/kg dry	3.53	ND	92.0		40-140			

con-test® ANALYTICAL LABORATORY

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

QUALITY CONTROL

PCB Congeners in Soil by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B092337 - SW-846 3540C											
Matrix Spike (B092337-MS1)	**Source: 14C0171-08RE1**			Prepared: 03/21/14 Analyzed: 03/25/14							
Cl6-BZ#169	3.05	0.28	µg/kg dry	3.53	ND	86.5		40-140			
Cl7-BZ#189	2.62	0.28	µg/kg dry	3.53	ND	74.4		40-140			
Surrogate: Tetrachloro-m-xylene	*3.26*		µg/kg dry	3.53		92.5		40-140			
Matrix Spike Dup (B092337-MSD1)	**Source: 14C0171-08RE1**			Prepared: 03/21/14 Analyzed: 03/25/14							
Cl4-BZ#81	2.68	0.28	µg/kg dry	3.53	ND	76.1		40-140	3.78	50	
Cl5-BZ#123/#107	2.80	0.56	µg/kg dry	3.53	0.289	71.3		40-140	7.89	50	
Cl5-BZ#118	17.6	0.28	µg/kg dry	3.53	5.09	**354**	*	40-140	26.9	50	MS-12
Cl5-BZ#114	2.74	0.28	µg/kg dry	3.53	ND	77.8		40-140	0.554	50	
Cl5-BZ#105	7.54	0.28	µg/kg dry	3.53	1.76	**164**	*	40-140	22.2	50	MS-12
Cl5-BZ#126	2.26	0.28	µg/kg dry	3.53	ND	64.1		40-140	2.37	50	
Cl6-BZ#167	3.51	0.28	µg/kg dry	3.53	0.208	93.6		40-140	4.51	50	
Cl6-BZ#156	4.87	0.28	µg/kg dry	3.53	0.629	120		40-140	13.4	50	
Cl6-BZ#157	3.11	0.28	µg/kg dry	3.53	ND	88.2		40-140	4.20	50	
Cl6-BZ#169	3.05	0.28	µg/kg dry	3.53	ND	86.6		40-140	0.0323	50	
Cl7-BZ#189	2.75	0.28	µg/kg dry	3.53	ND	78.1		40-140	4.82	50	
Surrogate: Tetrachloro-m-xylene	*3.36*		µg/kg dry	3.53		95.4		40-140			

con-test® ANALYTICAL LABORATORY
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
	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.
MS-12	Matrix spike recovery and matrix spike duplicate recovery outside of control limits. Possibility of sample matrix effects that lead to a high bias for reported result or non-homogeneous sample aliquots cannot be eliminated.

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

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications

No certified Analyses included in this Report

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

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2016
MA	Massachusetts DEP	M-MA100	06/30/2014
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2015
NY	New York State Department of Health	10899 NELAP	04/1/2014
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2015
RI	Rhode Island Department of Health	LAO00112	12/30/2014
NC	North Carolina Div. of Water Quality	652	12/31/2014
NJ	New Jersey DEP	MA007 NELAP	06/30/2014
FL	Florida Department of Health	E871027 NELAP	06/30/2014
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2014
WA	State of Washington Department of Ecology	C2065	02/23/2015
ME	State of Maine	2011028	06/9/2015
VA	Commonwealth of Virginia	460217	12/14/2014
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2014

CHAIN OF CUSTODY RECORD

14C0171

Rev 04.05.12

con-test® ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

Page 1 of 1

Company Name: GEC
Address: 60 BROOKS DRIVE
BRAINTREE, MA 02184
Attention:
Project Location: BOOTT MILLS, LOWELL
Sampled By: MBRADLEY

Telephone: 781-356-9140
Project # 911JR-3117
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ○ EMAIL ○ WEBSITE
Fax #
Email:
Format: ○ PDF ○ EXCEL ○ GIS
○ OTHER
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	PCB Congeners 3450	# of Containers	** Preservation	***Container Code	Dissolved Metals: ○ Field Filtered ○ Lab to Filter
-01	B-49A 0-1'	3-4-14	1330		X	S	U	X	8	I	A	
-02	B-50A 0-1'	3-4-14	1340		X	S	U	X				
-03	B-2A 0-1'	3-4-14	1015		X	S	U	X				
-04	B-16A 0-1'	3-4-14	1040		X	S	U	X				
-05	B-11A 0-0.5'	3-4-14	1130		X	S	U	X				
-06	B-11A 0-0.5' DUP	3-4-14	1130		X	S	U	X				
-07	B-21A 0-0.5'	3-5-14	0930		X	S	U	X				
-08	COMP 6A ~~0-0.5'~~ 0-0.5'	3-5-14	1130		X	S	U	X				

ANALYSIS REQUESTED

***Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
V=vial
S=summa can
T=tedlar bag
O=Other

****Preservation**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfa
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Comments:
INCLUDE ALL DOCUMENTATION AS REQUIRED BY CPA FOR COLCHER ANALYSIS. COLCHER LIST ATTACHED

Relinquished by: (signature)	Date/Time:
Received by: (signature) 3/6/14	Date/Time: 1310
Relinquished by: (signature) 3/6/14	Date/Time: 2080
Received by: (signature) 3.9°C 3/6/14	Date/Time: 2030

Turnar
☐
☐
☐
RU
☐ †24-Hr ☐
☐ †72-Hr ☐
† Require la

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RI
IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUEST

** Includes five duplicate samples

^ Analysis will be conducted for the following PCB congeners:

3,3',4,4'-TCB (77)	3,3',4,4',5,5'-HxCB (169)	2,3',4,4',5-PeCB (118)	2,3,3',4,4',5'-HxCB (157)
3,4,4',5-TCB (81)	2,3,3',4,4'-PeCB (105)	2',3,4,4',5-PeCB (123)	2,3',4,4',5,5'-HxCB (167)
3,3',4,4',5-PeCB (126)	2,3,4,4',5-PeCB (114)	2,3,3',4,4', 5 -HXCB (156)	2,3,3',4,4',5,5'-HpCB (189)

Source: USEPA, *Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-p-dioxin and Dioxin-Like Compounds*, EPA/100/R 10/005, www.epa.gov/ncea

Use extraction and analytical methods approved under either Subpart N or Subpart O of 40 CFR Part 761.

Page 25 of 27 14C0171_2 Contest_Final 03 27 14 1231 03/27/14 12:32:12

39 Spruce St.
East Longmeadow, MA. 01028
P: 413-525-2332
F: 413-525-6405
www.contestlabs.com

con-test® ANALYTICAL LABORATORY

Sample Receipt Checklist

CLIENT NAME: GEC RECEIVED BY: MJ DATE: 03/06/14

1) **Was the chain(s) of custody relinquished and signed?** (Yes) No No CoC Included

2) **Does the chain agree with the samples?** (Yes) No
If not, explain:

3) **Are all the samples in good condition?** (Yes) No
If not, explain:

4) **How were the samples received:**
On Ice ☑ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☑

Were the samples received in Temperature Compliance of (2-6°C)? (Yes) No N/A

Temperature °C by Temp blank _____ Temperature °C by Temp gun 3.9°C

5) **Are there Dissolved samples for the lab to filter?** Yes (No)
Who was notified _____ Date _____ Time _____

6) **Are there any RUSH or SHORT HOLDING TIME samples?** Yes (No)
Who was notified _____ Date _____ Time _____

7) **Location where samples are stored:** 19

Permission to subcontract samples? Yes No
(Walk-in clients only) if not already approved
Client Signature: _____

8) **Do all samples have the proper Acid pH:** Yes No (N/A) _____

9) **Do all samples have the proper Base pH:** Yes No (N/A) _____

10) **Was the PC notified of any discrepancies with the CoC vs the samples:** Yes No (N/A)

Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		8 oz amber/clear jar	4 A
500 mL Amber		4 oz amber/clear jar	16 A
250 mL Amber (8oz amber)		2 oz amber/clear jar	
1 Liter Plastic		Plastic Bag / Ziploc	
500 mL Plastic		SOC Kit	
250 mL plastic		Non-ConTest Container	
40 mL Vial - type listed below		Perchlorate Kit	
Colisure / bacteria bottle		Flashpoint bottle	
Dissolved Oxygen bottle		Other glass jar	
Encore		Other	

Laboratory Comments:

40 mL vials: # HCl _____ # Methanol _____
Bisulfate _____ # DI Water _____
Thiosulfate _____

Time and Date Frozen:

Login Sample Receipt Checklist

(Rejection Criteria Listing - Using Sample Acceptance Policy)

Any False statement will be brought to the attention of Client

Question	Answer (True/False) T/F/NA	Comment
1) The cooler's custody seal, if present, is intact.	T	
2) The cooler or samples do not appear to have been compromised or tampered with.	T	
3) Samples were received on ice.	T	
4) Cooler Temperature is acceptable.	T	
5) Cooler Temperature is recorded.	T	
6) COC is filled out in ink and legible.	T	
7) COC is filled out with all pertinent information.	T	
8) Field Sampler's name present on COC.	T	
9) There are no discrepancies between the sample IDs on the container and the COC.	T	
10) Samples are received within Holding Time.	T	
11) Sample containers have legible labels.	T	
12) Containers are not broken or leaking.	T	
13) Air Cassettes are not broken/open.	NA	
14) Sample collection date/times are provided.	T	
15) Appropriate sample containers are used.	T	
16) Proper collection media used.	T	
17) No headspace sample bottles are completely filled.	T	
18) There is sufficient volume for all requsted analyses, including any requested MS/MSDs.	T	
19) Trip blanks provided if applicable.	T	
20) VOA sample vials do not have head space or bubble is <6mm (1/4") in diameter.	NA	
21) Samples do not require splitting or compositing.	T	

Who notified of False statements? **Date/Time:**

Doc #277 Rev. 4 August 2013 **Log-In Technician Initials:** **Date/Time:**

MJ 03/06/14 2030

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

July 23, 2014

Lauren Mckinlay
Goldman Environmental
60 Brooks Drive
Braintree, MA 02184

Project Location: Lowell, MA
Client Job Number:
Project Number: 911-3117B
Laboratory Work Order Number: 14F0128

Enclosed are results of analyses for samples received by the laboratory on June 4, 2014. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

James M. Georgantas
Project Manager

Table of Contents

Sample Summary 5

Case Narrative 7

Sample Results 9

14F0128-01 9

14F0128-02 11

14F0128-03 13

14F0128-04 15

14F0128-05 17

14F0128-06 19

14F0128-07 21

14F0128-08 23

14F0128-09 25

14F0128-10 27

14F0128-11 29

14F0128-12 31

14F0128-13 33

14F0128-14 35

14F0128-15 37

14F0128-16 39

14F0128-17 41

14F0128-18 43

14F0128-19 45

14F0128-20 47

14F0128-21 49

14F0128-22 51

14F0128-23 53

Table of Contents (continued)

14F0128-24 55

14F0128-25 57

14F0128-26 59

14F0128-27 61

14F0128-28 63

14F0128-29 65

14F0128-30 67

14F0128-31 69

14F0128-32 71

14F0128-33 73

14F0128-34 75

14F0128-35 77

14F0128-36 79

14F0128-37 81

14F0128-38 83

14F0128-39 85

14F0128-40 87

Sample Preparation Information 89

QC Data 91

Polychlorinated Biphenyls with 3540 Soxhlet Extraction 91

B097132 91

B097253 92

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) 94

B097382 94

Dual Column RPD Report 95

Table of Contents (continued)

Flag/Qualifier Summary	126
Certifications	127
Chain of Custody/Sample Receipt	128

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

Goldman Environmental
60 Brooks Drive
Braintree, MA 02184
ATTN: Lauren Mckinlay

REPORT DATE: 7/23/2014

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 911-3117B

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 14F0128

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

PROJECT LOCATION: Lowell, MA

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
ASC-1	14F0128-01	Soil		SM 2540G	
				SW-846 8082A	
ASC-2	14F0128-02	Soil		SM 2540G	
				SW-846 8082A	
ASC-3	14F0128-03	Soil		SM 2540G	
				SW-846 8082A	
ASC-4	14F0128-04	Soil		SM 2540G	
				SW-846 8082A	
ASC-5	14F0128-05	Soil		SM 2540G	
				SW-846 8082A	
ASC-6	14F0128-06	Soil		SM 2540G	
				SW-846 8082A	
B-51B (1-2)	14F0128-07	Soil		SM 2540G	
				SW-846 8082A	
B-51B (2-3)	14F0128-08	Soil		SM 2540G	
				SW-846 8082A	
B-51B (3-5)	14F0128-09	Soil		SM 2540G	
				SW-846 8082A	
B-52B (1-2)	14F0128-10	Soil		SM 2540G	
				SW-846 8082A	
B-52B (2-3)	14F0128-11	Soil		SM 2540G	
				SW-846 8082A	
B-52B (3-5)	14F0128-12	Soil		SM 2540G	
				SW-846 8082A	
B-55B (1-2)	14F0128-13	Soil		SM 2540G	
				SW-846 8082A	
B-55B (2-3)	14F0128-14	Soil		SM 2540G	
				SW-846 8082A	
B-55B (3-5)	14F0128-15	Soil		SM 2540G	
				SW-846 8082A	
B-56B (1-2)	14F0128-16	Soil		SM 2540G	
				SW-846 8082A	
B-56B (2-3)	14F0128-17	Soil		SM 2540G	
				SW-846 8082A	
B-56B (3-4)	14F0128-18	Soil		SM 2540G	
				SW-846 8082A	
B-57B (1-2)	14F0128-19	Soil		SM 2540G	
				SW-846 8082A	
B-57B (2-3)	14F0128-20	Soil		SM 2540G	
				SW-846 8082A	

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

Goldman Environmental
60 Brooks Drive
Braintree, MA 02184
ATTN: Lauren Mckinlay

REPORT DATE: 7/23/2014

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 911-3117B

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 14F0128

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

PROJECT LOCATION: Lowell, MA

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
B-57B (3-5)	14F0128-21	Soil		SM 2540G	
				SW-846 8082A	
B-69 (0-0.5)	14F0128-22	Soil		SM 2540G	
				SW-846 8082A	
B-69 (0.5-1)	14F0128-23	Soil		SM 2540G	
				SW-846 8082A	
B-69 (1-2)	14F0128-24	Soil		SM 2540G	
				SW-846 8082A	
B-69 (2-5)	14F0128-25	Soil		SM 2540G	
				SW-846 8082A	
B-69 (5-7)	14F0128-26	Soil		SM 2540G	
				SW-846 8082A	
B-70 (0-0.5)	14F0128-27	Soil		SM 2540G	
				SW-846 8082A	
B-70 (0.5-1)	14F0128-28	Soil		SM 2540G	
				SW-846 8082A	
B-70 (1-2)	14F0128-29	Soil		SM 2540G	
				SW-846 8082A	
B-70 (2-5)	14F0128-30	Soil		SM 2540G	
				SW-846 8082A	
B-70 (5-7)	14F0128-31	Soil		SM 2540G	
				SW-846 8082A	
B-71 (0-0.5)	14F0128-32	Soil		SM 2540G	
				SW-846 8082A	
B-71 (0.5-1)	14F0128-33	Soil		SM 2540G	
				SW-846 8082A	
B-71 (1-2)	14F0128-34	Soil		SM 2540G	
				SW-846 8082A	
B-72 (0-0.5)	14F0128-35	Soil		SM 2540G	
				SW-846 8082A	
B-72 (0.5-1)	14F0128-36	Soil		SM 2540G	
				SW-846 8082A	
B-72 (1-2)	14F0128-37	Soil		SM 2540G	
				SW-846 8082A	
B-73 (0-0.5)	14F0128-38	Soil		SM 2540G	
				SW-846 8082A	
B-73 (0.5-1)	14F0128-39	Soil		SM 2540G	
				SW-846 8082A	
B-73 (1-2)	14F0128-40	Soil		SM 2540G	
				SW-846 8082A	

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.

SW-846 8082A

Qualifications:

O-03

Sample contains two incompletely resolved aroclors. Aroclor with the closest matching pattern is reported.

Analyte & Samples(s) Qualified:

Aroclor-1254
14F0128-39[B-73 (0.5-1)]

Aroclor-1254 [2C]
14F0128-39[B-73 (0.5-1)]

O-04

Sample fingerprint does not match standard exactly. Sample was quantitated against the closest matching standard.

Analyte & Samples(s) Qualified:

Aroclor-1248
14F0128-01[ASC-1], 14F0128-04[ASC-4], 14F0128-05[ASC-5], 14F0128-06[ASC-6], 14F0128-07[B-51B (1-2)], 14F0128-08[B-51B (2-3)], 14F0128-10[B-52B (1-2)], 14F0128-11[B-52B (2-3)], 14F0128-14[B-55B (2-3)], 14F0128-15[B-55B (3-5)], 14F0128-16[B-56B (1-2)], 14F0128-17[B-56B (2-3)], 14F0128-19[B-57B (1-2)], 14F0128-20[B-57B (2-3)], 14F0128-21[B-57B (3-5)], 14F0128-30[B-70 (2-5)], 14F0128-37[B-72 (1-2)]

Aroclor-1248 [2C]
14F0128-01[ASC-1], 14F0128-04[ASC-4], 14F0128-05[ASC-5], 14F0128-06[ASC-6], 14F0128-07[B-51B (1-2)], 14F0128-08[B-51B (2-3)], 14F0128-10[B-52B (1-2)], 14F0128-11[B-52B (2-3)], 14F0128-14[B-55B (2-3)], 14F0128-15[B-55B (3-5)], 14F0128-16[B-56B (1-2)], 14F0128-17[B-56B (2-3)], 14F0128-19[B-57B (1-2)], 14F0128-20[B-57B (2-3)], 14F0128-21[B-57B (3-5)], 14F0128-30[B-70 (2-5)], 14F0128-37[B-72 (1-2)]

O-32

A five times dilution was performed as part of the standard analytical procedure.

Analyte & Samples(s) Qualified:

14F0128-02[ASC-2], 14F0128-03[ASC-3], 14F0128-09[B-51B (3-5)], 14F0128-12[B-52B (3-5)], 14F0128-18[B-56B (3-4)], 14F0128-22[B-69 (0-0.5)], 14F0128-23[B-69 (0.5-1)], 14F0128-27[B-70 (0-0.5)], 14F0128-29[B-70 (1-2)], 14F0128-32[B-71 (0-0.5)], 14F0128-33[B-71 (0.5-1)], 14F0128-35[B-72 (0-0.5)], 14F0128-36[B-72 (0.5-1)], 14F0128-38[B-73 (0-0.5)]

P-01

Result was confirmed using a dissimilar column. Relative percent difference between the two results was >40%. In accordance with the method, the higher result was reported.

Analyte & Samples(s) Qualified:

Aroclor-1248 [2C]
14F0128-16[B-56B (1-2)]

S-01

The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.

Analyte & Samples(s) Qualified:

Decachlorobiphenyl
14F0128-25[B-69 (2-5)], 14F0128-34[B-71 (1-2)]

Decachlorobiphenyl [2C]
14F0128-25[B-69 (2-5)], 14F0128-34[B-71 (1-2)]

Tetrachloro-m-xylene
14F0128-25[B-69 (2-5)], 14F0128-34[B-71 (1-2)]

Tetrachloro-m-xylene [2C]
14F0128-25[B-69 (2-5)], 14F0128-34[B-71 (1-2)]

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

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.

Michael A. Erickson
Laboratory Director

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: ASC-1 | Sampled: 6/3/2014 09:28

Sample ID: 14F0128-01

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 19:40	MJC
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 19:40	MJC
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 19:40	MJC
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 19:40	MJC
Aroclor-1248 [2]	0.39	0.11	mg/Kg dry	5	O-04	SW-846 8082A	6/5/14	6/6/14 19:40	MJC
Aroclor-1254 [2]	0.30	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 19:40	MJC
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 19:40	MJC
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 19:40	MJC
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 19:40	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	111	30-150		6/6/14 19:40
Decachlorobiphenyl [2]	101	30-150		6/6/14 19:40
Tetrachloro-m-xylene [1]	95.0	30-150		6/6/14 19:40
Tetrachloro-m-xylene [2]	108	30-150		6/6/14 19:40

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: ASC-1 | Sampled: 6/3/2014 09:28

Sample ID: 14F0128-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	87.0		% Wt	1		SM 2540G	6/9/14	6/10/14 7:17	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: ASC-2 | Sampled: 6/3/2014 00:00

Sample ID: 14F0128-02

Sample Matrix: Soil

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 19:52	MJC
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 19:52	MJC
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 19:52	MJC
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 19:52	MJC
Aroclor-1248 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 19:52	MJC
Aroclor-1254 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 19:52	MJC
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 19:52	MJC
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 19:52	MJC
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 19:52	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
Decachlorobiphenyl [1]	102	30-150		6/6/14	19:52
Decachlorobiphenyl [2]	95.7	30-150		6/6/14	19:52
Tetrachloro-m-xylene [1]	88.8	30-150		6/6/14	19:52
Tetrachloro-m-xylene [2]	101	30-150		6/6/14	19:52

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: ASC-2 | Sampled: 6/3/2014 00:00

Sample ID: 14F0128-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	87.5		% Wt	1		SM 2540G	6/9/14	6/10/14 7:17	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: ASC-3 | Sampled: 6/3/2014 11:21

Sample ID: 14F0128-03

Sample Matrix: Soil

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 20:05	MJC
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 20:05	MJC
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 20:05	MJC
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 20:05	MJC
Aroclor-1248 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 20:05	MJC
Aroclor-1254 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 20:05	MJC
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 20:05	MJC
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 20:05	MJC
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 20:05	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	91.8	30-150		6/6/14 20:05
Decachlorobiphenyl [2]	88.5	30-150		6/6/14 20:05
Tetrachloro-m-xylene [1]	86.3	30-150		6/6/14 20:05
Tetrachloro-m-xylene [2]	97.5	30-150		6/6/14 20:05

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: ASC-3 | Sampled: 6/3/2014 11:21

Sample ID: 14F0128-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	87.0		% Wt	1		SM 2540G	6/9/14	6/10/14 7:17	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: ASC-4 | Sampled: 6/3/2014 00:00

Sample ID: 14F0128-04

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 20:18	MJC
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 20:18	MJC
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 20:18	MJC
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 20:18	MJC
Aroclor-1248 [2]	0.93	0.11	mg/Kg dry	5	O-04	SW-846 8082A	6/5/14	6/6/14 20:18	MJC
Aroclor-1254 [2]	0.74	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 20:18	MJC
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 20:18	MJC
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 20:18	MJC
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 20:18	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	82.0	30-150		6/6/14 20:18
Decachlorobiphenyl [2]	81.0	30-150		6/6/14 20:18
Tetrachloro-m-xylene [1]	80.2	30-150		6/6/14 20:18
Tetrachloro-m-xylene [2]	91.9	30-150		6/6/14 20:18

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: ASC-4 | Sampled: 6/3/2014 00:00

Sample ID: 14F0128-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	87.1		% Wt	1		SM 2540G	6/9/14	6/10/14 7:17	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: ASC-5 | Sampled: 6/3/2014 10:40

Sample ID: 14F0128-05

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.56	mg/Kg dry	25		SW-846 8082A	6/5/14	6/7/14 1:18	MJC
Aroclor-1221 [1]	ND	0.56	mg/Kg dry	25		SW-846 8082A	6/5/14	6/7/14 1:18	MJC
Aroclor-1232 [1]	ND	0.56	mg/Kg dry	25		SW-846 8082A	6/5/14	6/7/14 1:18	MJC
Aroclor-1242 [1]	ND	0.56	mg/Kg dry	25		SW-846 8082A	6/5/14	6/7/14 1:18	MJC
Aroclor-1248 [2]	4.3	0.56	mg/Kg dry	25	O-04	SW-846 8082A	6/5/14	6/7/14 1:18	MJC
Aroclor-1254 [2]	3.1	0.56	mg/Kg dry	25		SW-846 8082A	6/5/14	6/7/14 1:18	MJC
Aroclor-1260 [1]	ND	0.56	mg/Kg dry	25		SW-846 8082A	6/5/14	6/7/14 1:18	MJC
Aroclor-1262 [1]	ND	0.56	mg/Kg dry	25		SW-846 8082A	6/5/14	6/7/14 1:18	MJC
Aroclor-1268 [1]	ND	0.56	mg/Kg dry	25		SW-846 8082A	6/5/14	6/7/14 1:18	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	102	30-150		6/7/14 1:18
Decachlorobiphenyl [2]	89.7	30-150		6/7/14 1:18
Tetrachloro-m-xylene [1]	90.9	30-150		6/7/14 1:18
Tetrachloro-m-xylene [2]	98.8	30-150		6/7/14 1:18

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: ASC-5 | Sampled: 6/3/2014 10:40

Sample ID: 14F0128-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	88.3		% Wt	1		SM 2540G	6/9/14	6/10/14 7:17	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: ASC-6 | Sampled: 6/3/2014 10:12

Sample ID: 14F0128-06

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.21	mg/Kg dry	10		SW-846 8082A	6/5/14	6/7/14 1:31	MJC
Aroclor-1221 [1]	ND	0.21	mg/Kg dry	10		SW-846 8082A	6/5/14	6/7/14 1:31	MJC
Aroclor-1232 [1]	ND	0.21	mg/Kg dry	10		SW-846 8082A	6/5/14	6/7/14 1:31	MJC
Aroclor-1242 [1]	ND	0.21	mg/Kg dry	10		SW-846 8082A	6/5/14	6/7/14 1:31	MJC
Aroclor-1248 [2]	2.6	0.21	mg/Kg dry	10	O-04	SW-846 8082A	6/5/14	6/7/14 1:31	MJC
Aroclor-1254 [2]	1.7	0.21	mg/Kg dry	10		SW-846 8082A	6/5/14	6/7/14 1:31	MJC
Aroclor-1260 [1]	ND	0.21	mg/Kg dry	10		SW-846 8082A	6/5/14	6/7/14 1:31	MJC
Aroclor-1262 [1]	ND	0.21	mg/Kg dry	10		SW-846 8082A	6/5/14	6/7/14 1:31	MJC
Aroclor-1268 [1]	ND	0.21	mg/Kg dry	10		SW-846 8082A	6/5/14	6/7/14 1:31	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	95.0	30-150		6/7/14 1:31
Decachlorobiphenyl [2]	90.5	30-150		6/7/14 1:31
Tetrachloro-m-xylene [1]	91.8	30-150		6/7/14 1:31
Tetrachloro-m-xylene [2]	103	30-150		6/7/14 1:31

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: ASC-6 | Sampled: 6/3/2014 10:12

Sample ID: 14F0128-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	89.1		% Wt	1		SM 2540G	6/9/14	6/10/14 7:17	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-51B (1-2) | Sampled: 6/3/2014 11:33

Sample ID: 14F0128-07

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	1.2	mg/Kg dry	50		SW-846 8082A	6/5/14	6/7/14 1:43	MJC
Aroclor-1221 [1]	ND	1.2	mg/Kg dry	50		SW-846 8082A	6/5/14	6/7/14 1:43	MJC
Aroclor-1232 [1]	ND	1.2	mg/Kg dry	50		SW-846 8082A	6/5/14	6/7/14 1:43	MJC
Aroclor-1242 [1]	ND	1.2	mg/Kg dry	50		SW-846 8082A	6/5/14	6/7/14 1:43	MJC
Aroclor-1248 [2]	8.6	1.2	mg/Kg dry	50	O-04	SW-846 8082A	6/5/14	6/7/14 1:43	MJC
Aroclor-1254 [2]	7.6	1.2	mg/Kg dry	50		SW-846 8082A	6/5/14	6/7/14 1:43	MJC
Aroclor-1260 [1]	ND	1.2	mg/Kg dry	50		SW-846 8082A	6/5/14	6/7/14 1:43	MJC
Aroclor-1262 [1]	ND	1.2	mg/Kg dry	50		SW-846 8082A	6/5/14	6/7/14 1:43	MJC
Aroclor-1268 [1]	ND	1.2	mg/Kg dry	50		SW-846 8082A	6/5/14	6/7/14 1:43	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
Decachlorobiphenyl [1]	104	30-150		6/7/14 1:43	
Decachlorobiphenyl [2]	89.5	30-150		6/7/14 1:43	
Tetrachloro-m-xylene [1]	90.7	30-150		6/7/14 1:43	
Tetrachloro-m-xylene [2]	95.0	30-150		6/7/14 1:43	

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-51B (1-2) | Sampled: 6/3/2014 11:33

Sample ID: 14F0128-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	84.7		% Wt	1		SM 2540G	6/9/14	6/10/14 7:17	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-51B (2-3) | Sampled: 6/3/2014 11:34

Sample ID: 14F0128-08

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.24	mg/Kg dry	10		SW-846 8082A	6/5/14	6/7/14 1:56	MJC
Aroclor-1221 [1]	ND	0.24	mg/Kg dry	10		SW-846 8082A	6/5/14	6/7/14 1:56	MJC
Aroclor-1232 [1]	ND	0.24	mg/Kg dry	10		SW-846 8082A	6/5/14	6/7/14 1:56	MJC
Aroclor-1242 [2]	0.58	0.24	mg/Kg dry	10		SW-846 8082A	6/5/14	6/7/14 1:56	MJC
Aroclor-1248 [1]	1.5	0.24	mg/Kg dry	10	O-04	SW-846 8082A	6/5/14	6/7/14 1:56	MJC
Aroclor-1254 [1]	ND	0.24	mg/Kg dry	10		SW-846 8082A	6/5/14	6/7/14 1:56	MJC
Aroclor-1260 [1]	ND	0.24	mg/Kg dry	10		SW-846 8082A	6/5/14	6/7/14 1:56	MJC
Aroclor-1262 [1]	ND	0.24	mg/Kg dry	10		SW-846 8082A	6/5/14	6/7/14 1:56	MJC
Aroclor-1268 [1]	ND	0.24	mg/Kg dry	10		SW-846 8082A	6/5/14	6/7/14 1:56	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	100	30-150		6/7/14 1:56
Decachlorobiphenyl [2]	93.1	30-150		6/7/14 1:56
Tetrachloro-m-xylene [1]	95.2	30-150		6/7/14 1:56
Tetrachloro-m-xylene [2]	104	30-150		6/7/14 1:56

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-51B (2-3) | Sampled: 6/3/2014 11:34

Sample ID: 14F0128-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	80.5		% Wt	1		SM 2540G	6/9/14	6/10/14 7:18	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-51B (3-5) | Sampled: 6/3/2014 11:35

Sample ID: 14F0128-09

Sample Matrix: Soil

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.13	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 21:22	MJC
Aroclor-1221 [1]	ND	0.13	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 21:22	MJC
Aroclor-1232 [1]	ND	0.13	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 21:22	MJC
Aroclor-1242 [1]	ND	0.13	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 21:22	MJC
Aroclor-1248 [1]	ND	0.13	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 21:22	MJC
Aroclor-1254 [1]	ND	0.13	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 21:22	MJC
Aroclor-1260 [1]	ND	0.13	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 21:22	MJC
Aroclor-1262 [1]	ND	0.13	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 21:22	MJC
Aroclor-1268 [1]	ND	0.13	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 21:22	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	88.7	30-150		6/6/14 21:22
Decachlorobiphenyl [2]	86.9	30-150		6/6/14 21:22
Tetrachloro-m-xylene [1]	84.6	30-150		6/6/14 21:22
Tetrachloro-m-xylene [2]	95.6	30-150		6/6/14 21:22

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-51B (3-5) | Sampled: 6/3/2014 11:35

Sample ID: 14F0128-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	75.6		% Wt	1		SM 2540G	6/9/14	6/10/14 7:18	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-52B (1-2) | Sampled: 6/3/2014 11:39

Sample ID: 14F0128-10

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.21	mg/Kg dry	10		SW-846 8082A	6/5/14	6/7/14 9:37	MJC
Aroclor-1221 [1]	ND	0.21	mg/Kg dry	10		SW-846 8082A	6/5/14	6/7/14 9:37	MJC
Aroclor-1232 [1]	ND	0.21	mg/Kg dry	10		SW-846 8082A	6/5/14	6/7/14 9:37	MJC
Aroclor-1242 [1]	ND	0.21	mg/Kg dry	10		SW-846 8082A	6/5/14	6/7/14 9:37	MJC
Aroclor-1248 [2]	1.8	0.21	mg/Kg dry	10	O-04	SW-846 8082A	6/5/14	6/7/14 9:37	MJC
Aroclor-1254 [2]	1.2	0.21	mg/Kg dry	10		SW-846 8082A	6/5/14	6/7/14 9:37	MJC
Aroclor-1260 [1]	ND	0.21	mg/Kg dry	10		SW-846 8082A	6/5/14	6/7/14 9:37	MJC
Aroclor-1262 [1]	ND	0.21	mg/Kg dry	10		SW-846 8082A	6/5/14	6/7/14 9:37	MJC
Aroclor-1268 [1]	ND	0.21	mg/Kg dry	10		SW-846 8082A	6/5/14	6/7/14 9:37	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	101	30-150		6/7/14 9:37
Decachlorobiphenyl [2]	89.5	30-150		6/7/14 9:37
Tetrachloro-m-xylene [1]	85.6	30-150		6/7/14 9:37
Tetrachloro-m-xylene [2]	96.2	30-150		6/7/14 9:37

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-52B (1-2) | Sampled: 6/3/2014 11:39

Sample ID: 14F0128-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	89.7		% Wt	1		SM 2540G	6/9/14	6/10/14 7:18	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-52B (2-3) | Sampled: 6/3/2014 11:41

Sample ID: 14F0128-11

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.55	mg/Kg dry	25		SW-846 8082A	6/5/14	6/7/14 9:50	MJC
Aroclor-1221 [1]	ND	0.55	mg/Kg dry	25		SW-846 8082A	6/5/14	6/7/14 9:50	MJC
Aroclor-1232 [1]	ND	0.55	mg/Kg dry	25		SW-846 8082A	6/5/14	6/7/14 9:50	MJC
Aroclor-1242 [1]	ND	0.55	mg/Kg dry	25		SW-846 8082A	6/5/14	6/7/14 9:50	MJC
Aroclor-1248 [2]	4.4	0.55	mg/Kg dry	25	O-04	SW-846 8082A	6/5/14	6/7/14 9:50	MJC
Aroclor-1254 [2]	4.9	0.55	mg/Kg dry	25		SW-846 8082A	6/5/14	6/7/14 9:50	MJC
Aroclor-1260 [1]	ND	0.55	mg/Kg dry	25		SW-846 8082A	6/5/14	6/7/14 9:50	MJC
Aroclor-1262 [1]	ND	0.55	mg/Kg dry	25		SW-846 8082A	6/5/14	6/7/14 9:50	MJC
Aroclor-1268 [1]	ND	0.55	mg/Kg dry	25		SW-846 8082A	6/5/14	6/7/14 9:50	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
Decachlorobiphenyl [1]	110	30-150		6/7/14 9:50	
Decachlorobiphenyl [2]	98.1	30-150		6/7/14 9:50	
Tetrachloro-m-xylene [1]	96.5	30-150		6/7/14 9:50	
Tetrachloro-m-xylene [2]	104	30-150		6/7/14 9:50	

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-52B (2-3) | Sampled: 6/3/2014 11:41

Sample ID: 14F0128-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	84.5		% Wt	1		SM 2540G	6/9/14	6/10/14 7:18	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-52B (3-5) | Sampled: 6/3/2014 11:41

Sample ID: 14F0128-12

Sample Matrix: Soil

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 22:26	MJC
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 22:26	MJC
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 22:26	MJC
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 22:26	MJC
Aroclor-1248 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 22:26	MJC
Aroclor-1254 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 22:26	MJC
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 22:26	MJC
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 22:26	MJC
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 22:26	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	97.2	30-150		6/6/14 22:26
Decachlorobiphenyl [2]	92.8	30-150		6/6/14 22:26
Tetrachloro-m-xylene [1]	88.0	30-150		6/6/14 22:26
Tetrachloro-m-xylene [2]	100	30-150		6/6/14 22:26

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-52B (3-5) | Sampled: 6/3/2014 11:41

Sample ID: 14F0128-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	86.5		% Wt	1		SM 2540G	6/9/14	6/10/14 7:18	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-55B (1-2) | Sampled: 6/3/2014 11:46

Sample ID: 14F0128-13

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 22:39	MJC
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 22:39	MJC
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 22:39	MJC
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 22:39	MJC
Aroclor-1248 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 22:39	MJC
Aroclor-1254 [2]	0.14	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 22:39	MJC
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 22:39	MJC
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 22:39	MJC
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 22:39	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	89.6	30-150		6/6/14 22:39
Decachlorobiphenyl [2]	85.3	30-150		6/6/14 22:39
Tetrachloro-m-xylene [1]	83.5	30-150		6/6/14 22:39
Tetrachloro-m-xylene [2]	94.7	30-150		6/6/14 22:39

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-55B (1-2) | Sampled: 6/3/2014 11:46

Sample ID: 14F0128-13

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	87.9		% Wt	1		SM 2540G	6/9/14	6/10/14 7:18	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-55B (2-3) | Sampled: 6/3/2014 11:47

Sample ID: 14F0128-14

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 22:52	MJC
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 22:52	MJC
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 22:52	MJC
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 22:52	MJC
Aroclor-1248 [2]	0.47	0.11	mg/Kg dry	5	O-04	SW-846 8082A	6/5/14	6/6/14 22:52	MJC
Aroclor-1254 [2]	0.45	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 22:52	MJC
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 22:52	MJC
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 22:52	MJC
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 22:52	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	94.3	30-150		6/6/14 22:52
Decachlorobiphenyl [2]	89.6	30-150		6/6/14 22:52
Tetrachloro-m-xylene [1]	84.3	30-150		6/6/14 22:52
Tetrachloro-m-xylene [2]	95.4	30-150		6/6/14 22:52

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-55B (2-3) | Sampled: 6/3/2014 11:47

Sample ID: 14F0128-14

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	87.5		% Wt	1		SM 2540G	6/9/14	6/10/14 7:18	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-55B (3-5) | Sampled: 6/3/2014 11:48

Sample ID: 14F0128-15

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:05	MJC
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:05	MJC
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:05	MJC
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:05	MJC
Aroclor-1248 [2]	1.0	0.11	mg/Kg dry	5	O-04	SW-846 8082A	6/5/14	6/6/14 23:05	MJC
Aroclor-1254 [2]	0.97	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:05	MJC
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:05	MJC
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:05	MJC
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:05	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	93.8	30-150		6/6/14 23:05
Decachlorobiphenyl [2]	88.4	30-150		6/6/14 23:05
Tetrachloro-m-xylene [1]	85.8	30-150		6/6/14 23:05
Tetrachloro-m-xylene [2]	96.4	30-150		6/6/14 23:05

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-55B (3-5) | Sampled: 6/3/2014 11:48

Sample ID: 14F0128-15

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	85.5		% Wt	1		SM 2540G	6/9/14	6/10/14 7:19	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-56B (1-2) | Sampled: 6/3/2014 11:55

Sample ID: 14F0128-16

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:17	MJC
Aroclor-1221 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:17	MJC
Aroclor-1232 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:17	MJC
Aroclor-1242 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:17	MJC
Aroclor-1248 [2]	0.78	0.12	mg/Kg dry	5	O-04, P-01	SW-846 8082A	6/5/14	6/6/14 23:17	MJC
Aroclor-1254 [2]	1.2	0.12	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:17	MJC
Aroclor-1260 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:17	MJC
Aroclor-1262 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:17	MJC
Aroclor-1268 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:17	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	88.4	30-150		6/6/14 23:17
Decachlorobiphenyl [2]	85.0	30-150		6/6/14 23:17
Tetrachloro-m-xylene [1]	82.8	30-150		6/6/14 23:17
Tetrachloro-m-xylene [2]	93.6	30-150		6/6/14 23:17

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-56B (1-2) | Sampled: 6/3/2014 11:55

Sample ID: 14F0128-16

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	82.4		% Wt	1		SM 2540G	6/9/14	6/10/14 7:20	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-56B (2-3) | Sampled: 6/3/2014 11:56

Sample ID: 14F0128-17

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:30	MJC
Aroclor-1221 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:30	MJC
Aroclor-1232 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:30	MJC
Aroclor-1242 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:30	MJC
Aroclor-1248 [2]	0.74	0.12	mg/Kg dry	5	O-04	SW-846 8082A	6/5/14	6/6/14 23:30	MJC
Aroclor-1254 [2]	1.0	0.12	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:30	MJC
Aroclor-1260 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:30	MJC
Aroclor-1262 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:30	MJC
Aroclor-1268 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:30	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	90.9	30-150		6/6/14 23:30
Decachlorobiphenyl [2]	85.8	30-150		6/6/14 23:30
Tetrachloro-m-xylene [1]	83.1	30-150		6/6/14 23:30
Tetrachloro-m-xylene [2]	94.3	30-150		6/6/14 23:30

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-56B (2-3) | Sampled: 6/3/2014 11:56

Sample ID: 14F0128-17

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	83.3		% Wt	1		SM 2540G	6/9/14	6/10/14 7:20	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-56B (3-4) | Sampled: 6/3/2014 11:57

Sample ID: 14F0128-18

Sample Matrix: Soil

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:43	MJC
Aroclor-1221 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:43	MJC
Aroclor-1232 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:43	MJC
Aroclor-1242 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:43	MJC
Aroclor-1248 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:43	MJC
Aroclor-1254 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:43	MJC
Aroclor-1260 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:43	MJC
Aroclor-1262 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:43	MJC
Aroclor-1268 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:43	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	82.8	30-150		6/6/14 23:43
Decachlorobiphenyl [2]	83.1	30-150		6/6/14 23:43
Tetrachloro-m-xylene [1]	63.9	30-150		6/6/14 23:43
Tetrachloro-m-xylene [2]	73.8	30-150		6/6/14 23:43

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-56B (3-4) | Sampled: 6/3/2014 11:57

Sample ID: 14F0128-18

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	81.7		% Wt	1		SM 2540G	6/9/14	6/10/14 7:20	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-57B (1-2) | Sampled: 6/3/2014 12:03

Sample ID: 14F0128-19

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:56	MJC
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:56	MJC
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:56	MJC
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:56	MJC
Aroclor-1248 [2]	0.33	0.11	mg/Kg dry	5	O-04	SW-846 8082A	6/5/14	6/6/14 23:56	MJC
Aroclor-1254 [2]	0.42	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:56	MJC
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:56	MJC
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:56	MJC
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/5/14	6/6/14 23:56	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	96.1	30-150		6/6/14 23:56
Decachlorobiphenyl [2]	97.2	30-150		6/6/14 23:56
Tetrachloro-m-xylene [1]	87.7	30-150		6/6/14 23:56
Tetrachloro-m-xylene [2]	99.6	30-150		6/6/14 23:56

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-57B (1-2) | Sampled: 6/3/2014 12:03

Sample ID: 14F0128-19

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	85.1		% Wt	1		SM 2540G	6/9/14	6/10/14 7:20	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-57B (2-3) | Sampled: 6/3/2014 12:04

Sample ID: 14F0128-20

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.59	mg/Kg dry	25		SW-846 8082A	6/5/14	6/7/14 10:03	MJC
Aroclor-1221 [1]	ND	0.59	mg/Kg dry	25		SW-846 8082A	6/5/14	6/7/14 10:03	MJC
Aroclor-1232 [1]	ND	0.59	mg/Kg dry	25		SW-846 8082A	6/5/14	6/7/14 10:03	MJC
Aroclor-1242 [1]	ND	0.59	mg/Kg dry	25		SW-846 8082A	6/5/14	6/7/14 10:03	MJC
Aroclor-1248 [2]	1.7	0.59	mg/Kg dry	25	O-04	SW-846 8082A	6/5/14	6/7/14 10:03	MJC
Aroclor-1254 [2]	3.2	0.59	mg/Kg dry	25		SW-846 8082A	6/5/14	6/7/14 10:03	MJC
Aroclor-1260 [1]	ND	0.59	mg/Kg dry	25		SW-846 8082A	6/5/14	6/7/14 10:03	MJC
Aroclor-1262 [1]	ND	0.59	mg/Kg dry	25		SW-846 8082A	6/5/14	6/7/14 10:03	MJC
Aroclor-1268 [1]	ND	0.59	mg/Kg dry	25		SW-846 8082A	6/5/14	6/7/14 10:03	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	115	30-150		6/7/14 10:03
Decachlorobiphenyl [2]	101	30-150		6/7/14 10:03
Tetrachloro-m-xylene [1]	98.3	30-150		6/7/14 10:03
Tetrachloro-m-xylene [2]	107	30-150		6/7/14 10:03

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-57B (2-3) | Sampled: 6/3/2014 12:04

Sample ID: 14F0128-20

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	83.3		% Wt	1		SM 2540G	6/9/14	6/10/14 7:20	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-57B (3-5) | Sampled: 6/3/2014 12:05

Sample ID: 14F0128-21

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 19:07	MJC
Aroclor-1221 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 19:07	MJC
Aroclor-1232 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 19:07	MJC
Aroclor-1242 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 19:07	MJC
Aroclor-1248 [2]	0.76	0.12	mg/Kg dry	5	O-04	SW-846 8082A	6/6/14	6/9/14 19:07	MJC
Aroclor-1254 [1]	1.4	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 19:07	MJC
Aroclor-1260 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 19:07	MJC
Aroclor-1262 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 19:07	MJC
Aroclor-1268 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 19:07	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	81.9	30-150		6/9/14 19:07
Decachlorobiphenyl [2]	91.0	30-150		6/9/14 19:07
Tetrachloro-m-xylene [1]	102	30-150		6/9/14 19:07
Tetrachloro-m-xylene [2]	97.2	30-150		6/9/14 19:07

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-57B (3-5) | Sampled: 6/3/2014 12:05

Sample ID: 14F0128-21

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	81.2		% Wt	1		SM 2540G	6/9/14	6/10/14 7:20	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-69 (0-0.5) | Sampled: 6/3/2014 12:17

Sample ID: 14F0128-22

Sample Matrix: Soil

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 21:16	KAL
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 21:16	KAL
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 21:16	KAL
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 21:16	KAL
Aroclor-1248 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 21:16	KAL
Aroclor-1254 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 21:16	KAL
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 21:16	KAL
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 21:16	KAL
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 21:16	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	93.3	30-150		6/10/14 21:16
Decachlorobiphenyl [2]	92.6	30-150		6/10/14 21:16
Tetrachloro-m-xylene [1]	81.3	30-150		6/10/14 21:16
Tetrachloro-m-xylene [2]	96.5	30-150		6/10/14 21:16

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-69 (0-0.5) | Sampled: 6/3/2014 12:17

Sample ID: 14F0128-22

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.0		% Wt	1		SM 2540G	6/9/14	6/10/14 7:20	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-69 (0.5-1) | Sampled: 6/3/2014 12:18

Sample ID: 14F0128-23

Sample Matrix: Soil

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 21:34	KAL
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 21:34	KAL
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 21:34	KAL
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 21:34	KAL
Aroclor-1248 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 21:34	KAL
Aroclor-1254 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 21:34	KAL
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 21:34	KAL
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 21:34	KAL
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 21:34	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	97.5	30-150		6/10/14 21:34
Decachlorobiphenyl [2]	96.0	30-150		6/10/14 21:34
Tetrachloro-m-xylene [1]	87.2	30-150		6/10/14 21:34
Tetrachloro-m-xylene [2]	109	30-150		6/10/14 21:34

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-69 (0.5-1) | Sampled: 6/3/2014 12:18

Sample ID: 14F0128-23

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	89.7		% Wt	1		SM 2540G	6/9/14	6/10/14 7:20	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-69 (1-2) | Sampled: 6/3/2014 12:19

Sample ID: 14F0128-24

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.57	mg/Kg dry	25		SW-846 8082A	6/6/14	6/10/14 21:53	KAL
Aroclor-1221 [1]	ND	0.57	mg/Kg dry	25		SW-846 8082A	6/6/14	6/10/14 21:53	KAL
Aroclor-1232 [1]	ND	0.57	mg/Kg dry	25		SW-846 8082A	6/6/14	6/10/14 21:53	KAL
Aroclor-1242 [1]	ND	0.57	mg/Kg dry	25		SW-846 8082A	6/6/14	6/10/14 21:53	KAL
Aroclor-1248 [2]	1.8	0.57	mg/Kg dry	25		SW-846 8082A	6/6/14	6/10/14 21:53	KAL
Aroclor-1254 [2]	2.9	0.57	mg/Kg dry	25		SW-846 8082A	6/6/14	6/10/14 21:53	KAL
Aroclor-1260 [1]	ND	0.57	mg/Kg dry	25		SW-846 8082A	6/6/14	6/10/14 21:53	KAL
Aroclor-1262 [1]	ND	0.57	mg/Kg dry	25		SW-846 8082A	6/6/14	6/10/14 21:53	KAL
Aroclor-1268 [1]	ND	0.57	mg/Kg dry	25		SW-846 8082A	6/6/14	6/10/14 21:53	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	90.5	30-150		6/10/14 21:53
Decachlorobiphenyl [2]	86.9	30-150		6/10/14 21:53
Tetrachloro-m-xylene [1]	76.2	30-150		6/10/14 21:53
Tetrachloro-m-xylene [2]	89.1	30-150		6/10/14 21:53

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-69 (1-2) | Sampled: 6/3/2014 12:19

Sample ID: 14F0128-24

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	85.3		% Wt	1		SM 2540G	6/9/14	6/10/14 7:21	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-69 (2-5) | Sampled: 6/3/2014 12:20

Sample ID: 14F0128-25

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	2.4	mg/Kg dry	100		SW-846 8082A	6/6/14	6/10/14 22:11	KAL
Aroclor-1221 [1]	ND	2.4	mg/Kg dry	100		SW-846 8082A	6/6/14	6/10/14 22:11	KAL
Aroclor-1232 [1]	ND	2.4	mg/Kg dry	100		SW-846 8082A	6/6/14	6/10/14 22:11	KAL
Aroclor-1242 [1]	ND	2.4	mg/Kg dry	100		SW-846 8082A	6/6/14	6/10/14 22:11	KAL
Aroclor-1248 [2]	22	2.4	mg/Kg dry	100		SW-846 8082A	6/6/14	6/10/14 22:11	KAL
Aroclor-1254 [2]	19	2.4	mg/Kg dry	100		SW-846 8082A	6/6/14	6/10/14 22:11	KAL
Aroclor-1260 [1]	ND	2.4	mg/Kg dry	100		SW-846 8082A	6/6/14	6/10/14 22:11	KAL
Aroclor-1262 [1]	ND	2.4	mg/Kg dry	100		SW-846 8082A	6/6/14	6/10/14 22:11	KAL
Aroclor-1268 [1]	ND	2.4	mg/Kg dry	100		SW-846 8082A	6/6/14	6/10/14 22:11	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	*	30-150	S-01	6/10/14 22:11
Decachlorobiphenyl [2]	*	30-150	S-01	6/10/14 22:11
Tetrachloro-m-xylene [1]	*	30-150	S-01	6/10/14 22:11
Tetrachloro-m-xylene [2]	*	30-150	S-01	6/10/14 22:11

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-69 (2-5) | Sampled: 6/3/2014 12:20

Sample ID: 14F0128-25

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	84.1		% Wt	1		SM 2540G	6/9/14	6/10/14 7:21	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-69 (5-7) | Sampled: 6/3/2014 12:25

Sample ID: 14F0128-26

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 20:09	MJC
Aroclor-1221 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 20:09	MJC
Aroclor-1232 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 20:09	MJC
Aroclor-1242 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 20:09	MJC
Aroclor-1248 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 20:09	MJC
Aroclor-1254 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 20:09	MJC
Aroclor-1260 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 20:09	MJC
Aroclor-1262 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 20:09	MJC
Aroclor-1268 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 20:09	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	81.7	30-150		6/9/14 20:09
Decachlorobiphenyl [2]	83.5	30-150		6/9/14 20:09
Tetrachloro-m-xylene [1]	111	30-150		6/9/14 20:09
Tetrachloro-m-xylene [2]	112	30-150		6/9/14 20:09

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-69 (5-7) | Sampled: 6/3/2014 12:25

Sample ID: 14F0128-26

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	83.7		% Wt	1		SM 2540G	6/9/14	6/10/14 7:21	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-70 (0-0.5) | Sampled: 6/3/2014 12:35

Sample ID: 14F0128-27

Sample Matrix: Soil

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 22:29	KAL
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 22:29	KAL
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 22:29	KAL
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 22:29	KAL
Aroclor-1248 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 22:29	KAL
Aroclor-1254 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 22:29	KAL
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 22:29	KAL
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 22:29	KAL
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 22:29	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	87.2	30-150		6/10/14 22:29
Decachlorobiphenyl [2]	85.8	30-150		6/10/14 22:29
Tetrachloro-m-xylene [1]	82.4	30-150		6/10/14 22:29
Tetrachloro-m-xylene [2]	99.1	30-150		6/10/14 22:29

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-70 (0-0.5) | Sampled: 6/3/2014 12:35

Sample ID: 14F0128-27

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	87.1		% Wt	1		SM 2540G	6/9/14	6/10/14 7:21	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-70 (0.5-1) | Sampled: 6/3/2014 12:36

Sample ID: 14F0128-28

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 22:47	KAL
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 22:47	KAL
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 22:47	KAL
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 22:47	KAL
Aroclor-1248 [2]	0.65	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 22:47	KAL
Aroclor-1254 [2]	0.44	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 22:47	KAL
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 22:47	KAL
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 22:47	KAL
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 22:47	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	85.0	30-150		6/10/14 22:47
Decachlorobiphenyl [2]	84.0	30-150		6/10/14 22:47
Tetrachloro-m-xylene [1]	79.9	30-150		6/10/14 22:47
Tetrachloro-m-xylene [2]	94.6	30-150		6/10/14 22:47

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-70 (0.5-1) | Sampled: 6/3/2014 12:36

Sample ID: 14F0128-28

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	86.5		% Wt	1		SM 2540G	6/9/14	6/10/14 7:21	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-70 (1-2) | Sampled: 6/3/2014 12:40

Sample ID: 14F0128-29

Sample Matrix: Soil

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 23:05	KAL
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 23:05	KAL
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 23:05	KAL
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 23:05	KAL
Aroclor-1248 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 23:05	KAL
Aroclor-1254 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 23:05	KAL
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 23:05	KAL
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 23:05	KAL
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/10/14 23:05	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	92.1	30-150		6/10/14 23:05
Decachlorobiphenyl [2]	88.2	30-150		6/10/14 23:05
Tetrachloro-m-xylene [1]	80.9	30-150		6/10/14 23:05
Tetrachloro-m-xylene [2]	97.2	30-150		6/10/14 23:05

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-70 (1-2) | Sampled: 6/3/2014 12:40

Sample ID: 14F0128-29

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.7		% Wt	1		SM 2540G	6/9/14	6/10/14 7:21	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-70 (2-5) | Sampled: 6/3/2014 12:43

Sample ID: 14F0128-30

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 20:59	MJC
Aroclor-1221 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 20:59	MJC
Aroclor-1232 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 20:59	MJC
Aroclor-1242 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 20:59	MJC
Aroclor-1248 [2]	1.1	0.12	mg/Kg dry	5	O-04	SW-846 8082A	6/6/14	6/9/14 20:59	MJC
Aroclor-1254 [1]	0.98	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 20:59	MJC
Aroclor-1260 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 20:59	MJC
Aroclor-1262 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 20:59	MJC
Aroclor-1268 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 20:59	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	69.0	30-150		6/9/14 20:59
Decachlorobiphenyl [2]	72.5	30-150		6/9/14 20:59
Tetrachloro-m-xylene [1]	101	30-150		6/9/14 20:59
Tetrachloro-m-xylene [2]	102	30-150		6/9/14 20:59

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-70 (2-5) | Sampled: 6/3/2014 12:43

Sample ID: 14F0128-30

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	85.2		% Wt	1		SM 2540G	6/9/14	6/10/14 7:21	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-70 (5-7) | Sampled: 6/3/2014 12:46

Sample ID: 14F0128-31

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 21:36	MJC
Aroclor-1221 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 21:36	MJC
Aroclor-1232 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 21:36	MJC
Aroclor-1242 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 21:36	MJC
Aroclor-1248 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 21:36	MJC
Aroclor-1254 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 21:36	MJC
Aroclor-1260 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 21:36	MJC
Aroclor-1262 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 21:36	MJC
Aroclor-1268 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 21:36	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	80.2	30-150		6/9/14 21:36
Decachlorobiphenyl [2]	77.7	30-150		6/9/14 21:36
Tetrachloro-m-xylene [1]	110	30-150		6/9/14 21:36
Tetrachloro-m-xylene [2]	112	30-150		6/9/14 21:36

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-70 (5-7) | Sampled: 6/3/2014 12:46

Sample ID: 14F0128-31

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	82.9		% Wt	1		SM 2540G	6/9/14	6/10/14 7:21	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-71 (0-0.5) | Sampled: 6/3/2014 12:51

Sample ID: 14F0128-32

Sample Matrix: Soil

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 0:30	KAL
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 0:30	KAL
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 0:30	KAL
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 0:30	KAL
Aroclor-1248 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 0:30	KAL
Aroclor-1254 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 0:30	KAL
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 0:30	KAL
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 0:30	KAL
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 0:30	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
Decachlorobiphenyl [1]	81.5	30-150		6/11/14 0:30	
Decachlorobiphenyl [2]	80.3	30-150		6/11/14 0:30	
Tetrachloro-m-xylene [1]	77.0	30-150		6/11/14 0:30	
Tetrachloro-m-xylene [2]	92.6	30-150		6/11/14 0:30	

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-71 (0-0.5) | Sampled: 6/3/2014 12:51

Sample ID: 14F0128-32

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	88.2		% Wt	1		SM 2540G	6/9/14	6/10/14 7:22	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-71 (0.5-1) | Sampled: 6/3/2014 12:58

Sample ID: 14F0128-33

Sample Matrix: Soil

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 0:48	KAL
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 0:48	KAL
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 0:48	KAL
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 0:48	KAL
Aroclor-1248 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 0:48	KAL
Aroclor-1254 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 0:48	KAL
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 0:48	KAL
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 0:48	KAL
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 0:48	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	76.2	30-150		6/11/14 0:48
Decachlorobiphenyl [2]	75.1	30-150		6/11/14 0:48
Tetrachloro-m-xylene [1]	71.7	30-150		6/11/14 0:48
Tetrachloro-m-xylene [2]	86.5	30-150		6/11/14 0:48

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-71 (0.5-1) | Sampled: 6/3/2014 12:58

Sample ID: 14F0128-33

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	88.9		% Wt	1		SM 2540G	6/9/14	6/10/14 7:22	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-71 (1-2) | Sampled: 6/3/2014 13:00

Sample ID: 14F0128-34

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	6/6/14	6/11/14 1:06	KAL
Aroclor-1221 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	6/6/14	6/11/14 1:06	KAL
Aroclor-1232 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	6/6/14	6/11/14 1:06	KAL
Aroclor-1242 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	6/6/14	6/11/14 1:06	KAL
Aroclor-1248 [2]	5.3	1.1	mg/Kg dry	50		SW-846 8082A	6/6/14	6/11/14 1:06	KAL
Aroclor-1254 [2]	4.1	1.1	mg/Kg dry	50		SW-846 8082A	6/6/14	6/11/14 1:06	KAL
Aroclor-1260 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	6/6/14	6/11/14 1:06	KAL
Aroclor-1262 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	6/6/14	6/11/14 1:06	KAL
Aroclor-1268 [1]	ND	1.1	mg/Kg dry	50		SW-846 8082A	6/6/14	6/11/14 1:06	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	*	30-150	S-01	6/11/14 1:06
Decachlorobiphenyl [2]	*	30-150	S-01	6/11/14 1:06
Tetrachloro-m-xylene [1]	*	30-150	S-01	6/11/14 1:06
Tetrachloro-m-xylene [2]	*	30-150	S-01	6/11/14 1:06

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-71 (1-2) | Sampled: 6/3/2014 13:00

Sample ID: 14F0128-34

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	85.5		% Wt	1		SM 2540G	6/9/14	6/10/14 7:22	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-72 (0-0.5) | Sampled: 6/3/2014 13:07

Sample ID: 14F0128-35

Sample Matrix: Soil

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 1:24	KAL
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 1:24	KAL
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 1:24	KAL
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 1:24	KAL
Aroclor-1248 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 1:24	KAL
Aroclor-1254 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 1:24	KAL
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 1:24	KAL
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 1:24	KAL
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 1:24	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
Decachlorobiphenyl [1]	88.0	30-150		6/11/14	1:24
Decachlorobiphenyl [2]	86.9	30-150		6/11/14	1:24
Tetrachloro-m-xylene [1]	81.1	30-150		6/11/14	1:24
Tetrachloro-m-xylene [2]	97.2	30-150		6/11/14	1:24

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-72 (0-0.5) | Sampled: 6/3/2014 13:07

Sample ID: 14F0128-35

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	89.9		% Wt	1		SM 2540G	6/9/14	6/10/14 7:22	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-72 (0.5-1) | Sampled: 6/3/2014 13:08

Sample ID: 14F0128-36

Sample Matrix: Soil

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 1:42	KAL
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 1:42	KAL
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 1:42	KAL
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 1:42	KAL
Aroclor-1248 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 1:42	KAL
Aroclor-1254 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 1:42	KAL
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 1:42	KAL
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 1:42	KAL
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 1:42	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
Decachlorobiphenyl [1]	86.5	30-150		6/11/14	1:42
Decachlorobiphenyl [2]	85.3	30-150		6/11/14	1:42
Tetrachloro-m-xylene [1]	81.5	30-150		6/11/14	1:42
Tetrachloro-m-xylene [2]	97.6	30-150		6/11/14	1:42

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-72 (0.5-1) | Sampled: 6/3/2014 13:08

Sample ID: 14F0128-36

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	87.8		% Wt	1		SM 2540G	6/9/14	6/10/14 7:22	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-72 (1-2) | Sampled: 6/3/2014 13:12

Sample ID: 14F0128-37

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 22:50	MJC
Aroclor-1221 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 22:50	MJC
Aroclor-1232 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 22:50	MJC
Aroclor-1242 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 22:50	MJC
Aroclor-1248 [2]	1.2	0.12	mg/Kg dry	5	O-04	SW-846 8082A	6/6/14	6/9/14 22:50	MJC
Aroclor-1254 [1]	0.76	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 22:50	MJC
Aroclor-1260 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 22:50	MJC
Aroclor-1262 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 22:50	MJC
Aroclor-1268 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/9/14 22:50	MJC

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	67.4	30-150		6/9/14 22:50
Decachlorobiphenyl [2]	74.8	30-150		6/9/14 22:50
Tetrachloro-m-xylene [1]	105	30-150		6/9/14 22:50
Tetrachloro-m-xylene [2]	106	30-150		6/9/14 22:50

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-72 (1-2) | Sampled: 6/3/2014 13:12

Sample ID: 14F0128-37

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	81.7		% Wt	1		SM 2540G	6/9/14	6/10/14 7:22	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-73 (0-0.5) | Sampled: 6/3/2014 13:12

Sample ID: 14F0128-38

Sample Matrix: Soil

Sample Flags: O-32

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 2:00	KAL
Aroclor-1221 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 2:00	KAL
Aroclor-1232 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 2:00	KAL
Aroclor-1242 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 2:00	KAL
Aroclor-1248 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 2:00	KAL
Aroclor-1254 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 2:00	KAL
Aroclor-1260 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 2:00	KAL
Aroclor-1262 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 2:00	KAL
Aroclor-1268 [1]	ND	0.12	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 2:00	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	75.3	30-150		6/11/14 2:00
Decachlorobiphenyl [2]	75.7	30-150		6/11/14 2:00
Tetrachloro-m-xylene [1]	71.8	30-150		6/11/14 2:00
Tetrachloro-m-xylene [2]	85.7	30-150		6/11/14 2:00

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-73 (0-0.5) | Sampled: 6/3/2014 13:12

Sample ID: 14F0128-38

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	86.1		% Wt	1		SM 2540G	6/9/14	6/10/14 7:22	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-73 (0.5-1) | Sampled: 6/3/2014 13:14

Sample ID: 14F0128-39

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 2:18	KAL
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 2:18	KAL
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 2:18	KAL
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 2:18	KAL
Aroclor-1248 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 2:18	KAL
Aroclor-1254 [2]	0.20	0.11	mg/Kg dry	5	O-03	SW-846 8082A	6/6/14	6/11/14 2:18	KAL
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 2:18	KAL
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 2:18	KAL
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 2:18	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	78.1	30-150		6/11/14 2:18
Decachlorobiphenyl [2]	77.9	30-150		6/11/14 2:18
Tetrachloro-m-xylene [1]	74.6	30-150		6/11/14 2:18
Tetrachloro-m-xylene [2]	87.4	30-150		6/11/14 2:18

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-73 (0.5-1) | Sampled: 6/3/2014 13:14

Sample ID: 14F0128-39

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	86.5		% Wt	1		SM 2540G	6/9/14	6/10/14 7:23	AKS

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-73 (1-2) | Sampled: 6/3/2014 13:14

Sample ID: 14F0128-40

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 2:36	KAL
Aroclor-1221 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 2:36	KAL
Aroclor-1232 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 2:36	KAL
Aroclor-1242 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 2:36	KAL
Aroclor-1248 [2]	0.40	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 2:36	KAL
Aroclor-1254 [2]	1.1	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 2:36	KAL
Aroclor-1260 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 2:36	KAL
Aroclor-1262 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 2:36	KAL
Aroclor-1268 [1]	ND	0.11	mg/Kg dry	5		SW-846 8082A	6/6/14	6/11/14 2:36	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	94.0	30-150		6/11/14 2:36
Decachlorobiphenyl [2]	94.3	30-150		6/11/14 2:36
Tetrachloro-m-xylene [1]	70.2	30-150		6/11/14 2:36
Tetrachloro-m-xylene [2]	83.2	30-150		6/11/14 2:36

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

Project Location: Lowell, MA | Sample Description: | Work Order: 14F0128

Date Received: 6/4/2014

Field Sample #: B-73 (1-2) | Sampled: 6/3/2014 13:14

Sample ID: 14F0128-40

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	84.3		% Wt	1		SM 2540G	6/9/14	6/10/14 7:23	AKS

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

Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
14F0128-01 [ASC-1]	B097382	06/09/14
14F0128-02 [ASC-2]	B097382	06/09/14
14F0128-03 [ASC-3]	B097382	06/09/14
14F0128-04 [ASC-4]	B097382	06/09/14
14F0128-05 [ASC-5]	B097382	06/09/14
14F0128-06 [ASC-6]	B097382	06/09/14
14F0128-07 [B-51B (1-2)]	B097382	06/09/14
14F0128-08 [B-51B (2-3)]	B097382	06/09/14
14F0128-09 [B-51B (3-5)]	B097382	06/09/14
14F0128-10 [B-52B (1-2)]	B097382	06/09/14
14F0128-11 [B-52B (2-3)]	B097382	06/09/14
14F0128-12 [B-52B (3-5)]	B097382	06/09/14
14F0128-13 [B-55B (1-2)]	B097382	06/09/14
14F0128-14 [B-55B (2-3)]	B097382	06/09/14
14F0128-15 [B-55B (3-5)]	B097382	06/09/14
14F0128-16 [B-56B (1-2)]	B097382	06/09/14
14F0128-17 [B-56B (2-3)]	B097382	06/09/14
14F0128-18 [B-56B (3-4)]	B097382	06/09/14
14F0128-19 [B-57B (1-2)]	B097382	06/09/14
14F0128-20 [B-57B (2-3)]	B097382	06/09/14
14F0128-21 [B-57B (3-5)]	B097382	06/09/14
14F0128-22 [B-69 (0-0.5)]	B097382	06/09/14
14F0128-23 [B-69 (0.5-1)]	B097382	06/09/14
14F0128-24 [B-69 (1-2)]	B097382	06/09/14
14F0128-25 [B-69 (2-5)]	B097382	06/09/14
14F0128-26 [B-69 (5-7)]	B097382	06/09/14
14F0128-27 [B-70 (0-0.5)]	B097382	06/09/14
14F0128-28 [B-70 (0.5-1)]	B097382	06/09/14
14F0128-29 [B-70 (1-2)]	B097382	06/09/14
14F0128-30 [B-70 (2-5)]	B097382	06/09/14
14F0128-31 [B-70 (5-7)]	B097382	06/09/14
14F0128-32 [B-71 (0-0.5)]	B097382	06/09/14
14F0128-33 [B-71 (0.5-1)]	B097382	06/09/14
14F0128-34 [B-71 (1-2)]	B097382	06/09/14
14F0128-35 [B-72 (0-0.5)]	B097382	06/09/14
14F0128-36 [B-72 (0.5-1)]	B097382	06/09/14
14F0128-37 [B-72 (1-2)]	B097382	06/09/14
14F0128-38 [B-73 (0-0.5)]	B097382	06/09/14
14F0128-39 [B-73 (0.5-1)]	B097382	06/09/14
14F0128-40 [B-73 (1-2)]	B097382	06/09/14

Prep Method: SW-846 3540C-SW-846 8082A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
14F0128-01 [ASC-1]	B097132	10.1	10.0	06/05/14
14F0128-02 [ASC-2]	B097132	10.4	10.0	06/05/14
14F0128-03 [ASC-3]	B097132	10.5	10.0	06/05/14
14F0128-04 [ASC-4]	B097132	10.1	10.0	06/05/14
14F0128-05 [ASC-5]	B097132	10.2	10.0	06/05/14
14F0128-06 [ASC-6]	B097132	10.6	10.0	06/05/14
14F0128-07 [B-51B (1-2)]	B097132	10.2	10.0	06/05/14
14F0128-08 [B-51B (2-3)]	B097132	10.2	10.0	06/05/14
14F0128-09 [B-51B (3-5)]	B097132	10.5	10.0	06/05/14
14F0128-10 [B-52B (1-2)]	B097132	10.8	10.0	06/05/14

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

Sample Extraction Data

Prep Method: SW-846 3540C-SW-846 8082A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
14F0128-11 [B-52B (2-3)]	B097132	10.7	10.0	06/05/14
14F0128-12 [B-52B (3-5)]	B097132	10.4	10.0	06/05/14
14F0128-13 [B-55B (1-2)]	B097132	10.5	10.0	06/05/14
14F0128-14 [B-55B (2-3)]	B097132	10.2	10.0	06/05/14
14F0128-15 [B-55B (3-5)]	B097132	10.2	10.0	06/05/14
14F0128-16 [B-56B (1-2)]	B097132	10.4	10.0	06/05/14
14F0128-17 [B-56B (2-3)]	B097132	10.2	10.0	06/05/14
14F0128-18 [B-56B (3-4)]	B097132	10.6	10.0	06/05/14
14F0128-19 [B-57B (1-2)]	B097132	10.7	10.0	06/05/14
14F0128-20 [B-57B (2-3)]	B097132	10.2	10.0	06/05/14

Prep Method: SW-846 3540C-SW-846 8082A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
14F0128-21 [B-57B (3-5)]	B097253	10.0	10.0	06/06/14
14F0128-22 [B-69 (0-0.5)]	B097253	10.1	10.0	06/06/14
14F0128-23 [B-69 (0.5-1)]	B097253	10.1	10.0	06/06/14
14F0128-24 [B-69 (1-2)]	B097253	10.3	10.0	06/06/14
14F0128-25 [B-69 (2-5)]	B097253	10.1	10.0	06/06/14
14F0128-26 [B-69 (5-7)]	B097253	10.1	10.0	06/06/14
14F0128-27 [B-70 (0-0.5)]	B097253	10.1	10.0	06/06/14
14F0128-28 [B-70 (0.5-1)]	B097253	10.3	10.0	06/06/14
14F0128-29 [B-70 (1-2)]	B097253	10.4	10.0	06/06/14
14F0128-30 [B-70 (2-5)]	B097253	10.2	10.0	06/06/14
14F0128-31 [B-70 (5-7)]	B097253	10.4	10.0	06/06/14
14F0128-32 [B-71 (0-0.5)]	B097253	10.1	10.0	06/06/14
14F0128-33 [B-71 (0.5-1)]	B097253	10.3	10.0	06/06/14
14F0128-34 [B-71 (1-2)]	B097253	10.2	10.0	06/06/14
14F0128-35 [B-72 (0-0.5)]	B097253	10.1	10.0	06/06/14
14F0128-36 [B-72 (0.5-1)]	B097253	10.2	10.0	06/06/14
14F0128-37 [B-72 (1-2)]	B097253	10.4	10.0	06/06/14
14F0128-38 [B-73 (0-0.5)]	B097253	10.1	10.0	06/06/14
14F0128-39 [B-73 (0.5-1)]	B097253	10.1	10.0	06/06/14
14F0128-40 [B-73 (1-2)]	B097253	10.4	10.0	06/06/14

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

QUALITY CONTROL

Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B097132 - SW-846 3540C										
Blank (B097132-BLK1)				Prepared: 06/05/14 Analyzed: 06/06/14						
Aroclor-1016	ND	0.020	mg/Kg wet							
Aroclor-1016 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1221	ND	0.020	mg/Kg wet							
Aroclor-1221 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1232	ND	0.020	mg/Kg wet							
Aroclor-1232 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1242	ND	0.020	mg/Kg wet							
Aroclor-1242 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1248	ND	0.020	mg/Kg wet							
Aroclor-1248 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1254	ND	0.020	mg/Kg wet							
Aroclor-1254 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1260	ND	0.020	mg/Kg wet							
Aroclor-1260 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1262	ND	0.020	mg/Kg wet							
Aroclor-1262 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1268	ND	0.020	mg/Kg wet							
Aroclor-1268 [2C]	ND	0.020	mg/Kg wet							
Surrogate: Decachlorobiphenyl	*0.190*		mg/Kg wet	0.200		94.9	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.180*		mg/Kg wet	0.200		90.1	30-150			
Surrogate: Tetrachloro-m-xylene	*0.142*		mg/Kg wet	0.200		70.8	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.167*		mg/Kg wet	0.200		83.5	30-150			
LCS (B097132-BS1)				Prepared: 06/05/14 Analyzed: 06/06/14						
Aroclor-1016	0.19	0.10	mg/Kg wet	0.200		96.7	40-140			
Aroclor-1016 [2C]	0.22	0.10	mg/Kg wet	0.200		110	40-140			
Aroclor-1260	0.22	0.10	mg/Kg wet	0.200		108	40-140			
Aroclor-1260 [2C]	0.21	0.10	mg/Kg wet	0.200		106	40-140			
Surrogate: Decachlorobiphenyl	*0.217*		mg/Kg wet	0.200		109	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.193*		mg/Kg wet	0.200		96.3	30-150			
Surrogate: Tetrachloro-m-xylene	*0.164*		mg/Kg wet	0.200		82.2	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.185*		mg/Kg wet	0.200		92.6	30-150			
LCS Dup (B097132-BSD1)				Prepared: 06/05/14 Analyzed: 06/06/14						
Aroclor-1016	0.21	0.10	mg/Kg wet	0.200		103	40-140	6.33	30	
Aroclor-1016 [2C]	0.23	0.10	mg/Kg wet	0.200		113	40-140	3.02	30	
Aroclor-1260	0.22	0.10	mg/Kg wet	0.200		111	40-140	2.49	30	
Aroclor-1260 [2C]	0.22	0.10	mg/Kg wet	0.200		109	40-140	2.35	30	
Surrogate: Decachlorobiphenyl	*0.220*		mg/Kg wet	0.200		110	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.196*		mg/Kg wet	0.200		98.1	30-150			
Surrogate: Tetrachloro-m-xylene	*0.177*		mg/Kg wet	0.200		88.6	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.199*		mg/Kg wet	0.200		99.7	30-150			

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

QUALITY CONTROL

Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B097132 - SW-846 3540C										
Matrix Spike (B097132-MS1)	**Source: 14F0128-18**			Prepared: 06/05/14 Analyzed: 06/07/14						
Aroclor-1016	0.15	0.12	mg/Kg dry	0.240	0.0	64.4	40-140			
Aroclor-1016 [2C]	0.18	0.12	mg/Kg dry	0.240	0.0	74.3	40-140			
Aroclor-1260	0.14	0.12	mg/Kg dry	0.240	0.0	59.0	40-140			
Aroclor-1260 [2C]	0.14	0.12	mg/Kg dry	0.240	0.0	59.8	40-140			
Surrogate: Decachlorobiphenyl	*0.141*		mg/Kg dry	0.240		58.6	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.138*		mg/Kg dry	0.240		57.7	30-150			
Surrogate: Tetrachloro-m-xylene	*0.118*		mg/Kg dry	0.240		49.2	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.133*		mg/Kg dry	0.240		55.4	30-150			
Matrix Spike Dup (B097132-MSD1)	**Source: 14F0128-18**			Prepared: 06/05/14 Analyzed: 06/07/14						
Aroclor-1016	0.23	0.12	mg/Kg dry	0.242	0.0	95.1	40-140	39.4	50	
Aroclor-1016 [2C]	0.27	0.12	mg/Kg dry	0.242	0.0	112	40-140	41.1	50	
Aroclor-1260	0.22	0.12	mg/Kg dry	0.242	0.0	91.8	40-140	44.5	50	
Aroclor-1260 [2C]	0.23	0.12	mg/Kg dry	0.242	0.0	96.5	40-140	47.8	50	
Surrogate: Decachlorobiphenyl	*0.239*		mg/Kg dry	0.242		98.5	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.242*		mg/Kg dry	0.242		99.9	30-150			
Surrogate: Tetrachloro-m-xylene	*0.195*		mg/Kg dry	0.242		80.3	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.222*		mg/Kg dry	0.242		91.5	30-150			
Batch B097253 - SW-846 3540C										
Blank (B097253-BLK1)				Prepared: 06/06/14 Analyzed: 06/09/14						
Aroclor-1016	ND	0.020	mg/Kg wet							
Aroclor-1016 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1221	ND	0.020	mg/Kg wet							
Aroclor-1221 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1232	ND	0.020	mg/Kg wet							
Aroclor-1232 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1242	ND	0.020	mg/Kg wet							
Aroclor-1242 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1248	ND	0.020	mg/Kg wet							
Aroclor-1248 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1254	ND	0.020	mg/Kg wet							
Aroclor-1254 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1260	ND	0.020	mg/Kg wet							
Aroclor-1260 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1262	ND	0.020	mg/Kg wet							
Aroclor-1262 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1268	ND	0.020	mg/Kg wet							
Aroclor-1268 [2C]	ND	0.020	mg/Kg wet							
Surrogate: Decachlorobiphenyl	*0.179*		mg/Kg wet	0.200		89.6	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.169*		mg/Kg wet	0.200		84.3	30-150			
Surrogate: Tetrachloro-m-xylene	*0.206*		mg/Kg wet	0.200		103	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.202*		mg/Kg wet	0.200		101	30-150			

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

QUALITY CONTROL

Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B097253 - SW-846 3540C										
LCS (B097253-BS1)				Prepared: 06/06/14 Analyzed: 06/09/14						
Aroclor-1016	0.23	0.10	mg/Kg wet	0.200		117	40-140			
Aroclor-1016 [2C]	0.22	0.10	mg/Kg wet	0.200		108	40-140			
Aroclor-1260	0.22	0.10	mg/Kg wet	0.200		108	40-140			
Aroclor-1260 [2C]	0.20	0.10	mg/Kg wet	0.200		101	40-140			
Surrogate: Decachlorobiphenyl	*0.193*		mg/Kg wet	0.200		96.5	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.179*		mg/Kg wet	0.200		89.5	30-150			
Surrogate: Tetrachloro-m-xylene	*0.220*		mg/Kg wet	0.200		110	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.220*		mg/Kg wet	0.200		110	30-150			
LCS Dup (B097253-BSD1)				Prepared: 06/06/14 Analyzed: 06/09/14						
Aroclor-1016	0.26	0.10	mg/Kg wet	0.200		131	40-140	10.9	30	
Aroclor-1016 [2C]	0.25	0.10	mg/Kg wet	0.200		123	40-140	12.7	30	
Aroclor-1260	0.25	0.10	mg/Kg wet	0.200		124	40-140	13.0	30	
Aroclor-1260 [2C]	0.23	0.10	mg/Kg wet	0.200		113	40-140	11.6	30	
Surrogate: Decachlorobiphenyl	*0.210*		mg/Kg wet	0.200		105	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.193*		mg/Kg wet	0.200		96.7	30-150			
Surrogate: Tetrachloro-m-xylene	*0.233*		mg/Kg wet	0.200		116	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.233*		mg/Kg wet	0.200		116	30-150			
Matrix Spike (B097253-MS1)		**Source: 14F0128-26**		Prepared: 06/06/14 Analyzed: 06/09/14						
Aroclor-1016	0.28	0.12	mg/Kg dry	0.237	0.0	117	40-140			
Aroclor-1016 [2C]	0.26	0.12	mg/Kg dry	0.237	0.0	112	40-140			
Aroclor-1260	0.21	0.12	mg/Kg dry	0.237	0.0	90.9	40-140			
Aroclor-1260 [2C]	0.20	0.12	mg/Kg dry	0.237	0.0	86.0	40-140			
Surrogate: Decachlorobiphenyl	*0.145*		mg/Kg dry	0.237		61.1	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.164*		mg/Kg dry	0.237		69.4	30-150			
Surrogate: Tetrachloro-m-xylene	*0.261*		mg/Kg dry	0.237		110	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.267*		mg/Kg dry	0.237		113	30-150			
Matrix Spike Dup (B097253-MSD1)		**Source: 14F0128-26**		Prepared: 06/06/14 Analyzed: 06/09/14						
Aroclor-1016	0.29	0.12	mg/Kg dry	0.237	0.0	124	40-140	6.10	50	
Aroclor-1016 [2C]	0.28	0.12	mg/Kg dry	0.237	0.0	119	40-140	6.49	50	
Aroclor-1260	0.24	0.12	mg/Kg dry	0.237	0.0	102	40-140	11.4	50	
Aroclor-1260 [2C]	0.22	0.12	mg/Kg dry	0.237	0.0	92.5	40-140	7.24	50	
Surrogate: Decachlorobiphenyl	*0.158*		mg/Kg dry	0.237		66.6	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.165*		mg/Kg dry	0.237		69.9	30-150			
Surrogate: Tetrachloro-m-xylene	*0.259*		mg/Kg dry	0.237		110	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.266*		mg/Kg dry	0.237		112	30-150			

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

QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B097382 - % Solids										
Duplicate (B097382-DUP3)	**Source: 14F0128-30**			Prepared: 06/09/14 Analyzed: 06/10/14						
% Solids	84.7		% Wt		85.2			0.584	20	
Duplicate (B097382-DUP4)	**Source: 14F0128-31**			Prepared: 06/09/14 Analyzed: 06/10/14						
% Solids	84.3		% Wt		82.9			1.61	20	
Duplicate (B097382-DUP5)	**Source: 14F0128-32**			Prepared: 06/09/14 Analyzed: 06/10/14						
% Solids	86.8		% Wt		88.2			1.67	20	

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

ASC-1

Lab Sample ID: 14F0128-01

Date(s) Analyzed: 06/06/2014 06/06/2014

Instrument ID (1):

Instrument ID (2):

GC Column (1): ID: (mm)

GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1248	1	0.00	0.00	0.00	0.28	
	2	0.00	0.00	0.00	0.39	32.5
Aroclor-1254	1	0.00	0.00	0.00	0.24	
	2	0.00	0.00	0.00	0.30	22.2

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

ASC-4

Lab Sample ID: 14F0128-04 Date(s) Analyzed: 06/06/2014 06/06/2014

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1248	1	0.00	0.00	0.00	0.71	
	2	0.00	0.00	0.00	0.93	26.3
Aroclor-1254	1	0.00	0.00	0.00	0.59	
	2	0.00	0.00	0.00	0.74	21.9

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

ASC-5

Lab Sample ID: 14F0128-05 Date(s) Analyzed: 06/07/2014 06/07/2014

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1248	1	0.00	0.00	0.00	3.4	
	2	0.00	0.00	0.00	4.3	23.1
Aroclor-1254	1	0.00	0.00	0.00	2.6	
	2	0.00	0.00	0.00	3.1	18.7

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

ASC-6

Lab Sample ID: 14F0128-06 Date(s) Analyzed: 06/07/2014 06/07/2014

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1248	1	0.00	0.00	0.00	1.9	
	2	0.00	0.00	0.00	2.6	29.1
Aroclor-1254	1	0.00	0.00	0.00	1.3	
	2	0.00	0.00	0.00	1.7	23.0

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

B-51B (1-2)

Lab Sample ID: 14F0128-07

Date(s) Analyzed: 06/07/2014 06/07/2014

Instrument ID (1):

Instrument ID (2):

GC Column (1): ID: (mm)

GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1248	1	0.00	0.00	0.00	6.5	
	2	0.00	0.00	0.00	8.6	27.7
Aroclor-1254	1	0.00	0.00	0.00	6.1	
	2	0.00	0.00	0.00	7.6	22.5

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

B-51B (2-3)

Lab Sample ID: 14F0128-08

Date(s) Analyzed: 06/07/2014 06/07/2014

Instrument ID (1):

Instrument ID (2):

GC Column (1): ID: (mm)

GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1242	1	0.00	0.00	0.00	0.47	
	2	0.00	0.00	0.00	0.58	21.4
Aroclor-1248	1	0.00	0.00	0.00	1.5	
	2	0.00	0.00	0.00	2.0	29.2

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

B-52B (1-2)

Lab Sample ID: 14F0128-10 Date(s) Analyzed: 06/07/2014 06/07/2014

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1248	1	0.00	0.00	0.00	1.3	
	2	0.00	0.00	0.00	1.8	28.6
Aroclor-1254	1	0.00	0.00	0.00	1.0	
	2	0.00	0.00	0.00	1.2	15.2

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

B-52B (2-3)

Lab Sample ID: 14F0128-11

Date(s) Analyzed: 06/07/2014 06/07/2014

Instrument ID (1):

Instrument ID (2):

GC Column (1): ID: (mm)

GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1248	1	0.00	0.00	0.00	3.2	
	2	0.00	0.00	0.00	4.4	31.9
Aroclor-1254	1	0.00	0.00	0.00	4.0	
	2	0.00	0.00	0.00	4.9	20.7

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

B-55B (2-3)

Lab Sample ID: 14F0128-14

Date(s) Analyzed: 06/06/2014 06/06/2014

Instrument ID (1):

Instrument ID (2):

GC Column (1): ID: (mm)

GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1248	1	0.00	0.00	0.00	0.37	
	2	0.00	0.00	0.00	0.47	23.8
Aroclor-1254	1	0.00	0.00	0.00	0.35	
	2	0.00	0.00	0.00	0.45	23.9

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

B-55B (3-5)

Lab Sample ID: 14F0128-15

Date(s) Analyzed: 06/06/2014 06/06/2014

Instrument ID (1):

Instrument ID (2):

GC Column (1): ID: (mm)

GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1248	1	0.00	0.00	0.00	0.75	
	2	0.00	0.00	0.00	1.0	28.2
Aroclor-1254	1	0.00	0.00	0.00	0.72	
	2	0.00	0.00	0.00	0.97	29.0

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

B-56B (1-2)

Lab Sample ID: 14F0128-16 Date(s) Analyzed: 06/06/2014 06/06/2014

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1248	1	0.00	0.00	0.00	0.51	
	2	0.00	0.00	0.00	0.78	41.5
Aroclor-1254	1	0.00	0.00	0.00	0.86	
	2	0.00	0.00	0.00	1.2	32.8

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

B-56B (2-3)

Lab Sample ID: 14F0128-17

Date(s) Analyzed: 06/06/2014 06/06/2014

Instrument ID (1):

Instrument ID (2):

GC Column (1): ID: (mm)

GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1248	1	0.00	0.00	0.00	0.61	
	2	0.00	0.00	0.00	0.74	19.1
Aroclor-1254	1	0.00	0.00	0.00	0.89	
	2	0.00	0.00	0.00	1.0	11.2

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

B-57B (1-2)

Lab Sample ID: 14F0128-19

Date(s) Analyzed: 06/06/2014 06/06/2014

Instrument ID (1):

Instrument ID (2):

GC Column (1): ID: (mm)

GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1248	1	0.00	0.00	0.00	0.23	
	2	0.00	0.00	0.00	0.33	34.5
Aroclor-1254	1	0.00	0.00	0.00	0.32	
	2	0.00	0.00	0.00	0.42	26.4

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

B-57B (2-3)

Lab Sample ID: 14F0128-20

Date(s) Analyzed: 06/07/2014 06/07/2014

Instrument ID (1):

Instrument ID (2):

GC Column (1): ID: (mm)

GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1248	1	0.00	0.00	0.00	1.4	
	2	0.00	0.00	0.00	1.7	17.9
Aroclor-1254	1	0.00	0.00	0.00	2.5	
	2	0.00	0.00	0.00	3.2	24.2

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

B-57B (3-5)

Lab Sample ID: 14F0128-21 Date(s) Analyzed: 06/09/2014 06/09/2014

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1248	1	0.00	0.00	0.00	0.66	
	2	0.00	0.00	0.00	0.76	13.8
Aroclor-1254	1	0.00	0.00	0.00	1.4	
	2	0.00	0.00	0.00	1.3	3.8

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

B-69 (1-2)

Lab Sample ID: 14F0128-24 Date(s) Analyzed: 06/10/2014 06/10/2014

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1248	1	0.00	0.00	0.00	1.3	
	2	0.00	0.00	0.00	1.8	31.5
Aroclor-1254	1	0.00	0.00	0.00	2.1	
	2	0.00	0.00	0.00	2.9	34.3

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

B-69 (2-5)

Lab Sample ID: 14F0128-25 Date(s) Analyzed: 06/10/2014 06/10/2014

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1248	1	0.00	0.00	0.00	16	
	2	0.00	0.00	0.00	22	32.2
Aroclor-1254	1	0.00	0.00	0.00	15	
	2	0.00	0.00	0.00	19	26.2

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

B-70 (0.5-1)

Lab Sample ID: 14F0128-28 Date(s) Analyzed: 06/10/2014 06/10/2014

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1248	1	0.00	0.00	0.00	0.46	
	2	0.00	0.00	0.00	0.65	33.4
Aroclor-1254	1	0.00	0.00	0.00	0.36	
	2	0.00	0.00	0.00	0.44	20.3

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

B-70 (2-5)

Lab Sample ID: 14F0128-30 Date(s) Analyzed: 06/09/2014 06/09/2014

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1248	1	0.00	0.00	0.00	1.1	
	2	0.00	0.00	0.00	1.1	0.9
Aroclor-1254	1	0.00	0.00	0.00	0.98	
	2	0.00	0.00	0.00	0.88	10.4

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

B-71 (1-2)

Lab Sample ID: 14F0128-34 Date(s) Analyzed: 06/11/2014 06/11/2014

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1248	1	0.00	0.00	0.00	3.9	
	2	0.00	0.00	0.00	5.3	29.4
Aroclor-1254	1	0.00	0.00	0.00	3.3	
	2	0.00	0.00	0.00	4.1	21.9

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

B-72 (1-2)

Lab Sample ID: 14F0128-37 Date(s) Analyzed: 06/09/2014 06/09/2014

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1248	1	0.00	0.00	0.00	1.1	
	2	0.00	0.00	0.00	1.2	5.1
Aroclor-1254	1	0.00	0.00	0.00	0.76	
	2	0.00	0.00	0.00	0.71	6.8

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

B-73 (0.5-1)

Lab Sample ID: 14F0128-39 Date(s) Analyzed: 06/11/2014 06/11/2014

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1254	1	0.00	0.00	0.00	0.14	
	2	0.00	0.00	0.00	0.20	36.0

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

B-73 (1-2)

Lab Sample ID: 14F0128-40 Date(s) Analyzed: 06/11/2014 06/11/2014

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1248	1	0.00	0.00	0.00	0.29	
	2	0.00	0.00	0.00	0.40	31.9
Aroclor-1254	1	0.00	0.00	0.00	0.75	
	2	0.00	0.00	0.00	1.1	37.8

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LCS

Lab Sample ID: B097132-BS1 Date(s) Analyzed: 06/06/2014 06/06/2014

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1016	1	0.00	0.00	0.00	0.19	
	2	0.00	0.00	0.00	0.22	13
Aroclor-1260	1	0.00	0.00	0.00	0.22	
	2	0.00	0.00	0.00	0.21	3

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LCS Dup

Lab Sample ID: B097132-BSD1 Date(s) Analyzed: 06/06/2014 06/06/2014

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1016	1	0.00	0.00	0.00	0.21	
	2	0.00	0.00	0.00	0.23	11
Aroclor-1260	1	0.00	0.00	0.00	0.22	
	2	0.00	0.00	0.00	0.22	1

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

Matrix Spike

Lab Sample ID: B097132-MS1 Date(s) Analyzed: 06/07/2014 06/07/2014

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1016	1	0.00	0.00	0.00	0.15	
	2	0.00	0.00	0.00	0.18	15
Aroclor-1260	1	0.00	0.00	0.00	0.14	
	2	0.00	0.00	0.00	0.14	1

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

Matrix Spike Dup

Lab Sample ID: B097132-MSD1 Date(s) Analyzed: 06/07/2014 06/07/2014

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1016	1	0.00	0.00	0.00	0.23	
	2	0.00	0.00	0.00	0.27	16
Aroclor-1260	1	0.00	0.00	0.00	0.22	
	2	0.00	0.00	0.00	0.23	3

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LCS

Lab Sample ID: B097253-BS1 Date(s) Analyzed: 06/09/2014 06/09/2014

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1016	1	0.00	0.00	0.00	0.23	
	2	0.00	0.00	0.00	0.22	7
Aroclor-1260	1	0.00	0.00	0.00	0.22	
	2	0.00	0.00	0.00	0.20	8

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LCS Dup

Lab Sample ID: B097253-BSD1 Date(s) Analyzed: 06/09/2014 06/09/2014

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1016	1	0.00	0.00	0.00	0.26	
	2	0.00	0.00	0.00	0.25	5
Aroclor-1260	1	0.00	0.00	0.00	0.25	
	2	0.00	0.00	0.00	0.23	7

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

Matrix Spike

Lab Sample ID: B097253-MS1 Date(s) Analyzed: 06/09/2014 06/09/2014

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1016	1	0.00	0.00	0.00	0.28	
	2	0.00	0.00	0.00	0.26	6
Aroclor-1260	1	0.00	0.00	0.00	0.21	
	2	0.00	0.00	0.00	0.20	7

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

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

Matrix Spike Dup

Lab Sample ID: B097253-MSD1 Date(s) Analyzed: 06/09/2014 06/09/2014

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1016	1	0.00	0.00	0.00	0.29	
	2	0.00	0.00	0.00	0.28	5
Aroclor-1260	1	0.00	0.00	0.00	0.24	
	2	0.00	0.00	0.00	0.22	9

con-test® ANALYTICAL LABORATORY
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
	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.
O-03	Sample contains two incompletely resolved aroclors. Aroclor with the closest matching pattern is reported.
O-04	Sample fingerprint does not match standard exactly. Sample was quantitated against the closest matching standard.
O-32	A five times dilution was performed as part of the standard analytical procedure.
P-01	Result was confirmed using a dissimilar column. Relative percent difference between the two results was >40%. In accordance with the method, the higher result was reported.
S-01	The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.

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

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8082A in Soil	
Aroclor-1016	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1016 [2C]	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1221	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1221 [2C]	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1232	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1232 [2C]	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1242	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1242 [2C]	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1248	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1248 [2C]	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1254	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1254 [2C]	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1260	CT,NH,NY,ME,NC,VA,NJ
Aroclor-1260 [2C]	CT,NH,NY,ME,NC,VA,NJ

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

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2016
MA	Massachusetts DEP	M-MA100	06/30/2015
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2015
NY	New York State Department of Health	10899 NELAP	04/1/2015
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2015
RI	Rhode Island Department of Health	LAO00112	12/30/2014
NC	North Carolina Div. of Water Quality	652	12/31/2014
NJ	New Jersey DEP	MA007 NELAP	06/30/2015
FL	Florida Department of Health	E871027 NELAP	06/30/2015
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2015
WA	State of Washington Department of Ecology	C2065	02/23/2015
ME	State of Maine	2011028	06/9/2015
VA	Commonwealth of Virginia	460217	12/14/2014
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2014

con-test ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com

CHAIN OF CUSTODY RECORD

14F0128

Rev 04.05.12

39 Spruce Street
East longmeadow, MA 01028

Company Name: Goldman Environmental Consultants
Address: 60 Brooks Drive
Braintree, MA 02184
Attention: Lauren McKinlay
Project Location: Lowell, MA
Sampled By: D. Homan & A. Sading

Telephone: 781 356 9140
Project # 911-3117B
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ☒ EMAIL ○ WEBSITE
Fax #
Email: lmckinlay@goldmanenvironmental.com
Format: ☒ PDF ☒ EXCEL ○ GIS
○ OTHER
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

ANALYSIS REQUESTED

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	PCB 8082										
1	ASC-1	6/3/14	9:28am	X		S	U	X										
2	ASC-2	6/3/14	NA	X		S	U	X										
3	ASC-3	6/3/14	11:21am	X		S	U	X										
4	ASC-4	6/3/14	NA	X		S	U	X										
5	ASC-5	6/3/14	10:40am	X		S	U	X										
6	ASC-6	6/3/14	10:12am	X		S	U	X										
7	B-51B (1-2)	6/3/14	11:33am	X		S	U	X										
8	B-51B (2-3)	6/3/14	11:34am	X		S	U	X										
9	B-51B (3-5)	6/3/14	11:35am	X		S	U	X										
10	B-52B (1-2)	6/3/14	11:39am	X		S	U	X										

# of Containers	10
** Preservation	/
***Container Co	A

Dissolved Meta
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other

Comments: Analyses must comply with EPA requirements for PCBs via Aroclor PCB via EPA 8082 Soxhlet

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
[signature]	6/3/14
Received by: (signature) [signature] 6/4/14	Date/Time: 1020
Relinquished by: (signature) [signature] 6/4/14	Date/Time: 340
Received by: (signature) [signature] 6/4/14	Date/Time: 1540

Turnaround ††
☐ 7-Day
☐ 10-Day
☒ Other 5-day
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP?
☒ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID #

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

Table of Contents

con-test® ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

CHAIN OF CUSTODY RECORD

14F0128

Rev 04.05.12

Company Name: Goldman Environmental Consultants
Address: 60 Brooks Drive, Braintree, MA 02184
Attention: Lauren McKinlay
Project Location: Lowell, MA
Sampled By: D. Homan & A. Suding

Telephone: 781 356 9140
Project #: 911-3117B
Client PO#:

DATA DELIVERY (check all that apply)
○ FAX ⊗ EMAIL ○ WEBSITE
Fax #:
Email: lmckinlay@goldmonenvironmental.com
Format: ⊗ PDF ⊗ EXCEL ○ GIS
○ OTHER ___
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes ___ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	PCB 8082	# of Containers	** Preservation	***Container Co
								10			# of Containers
								—			** Preservation
								A			***Container Co
11	B-52B (2-3)	6/3/14	11:41am	X		S	U	X			
12	B-52B (3-5)	6/3/14	11:41am	X		S	U	X			
13	B-55B (1-2)	6/3/14	11:46am	X		S	U	X			
14	B-55B (2-3)	6/3/14	11:47am	X		S	U	X			
15	B-55B (3-5)	6/3/14	11:48am	X		S	U	X			
16	B-56B (1-2)	6/3/14	11:55am	X		S	U	X			
17	B-56B (2-3)	6/3/14	11:56am	X		S	U	X			
18	B-56B (3-4)	6/3/14	11:57am	X		S	U	X			
19	B-57B (1-2)	6/3/14	12:03pm	X		S	U	X			
20	B-57B (2-3)	6/3/14	12:04pm	X		S	U	X			

ANALYSIS REQUESTED

Dissolved Met
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other ___

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other ___

Comments: see page 1

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
Dan Homan	6/3/14
Received by: (signature)	Date/Time:
	6/4/14 702
Relinquished by: (signature)	Date/Time:
	6/4/14 540
Received by: (signature)	Date/Time:
Rebecca Jarrett	6/4/14 1540

Turnaround ††
☐ 7-Day
☐ 10-Day
☑ Other 5-day
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
⊗ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # ___

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

Page 129 of 134 14F0128 FINAL 07 23 14 1825 07/23/14 18:25:44

Table of Contents

con-test ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

CHAIN OF CUSTODY RECORD

14F0128

Rev 04.05.12

Company Name: Goldman Environmental Consultants
Address: 60 Brooks Drive
Braintree, MA 02184
Attention: Lauren McKinlay
Project Location: Lowell, MA
Sampled By: D. Homan & A. Suding

Telephone: 781 356 9140
Project #: 91-3117B
Client PO#:

DATA DELIVERY (check all that apply)
○ FAX ☒ EMAIL ○ WEBSITE
Fax #:
Email: mckinlay@goldmanenvironmental.com
Format: ☒ PDF ☒ EXCEL ○ GIS
○ OTHER
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	10	–	A	8082	PCB	# of Containers	** Preservation	***Container Co
21	B-57B (3-5)	6/3/14	12:05pm	X		S	U				X	X			
22	B-69 (0-0.5)	6/3/14	12:17pm	X		S	U				X	X			
23	B-69 (0.5-1)	6/3/14	12:18pm	X		S	U				X	X			
24	B-69 (1-2)	6/3/14	12:19pm	X		S	U				X	X			
25	B-69 (2-5)	6/3/14	12:20pm	X		S	U				X	X			
26	B-69 (5-7)	6/3/14	12:25pm	X		S	U				X	X			
27	B-70 (0-0.5)	6/3/14	12:35pm	X		S	U				X	X			
28	B-70 (0.5-1)	6/3/14	12:36pm	X		S	U				X	X			
29	B-70 (1-2)	6/3/14	12:46pm	X		S	U				X	X			
30	B-70 (2-5)	6/3/14	12:43pm	X		S	U				X	X			

ANALYSIS REQUESTED

Dissolved Met
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V=vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW = groundwater
WW = wastewater
DW = drinking water
A = air
S = soil/solid
SL = sludge
O = other

Comments: see page 1

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
Paul Homan	6/3/14
Received by: (signature)	Date/Time:
6/4/14	1020
Relinquished by: (signature)	Date/Time:
6/4/14	34
Received by: (signature) 5°C	Date/Time:
Rebecca Faust 6/4/14	1540

Turnaround ††
☐ 7-Day
☐ 10-Day
☒ Other 5-day
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
☒ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

Page 130 of 134 14F0128 FINAL 07 23 14 1825 07/23/14 18:25:44

Table of Contents

con-test® ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

CHAIN OF CUSTODY RECORD

14F0128

Rev 04.05.12

Company Name: Goldman Environmental Consultants
Telephone: 781 356 9140
Address: 60 Brooks Drive
Braintree, MA 02184
Project # 911-3117B
Client PO#
Attention: Lauren McKinlay
Project Location: Lowell, MA
Sampled By: D. Homan & A. Sudina

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

DATA DELIVERY (check all that apply)
○ FAX ⊗ EMAIL ○ WEBSITE
Fax #
Email: lmckinlay@goldmanenvironmental.com
Format: ⊗ PDF ⊗ EXCEL ○ GIS ○ OTHER _____
○ "Enhanced Data Package"

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers: 10	** Preservation: /	***Container Code: A	ANALYSIS REQUESTED: PCB 8082
31	B-70 (5-7)	6/3/14	12:46pm	X		S	U				X
32	B-71 (0-0.5)	6/3/14	12:51pm	X		S	U				X
33	B-71 (0.5-1)	6/3/14	12:58pm	X		S	U				X
34	B-71 (1-2)	6/3/14	1:00pm	X		S	U				X
35	B-72 (0-0.5)	6/3/14	1:07pm	X		S	U				X
36	B-72 (0.5-1)	6/3/14	1:08pm	X		S	U				X
37	B-72 (1-2)	6/3/14	1:12pm	X		S	U				X
38	B-73 (0-0.5)	6/3/14	1:12pm	X		S	U				X
39	B-73 (0.5-1)	6/3/14	1:14pm	X		S	U				X
40	B-73 (1-2)	6/3/14	1:14pm	X		S	U				X

Dissolved Metal
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V=vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other _____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other _____

Comments: See page 1

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
D. Homan	6/3/14
Received by: (signature)	Date/Time:
	6/4/14 1025
Relinquished by: (signature)	Date/Time:
	6/4/14 340
Received by: (signature)	Date/Time:
Rebecca Austin	6/4/14 1540

Turnaround ††
☐ 7-Day
☐ 10-Day
☒ Other 5-day
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
⊗ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

AIHA LAP, LLC ACCREDITED LABORATORY
ACCREDITED IN ACCORDANCE OF nelac
NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

Page 131 of 134 14F0128 FINAL 07 23 14 1825 07/23/14 18:25:44

39 Spruce St.
East Longmeadow, MA. 01028
P: 413-525-2332
F: 413-525-6405
www.contestlabs.com

con-test® ANALYTICAL LABORATORY

Sample Receipt Checklist

CLIENT NAME: Goldman Environmental RECEIVED BY: RLF DATE: 6/4/14

1) **Was the chain(s) of custody relinquished and signed?** (Yes) No No CoC Included
2) **Does the chain agree with the samples?** (Yes) No
   If not, explain:
3) **Are all the samples in good condition?** (Yes) No
   If not, explain:
4) **How were the samples received:**
   On Ice [✓] Direct from Sampling [ ] Ambient [ ] In Cooler(s) [✓]
   Were the samples received in Temperature Compliance of (2-6°C)? (Yes) No N/A
   Temperature °C by Temp blank _____ Temperature °C by Temp gun 5.1°C
5) **Are there Dissolved samples for the lab to filter?** Yes (No)
   Who was notified _____ Date _____ Time _____
6) **Are there any RUSH or SHORT HOLDING TIME samples?** Yes (No)
   Who was notified _____ Date _____ Time _____
7) **Location where samples are stored:** 19
   Permission to subcontract samples? Yes No
   (Walk-in clients only) if not already approved
   Client Signature: _____
8) **Do all samples have the proper Acid pH:** Yes No (N/A) _____
9) **Do all samples have the proper Base pH:** Yes No (N/A) _____
10) **Was the PC notified of any discrepancies with the CoC vs the samples:** Yes No (N/A)

Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		8 oz amber/clear jar	40
500 mL Amber		4 oz amber/clear jar	
250 mL Amber (8oz amber)		2 oz amber/clear jar	
1 Liter Plastic		Plastic Bag / Ziploc	
500 mL Plastic		SOC Kit	
250 mL plastic		Non-ConTest Container	
40 mL Vial - type listed below		Perchlorate Kit	
Colisure / bacteria bottle		Flashpoint bottle	
Dissolved Oxygen bottle		Other glass jar	
Encore		Other	

Laboratory Comments:

40 mL vials: # HCl _____ # Methanol _____
Bisulfate _____ # DI Water _____
Thiosulfate _____ Unpreserved

Time and Date Frozen:

Login Sample Receipt Checklist

(Rejection Criteria Listing - Using Sample Acceptance Policy)
Any False statement will be brought to the attention of Client

Question	Answer (True/False) T/F/NA	Comment
1) The cooler's custody seal, if present, is intact.	T	
2) The cooler or samples do not appear to have been compromised or tampered with.	T	
3) Samples were received on ice.	T	
4) Cooler Temperature is acceptable.	T	
5) Cooler Temperature is recorded.	T	
6) COC is filled out in ink and legible.	T	
7) COC is filled out with all pertinent information.	T	
8) Field Sampler's name present on COC.	T	
9) There are no discrepancies between the sample IDs on the container and the COC.	T	
10) Samples are received within Holding Time.	T	
11) Sample containers have legible labels.	T	
12) Containers are not broken or leaking.	T	
13) Air Cassettes are not broken/open.	NA	
14) Sample collection date/times are provided.	T	
15) Appropriate sample containers are used.	T	
16) Proper collection media used.	T	
17) No headspace sample bottles are completely filled.	T	
18) There is sufficient volume for all requsted analyses, including any requested MS/MSDs.	T	
19) Trip blanks provided if applicable.	NA	
20) VOA sample vials do not have head space or bubble is <6mm (1/4") in diameter.	NA	
21) Samples do not require splitting or compositing.	T	

Who notified of False statements? **Date/Time:**

Doc #277 Rev. 4 August 2013 **Log-In Technician Initials:** **Date/Time:** RLF 6/4/14 1540

MADEP MCP Analytical Method Report Certification Form

Laboratory Name: Con-Test Analytical Laboratory	Project #: 14F0128
Project Location: Lowell, MA	RTN:

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

14F0128-01 thru 14F0128-40

Matrices: Soil

CAM Protocol (check all that below)

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

Printed Name: Michael A. Erickson Date: 06/11/14

ATTACHMENT 5

Data Usability & Representativeness Evaluation

Attachment 5

Representativeness Evaluation and Data Usability Assessment

Boott Mills – Exterior Courtyard PCB Release
130 Foot of John Street
Lowell, Massachusetts
MADEP RTN: 3-26688

July 2014

A representativeness evaluation and data usability assessment were conducted consistent with MADEP guidance, *MCP Representativeness Evaluations and Data Usability Assessments*, Policy WSC-07-350, dated September 19, 2007. This evaluation and assessment focuses on whether the available information supports the conclusions that: (1) disposal site conditions are adequately characterized; (2) risks to health, safety, public welfare and the environment have been adequately addressed (i.e., all Exposure Pathways have been identified, Exposure Point Concentrations meet the applicable cleanup requirements); and (3) all sources have been eliminated/or controlled to the extent required.

1. Representativeness Evaluation

According to MADEP's policy: *The Representativeness Evaluation is an evaluation and demonstration of the adequacy of the spatial and temporal sets used to support the Response Action Outcome (RAO). …. The Representativeness Evaluation determines whether the data set in total sufficiently characterizes conditions at the disposal site and supports a coherent Conceptual Site Model. The Representativeness Evaluation determines whether there is enough information from the right locations, both spatially and temporally, to support the RAO.*

The policy identifies several different elements that must be considered when conducting a Representativeness Evaluation. The available data and information, relative to each of these elements, are evaluated below.

Use of Field/Screening Data

All soil samples collected in the field were jar head-space screened in the field using a photoionization detector (PID). The main contaminants of concern at the Site are polychlorinated biphenyls (PCBs) and lead, which are relatively non-volatile. Therefore, the

results of the PID screening were not utilized to select soil samples for analysis of the main contaminants of concern but to screen soils to support soil analytical data used to determine that volatile organic compounds (VOCs) and volatile petroleum hydrocarbons (VPH) were not significantly present. During test boring, if soil recoveries were found to have elevated levels of total ionizable compounds (TICs) based on head-space screening using a PID, the soils would have been submitted for analysis of VOCs and VPH. Elevated levels of TICs were not observed. Soil samples selected for analysis of non-volatile oils or hazards materials were determined based on needs to determine the horizontal and vertical extent of contamination, identify and characterize hot spots of contamination, evaluate migration pathways and obtain sufficient data to support a risk characterization. The soil samples collected for analysis of PCBs were determined, in part, based on a grid pattern established in compliance with the United States Environmental Protection Agency (USEPA) protocol 40 CFR 761.

Sampling Rationale

This response action relies on field investigations conducted by GEC during the period February 2010 to June 2014, and on investigations and remediation conducted by Environmental Compliance Services, Inc. (ECS) during December 2006 to April 2007. The sampling rationale varied during this period. Initially, field investigations were conducted as part of due diligence activities to assess Site conditions and to determine if residual contaminant levels were present following soil excavation conducted by ECS in 2007, and later to support the Phase I Initial Site Investigation, Tier Classification and Numerical Ranking Scoresheet. Subsequent investigations were conducted to determine the horizontal and vertical extent of contamination and the magnitude of contamination; to evaluate migration pathways; to provide sufficient data to derive exposure point concentrations for the risk characterization; and to provide the level of data needed to identify hot spots of PCB contamination and the boundaries of areas to be remediated via excavation. The soil sampling plan was also developed in accordance with EPA grid sampling regulations 40 CFR 761.

Soil samples, groundwater samples and soil vapor samples were collected for analysis of OHM considered potentially present at the Subject Site based on site history. Therefore, soil samples were analyzed for VOCs, semi-volatile organic compounds (SVOCs), extractable petroleum hydrocarbons (EPH) including target polycyclic aromatic hydrocarbons (PAHs), metals and PCBs. Groundwater samples were analyzed for VOCs, SVOCs, EPH including target PAHs, total and dissolved metals, PCBs, and VPH. Soil vapor samples were analyzed for PCBs.

Based on an evaluation of groundwater data, no OHM were identified as potential indoor air contaminants of concern. However, given the presence of some high levels of PCBs detected

in Site soils proximal to the Site building and the residential use of the building, soil vapor samples were collected for analysis of PCBs, to determine whether intrusion of PCBs as soil vapor into indoor air might be occurring.

Critical Samples are the following:

(1) soil samples collected for PCB analysis from throughout the exterior courtyard, beneath Mill Building #3 and from boring B-13 to determine the horizontal and vertical extent of contamination, to identify hot spots of PCB contamination, and to obtain data to support a risk characterization;

(2) groundwater samples collected for analysis of total and dissolved PCBs, PAH and lead, which are used to determine whether dissolved groundwater contamination is present and whether a dissolved-phase plume is emanating from the Site;

(3) groundwater samples collected for analysis of VOCs and VPH, which are used to determine that sufficient VOC and VPH contamination is present to act as a co-solvent to facilitate the dissolution of PCB in groundwater;

(4) the soil samples collected from the 0-3 foot interval of B-16, where were used to determine whether all or a portion of the chromium detected in soil is attributable to Cr(VI); and

(5) the two soil vapor samples analyzed to determine whether PCB vapors are present in the subsurface and whether PCB vapor migration into indoor air is a migration pathway of concern for the Site.

Number, Spatial Distribution and Handling of Samples

Soil and groundwater samples were collected from throughout the Site, with most samples collected from the areas of known contamination, or to investigate potential source areas or migration pathways or to determine the extent of soil contamination or potential hot spots. Soil vapor samples were collected from locations where underlying contamination might impact indoor air. The samples specifically used to characterize release conditions are identified in Tables 1.1 to 1.5 for groundwater, Tables 2.1 to 2.3 for soil and Table 3 for soil vapor.

From June 2011 through June 2014, the following samples were collected for analysis:

Parameter	Groundwater	Soil	Soil Vapor
EPH / target PAHs		8	
EPH	6		
PAHs	8	8	
VPH	2		
VOCs	5	7	
PCBs	8	199	2
Metals	6	37	
TPH		2	
Corrosivity, Ignitability, Reactivity, pH, flash point		2	

Refer to Table 1, in Attachment 3, QA/QC Plan & SOPs for a summary of analytical methods used. Soil and/or groundwater samples were collected from locations throughout the property, from ground surface to 15 feet below grade. Emphasis was placed on the area impacted by the PCB release, located in the exterior courtyard. Initial sampling was distributed throughout the property to assess Site conditions and to determine if residual contaminant levels were present following soil excavation conducted by ECS in 2007. Follow-up investigations were distributed throughout the exterior courtyard to investigate the horizontal and vertical distribution of PCB and lead contamination within the exterior courtyard.

The soil, groundwater and soil vapor samples were handled in accordance with GEC's Standard Operating Procedures (SOPs) and applicable MADEP and EPA policy, included as Attachment 3. Specific exceptions are described below.

1. Soil samples collected on September 1, 2011 were submitted to Groundwater Analytical for VOC analysis. Groundwater Analytical terminated its business and therefore, samples were transferred to Alpha Analytical for analysis on September 9, 2011. Alpha Analytical reported that the water-preserved VOA containers for low VOC analyses were received outside the 48-hour hold time for freezing prior to analysis. However, the soil samples were preserved with methanol for high level VOC analysis not with water. The soil samples were analyzed on September 15, 2011, which is on day 14 following sample collection, which is within the hold time for analysis via USEPA Method 8260. Presuming the proper handling of the soil samples by Groundwater Analytical and Alpha Analytical, the analytical data should be acceptable.

2. The sample times of some soil samples collected on 10/17/12 were labeled incorrectly on the chain of custody and there was no label on the sample container for B-25 5-7' GEC and the laboratory communicated to label the blank sample container correctly.

Temporal Distribution of Samples

Groundwater samples used within this investigation were collected from the Site during June 2011 and September 2011 and October 2012, representing summer and fall conditions. No one-year period of seasonal groundwater sampling was conducted for a given monitoring well or a given analyte. Very little groundwater contamination was detected. Groundwater contaminants are not expected to impact surface water or a drinking water source; therefore, cumulatively, sufficient data exists to evaluate migration pathways, exposure scenarios and risk of harm attributable to groundwater contamination.

Soil samples were collected during the period February 2010 to June 2014, all soil data are from soil samples collected subsequent to Environmental Compliance Services, Inc.'s (ECS) soil excavation in March 2007 and provide data representative of current Site conditions. Temporal variation in OHM levels in soils is not considered significant over this period.

GEC collected a total of two soil vapor samples for analysis, from the Site buildings during September 2011. There is no temporal distribution for soil vapor samples. However, very low detection limits were achieved for PCBs in these soil vapor samples; no PCBs were detected in the soil vapor samples; water-saturated soils is not an issue (which would reduce vapor levels in soil vapor) because the groundwater table is significantly below grade and the soils are covered with asphalt or concrete; and PCBs are relatively non-volatile. Therefore, the lack of temporal distribution of PCBs in soil vapor is not a significant issue.

Completeness

As with all sites, additional sampling and analyses could be conducted to address uncertainties in the data set. However, sufficient data exists to support the Revised Release Abatement Measure Plan Modification, Application for Risk-Based Clean-up of PCBs and risk characterization. In particular, data was obtained for all samples identified as critical. The existing data is considered complete.

Inconsistency and Uncertainty

A limited amount of soil vapor data exists for the Site. The soil vapor data were used to support the elimination of soil vapor intrusion as a significant migration pathway. The soil vapor points are located in or near locations of specific buildings most apt to be impacted by soil vapor intrusion, due to proximity to the subsurface contamination. Therefore, the soil vapor data represents worst-case conditions. No dissolved-phase PCBs were detected in groundwater at levels exceeding Method 1 GW-2 standards. In addition, PCBs are relatively non-volatile.

Sufficient information exists to eliminate soil vapor intrusion as a migration pathway. The soil vapor data are provided in Table 3.

No indoor air samples were collected for analysis; however, no PCBs were detected in the soil vapor, which indicates that soil vapor intrusion is unlikely to occur to an extent resulting in a measurable impact on indoor air.

PCBs were detected in non-filtered groundwater samples from newly installed monitoring wells (GEC-1 and GEC-2) collected on June 15, 2011. However, PCBs were not detected in non-filtered groundwater samples from these same wells collected on September 12, 2011. No dissolved-phase PCBs were detected in groundwater samples from these same wells collected on September 12, 2011. The presence of PCBs in non-filtered groundwater samples from newly installed monitoring wells GEC-1 and GEC-2 is likely due to these wells presence in an area of significant PCB soil contamination and the tendency for newly installed monitoring wells to have a significant amount of suspended soil particulates in their groundwater samples.

Information Considered Unrepresentative

PCB concentrations detected in non-filtered groundwater samples of GEC-1 and GEC-2 were not considered representative of the levels of PCBs that could be migrating dissolved phase toward the surface water of the Merrimac River. The filtered groundwater samples were used to represent dissolved-phase PCB conditions.

Similarly, lead, EPH and PAH data for non-filtered groundwater samples were not used to represent the levels of lead, EPH and PAHs that could be migrating in groundwater toward the Merrimac River. The lead, EPH and PAH data for filtered groundwater samples was used for this evaluation.

Total petroleum hydrocarbon (TPH) data for soil was not utilized in the risk characterization because the EPH data provides more applicable data for the risk characterization and sufficient EPH data exists to not have to rely on the TPH data.

The PCB data for the Composite 4 soil sample was not used in the risk characterization, because separate PCB data exists for borings B-39, B-49 and B-50, which comprise Composite 4. PCB data exists for the 0-3, 0-1 and 1-3 foot intervals of boring B-8. The B-8 0-3 foot interval data point was used in the risk characterization in lieu of the 0-1 and 1-3 foot interval samples.

The chromium data was considered representative of trivalent chromium conditions, not hexavalent chromium conditions, because no hexavalent chromium was detected in the soil samples collected from two borings for total chromium, hexavalent chromium, ORP and pH analysis.

2. Data Usability Assessment

The Data Usability Assessment has both an analytical and field component. According to MADEP's policy, it *is used to evaluate whether analytical data points are scientifically valid and defensible, and of a sufficient level of precision, accuracy and sensitivity to support the RAO.*

Analytical Data Usability Assessments / Data Evaluation Criteria

The data collected to support the Release Abatement Measure Plan Modification, Application for Risk-Based Clean-up of PCBs and risk characterization was collected following the release of, MADEP's *Compendium of Analytical Methods Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data in Support of Response Actions Conducted Under the Massachusetts Contingency Plan (MCP)* (WSC-CAM-VIIA) (CAM). Each of the data sets were evaluated for compliance with the CAM, as documented in the spreadsheets attached to this evaluation in Attachment 5.

Twenty four analytical laboratory reports exist for samples of environmental media collected from the Subject Site. These samples were collected by GEC during the period February 2010 to June 2014. All the laboratory reports were available for GEC's data usability / data evaluation. All of the data collected across the Subject Site were evaluated for compliance with the CAM; however, not all data included in this evaluation pertain to the enclosed courtyard, for which the Revised Release Abatement Measure Plan Modification, Application for Risk-Based Clean-up of PCBs and risk characterization was prepared. Some of the data evaluated pertains to the interior courtyard, and activities associated with the interior courtyard are discussed in separate Release Abatement Measure submittals. That data is eliminated from the evaluation, below.

All the soil and groundwater data used in the human health risk characterization were analyzed using accepted CAM methodologies. For groundwater and soil, most samples were received by the laboratory under chain of custody and in good condition. Given the large number of samples collected, occasional issues with specific samples are to be expected. However, for groundwater samples, two rounds of sampling were conducted for key monitoring wells, and for soil samples, many soil samples were collected throughout the contaminated area for analysis.

Except as identified below, all QA/QC procedures for sample handling were followed and all data meets QA/QC guidelines.

Media / Date	Consultant	Issue
Soil: 9/1/2011	GEC	Soil samples collected on September 1, 2011 were submitted to Groundwater Analytical for VOC analysis. Groundwater Analytical terminated its business and therefore, samples were transferred to Alpha Analytical for analysis on September 9, 2011. The preserved VOA containers for low level VOC analyses were received outside the 48 hour hold time. However, the VOA vials did not contain water to freeze the soil samples, but contained methanol for high level VOC analyses. The soil samples were analyzed on September 15, 2011, within the 14-day hold time for VOC analysis of methanol-preserved soil samples.
Soil: 10/5/2011	GEC	Soil sample WC-1 was collected on 10/5/2011, and submitted on 10/15/2011 for disposal criteria testing (except for 8260 testing which was conducted earlier). pH analysis was conducted on 10/17/2011, 11 days after the expiration of its 24-hour hold time.
Soil: 10/9/2011	GEC	Soil sample WC-2 was collected on 10/9/2011, and submitted on 10/16/2011 for disposal criteria testing. pH analysis was conducted on 10/17/2011, 7 days after the expiration of its 24-hour hold time.
Soil: 10/5&9/2011	GEC	Soil samples B-20 0-3', B-35 5-7' and B-35 7-9' were collected on 10/5/2011 and soil sample B-26 9-12' was collected on 10/9/2011. These samples were submitted for analysis after the results of other PCB samples were obtained. The extraction for these samples was conducted 52 to 56 days following sample collection, which after the 14-day hold period for sample extraction.
Soil: 10/17/12	GEC	The sample times of some soil samples collected on 10/17/12 were labeled incorrectly on the chain of custody and there was no label on the sample container for B-25 5-7' GEC and the laboratory communicated to label the container correctly.

Occasionally, for a given sample and analysis, only a subset of the target analytes for the analytical method were reported. Specific incidences are identified below.

Media / Date	Consultant	Issue
Soil: 9/1/2011	GEC	For all soil samples analyzed for 8270, only PAH compounds were requested and analyzed.
Groundwater: 9/7/2011	GEC	For groundwater sample analyzed for 6010, only total and dissolved lead were requested and analyzed. On June 15, 2011, four groundwater samples were collected and analyzed for MA14 metals. This data was used to reduce the number of metal contaminants of concern requiring further groundwater analysis to lead.
Groundwater: 9/12/2011	GEC	For all groundwater samples analyzed for 8270, only PAH compounds were requested and analyzed. For all groundwater samples analyzed for MA VPH, only carbon range compounds were requested and analyzed, because VOCs analyzed via 8260B. For groundwater sample analyzed for 6010, only total and dissolved lead were requested and analyzed. On June 15, 2011, four groundwater samples were collected and analyzed for MA14 metals. This data was used to reduce the number of metal contaminants of concern requiring further groundwater analysis to lead.
Soil: 10/5/2012	GEC	All soil samples analyzed for 6010: only chromium, nickel and lead were requested and analyzed. Fourteen soil samples were previously collected and analyzed for MA14 metals. Chromium, nickel and lead were identified as the metal contaminants of concern for the Site.
Soil: 10/5/2012	GEC	All soil samples analyzed for 6010: only RCRA 8 metals were requested and analyzed. These samples were collected for disposal criteria testing.
Soil: 10/9/2012	GEC	All soil samples analyzed for 6010C: only RCRA 8 metals were requested and analyzed. These samples were collected for disposal criteria testing. All soils samples analyzed for 6010: only lead was requested and analyzed. Fourteen soil samples were previously collected and analyzed for MA14 metals. Chromium, nickel and lead were identified as the metal contaminants of concern for the Site.
Soil: 10/5&9/2012	GEC	All soil samples analyzed for 6010: GEC requested only a select list of metals, including one or more of the following, chromium, nickel and/or lead. Fourteen soil samples were previously collected and analyzed for MA14 metals. Chromium, nickel and lead were identified as the metal contaminants of concern for the Site.
Soil: 10/17/2012	GEC	All soil samples analyzed for 6010C: only lead was requested and analyzed. Fourteen soil samples were previously collected and analyzed for MA14 metals. Chromium, nickel and lead were identified as the metal contaminants of concern for the Site.
Groundwater: 10/22/2012	GEC	All samples analyzed for 8270: only a select list of PAHs was analyzed and reported in order to achieve lower detection limits than possible with the EPH analysis. The remaining PAHs were analyzed via MADEP's method.

Most analytical data sets had one or more small issues identified in the case narrative. A few examples of these issues are provided below. The issues are described in greater detail in the data validation forms attached to this summary in Attachment 6.

Media / Date	Consultant	Issue
Soil: 6/6/2011	GEC	Sample B-4 2-5': For EPH analysis, surrogate was not measurable due to required sample dilution. Samples B-4 2-5', B-2 1-5', B-2 10-15', and B-4 2-5': For EPH and PCB analyses, sample was diluted prior to analysis to keep all target analytes within calibration.
Soil: 9/1/2011	GEC	All soil samples analyzed for 8260C: The LCS and LCS duplicates were detected above the acceptance criteria for Methylene chloride (25%), 1,1-Dichloroethane (27%), Chloroform (28%), Carbontetrachloride (27%), 1,1,1-Trichloroethane.
Soil 10/5&9/2012	GEC	Sample B-35 3-5' and B-26 5-7': For PCBs analysis, surrogates were not measureable due to required sample dilution. All samples: For PCB analysis, sample fingerprint does not match standard exactly.
Groundwater: 10/17/2012	GEC	Sample GEC-1: For 8270 analysis, benzo(a)anthracence was detected in the sample as well as in the blank.
Soil: 5/8/2013	GEC	Samples B-49 0-3' and B-50 0-3': For PCB analysis, surrogates were not measurable due to required sample dilution. Samples B-39 0-3' and B-39 3-9': For PCB analysis, samples contain two incompletely resolved Aroclors.
Soil: 5/8&9/2013	GEC	Samples B-38 0-9', Composite 1 0-5', Composite 4 0-3' and Composite 6 0-3': For PCB analysis, surrogates were not measureable due to required sample dilution. All soil samples analyzed for PCBs: The recovery bias was high for the LCS and the LCS duplicate due to contribution of other Aroclors present in the source sample. Samples Composite 1 0-5' and Composite 4 3-9': For PCB analysis, sample fingerprint does not match standard exactly.
Soil 3/4&5/2014	GEC	Samples B49A 1-2', B49A 2-3', B50A 1-2', B50A 2-3', B50 2-3' DUP, B2A 2-3' DUP, B2A 3-4', B2A 4-5', B2A 4-5' DUPB16Q 2-3', B16A3-4, B11A 0-0.5', B11A 0-0.5' DUP, B11A 0.5-1', B20A 1-2', B20A1-2' DUP and B-21A 1-2": Sample fingerprint does not match standard exactly for analyte Aroclor 1248 and 1248 (2C). Sample was quantitated against the closest matching standard. Samples B50A 2-3', B502A DUP, B2A 4-5', B2a 4-5' DUP, B16A 3-4', Comp1A 2-3', Comp1A 3-4', Comp2A 0.5-1' and Comp6A 2-3': The surrogate recovery for Decachlorobiphenyl, Decachlorobiphenyl (2C), Tetrachloro-m-xylene and Tetrachloro-m-xylen (2C) is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences. Matrix spike and matrix spike duplicate recoveries are outside of control limits. Data validation is not affected since results for this compound in this sample are "not detected", and recovery bias is on the high side. Sample B10A 0-0.5': Matrix spike duplicate RPD is outside of control limits. Reduced precision is anticipated for reported result for this Aroclor 1016 in this sample. Samples B10A 2-3', B10A 2-3' DUP, B20A2-3' and B21A 2-3': The surrogate recovery for Decachlorobiphenyl, Decachlorobiphenyl (2C)

		, Tetrachloro-m-xylene and Tetrachloro-m-xylene (2C) is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences. Samples B48A 1-2', B48A 2-3', Comp1A 1-2', Comp1A 2-3', Comp!A 4-5', Comp5A 0-.5', Comp5A 0.5-1', Comp 6A 0.5-1' Comp6A 2-3' and Comp2A 0-0.5': Sample fingerprint does not match standard exactly for analyte Aroclor 1248, 1248 (2C), 1254 and 1254 (2C). Sample was quantitated against the closest matching. Sample Comp 6A 0-0.5': Matrix spike recovery and matrix spike duplicate recovery outside of control limits for Cl5-BZ#105, Cl5-BZ#118. Possibility of sample matrix effects that lead to a high bias for reported result or non-homogeneous sample aliquots cannot be eliminated.
Soil 6/3/2014	GEC	Samples ASC-1, ASC-4, ASC-5, ASC-6, B-51B 1-2', B51B (2-3), B-52B (1-2), B-52B (2-3), B-55B (2-3), B-55BB (3-5), B-56B (2-3), B-57B (1-2), B-57B (3-5), B-70 (2-5) B-72 (1-2): Sample fingerprint does not match standard exactly for Aroclor-1248, Aroclor-1248 [2C]. Sample was quantitated against the closest matching standard. Samples B-69 (2-5) and B-71(1-2): The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration of Decachlorobiphenyl, Decachlorobiphenyl [2C], Tetrachloro-m-xylene, Tetrachloro-m-xylene [2C] and/or matrix interferences.

No PCB air analyses were conducted under CAM, because no CAM method is currently in effect for EPA method TO-10A. The soil vapor samples were analyzed for PCBs via EPA TO-10A method. This method is a standard procedure, approved by EPA, for analyzing PCBs in air. Sample collection was conducted over a prolonged period of time in order to obtain low PCB detection limits needed due to PCB's toxicity. Unless specifically identified below, for the soil vapor samples analyzed for PCBs, the surrogate recoveries for the field samples and laboratory blanks had surrogate recoveries within the recommended recovery limits. Other issues with the data are also identified below.

Media / Date	Consultant	Issue
Soil Vapor / 9/12-9/15/2011	GEC	All samples: For TO-10A analysis, only the quartz filter was extracted and analyzed. Blank sample: For TO-10A analysis, Surrogate compounds Decachlorobiphenyl and Tetrachloro-m-xylene were recovered at levels (40.3 and 27.8%, respectively) below QC recovery limit

Field Data Usability Assessment

The data used to support the Release Abatement Measure Plan Modification, Application for Risk-Based Clean-up of PCBs and risk characterization was collected by GEC, during the period February 2010 to June 2014.

The sampling procedures used by GEC were conducted in accordance with GEC's Standard Operating Procedures, which were developed in accordance with industry standards and MADEP and EPA policies and guidance. Appropriate sampling methods and preservation methods were used; samples were extracted and / or analyzed within the appropriate hold times, except where noted, above. For this project there were no significant issues with equipment problems, preservation methods and holding time.

Field data collected by GEC during the field investigations included the following: (1) visual and olfactory observations of soil recoveries collected during soil borings; (2) soil headspace screening using a PID; and (3) groundwater geochemical measurements during water sampling. These field data were collected in accordance with GEC's Standard Operating Procedures. Soil vapor samples were submitted for analysis via EPA TO-10A method to support a multiple-line-of-evidence evaluation that indicated that soil vapor intrusion is unlikely to occur to an extent that would result in a measurable impact on indoor air.

Rejection of Analytical Data as the Result of Gross Failure

The data used in support of the Revised Release Abatement Measure Plan Modification, Application for Risk-Based Clean-up of PCBs and risk characterization were assessed against the criteria indicative of "gross failure" in quality control, as described in Appendix IV of MADEP's guidance, *Representativeness Evaluations and Data Usability Assessments*. For inorganic compounds, criteria indicative for "gross failure" exist for holding times, laboratory control samples and laboratory control sample duplicates and matrix spike recoveries. For organic compounds, criteria indicative of "gross failure" exist for holding time, sample preservation for VOC analyses, laboratory control samples and laboratory control sample duplicates, surrogate recoveries, matrix spike and matrix spike duplicate recoveries, calibration, internal standards, fractionation check standard recoveries for EPH analyses, and dual column precision for PCB analyses.

If a sample is held more than two-fold beyond it holding time, then it meets the holding time criterion for rejection for "gross failure". For disposal criteria samples, WC-1 and WC-2 were held more than two-fold beyond their holding time for pH analyses. These data were not used in the risk characterization, and were only used to support decisions about where soils could be disposed and no acidic or basic releases were known to occurred at the Site. In addition, soil samples collected for CrVI testing had pH analyses within holding times for pH and did not indicate an acidic or basic release. Geochemical screening during groundwater sampling did not indicate the presence of an acidic or basic release.

Five soil samples were submitted for laboratory analysis of PCBs more than two-fold beyond their extraction hold time of two weeks from sample collection. The following soil samples were extracted between 5 and 6 weeks after sample collection, which is more than two fold beyond the two-week hold time for extraction prior to PCB analysis: B-20 0-3', B-26 9-12', B-35 5-7', B-35 7-9' and B-37 3-5'. Since the collection of these samples, additional soil samples have been collected adjacent to or proximal to these locations at similar sample depths and provide additional data to rely upon. Sample B-20 0-3' is located within Hot Spot #3 and therefore, the 0-2' portion will be reused as backfill within the excavation and the 2-3' portion will be disposed off-Site. The remaining soil samples are four of one hundred nine soil samples used to represent PCB conditions in the remainder of the exterior courtyard, outside of the three hot spots. These four soil samples had PCB levels that were consistent with those detected elsewhere outside the hot spots. If rejected, they would not alter the results of the risk characterization. They were not rejected.

Based on the available laboratory reports, all soil samples collected for VOC and VPH analyses were preserved with methanol. Therefore, the criterion for "gross failure" was not met, because methanol was used for sample preservation.

For each sample / analysis, no laboratory control sample and / or laboratory control sample duplicate recoveries were less than CAM's recommended criteria for gross failure. None of the OHM detected in any sample met the laboratory control sample criterion for "gross failure" rejection.

No data for Site-specific contaminants of concern collected from the Subject Site met the criteria for "gross failure"; therefore, no data were rejected on this basis.

3. Conclusions

The data set relied upon to support the Revised Release Abatement Measure Plan Modification, Application for Risk-Based Clean-up of PCBs and risk characterization is scientifically valid, and of sufficient accuracy, precision and completeness. The data is also representative with regards to the spatial and temporal distribution of sampling points. Decisions in sampling location were made that would tend to err on the side of obtaining over-estimates of OHM concentrations. Therefore, the resulting risk characterization relies on data that would contribute to a conservative estimate of risk.

Appendix D:
Inventory of Laboratory Reports for Data Enhancement Evaluation

Data Enhancement File	Sample Date	Consultant	Media	Laboratory	Lab Report Number	Report Date	C-O-C	Field Notes
6-6-2011.Soil.GWA.142417	6/6/2011	GEC	S	GWA	142417	6/15/2011	Y	Y
6-15-2011. GW.GWA.142740	6/15/2011	GEC	GW	GWA	142740	6/24/2011	Y	Y
9-1-2011.Soil.Alpha.L1114144	9/1/2011	GEC	S	Alpha	L1114144	9/21/2011	Y	Y
9-7-2011.GW.Alpha.L1114121	9/7/2011	GEC	GW	Alpha	L1114121	9/26/2011	Y	Y
9-12&13.Soil&GW.Contest.11I0524	9/12to13/2011	GEC	S&GW	Con-Test	11I0524	9/26/2011	Y	Y
9-14-2011.Soil.Contest.11I514	9/14/2011	GEC	S	Con-Test	11I514	9/22/2011	Y	Y
9-15-2011.SV.Contest.11I0599	9/15/2011	GEC	SV	Con-Test	11I0599	9/27/2011	Y	Y
10-5-2012.Soil.Contest.12J0289	10/5/2012	GEC	S	Con-Test	12J0289	10/12/2012	Y	Y
10-5&9-2012.Soil.Contest.12J0450	10/5&9/2012	GEC	S	Con-Test	12J0450	10/22/2012	Y	Y
10-5-2012.Soil.Contest.12J0290	10/5/2012	GEC	S	Con-Test	12J0290	10/12/2012	Y	Y
10-5-2012.Soil.Conteest.12J0624	10/5/2012	GEC	S	Con-Test	12J0624	10/23/2012	Y	Y
10/5/2012.Soil.Contest.12J0793	10/5/2012	GEC	S	Con-Test	12J0793	10/26/2012	Y	Y
10/5/2012.Soil.Contest.12J826	10/5/2012	GEC	S	Con-Test	12J0826	12/4/2012	Y	Y
10-9-2012.Soil.Contest.12J0625	10/9/2012	GEC	S	Con-Test	12J0625	10/23/2012	Y	Y
10-9-2012.Soil.Contest.12J0794	10/9/2012	GEC	S	Con-Test	12J0794	10/26/2012	Y	Y
10-17-2012.Soil.Contest.12J0765	10/17/2012	GEC	S	Con-Test	12J0765	10/26/2012	Y	Y
10-22-2012.GW.Contest.12J0911	10/22/2012	GEC	GW	Con-Test	12J0911	10/31/2012	Y	Y
5-8&9-2013.Soil.Contest.13E0875	5/8&9/2013	GEC	S	Con-Test	13E0387	5/17/2013	Y	Y
5-8-2013.Soil.Contest.13E0875	5/8/2013	GEC	S	Con-Test	13E0875	5/24/2013	Y	Y
3-4&5-2014(1).soil.Contest.14C0168	3/4&5/2014	GEC	S	Con-Test	14C0168	3/13/2014	Y	Y
3-4&5-2014(2).soil.Contest. 14C0169	3/4&5/2014	GEC	S	Con-Test	14C0169	3/13/2014	Y	Y
3-4&5-2014(3).soil.Contest. 14C0170	3/4&5/2014	GEC	S	Con-Test	14C0170	3/13/2014	Y	Y
3-4&5-2014.soil(pcb cogeners).14C0171	3/4&5/2014	GEC	S	Con-Test	14C0171	3/27/2014	Y	Y
6-3-2014.soil.Contest. 14F0128	6/3/2014	GEC	S	Con-Test	14F0128	6/11/2014	Y	Y

Consultants

GEC = Goldman Environmental Consultants, Inc.

Laboratories

Alpha = Alpha Analytical Laboratory, Inc.
Con-Test = Contest Analytical Laboratory
GWA = Groundwater Analytical, Inc.

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911-1730
Client:	Winn	**Laboratory Report Date:**	6/15/2011
Laboratory:	Groundwater Analytical	**Sample Date(s):**	6/6/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	142417		

	CAM Methodology									
Analytical Method	**VOCs (8260B)**	**SVOCs (8270C)**	**Metals (6010B)**	**Mercury (7470A / 7471A)**	**Metals (7000)**	**Metals (6020A)**	**VPH (MADEP-VPH)**	**EPH (MADEP)**	**PCBs (8082)**	**Chlorinated Pesticides (8081A)**
CAM Revision	**4**	**5**	**5**	**5**	**4**	**2**	**3**	**3**	**4**	**4**
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**
Revision Date	**5/28/2004**	**12/20/2007**	**5/28/2004**	**8/13/2004**	**8/13/2004**	**8/13/2004**	**9/10/2004**	**9/10/2004**	**8/20/2004**	**8/20/2004**
Notes										
Soils										
No. Samples			10	10				10	10	
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

	CAM Methodology					Non-CAM Methodology				
Analytical Method	**Chlorinated Herbicides (8151A)**	**Aromatic / Chlorinated VOCs (8021B)**	**Total Cn & PAC (9014)**	**Hexavalent Chromium (7196A)**	**Nitroaromatics and Nitroamines (8330)**					
CAM Revision	**2**	**2**	**2**	**3**	**2**					
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**					
Revision Date	**5/28/2004**	**5/28/2004**	**8/13/204**	**8/20/2004**	**8/27/2004**					
Notes										
Soils										
No. Samples										
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911-1730
Client:	Winn	**Laboratory Report Date:**	6/15/2011
Laboratory:	Groundwater Analytical	**Sample Date(s):**	6/6/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	142417		

	CAM Methodology		Non-CAM Methodology							
Analytical Method	**VOCs (TO-15)**	**APH (MADEP-APH)**								
CAM Revision	**1**	**1**								
CAM Status	**Draft**	**Draft**								
Revision Date	**11/5/2009**	**11/9/2009**								
Notes										
Indoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor air sample										
Soil Vapor										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										

Notes:

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911-1730
Client:	Winn	**Laboratory Report Date:**	6/15/2011
Laboratory:	Groundwater Analytical	**Sample Date(s):**	6/6/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	142417		

Description of Samples Collected Inconsistent with GEC's Work Plan and / or Standard Operating Procedures

Type of PID not indicated
No Site Sketch included in notes

Headspace not available for all sample intervals. Reason not indicated in notes

Sample methodology, sample locations / depths, equipment failure, trip blanks, duplicates, sample preservation, screening protocols, etc.

Description of Field Screening and Field Screening Data

Samples headspaced screened via unknown type of PID

Screening values ranged from 0-1.5 ppm (highest at B-2 10-15')

Field screening methodology, equipment, data (attach data or provide reference to data), how screening data was used in decision making in the field.

Preparation of Chain of Custody

No Issues observed or reported by lab or GEC

Sample ID, type, date and time collected, collectors name, preservation, filtration, and relinquished signatures, correct analyt method, requested detection limits.
Note any analyses that were performed outside of submitted COC, provide explanation for why.

Prepared by: Mbradley **Date:** 7/22/2013

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911-1730
Client:	Winn	**Laboratory Report Date:**	6/15/2011
Laboratory:	Groundwater Analytical	**Sample Date(s):**	6/6/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	142417		

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet C: Sample Conditions, Holding Times, Sample Duplicates and Field Blanks

Site Name:	Boot Mills	**Project No.:**	911-1730
Client:	Winn	**Laboratory Report Date:**	40709
Laboratory:	Groundwater Analytical	**Sample Date(s):**	40700
Data Package Description:	Soil		
Lab Job / Batch Number:	142417		

Sample Conditions

Were there any issues with samples received by laboratory?	**Yes**		**No**	X
Were there any issues with sample preservation?	**Yes**		**No**	X
Were there any issues with type of sample container?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

Sample Condition Issues

Sample	Analysis	Description of Sample Condition Issue

Holding Times

Were any extraction / sample preparation holding times exceeded?	**Yes**		**No**	X
Were any analytical holding times exceeded?	**Yes**		**No**	X
Any evidence of gross failure for any sample (> 2 times holding time)?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

NA = Not Applicable // NI = No Information

Holding Time Issues

Sample	Analysis	Description of Holding Time Issue

Field Blanks / Field Duplicates / Matrix Spike

Were any drinking water samples analyzed?	**Yes**		**No**	
If YES, were field duplicates, trip blanks, and / or matrix spikes collected and analyzed as required?	**Yes**		**No**	

Prepared by: Mbradley **Date:** 7/22/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911-1730
Client:	Winn	**Laboratory Report Date:**	6/15/2011
Laboratory:	Groundwater Analytical	**Sample Date(s):**	6/6/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	142417		

Analytical Parameters

Were results for all analyte-list compounds/elements for specified method(s) reported? **Yes** ☐ **No** ☐

For **NO**, identify samples/analyses and provide reason why.

Analyte Issues

Sample	Analysis	Description of Analyte Issue

Sample Quality Control

Were any surrogate recoveries outside QC Limits for a sample? **Yes** ☐ **No** ☐

Was recovery data unavailable for any sample? **Yes** ☐ **No** ☐

For any **Yes** answers, provide further details below.

Sample Quality Control Issues

Sample	Analysis	Description of Sample Quality Control Issue
B-4 2-5'	MA DEP EPH	This sample's surrogate recovery was not measurable due to 5-fold dilution of sample.
B-4 2-5'	MA DEP EPH	Sample was diluted 5-fold prior to analysis to keep all target analytes within calibration.
B-2 1-5'	8082	Sample was diluted 50-fold prior to analysis to keep all target analytes within calibration.
B-2 10-15'	8082	Sample was diluted 5-fold prior to analysis to keep all target analytes within calibration.
B-4 2-5	8082	Sample was diluted 100-fold prior to analysis to keep all target analytes within calibration.

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911-1730
Client:	Winn	**Laboratory Report Date:**	6/15/2011
Laboratory:	Groundwater Analytical	**Sample Date(s):**	6/6/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	142417		

Laboratory Control Samples (LCS) and Method Blanks

Were any LCS or LCSD Limits exceeded for a LCS?	**Yes**		**No**	X
Were any surrogate recoveries outside QC Limits for a LCS?	**Yes**		**No**	X
Were any analytes detected in a Method Blank?	**Yes**		**No**	X
Were any surrogate recoveries outside QC Limits for a Method Blank?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

LCS and Method Blank Issues

Samples Affected	Analysis	Description of LCS or Method Blank Issues

Other Issues for Laboratory Report / Data Set

Are there any other issues for this laboratory report or data set?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

Other Issues (e.g., Analytes or concentrations detected that are inconsistent with Site History or Conceptual Site Model; Analytical method modifications, etc.)

Sample	Analysis	Description of Other Issues

Prepared by: Mbradley **Date:** 7/22/2013

Reviewed by: **Date:**

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet E: CAM, Pre-CAM, Non-CAM

Site Name:	Boot Mills	**Project No.:**	911-1730
Client:	Winn	**Laboratory Report Date:**	40709
Laboratory:	Groundwater Analytical	**Sample Date(s):**	40700
Data Package Description:	Soil		
Lab Job / Batch Number:	142417		

CAM, Non-CAM and Pre-CAM

Were all analytical methods CAM methods? **Yes** X **No** For **NO**, identify samples/analyses that are non-CAM

Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses	
Sample	**Analysis**	**Sample**	**Analysis**	**Sample**	**Analysis**

CAM Analyses

Do CAM analyses meet the requirements for Presumptive Certainty? **Yes** **No** For **NO**, provide further details below.

Do all samples meet QC perform. standards and recomm.? **Yes** **No** For **NO**, provide further details below.

Presumptive Certainty Exception		
Sample	**Analysis**	**Description of Presumptive Certainty Exception**
B-4 2-5'	MA DEP EPH	Elevated Reporting limits due to required sample dilution exceed recommended CAM reporting limit
B-4 2-5'	MA DEP EPH	Elevated Reporting limits due to required sample dilution exceed recommended CAM reporting limit
B-2 1-5'	8082	Elevated Reporting limits due to required sample dilution exceed recommended CAM reporting limit
B-2 10-15'	8082	Elevated Reporting limits due to required sample dilution exceed recommended CAM reporting limit
B-4 2-5	8082	Elevated Reporting limits due to required sample dilution exceed recommended CAM reporting limit

Prepared by: Mbradley **Date:** 7/22/2013

Reviewed by: **Date:**

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911-1730
Client:	Winn	**Laboratory Report Date:**	6/24/2013
Laboratory:	Groundwater Analytical	**Sample Date(s):**	6/15/2011
Data Package Description:	Groundwater		
Lab Job / Batch Number:	142740		

	CAM Methodology									
Analytical Method	**VOCs (8260B)**	**SVOCs (8270C)**	**Metals (6010B)**	**Mercury (7470A / 7471A)**	**Metals (7000)**	**Metals (6020A)**	**VPH (MADEP-VPH)**	**EPH (MADEP)**	**PCBs (8082)**	**Chlorinated Pesticides (8081A)**
CAM Revision	**4**	**5**	**5**	**5**	**4**	**2**	**3**	**3**	**4**	**4**
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**
Revision Date	**5/28/2004**	**12/20/2007**	**5/28/2004**	**8/13/2004**	**8/13/2004**	**8/13/2004**	**9/10/2004**	**9/10/2004**	**8/20/2004**	**8/20/2004**
Notes			Dissolved							
Soils										
No. Samples	1		4					4	4	
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

	CAM Methodology					Non-CAM Methodology				
Analytical Method	**Chlorinated Herbicides (8151A)**	**Aromatic / Chlorinated VOCs (8021B)**	**Total Cn & PAC (9014)**	**Hexavalent Chromium (7196A)**	**Nitroaromatics and Nitroamines (8330)**					
CAM Revision	**2**	**2**	**2**	**3**	**2**					
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**					
Revision Date	**5/28/2004**	**5/28/2004**	**8/13/204**	**8/20/2004**	**8/27/2004**					
Notes										
Soils										
No. Samples										
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911-1730
Client:	Winn	**Laboratory Report Date:**	6/24/2013
Laboratory:	Groundwater Analytical	**Sample Date(s):**	6/15/2011
Data Package Description:	Groundwater		
Lab Job / Batch Number:	142740		

	CAM Methodology		Non-CAM Methodology							
Analytical Method	**VOCs (TO-15)**	**APH (MADEP-APH)**								
CAM Revision	**1**	**1**								
CAM Status	**Draft**	**Draft**								
Revision Date	**11/5/2009**	**11/9/2009**								
Notes										
Indoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor air sample										
Soil Vapor										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										

Notes:

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911-1730
Client:	Winn	**Laboratory Report Date:**	6/24/2013
Laboratory:	Groundwater Analytical	**Sample Date(s):**	6/15/2011
Data Package Description:	Groundwater		
Lab Job / Batch Number:	142740		

Description of Samples Collected Inconsistent with GEC's Work Plan and / or Standard Operating Procedures

Due to low recharge GEC-1 was sampled with polyethylene disposable bailer after five well volumes removed.

Sample methodology, sample locations / depths, equipment failure, trip blanks, duplicates, sample preservation, screening protocols, etc.

Description of Field Screening and Field Screening Data

Physical parameters oberved via YSI to determine appropriate sample collection time.

Prior to purging the depth to water and bottom were measured with GEC Water Level.

Dissolved Metal Samples field filtered with a 0.45 um filter prior to metals sample collection

Field screening methodology, equipment, data (attach data or provide reference to data), how screening data was used in decision making in the field.

Preparation of Chain of Custody

No Issues observed or reported by lab or GEC

Sample ID, type, date and time collected, collectors name, preservation, filtration, and relinquished signatures, correct analyt method, requested detection limits.
Note any analyses that were performed outside of submitted COC, provide explanation for why.

Prepared by: Mbradley **Date:** 7/22/2013

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911-1730
Client:	Winn	**Laboratory Report Date:**	6/24/2013
Laboratory:	Groundwater Analytical	**Sample Date(s):**	6/15/2011
Data Package Description:	Groundwater		
Lab Job / Batch Number:	142740		

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet C: Sample Conditions, Holding Times, Sample Duplicates and Field Blanks

Site Name:	Boot Mills	**Project No.:**	911-1730
Client:	Winn	**Laboratory Report Date:**	6/24/2013
Laboratory:	Groundwater Analytical	**Sample Date(s):**	6/15/2011
Data Package Description:	Groundwater		
Lab Job / Batch Number:	142740		

Sample Conditions

Were there any issues with samples received by laboratory?	**Yes**		**No**	X
Were there any issues with sample preservation?	**Yes**		**No**	X
Were there any issues with type of sample container?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

Sample Condition Issues

Sample	Analysis	Description of Sample Condition Issue

Holding Times

Were any extraction / sample preparation holding times exceeded?	**Yes**		**No**	X
Were any analytical holding times exceeded?	**Yes**		**No**	X
Any evidence of gross failure for any sample (> 2 times holding time)?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

NA = Not Applicable // NI = No Information

Holding Time Issues

Sample	Analysis	Description of Holding Time Issue

Field Blanks / Field Duplicates / Matrix Spike

Were any drinking water samples analyzed?	**Yes**		**No**	
If YES, were field duplicates, trip blanks, and / or matrix spikes collected and analyzed as required?	**Yes**		**No**	

Prepared by: Mbradley **Date:** 7/22/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911-1730
Client:	Winn	**Laboratory Report Date:**	6/24/2013
Laboratory:	Groundwater Analytical	**Sample Date(s):**	6/15/2011
Data Package Description:	Groundwater		
Lab Job / Batch Number:	142740		

Analytical Parameters

Were results for all analyte-list compounds/elements for specified method(s) reported? **Yes** [X] **No** [ ]

For **NO**, identify samples/analyses and provide reason why.

Analyte Issues

Sample	Analysis	Description of Analyte Issue

Sample Quality Control

Were any surrogate recoveries outside QC Limits for a sample? **Yes** [ ] **No** [X]

Was recovery data unavailable for any sample? **Yes** [ ] **No** [X]

For any **Yes** answers, provide further details below.

Sample Quality Control Issues

Sample	Analysis	Description of Sample Quality Control Issue

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911-1730
Client:	Winn	**Laboratory Report Date:**	6/24/2013
Laboratory:	Groundwater Analytical	**Sample Date(s):**	6/15/2011
Data Package Description:	Groundwater		
Lab Job / Batch Number:	142740		

Laboratory Control Samples (LCS) and Method Blanks

Were any LCS or LCSD Limits exceeded for a LCS?	**Yes**		**No**	X
Were any surrogate recoveries outside QC Limits for a LCS?	**Yes**		**No**	X
Were any analytes detected in a Method Blank?	**Yes**		**No**	X
Were any surrogate recoveries outside QC Limits for a Method Blank?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

LCS and Method Blank Issues

Samples Affected	Analysis	Description of LCS or Method Blank Issues

Other Issues for Laboratory Report / Data Set

Are there any other issues for this laboratory report or data set?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

Other Issues (e.g., Analytes or concentrations detected that are inconsistent with Site History or Conceptual Site Model; Analytical method modifications, etc.)

Sample	Analysis	Description of Other Issues

Prepared by: Mbradley **Date:** 7/22/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet E: CAM, Pre-CAM, Non-CAM

Site Name:	Boot Mills	**Project No.:**	911-1730
Client:	Winn	**Laboratory Report Date:**	6/24/2013
Laboratory:	Groundwater Analytical	**Sample Date(s):**	6/15/2011
Data Package Description:	Groundwater		
Lab Job / Batch Number:	142740		

CAM, Non-CAM and Pre-CAM

Were all analytical methods CAM methods? **Yes** X **No** For **NO**, identify samples/analyses that are non-CAM

Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses	
Sample	**Analysis**	**Sample**	**Analysis**	**Sample**	**Analysis**

CAM Analyses

Do CAM analyses meet the requirements for Presumptive Certainty? **Yes** **No** For **NO**, provide further details below.

Do all samples meet QC perform. standards and recomm.? **Yes** **No** For **NO**, provide further details below.

Presumptive Certainty Exception		
Sample	**Analysis**	**Description of Presumptive Certainty Exception**
		**Lab Report provided as "Preliminary Data". Full Lab QA/QC not complete. Presumptive Certainty evaluation and Case Narrative not provided

Prepared by: Mbradley **Date:** 7/22/2013

Reviewed by: **Date:**

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/21/2011
Laboratory:	Alpha	**Sample Date(s):**	9/1/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	L1114144		

	CAM Methodology									
Analytical Method	**VOCs (8260B)**	**SVOCs (8270C)**	**Metals (6010B)**	**Mercury (7470A / 7471A)**	**Metals (7000)**	**Metals (6020A)**	**VPH (MADEP-VPH)**	**EPH (MADEP)**	**PCBs (8082)**	**Chlorinated Pesticides (8081A)**
CAM Revision	**4**	**5**	**5**	**5**	**4**	**2**	**3**	**3**	**4**	**4**
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**
Revision Date	**5/28/2004**	**12/20/2007**	**5/28/2004**	**8/13/2004**	**8/13/2004**	**8/13/2004**	**9/10/2004**	**9/10/2004**	**8/20/2004**	**8/20/2004**
Notes										
Soils									14	
No. Samples	6	7			7					
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

	CAM Methodology					Non-CAM Methodology				
Analytical Method	**Chlorinated Herbicides (8151A)**	**Aromatic / Chlorinated VOCs (8021B)**	**Total Cn & PAC (9014)**	**Hexavalent Chromium (7196A)**	**Nitroaromatics and Nitroamines (8330)**					
CAM Revision	**2**	**2**	**2**	**3**	**2**					
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**					
Revision Date	**5/28/2004**	**5/28/2004**	**8/13/204**	**8/20/2004**	**8/27/2004**					
Notes										
Soils										
No. Samples										
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/21/2011
Laboratory:	Alpha	**Sample Date(s):**	9/1/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	L1114144		

	CAM Methodology		Non-CAM Methodology							
Analytical Method	**VOCs (TO-15)**	**APH (MADEP-APH)**								
CAM Revision	**1**	**1**								
CAM Status	**Draft**	**Draft**								
Revision Date	**11/5/2009**	**11/9/2009**								
Notes										
Indoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor air sample										
Soil Vapor										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										

Notes:

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/21/2011
Laboratory:	Alpha	**Sample Date(s):**	9/1/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	L1114144		

Description of Samples Collected Inconsistent with GEC's Work Plan and / or Standard Operating Procedures

No Site Sketch in notes

Sample methodology, sample locations / depths, equipment failure, trip blanks, duplicates, sample preservation, screening protocols, etc.

Description of Field Screening and Field Screening Data

See Boring Logs

Soils Screened with a MiniRae 2000 equipped with an 11.7eV Lamp
No VOCs detected

Field screening methodology, equipment, data (attach data or provide reference to data), how screening data was used in decision making in the field.

Preparation of Chain of Custody

No issues reported

Samples transferred from Groundwater Analytical on Friday September 9, 2011
VOCs- The water preserved voas were received outside of the 48hr hold time, which was needed for VOCs Low-Level Analysis

Sample ID, type, date and time collected, collectors name, preservation, filtration, and relinquished signatures, correct analyt method, requested detection limits.
Note any analyses that were performed outside of submitted COC, provide explanation for why.

Prepared by: Mbradley **Date:** 7/25/2013

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/21/2011
Laboratory:	Alpha	**Sample Date(s):**	9/1/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	L1114144		

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet C: Sample Conditions, Holding Times, Sample Duplicates and Field Blanks

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/21/2011
Laboratory:	Alpha	**Sample Date(s):**	9/1/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	L1114144		

Sample Conditions

Were there any issues with samples received by laboratory?	**Yes**		**No**	X	For any **Yes** answers, provide
Were there any issues with sample preservation?	**Yes**		**No**	X	further details below.
Were there any issues with type of sample container?	**Yes**		**No**	X	

Sample Condition Issues

Sample	Analysis	Description of Sample Condition Issue

Holding Times

Were any extraction / sample preparation holding times exceeded?	**Yes**	X	**No**		For any **Yes** answers, provide
Were any analytical holding times exceeded?	**Yes**		**No**	X	further details below.
Any evidence of gross failure for any sample (> 2 times holding time)?	**Yes**		**No**	X	

NA = Not Applicable // NI = No Information

Holding Time Issues

Sample	Analysis	Description of Holding Time Issue
All	8260C	The water preserved voas were received outside of the 48hr hold time, which was needed for VOCs Low-Level Analysis
B-9 0-3'	8260C	Undiluted analysis conducted outside of holding time. Diluted analysis was conducted with in the holding time

Field Blanks / Field Duplicates / Matrix Spike

Were any drinking water samples analyzed?	**Yes**		**No**	X
If YES, were field duplicates, trip blanks, and / or matrix spikes collected and analyzed as required?	**Yes**		**No**	X

Prepared by: Mbradley **Date:** 7/25/2013

Reviewed by: **Date:**

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/21/2011
Laboratory:	Alpha	**Sample Date(s):**	9/1/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	L1114144		

Analytical Parameters

Were results for all analyte-list compounds/elements for specified method(s) reported? **Yes** [X] **No** [ ]

For **NO**, identify samples/analyses and provide reason why.

Analyte Issues

Sample	Analysis	Description of Analyte Issue

Sample Quality Control

Were any surrogate recoveries outside QC Limits for a sample? **Yes** [ ] **No** [X]

Was recovery data unavailable for any sample? **Yes** [ ] **No** [X]

For any **Yes** answers, provide further details below.

Sample Quality Control Issues

Sample	Analysis	Description of Sample Quality Control Issue

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/21/2011
Laboratory:	Alpha	**Sample Date(s):**	9/1/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	L1114144		

Laboratory Control Samples (LCS) and Method Blanks

	Yes	No	
Were any LCS or LCSD Limits exceeded for a LCS?	X		For any **Yes** answers, provide
Were any surrogate recoveries outside QC Limits for a LCS?		X	further details below.
Were any analytes detected in a Method Blank?		X	
Were any surrogate recoveries outside QC Limits for a Method Blank?		X	

LCS and Method Blank Issues

Samples Affected	Analysis	Description of LCS or Method Blank Issues
LCS/LCSD	8260C	Above the acceptance criteria for Methylene chloride (25%), 1,1-Dichloroethane (27%), Chloroform (28%), Carbontetrachloride (27%), 1,1,1-Trichloroethane (29%), Bbromomethane (21%), trans-1,2-Dichloroethene (24%),Methyl tert butyl ether (22%), cis-1,2-

Other Issues for Laboratory Report / Data Set

	Yes	No	
Are there any other issues for this laboratory report or data set?		X	For any **Yes** answers, provide further details below.

Other Issues (e.g., Analytes or concentrations detected that are inconsistent with Site History or Conceptual Site Model; Analytical method modifications, etc.)

Sample	Analysis	Description of Other Issues

Prepared by: Mbradley **Date:** 7/25/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet E: CAM, Pre-CAM, Non-CAM

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/21/2011
Laboratory:	Alpha	**Sample Date(s):**	9/1/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	L1114144		

CAM, Non-CAM and Pre-CAM

Were all analytical methods CAM methods? **Yes** [X] **No** [ ] For **NO**, identify samples/analyses that are non-CAM

Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses	
Sample	**Analysis**	**Sample**	**Analysis**	**Sample**	**Analysis**

CAM Analyses

Do CAM analyses meet the requirements for Presumptive Certainty? **Yes** [ ] **No** [X] For **NO**, provide further details below.

Do all samples meet QC perform. standards and recomm.? **Yes** [X] **No** [ ] For **NO**, provide further details below.

Presumptive Certainty Exception		
Sample	**Analysis**	**Description of Presumptive Certainty Exception**
All	8260C	The water preserved voas were received outside of the 48hr hold time, which was needed for VOCs Low-Level Analysis
B-9 1-3', B-10 0-3'	8082	Elevated Laboratory Detection Limits due to elevated concentrations of target compunds
B-10 3-6', B-11 0-3'	8082	Elevated Laboratory Detection Limits due to elevated concentrations of target compunds
B-13 0-3'	6010	Sample was diluted 2-fold prior to analysis due to matrix interference.
		All analytes were within calibration range. Sample surrogate recoveries were measurable and all were within QC limits.

Prepared by: MBRadley **Date:** 7/25/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/21/2011
Laboratory:	Alpha	**Sample Date(s):**	9/1/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	L1114144		

	CAM Methodology									
Analytical Method	**VOCs (8260B)**	**SVOCs (8270C)**	**Metals (6010B)**	**Mercury (7470A / 7471A)**	**Metals (7000)**	**Metals (6020A)**	**VPH (MADEP-VPH)**	**EPH (MADEP)**	**PCBs (8082)**	**Chlorinated Pesticides (8081A)**
CAM Revision	**4**	**5**	**5**	**5**	**4**	**2**	**3**	**3**	**4**	**4**
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**
Revision Date	**5/28/2004**	**12/20/2007**	**5/28/2004**	**8/13/2004**	**8/13/2004**	**8/13/2004**	**9/10/2004**	**9/10/2004**	**8/20/2004**	**8/20/2004**
Notes										
Soils										
No. Samples										
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

	CAM Methodology					Non-CAM Methodology				
Analytical Method	**Chlorinated Herbicides (8151A)**	**Aromatic / Chlorinated VOCs (8021B)**	**Total Cn & PAC (9014)**	**Hexavalent Chromium (7196A)**	**Nitroaromatics and Nitroamines (8330)**					
CAM Revision	**2**	**2**	**2**	**3**	**2**					
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**					
Revision Date	**5/28/2004**	**5/28/2004**	**8/13/204**	**8/20/2004**	**8/27/2004**					
Notes										
Soils										
No. Samples										
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/21/2011
Laboratory:	Alpha	**Sample Date(s):**	9/1/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	L1114144		

	CAM Methodology		Non-CAM Methodology							
Analytical Method	**VOCs (TO-15)**	**APH (MADEP-APH)**								
CAM Revision	**1**	**1**								
CAM Status	**Draft**	**Draft**								
Revision Date	**11/5/2009**	**11/9/2009**								
Notes										
Indoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor air sample										
Soil Vapor										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										

Notes:

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/21/2011
Laboratory:	Alpha	**Sample Date(s):**	9/1/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	L1114144		

Description of Samples Collected Inconsistent with GEC's Work Plan and / or Standard Operating Procedures

GEC-6 -MW went dry soon after start of purge. No samples collected

Sample methodology, sample locations / depths, equipment failure, trip blanks, duplicates, sample preservation, screening protocols, etc.

Description of Field Screening and Field Screening Data

When possible (see above) physical parameters were monitored prior to sample collection.

Field screening methodology, equipment, data (attach data or provide reference to data), how screening data was used in decision making in the field.

Preparation of Chain of Custody

None Reported

Samples transferred from Groundwater Ananlytical on 9-9-2011

Sample ID, type, date and time collected, collectors name, preservation, filtration, and relinquished signatures, correct analyt method, requested detection limits. Note any analyses that were performed outside of submitted COC, provide explanation for why.

Prepared by: Mbradley **Date:** 7/25/2013

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/21/2011
Laboratory:	Alpha	**Sample Date(s):**	9/1/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	L1114144		

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet C: Sample Conditions, Holding Times, Sample Duplicates and Field Blanks

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/21/2011
Laboratory:	Alpha	**Sample Date(s):**	9/1/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	L1114144		

Sample Conditions

Were there any issues with samples received by laboratory?	**Yes**		**No**	X
Were there any issues with sample preservation?	**Yes**		**No**	X
Were there any issues with type of sample container?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

Sample Condition Issues

Sample	Analysis	Description of Sample Condition Issue

Holding Times

Were any extraction / sample preparation holding times exceeded?	**Yes**		**No**	X
Were any analytical holding times exceeded?	**Yes**		**No**	X
Any evidence of gross failure for any sample (> 2 times holding time)?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

NA = Not Applicable // NI = No Information

Holding Time Issues

Sample	Analysis	Description of Holding Time Issue

Field Blanks / Field Duplicates / Matrix Spike

Were any drinking water samples analyzed?	**Yes**		**No**	X
If YES, were field duplicates, trip blanks, and / or matrix spikes collected and analyzed as required?	**Yes**		**No**	X

Prepared by: MBRadley **Date:** 7/25/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/21/2011
Laboratory:	Alpha	**Sample Date(s):**	9/1/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	L1114144		

Analytical Parameters

Were results for all analyte-list compounds/elements for specified method(s) reported? **Yes** [ ] **No** [X]

For **NO**, identify samples/analyses and provide reason why.

Analyte Issues

Sample	Analysis	Description of Analyte Issue
ALL	8270	Samples analyzed for a subset of MCP compunds per COC

Sample Quality Control

Were any surrogate recoveries outside QC Limits for a sample? **Yes** [ ] **No** [ ]

Was recovery data unavailable for any sample? **Yes** [ ] **No** [ ]

For any **Yes** answers, provide further details below.

Sample Quality Control Issues

Sample	Analysis	Description of Sample Quality Control Issue

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/21/2011
Laboratory:	Alpha	**Sample Date(s):**	9/1/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	L1114144		

Laboratory Control Samples (LCS) and Method Blanks

	Yes	No	
Were any LCS or LCSD Limits exceeded for a LCS?	X		For any **Yes** answers, provide
Were any surrogate recoveries outside QC Limits for a LCS?		X	further details below.
Were any analytes detected in a Method Blank?		X	
Were any surrogate recoveries outside QC Limits for a Method Blank?		X	

LCS and Method Blank Issues

Samples Affected	Analysis	Description of LCS or Method Blank Issues
WG489818-1/-2 LCS/LCSD RPD	8260	The WG489818-1/-2 LCS/LCSD RPD, associated with L1114121-01, is above the acceptance criteria for 1,2-Dibromo-3-chloropropane (26%).
L1114121-01	8260	The initial calibration did not meet the method required minimum response factor on the lowest calibration standard for 1,4-Dioxane (0.00501), as well as the average response factor for 1,4-Dioxane. In addition, a quadratic fit was utilized for Acetone, 1,2-Dibromoethane, 1,2-Dibromo-3-chloropropane and Hexachlorobutadiene.

Other Issues for Laboratory Report / Data Set

	Yes	No	
Are there any other issues for this laboratory report or data set?		X	For any **Yes** answers, provide further details below.

Other Issues (e.g., Analytes or concentrations detected that are inconsistent with Site History or Conceptual Site Model; Analytical method modifications, etc.)

Sample	Analysis	Description of Other Issues

Prepared by: Mbradley **Date:** 7/25/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet E: CAM, Pre-CAM, Non-CAM

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/21/2011
Laboratory:	Alpha	**Sample Date(s):**	9/1/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	L1114144		

CAM, Non-CAM and Pre-CAM

Were all analytical methods CAM methods? **Yes** [ ] **No** [ ] For **NO**, identify samples/analyses that are non-CAM

Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses	
Sample	**Analysis**	**Sample**	**Analysis**	**Sample**	**Analysis**

CAM Analyses

Do CAM analyses meet the requirements for Presumptive Certainty? **Yes** [ ] **No** [X] For **NO**, provide further details below.

Do all samples meet QC perform. standards and recomm.? **Yes** [ ] **No** [X] For **NO**, provide further details below.

Presumptive Certainty Exception		
Sample	**Analysis**	**Description of Presumptive Certainty Exception**
all	8260	One or more of the target analytes did not achieve the requested CAM reporting limits.
WG489818-1/-2 LCS/LCSD RPD	8260	The WG489818-1/-2 LCS/LCSD RPD, associated with L1114121-01, is above the acceptance criteria for 1,2-Dibromo-3-chloropropane (26%).
L1114121-01	8260	The initial calibration did not meet the method required minimum response factor on the lowest calibration standard for 1,4-Dioxane (0.00501), as well as the average response factor for 1,4-Dioxane. In addition, a quadratic fit was utilized for Acetone, 1,2-Dibromoethane, 1,2-Dibromo-3-chloropropane and Hexachlorobutadiene.
ALL	8270	Samples analyzed for a subset of MCP compunds per COC

Prepared by: Mbradley **Date:** 7/25/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/23/2011
Laboratory:	Alpha	**Sample Date(s):**	9/12/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	11I0524		

	CAM Methodology									
Analytical Method	**VOCs (8260B)**	**SVOCs (8270C)**	**Metals (6010B)**	**Mercury (7470A / 7471A)**	**Metals (7000)**	**Metals (6020A)**	**VPH (MADEP-VPH)**	**EPH (MADEP)**	**PCBs (8082)**	**Chlorinated Pesticides (8081A)**
CAM Revision	**4**	**5**	**5**	**5**	**4**	**2**	**3**	**3**	**4**	**4**
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**
Revision Date	**5/28/2004**	**12/20/2007**	**5/28/2004**	**8/13/2004**	**8/13/2004**	**8/13/2004**	**9/10/2004**	**9/10/2004**	**8/20/2004**	**8/20/2004**
Notes										
Soils										
No. Samples			3							
No. Duplicates										
Trip Blanks										
Water										
No. Samples	3	1	1				2		4	
No. Duplicates										
Trip Blanks										

	CAM Methodology					Non-CAM Methodology				
Analytical Method	**Chlorinated Herbicides (8151A)**	**Aromatic / Chlorinated VOCs (8021B)**	**Total Cn & PAC (9014)**	**Hexavalent Chromium (7196A)**	**Nitroaromatics and Nitroamines (8330)**	**Hardness (2340B)**				
CAM Revision	**2**	**2**	**2**	**3**	**2**					
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**					
Revision Date	**5/28/2004**	**5/28/2004**	**8/13/204**	**8/20/2004**	**8/27/2004**					
Notes										
Soils										
No. Samples										
No. Duplicates										
Trip Blanks										
Water										
No. Samples						1				
No. Duplicates										
Trip Blanks										

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/23/2011
Laboratory:	Alpha	**Sample Date(s):**	9/12/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	11I0524		

	CAM Methodology		Non-CAM Methodology							
Analytical Method	**VOCs (TO-15)**	**APH (MADEP-APH)**								
CAM Revision	**1**	**1**								
CAM Status	**Draft**	**Draft**								
Revision Date	**11/5/2009**	**11/9/2009**								
Notes										
Indoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor air sample										
Soil Vapor										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										

Notes:

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/23/2011
Laboratory:	Alpha	**Sample Date(s):**	9/12/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	11I0524		

Description of Samples Collected Inconsistent with GEC's Work Plan and / or Standard Operating Procedures

None Observed

Sample methodology, sample locations / depths, equipment failure, trip blanks, duplicates, sample preservation, screening protocols, etc.

Description of Field Screening and Field Screening Data

Prior to collecting GW Samples physical parameters were monitored until stabilized during purge.

Soils Headspace Screened with Minirae 2000 equipped with 11.7 eV Lamp

Field screening methodology, equipment, data (attach data or provide reference to data), how screening data was used in decision making in the field.

Preparation of Chain of Custody

None noted by lab

Sample ID, type, date and time collected, collectors name, preservation, filtration, and relinquished signatures, correct analyt method, requested detection limits.
Note any analyses that were performed outside of submitted COC, provide explanation for why.

Prepared by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/23/2011
Laboratory:	Alpha	**Sample Date(s):**	9/12/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	11I0524		

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet C: Sample Conditions, Holding Times, Sample Duplicates and Field Blanks

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/23/2011
Laboratory:	Alpha	**Sample Date(s):**	9/12/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	11I0524		

Sample Conditions

Were there any issues with samples received by laboratory?	**Yes**		**No**	X	For any **Yes** answers, provide
Were there any issues with sample preservation?	**Yes**		**No**	X	further details below.
Were there any issues with type of sample container?	**Yes**		**No**	X	

Sample Condition Issues		
Sample	**Analysis**	**Description of Sample Condition Issue**

Holding Times

Were any extraction / sample preparation holding times exceeded?	**Yes**		**No**	X	For any **Yes** answers, provide
Were any analytical holding times exceeded?	**Yes**		**No**	X	further details below.
Any evidence of gross failure for any sample (> 2 times holding time)?	**Yes**		**No**	X	

NA = Not Applicable // NI = No Information

Holding Time Issues		
Sample	**Analysis**	**Description of Holding Time Issue**

Field Blanks / Field Duplicates / Matrix Spike

Were any drinking water samples analyzed?	**Yes**		**No**	X
If YES, were field duplicates, trip blanks, and / or matrix spikes collected and analyzed as required?	**Yes**		**No**	

Prepared by: Mbradley **Date:** 7/25/2013

Reviewed by: **Date:**

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/23/2011
Laboratory:	Alpha	**Sample Date(s):**	9/12/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	11I0524		

Analytical Parameters

Were results for all analyte-list compounds/elements for specified method(s) reported? **Yes** [ ] **No** [X]

For **NO**, identify samples/analyses and provide reason why.

Analyte Issues

Sample	Analysis	Description of Analyte Issue
All	6010	For method 6010, only lead was requested and reported.
All	8270	For method 8270, only PAH compounds were requested and reported
All	VPH	For method MA VPH, only carbon ranges were requested and reported

Sample Quality Control

Were any surrogate recoveries outside QC Limits for a sample? **Yes** [ ] **No** [X]

Was recovery data unavailable for any sample? **Yes** [ ] **No** [X]

For any **Yes** answers, provide further details below.

Sample Quality Control Issues

Sample	Analysis	Description of Sample Quality Control Issue
GEC-2, GEC-6,	8260	Response factor is less than method specified minimum acceptable value. Reduced precision and accuracy are associated with reported result
GEC-7		for 2-Butanone (MEK), Bromomethane, Chloromethane

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/23/2011
Laboratory:	Alpha	**Sample Date(s):**	9/12/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	11I0524		

Laboratory Control Samples (LCS) and Method Blanks

Were any LCS or LCSD Limits exceeded for a LCS?	**Yes**	X	**No**		For any **Yes** answers, provide
Were any surrogate recoveries outside QC Limits for a LCS?	**Yes**		**No**	X	further details below.
Were any analytes detected in a Method Blank?	**Yes**		**No**	X	
Were any surrogate recoveries outside QC Limits for a Method Blank?	**Yes**		**No**	X	

LCS and Method Blank Issues

Samples Affected	Analysis	Description of LCS or Method Blank Issues
GEC-6 (GW)	2340B Hardenss	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.
LCSD	8260	LCSD analytes 2-Butanone (MEK) (22.7%), Bromomethane (20.4%)and Chloromethane(35.0%) RPDs were outside Qcrange of 40-160%).
		Remaining 68 analytes were within recommended QC limits.

Other Issues for Laboratory Report / Data Set

Are there any other issues for this laboratory report or data set?	**Yes**		**No**	X	For any **Yes** answers, provide further details below.

Other Issues (e.g., Analytes or concentrations detected that are inconsistent with Site History or Conceptual Site Model; Analytical method modifications, etc.)

Sample	Analysis	Description of Other Issues

Prepared by: Mbradley **Date:** 7/25/2013

Reviewed by: **Date:**

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet E: CAM, Pre-CAM, Non-CAM

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/23/2011
Laboratory:	Alpha	**Sample Date(s):**	9/12/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	11I0524		

CAM, Non-CAM and Pre-CAM

Were all analytical methods CAM methods? **Yes** [ ] **No** [X] For **NO**, identify samples/analyses that are non-CAM

Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses	
Sample	**Analysis**	**Sample**	**Analysis**	**Sample**	**Analysis**
GEC-6	2340B (Hardness)				

CAM Analyses

Do CAM analyses meet the requirements for Presumptive Certainty? **Yes** [ ] **No** [X] For **NO**, provide further details below.

Do all samples meet QC perform. standards and recomm.? **Yes** [ ] **No** [ ] For **NO**, provide further details below.

Presumptive Certainty Exception		
Sample	**Analysis**	**Description of Presumptive Certainty Exception**
GEC-2, GEC-6, GEC-7	8260	Response factor is less than method specified minimum acceptable value. Reduced precision and accuracy are associated with reported result for 2-Butanone (MEK), Bromomethane, Chloromethane
GEC-2, GEC-6, GEC-7	8260	Elevated reporting limit based on lowest point in calibration. MA CAM reporting limit not met for Carbon Disulfide, Methylene Chloride

Prepared by: Mbradley **Date:** 7/25/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/22/2011
Laboratory:	Contest	**Sample Date(s):**	9/14/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	11I514		

	CAM Methodology									
Analytical Method	**VOCs (8260B)**	**SVOCs (8270C)**	**Metals (6010B)**	**Mercury (7470A / 7471A)**	**Metals (7000)**	**Metals (6020A)**	**VPH (MADEP-VPH)**	**EPH (MADEP)**	**PCBs (8082)**	**Chlorinated Pesticides (8081A)**
CAM Revision	**4**	**5**	**5**	**5**	**4**	**2**	**3**	**3**	**4**	**4**
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**
Revision Date	**5/28/2004**	**12/20/2007**	**5/28/2004**	**8/13/2004**	**8/13/2004**	**8/13/2004**	**9/10/2004**	**9/10/2004**	**8/20/2004**	**8/20/2004**
Notes										
Soils										
No. Samples			1							
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

	CAM Methodology					Non-CAM Methodology				
Analytical Method	**Chlorinated Herbicides (8151A)**	**Aromatic / Chlorinated VOCs (8021B)**	**Total Cn & PAC (9014)**	**Hexavalent Chromium (7196A)**	**Nitroaromatics and Nitroamines (8330)**					
CAM Revision	**2**	**2**	**2**	**3**	**2**					
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**					
Revision Date	**5/28/2004**	**5/28/2004**	**8/13/204**	**8/20/2004**	**8/27/2004**					
Notes										
Soils										
No. Samples										
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/22/2011
Laboratory:	Contest	**Sample Date(s):**	9/14/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	11I514		

	CAM Methodology		Non-CAM Methodology							
Analytical Method	**VOCs (TO-15)**	**APH (MADEP-APH)**								
CAM Revision	**1**	**1**								
CAM Status	**Draft**	**Draft**								
Revision Date	**11/5/2009**	**11/9/2009**								
Notes										
Indoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor air sample										
Soil Vapor										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										

Notes:

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/22/2011
Laboratory:	Contest	**Sample Date(s):**	9/14/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	11I514		

Description of Samples Collected Inconsistent with GEC's Work Plan and / or Standard Operating Procedures

None Noted

B-6 installed on 6-6-2011, but COC says sample collected 9-14-2011

No field notes for 9-14-2011 in regards to sampling of B-6 4-6'. Sample not recorded on Boring log for B-6

Sample methodology, sample locations / depths, equipment failure, trip blanks, duplicates, sample preservation, screening protocols, etc.

Description of Field Screening and Field Screening Data

No Field Screening data recorded in notes

Field screening methodology, equipment, data (attach data or provide reference to data), how screening data was used in decision making in the field.

Preparation of Chain of Custody

No issues reported

Sample ID, type, date and time collected, collectors name, preservation, filtration, and relinquished signatures, correct analyt method, requested detection limits. Note any analyses that were performed outside of submitted COC, provide explanation for why.

Prepared by: Mbradley **Date:** 7/29/2013

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/22/2011
Laboratory:	Contest	**Sample Date(s):**	9/14/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	11I514		

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet C: Sample Conditions, Holding Times, Sample Duplicates and Field Blanks

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/22/2011
Laboratory:	Contest	**Sample Date(s):**	9/14/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	11I514		

Sample Conditions

Were there any issues with samples received by laboratory?	**Yes**		**No**	X
Were there any issues with sample preservation?	**Yes**		**No**	X
Were there any issues with type of sample container?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

Sample Condition Issues

Sample	Analysis	Description of Sample Condition Issue

Holding Times

Were any extraction / sample preparation holding times exceeded?	**Yes**		**No**	X
Were any analytical holding times exceeded?	**Yes**		**No**	X
Any evidence of gross failure for any sample (> 2 times holding time)?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

NA = Not Applicable // NI = No Information

Holding Time Issues

Sample	Analysis	Description of Holding Time Issue

Field Blanks / Field Duplicates / Matrix Spike

Were any drinking water samples analyzed?	**Yes**		**No**	X
If YES, were field duplicates, trip blanks, and / or matrix spikes collected and analyzed as required?	**Yes**		**No**	

Prepared by: Mbradley **Date:** 7/29/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/22/2011
Laboratory:	Contest	**Sample Date(s):**	9/14/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	11I514		

Analytical Parameters

Were results for all analyte-list compounds/elements for specified method(s) reported? **Yes** [ ] **No** [X]

For **NO**, identify samples/analyses and provide reason why.

Analyte Issues

Sample	Analysis	Description of Analyte Issue
B-6 4-6'	6010	Analyzed for Lead only

Sample Quality Control

Were any surrogate recoveries outside QC Limits for a sample? **Yes** [ ] **No** [X]

Was recovery data unavailable for any sample? **Yes** [ ] **No** [X]

For any **Yes** answers, provide further details below.

Sample Quality Control Issues

Sample	Analysis	Description of Sample Quality Control Issue

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/22/2011
Laboratory:	Contest	**Sample Date(s):**	9/14/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	11I514		

Laboratory Control Samples (LCS) and Method Blanks

Were any LCS or LCSD Limits exceeded for a LCS?	**Yes**		**No**	X
Were any surrogate recoveries outside QC Limits for a LCS?	**Yes**		**No**	X
Were any analytes detected in a Method Blank?	**Yes**		**No**	X
Were any surrogate recoveries outside QC Limits for a Method Blank?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

LCS and Method Blank Issues

Samples Affected	Analysis	Description of LCS or Method Blank Issues

Other Issues for Laboratory Report / Data Set

Are there any other issues for this laboratory report or data set?	**Yes**	X	**No**	

For any **Yes** answers, provide further details below.

Other Issues (e.g., Analytes or concentrations detected that are inconsistent with Site History or Conceptual Site Model; Analytical method modifications, etc.)

Sample	Analysis	Description of Other Issues
B-6 4-6'	6010	B-6 installed on 6-6-2011, but lab report indicates sample collected on 6-6-2011

Prepared by: Mbradley **Date:** 7/29/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet E: CAM, Pre-CAM, Non-CAM

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/22/2011
Laboratory:	Contest	**Sample Date(s):**	9/14/2011
Data Package Description:	Soil		
Lab Job / Batch Number:	11I514		

CAM, Non-CAM and Pre-CAM

Were all analytical methods CAM methods? **Yes** X **No** For **NO**, identify samples/analyses that are non-CAM

Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses	
Sample	**Analysis**	**Sample**	**Analysis**	**Sample**	**Analysis**

CAM Analyses

Do CAM analyses meet the requirements for Presumptive Certainty? **Yes** X **No** For **NO**, provide further details below.

Do all samples meet QC perform. standards and recomm.? **Yes** X **No** For **NO**, provide further details below.

Presumptive Certainty Exception		
Sample	**Analysis**	**Description of Presumptive Certainty Exception**

Prepared by: Mbradley **Date:** 7/29/2013

Reviewed by: **Date:**

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/27/2011
Laboratory:	Contest	**Sample Date(s):**	9-12-2011 to 9-15-2011
Data Package Description:	Soil Vapor		
Lab Job / Batch Number:	11I0599		

	CAM Methodology									
Analytical Method	**VOCs (8260B)**	**SVOCs (8270C)**	**Metals (6010B)**	**Mercury (7470A / 7471A)**	**Metals (7000)**	**Metals (6020A)**	**VPH (MADEP-VPH)**	**EPH (MADEP)**	**PCBs (8082)**	**Chlorinated Pesticides (8081A)**
CAM Revision	**4**	**5**	**5**	**5**	**4**	**2**	**3**	**3**	**4**	**4**
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**
Revision Date	**5/28/2004**	**12/20/2007**	**5/28/2004**	**8/13/2004**	**8/13/2004**	**8/13/2004**	**9/10/2004**	**9/10/2004**	**8/20/2004**	**8/20/2004**
Notes										
Soils										
No. Samples										
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

	CAM Methodology					Non-CAM Methodology				
Analytical Method	**Chlorinated Herbicides (8151A)**	**Aromatic / Chlorinated VOCs (8021B)**	**Total Cn & PAC (9014)**	**Hexavalent Chromium (7196A)**	**Nitroaromatics and Nitroamines (8330)**					
CAM Revision	**2**	**2**	**2**	**3**	**2**					
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**					
Revision Date	**5/28/2004**	**5/28/2004**	**8/13/204**	**8/20/2004**	**8/27/2004**					
Notes										
Soils										
No. Samples										
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/27/2011
Laboratory:	Contest	**Sample Date(s):**	9-12-2011 to 9-15-2011
Data Package Description:	Soil Vapor		
Lab Job / Batch Number:	11I0599		

	CAM Methodology		Non-CAM Methodology							
Analytical Method	**VOCs (TO-15)**	**APH (MADEP-APH)**	**PCBs TO-10a**							
CAM Revision	**1**	**1**								
CAM Status	**Draft**	**Draft**								
Revision Date	**11/5/2009**	**11/9/2009**								
Notes										
Indoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor air sample										
Soil Vapor										
No. Samples			2							
Duplicates										
Trip Blanks			1							
Field Blank										
Outdoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										

Notes:

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/27/2011
Laboratory:	Contest	**Sample Date(s):**	9-12-2011 to 9-15-2011
Data Package Description:	Soil Vapor		
Lab Job / Batch Number:	11I0599		

Description of Samples Collected Inconsistent with GEC's Work Plan and / or Standard Operating Procedures

NO SOP available for PCB Soil Vapor Samples.

Methodology recorded in detail in Field Notes

Sample methodology, sample locations / depths, equipment failure, trip blanks, duplicates, sample preservation, screening protocols, etc.

Description of Field Screening and Field Screening Data

ambient temp, pressure and flow rate recorded several times at the start of samples, during sampling and at the end of sampling.

monitoring equipment not recorded

Field screening methodology, equipment, data (attach data or provide reference to data), how screening data was used in decision making in the field.

Preparation of Chain of Custody

No issues reported

Sample ID, type, date and time collected, collectors name, preservation, filtration, and relinquished signatures, correct analyt method, requested detection limits. Note any analyses that were performed outside of submitted COC, provide explanation for why.

Prepared by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/27/2011
Laboratory:	Contest	**Sample Date(s):**	9-12-2011 to 9-15-2011
Data Package Description:	Soil Vapor		
Lab Job / Batch Number:	11I0599		

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet C: Sample Conditions, Holding Times, Sample Duplicates and Field Blanks

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/27/2011
Laboratory:	Contest	**Sample Date(s):**	9-12-2011 to 9-15-2011
Data Package Description:	Soil Vapor		
Lab Job / Batch Number:	11I0599		

Sample Conditions

Were there any issues with samples received by laboratory?	**Yes**		**No**	X	For any **Yes** answers, provide
Were there any issues with sample preservation?	**Yes**		**No**	X	further details below.
Were there any issues with type of sample container?	**Yes**		**No**	X	

Sample Condition Issues

Sample	Analysis	Description of Sample Condition Issue

Holding Times

Were any extraction / sample preparation holding times exceeded?	**Yes**		**No**	X	For any **Yes** answers, provide
Were any analytical holding times exceeded?	**Yes**		**No**	X	further details below.
Any evidence of gross failure for any sample (> 2 times holding time)?	**Yes**		**No**	X	

NA = Not Applicable // NI = No Information

Holding Time Issues

Sample	Analysis	Description of Holding Time Issue

Field Blanks / Field Duplicates / Matrix Spike

Were any drinking water samples analyzed?	**Yes**		**No**	X
If YES, were field duplicates, trip blanks, and / or matrix spikes collected and analyzed as required?	**Yes**		**No**	

Prepared by: Mbradley **Date:** 7/29/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/27/2011
Laboratory:	Contest	**Sample Date(s):**	9-12-2011 to 9-15-2011
Data Package Description:	Soil Vapor		
Lab Job / Batch Number:	11I0599		

Analytical Parameters

Were results for all analyte-list compounds/elements for specified method(s) reported? **Yes** [ ] **No** [ ]

For **NO**, identify samples/analyses and provide reason why.

Analyte Issues

Sample	Analysis	Description of Analyte Issue
ALL	TO-10	Only the quartz filter was extracted and analyzed

Sample Quality Control

Were any surrogate recoveries outside QC Limits for a sample? **Yes** [X] **No** [ ]

Was recovery data unavailable for any sample? **Yes** [ ] **No** [X]

For any **Yes** answers, provide further details below.

Sample Quality Control Issues

Sample	Analysis	Description of Sample Quality Control Issue
B037528-BLK1	TO-10	Surrogate compounds Decachlorobiphenyl and Tetrachloro-m-xylene were recovered at levels (40.3 and 27.8%, respectively) below QC r
		(60-120%), due to sample matrix interference.

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/27/2011
Laboratory:	Contest	**Sample Date(s):**	9-12-2011 to 9-15-2011
Data Package Description:	Soil Vapor		
Lab Job / Batch Number:	11I0599		

Laboratory Control Samples (LCS) and Method Blanks

Were any LCS or LCSD Limits exceeded for a LCS?	**Yes**	**No**
Were any surrogate recoveries outside QC Limits for a LCS?	**Yes**	**No**
Were any analytes detected in a Method Blank?	**Yes**	**No**
Were any surrogate recoveries outside QC Limits for a Method Blank?	**Yes**	**No**

For any **Yes** answers, provide further details below.

LCS and Method Blank Issues

Samples Affected	Analysis	Description of LCS or Method Blank Issues

Other Issues for Laboratory Report / Data Set

Are there any other issues for this laboratory report or data set? **Yes** **No**

For any **Yes** answers, provide further details below.

Other Issues (e.g., Analytes or concentrations detected that are inconsistent with Site History or Conceptual Site Model; Analytical method modifications, etc.)

Sample	Analysis	Description of Other Issues

Prepared by: _____ **Date:** _____

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet E: CAM, Pre-CAM, Non-CAM

Site Name:	Boot Mills	**Project No.:**	911-173A
Client:	Winn	**Laboratory Report Date:**	9/27/2011
Laboratory:	Contest	**Sample Date(s):**	9-12-2011 to 9-15-2011
Data Package Description:	Soil Vapor		
Lab Job / Batch Number:	11I0599		

CAM, Non-CAM and Pre-CAM

Were all analytical methods CAM methods? **Yes** [X] **No** [ ] For **NO**, identify samples/analyses that are non-CAM

Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses	
Sample	**Analysis**	**Sample**	**Analysis**	**Sample**	**Analysis**

CAM Analyses

Do CAM analyses meet the requirements for Presumptive Certainty? **Yes** [ ] **No** [X] For **NO**, provide further details below.

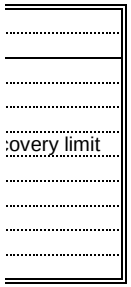
Do all samples meet QC perform. standards and recomm.? **Yes** [ ] **No** [X] For **NO**, provide further details below.

Presumptive Certainty Exception		
Sample	**Analysis**	**Description of Presumptive Certainty Exception**
All	TO-10	Only the quartz filter was extracted and analyzed
B037528-BLK1	TO-10	Surrogate compounds Decachlorobiphenyl and Tetrachloro-m-xylene were recovered at levels (40.3 and 27.8%, respectively) below QC rec
		(60-120%), due to sample matrix interference.

Prepared by: Mbradley **Date:** 7/29/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet E: CAM, Pre-CAM, Non-CAM



Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/12/2012
Laboratory:	Contest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0289		

	CAM Methodology									
Analytical Method	**VOCs (8260B)**	**SVOCs (8270C)**	**Metals (6010B)**	**Mercury (7470A / 7471A)**	**Metals (7000)**	**Metals (6020A)**	**VPH (MADEP-VPH)**	**EPH (MADEP)**	**PCBs (8082)**	**Chlorinated Pesticides (8081A)**
CAM Revision	**4**	**5**	**5**	**5**	**4**	**2**	**3**	**3**	**4**	**4**
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**
Revision Date	**5/28/2004**	**12/20/2007**	**5/28/2004**	**8/13/2004**	**8/13/2004**	**8/13/2004**	**9/10/2004**	**9/10/2004**	**8/20/2004**	**8/20/2004**
Notes										
Soils										
No. Samples	1		3						3	
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

	CAM Methodology					Non-CAM Methodology				
Analytical Method	**Chlorinated Herbicides (8151A)**	**Aromatic / Chlorinated VOCs (8021B)**	**Total Cn & PAC (9014)**	**Hexavalent Chromium (7196A)**	**Nitroaromatics and Nitroamines (8330)**	**%Solids 2540**				
CAM Revision	**2**	**2**	**2**	**3**	**2**					
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**					
Revision Date	**5/28/2004**	**5/28/2004**	**8/13/204**	**8/20/2004**	**8/27/2004**					
Notes										
Soils										
No. Samples						4				
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/12/2012
Laboratory:	Contest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0289		

	CAM Methodology		Non-CAM Methodology							
Analytical Method	**VOCs (TO-15)**	**APH (MADEP-APH)**								
CAM Revision	**1**	**1**								
CAM Status	**Draft**	**Draft**								
Revision Date	**11/5/2009**	**11/9/2009**								
Notes										
Indoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor air sample										
Soil Vapor										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										

Notes:

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/12/2012
Laboratory:	Contest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0289		

Description of Samples Collected Inconsistent with GEC's Work Plan and / or Standard Operating Procedures

None observed in Field Notes

Sample methodology, sample locations / depths, equipment failure, trip blanks, duplicates, sample preservation, screening protocols, etc.

Description of Field Screening and Field Screening Data

Soils headspaced screenned with PID equipped with unknown photoionization lamp

No detections noted

Field screening methodology, equipment, data (attach data or provide reference to data), how screening data was used in decision making in the field.

Preparation of Chain of Custody

None reported by lab
WC-1 submitted for "Disposal Package', but only 8260 requested to be run by GEC

Sample ID, type, date and time collected, collectors name, preservation, filtration, and relinquished signatures, correct analyt method, requested detection limits.
Note any analyses that were performed outside of submitted COC, provide explanation for why.

Prepared by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/12/2012
Laboratory:	Contest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0289		

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet C: Sample Conditions, Holding Times, Sample Duplicates and Field Blanks

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/12/2012
Laboratory:	Contest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0289		

Sample Conditions

Were there any issues with samples received by laboratory?	**Yes**		**No**	X
Were there any issues with sample preservation?	**Yes**		**No**	X
Were there any issues with type of sample container?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

Sample Condition Issues

Sample	Analysis	Description of Sample Condition Issue

Holding Times

Were any extraction / sample preparation holding times exceeded?	**Yes**		**No**	X
Were any analytical holding times exceeded?	**Yes**		**No**	X
Any evidence of gross failure for any sample (> 2 times holding time)?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

NA = Not Applicable // NI = No Information

Holding Time Issues

Sample	Analysis	Description of Holding Time Issue

Field Blanks / Field Duplicates / Matrix Spike

Were any drinking water samples analyzed?	**Yes**		**No**	X
If YES, were field duplicates, trip blanks, and / or matrix spikes collected and analyzed as required?	**Yes**		**No**	X

Prepared by: Mbradley **Date:** 7/29/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/12/2012
Laboratory:	Contest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0289		

Analytical Parameters

Were results for all analyte-list compounds/elements for specified method(s) reported? **Yes** [ ] **No** [X]

For **NO**, identify samples/analyses and provide reason why.

Analyte Issues

Sample	Analysis	Description of Analyte Issue
B-17 0-3, B-17 3-5	6010	Only Cr, Pb and Nickel reported per GEC request
B-17 5-7'	6010	Only Pb reported per GEC request

Sample Quality Control

Were any surrogate recoveries outside QC Limits for a sample? **Yes** [ ] **No** [X]

Was recovery data unavailable for any sample? **Yes** [ ] **No** [X]

For any **Yes** answers, provide further details below.

Sample Quality Control Issues

Sample	Analysis	Description of Sample Quality Control Issue

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/12/2012
Laboratory:	Contest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0289		

Laboratory Control Samples (LCS) and Method Blanks

	Yes	No	
Were any LCS or LCSD Limits exceeded for a LCS?	X		For any **Yes** answers, provide
Were any surrogate recoveries outside QC Limits for a LCS?		X	further details below.
Were any analytes detected in a Method Blank?		X	
Were any surrogate recoveries outside QC Limits for a Method Blank?		X	

LCS and Method Blank Issues

Samples Affected	Analysis	Description of LCS or Method Blank Issues
LCS	8260C	LCS Duplicate analytes Carbon Tetrachloride (136%)) were detected above recommended QC recovery limits (70 - 130)%).
		Remaining 52 analytes were within recommended QC limits.
LCSD	8260	LCSD analyte Carbon Tetrachloride (134%) was detected above recommended QC recovery limits (70 - 130)%).
		Remaining 52 analytes were within recommended QC limits.

Other Issues for Laboratory Report / Data Set

	Yes	No	
Are there any other issues for this laboratory report or data set?		X	For any **Yes** answers, provide further details below.

Other Issues (e.g., Analytes or concentrations detected that are inconsistent with Site History or Conceptual Site Model; Analytical method modifications, etc.)

Sample	Analysis	Description of Other Issues

Prepared by: Mbradley **Date:** 7/30/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet E: CAM, Pre-CAM, Non-CAM

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/12/2012
Laboratory:	Contest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0289		

CAM, Non-CAM and Pre-CAM

Were all analytical methods CAM methods? **Yes** [X] **No** [ ] For **NO**, identify samples/analyses that are non-CAM

Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses	
Sample	**Analysis**	**Sample**	**Analysis**	**Sample**	**Analysis**
WC-1	2540				

CAM Analyses

Do CAM analyses meet the requirements for Presumptive Certainty? **Yes** [ ] **No** [X] For **NO**, provide further details below.

Do all samples meet QC perform. standards and recomm.? **Yes** [ ] **No** [X] For **NO**, provide further details below.

Presumptive Certainty Exception		
Sample	**Analysis**	**Description of Presumptive Certainty Exception**
BS1, BSD1	8082	Continuing calibration did not meet method specifications and was biased on the high side for this compound. Increased uncertainty is
		associated with the reported value which is likely to be biased on the high side for Aroclor-101.
		Response factor is less than method specified minimum acceptable value.
WC-1, BLK1, BS1,	8260C	Reduced precision and accuracy are associated with reported result for 1,2-Dibromo-3-chloropropane (DBCP), 1,4-Dioxane,
BSD1		Acetone andTetrahydrofuran
B-17 0-3, B-17 3-5	6010	Only Cr, Pb and Nickel reported per GEC request
B-17 5-7'	6010	Only Pb reported per GEC request
LCS	8260C	LCS Duplicate analytes Carbon Tetrachloride (136%)) were detected above recommended QC recovery limits (70 - 130)%).
		Remaining 52 analytes were within recommended QC limits.
LCSD	8260	LCSD analyte Carbon Tetrachloride (134%) was detected above recommended QC recovery limits (70 - 130)%).
		Remaining 52 analytes were within recommended QC limits.

Prepared by: Mbradley **Date:** 7/30/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/22/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5&9/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0450		

	CAM Methodology									
Analytical Method	**VOCs (8260B)**	**SVOCs (8270C)**	**Metals (6010B)**	**Mercury (7470A / 7471A)**	**Metals (7000)**	**Metals (6020A)**	**VPH (MADEP-VPH)**	**EPH (MADEP)**	**PCBs (8082)**	**Chlorinated Pesticides (8081A)**
CAM Revision	**4**	**5**	**5**	**5**	**4**	**2**	**3**	**3**	**4**	**4**
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**
Revision Date	**5/28/2004**	**12/20/2007**	**5/28/2004**	**8/13/2004**	**8/13/2004**	**8/13/2004**	**9/10/2004**	**9/10/2004**	**8/20/2004**	**8/20/2004**
Notes										
Soils										
No. Samples					18				20	
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

	CAM Methodology					Non-CAM Methodology				
Analytical Method	**Chlorinated Herbicides (8151A)**	**Aromatic / Chlorinated VOCs (8021B)**	**Total Cn & PAC (9014)**	**Hexavalent Chromium (7196A)**	**Nitroaromatics and Nitroamines (8330)**	**pH (9045)**	**2540 %Solids**			
CAM Revision	**2**	**2**	**2**	**3**	**2**					
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**					
Revision Date	**5/28/2004**	**5/28/2004**	**8/13/204**	**8/20/2004**	**8/27/2004**					
Notes										
Soils										
No. Samples							28			
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/22/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5&9/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0450		

	CAM Methodology		Non-CAM Methodology							
Analytical Method	**VOCs (TO-15)**	**APH (MADEP-APH)**								
CAM Revision	**1**	**1**								
CAM Status	**Draft**	**Draft**								
Revision Date	**11/5/2009**	**11/9/2009**								
Notes										
Indoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor air sample										
Soil Vapor										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										

Notes:

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/22/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5&9/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0450		

Description of Samples Collected Inconsistent with GEC's Work Plan and / or Standard Operating Procedures

None indication of samples being collected for lab analyis

PID lamp not identified

Sample methodology, sample locations / depths, equipment failure, trip blanks, duplicates, sample preservation, screening protocols, etc.

Description of Field Screening and Field Screening Data

Samples screened with a PID equipped with an unknown photoionization lamp.

No VOCs detected via headspace screening

Field screening methodology, equipment, data (attach data or provide reference to data), how screening data was used in decision making in the field.

Preparation of Chain of Custody

GEC requested lab hold on B-26 9-12', WC-2

No issues identified by lab

Sample ID, type, date and time collected, collectors name, preservation, filtration, and relinquished signatures, correct analyt method, requested detection limits. Note any analyses that were performed outside of submitted COC, provide explanation for why.

Prepared by: Mbradley **Date:** 8/7/2013

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/22/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5&9/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0450		

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet C: Sample Conditions, Holding Times, Sample Duplicates and Field Blanks

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/22/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5&9/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0450		

Sample Conditions

Were there any issues with samples received by laboratory?	**Yes**		**No**	X
Were there any issues with sample preservation?	**Yes**		**No**	X
Were there any issues with type of sample container?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

Sample Condition Issues

Sample	Analysis	Description of Sample Condition Issue

Holding Times

Were any extraction / sample preparation holding times exceeded?	**Yes**		**No**	X
Were any analytical holding times exceeded?	**Yes**		**No**	X
Any evidence of gross failure for any sample (> 2 times holding time)?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

NA = Not Applicable // NI = No Information

Holding Time Issues

Sample	Analysis	Description of Holding Time Issue

Field Blanks / Field Duplicates / Matrix Spike

Were any drinking water samples analyzed?	**Yes**		**No**	X
If YES, were field duplicates, trip blanks, and / or matrix spikes collected and analyzed as required?	**Yes**		**No**	

Prepared by: Mbradley **Date:** 8/7/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/22/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5&9/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0450		

Analytical Parameters

Were results for all analyte-list compounds/elements for specified method(s) reported? **Yes** [ ] **No** [ ]

For **NO**, identify samples/analyses and provide reason why.

Analyte Issues

Sample	Analysis	Description of Analyte Issue
All	6010	GEC requested only a select list of metals including one or more of the following:
		Lead, Chromium and Nickel

Sample Quality Control

Were any surrogate recoveries outside QC Limits for a sample? **Yes** [ ] **No** [X]

Was recovery data unavailable for any sample? **Yes** [X] **No** [ ]

For any **Yes** answers, provide further details below.

Sample Quality Control Issues

Sample	Analysis	Description of Sample Quality Control Issue
B-35 3-5'	8082A	This sample's surrogate recovery was not measurable due to 50-fold dilution of sample.
B-26 5-7	8082A	This sample's surrogate recovery was not measurable due to 100-fold dilution of sample.

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/22/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5&9/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0450		

Laboratory Control Samples (LCS) and Method Blanks

Were any LCS or LCSD Limits exceeded for a LCS?	**Yes**		**No**	X
Were any surrogate recoveries outside QC Limits for a LCS?	**Yes**		**No**	X
Were any analytes detected in a Method Blank?	**Yes**		**No**	X
Were any surrogate recoveries outside QC Limits for a Method Blank?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

LCS and Method Blank Issues

Samples Affected	Analysis	Description of LCS or Method Blank Issues

Other Issues for Laboratory Report / Data Set

Are there any other issues for this laboratory report or data set?	**Yes**	X	**No**	

For any **Yes** answers, provide further details below.

Other Issues (e.g., Analytes or concentrations detected that are inconsistent with Site History or Conceptual Site Model; Analytical method modifications, etc.)

Sample	Analysis	Description of Other Issues
B-34 3-5', B-22 5-7',	8082	A five times dilution was perfomed as part of the standard analytical procedure.
B-23 0-3', B-23 3-5',		
B-32 0-3', B-313-5',		
B-32 3-5'		

Prepared by: Mbradley **Date:** 8/7/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet E: CAM, Pre-CAM, Non-CAM

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/22/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5&9/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0450		

CAM, Non-CAM and Pre-CAM

Were all analytical methods CAM methods? **Yes** [X] **No** [ ] For **NO**, identify samples/analyses that are non-CAM

Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses	
Sample	**Analysis**	**Sample**	**Analysis**	**Sample**	**Analysis**
# Samples = 28	2540				

CAM Analyses

Do CAM analyses meet the requirements for Presumptive Certainty? **Yes** [ ] **No** [X] For **NO**, provide further details below.

Do all samples meet QC perform. standards and recomm.? **Yes** [ ] **No** [X] For **NO**, provide further details below.

Presumptive Certainty Exception		
Sample	**Analysis**	**Description of Presumptive Certainty Exception**
B-35 3-5', B-37 0-3',	8082	Sample fingerprint does not match standard exactly. Sample was quantitated against the closest matching standard.
B-35 0-3', B-20 3-5'		
B-20 5-7', B-21 0-3',		
B-21 3-5', B-31 0-3',		
B-27 0-3'		
B-34 3-5', B-22 5-7',	8082	A five times dilution was perfomed as part of the standard analytical procedure.
B-23 0-3', B-23 3-5',		
B-32 0-3', B-313-5',		
B-32 3-5'		
All	6010	GEC requested only a select list of metals including one or more of the following:
		Lead, Chromium and Nickel

Prepared by: Mbradley **Date:** 8/7/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/12/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0290		

	CAM Methodology									
Analytical Method	**VOCs (8260B)**	**SVOCs (8270C)**	**Metals (6010B)**	**Mercury (7470A / 7471A)**	**Metals (7000)**	**Metals (6020A)**	**VPH (MADEP-VPH)**	**EPH (MADEP)**	**PCBs (8082)**	**Chlorinated Pesticides (8081A)**
CAM Revision	**4**	**5**	**5**	**5**	**4**	**2**	**3**	**3**	**4**	**4**
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**
Revision Date	**5/28/2004**	**12/20/2007**	**5/28/2004**	**8/13/2004**	**8/13/2004**	**8/13/2004**	**9/10/2004**	**9/10/2004**	**8/20/2004**	**8/20/2004**
Notes										
Soils										
No. Samples			2						6	
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

	CAM Methodology					Non-CAM Methodology				
Analytical Method	**Chlorinated Herbicides (8151A)**	**Aromatic / Chlorinated VOCs (8021B)**	**Total Cn & PAC (9014)**	**Hexavalent Chromium (7196A)**	**Nitroaromatics and Nitroamines (8330)**	**% Solids 2540**	**ORP 2580A**	**pH 9045**		
CAM Revision	**2**	**2**	**2**	**3**	**2**					
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**					
Revision Date	**5/28/2004**	**5/28/2004**	**8/13/204**	**8/20/2004**	**8/27/2004**					
Notes										
Soils										
No. Samples				2		8	2	2		
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/12/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0290		

	CAM Methodology		Non-CAM Methodology							
Analytical Method	**VOCs (TO-15)**	**APH (MADEP-APH)**								
CAM Revision	**1**	**1**								
CAM Status	**Draft**	**Draft**								
Revision Date	**11/5/2009**	**11/9/2009**								
Notes										
Indoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor air sample										
Soil Vapor										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										

Notes:

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/12/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0290		

Description of Samples Collected Inconsistent with GEC's Work Plan and / or Standard Operating Procedures

None observed in Field Notes

Sample methodology, sample locations / depths, equipment failure, trip blanks, duplicates, sample preservation, screening protocols, etc.

Description of Field Screening and Field Screening Data

Soils headspaced screenned with PID equipped with unknown photoionization lamp

Field screening methodology, equipment, data (attach data or provide reference to data), how screening data was used in decision making in the field.

Preparation of Chain of Custody

None reported by lab
Samples submitted for Lab hold B-16 5-7' and B-15 10-13'

Sample ID, type, date and time collected, collectors name, preservation, filtration, and relinquished signatures, correct analyt method, requested detection limits.
Note any analyses that were performed outside of submitted COC, provide explanation for why.

Prepared by: Mbradley **Date:** 7/30/2013

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/12/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0290		

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet C: Sample Conditions, Holding Times, Sample Duplicates and Field Blanks

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/12/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0290		

Sample Conditions

Were there any issues with samples received by laboratory?	**Yes**		**No**	X
Were there any issues with sample preservation?	**Yes**		**No**	X
Were there any issues with type of sample container?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

Sample Condition Issues

Sample	Analysis	Description of Sample Condition Issue

Holding Times

Were any extraction / sample preparation holding times exceeded?	**Yes**		**No**	X
Were any analytical holding times exceeded?	**Yes**		**No**	X
Any evidence of gross failure for any sample (> 2 times holding time)?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

NA = Not Applicable // NI = No Information

Holding Time Issues

Sample	Analysis	Description of Holding Time Issue

Field Blanks / Field Duplicates / Matrix Spike

Were any drinking water samples analyzed?	**Yes**		**No**	X
If YES, were field duplicates, trip blanks, and / or matrix spikes collected and analyzed as required?	**Yes**		**No**	

Prepared by: Mbradley **Date:** 7/30/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/12/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0290		

Analytical Parameters

Were results for all analyte-list compounds/elements for specified method(s) reported? **Yes** [ ] **No** [X]

For **NO**, identify samples/analyses and provide reason why.

Analyte Issues

Sample	Analysis	Description of Analyte Issue
All	6010	Only Cr, Pb and Ni results were requested and reported

Sample Quality Control

Were any surrogate recoveries outside QC Limits for a sample? **Yes** [ ] **No** [X]

Was recovery data unavailable for any sample? **Yes** [X] **No** [ ]

For any **Yes** answers, provide further details below.

Sample Quality Control Issues

Sample	Analysis	Description of Sample Quality Control Issue
B-16 5-7' and 7-9'	8082	This sample's surrogate recovery was not measurable due to 25-fold dilution of sample.
B-15 0-3', B-15 3-5'		This sample's surrogate recovery was not measurable due to 50-fold dilution of sample.

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/12/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0290		

Laboratory Control Samples (LCS) and Method Blanks

	Yes	No	
Were any LCS or LCSD Limits exceeded for a LCS?	X		For any **Yes** answers, provide
Were any surrogate recoveries outside QC Limits for a LCS?		X	further details below.
Were any analytes detected in a Method Blank?		X	
Were any surrogate recoveries outside QC Limits for a Method Blank?		X	

LCS and Method Blank Issues

Samples Affected	Analysis	Description of LCS or Method Blank Issues
MS-1, MS-2, MSD1	7196	Matrix Spike Hex Cr (74.5, 66.8, 57.6%, rspectively) RPD were outside recovery limits of 75-125%.
MS-1	8082	Matrix Spike Aroclor 1016 (1760%), Aroclor 1016(2C) (2240%), Aroclor 1260 (456%) and Aroclor 1260 (2C)(656%) RPD were outside recovery limits of 40-140%.
MSD1	8082	Matrix Spike Aroclor 1016 (1440%), Aroclor 1016(2C) (1800%), Aroclor 1260 (413%) and Aroclor 1260 (2C)(412%) RPD were outside recovery limits of 40-140%.

Other Issues for Laboratory Report / Data Set

	Yes	No	
Are there any other issues for this laboratory report or data set?	X		For any **Yes** answers, provide further details below.

Other Issues (e.g., Analytes or concentrations detected that are inconsistent with Site History or Conceptual Site Model; Analytical method modifications, etc.)

Sample	Analysis	Description of Other Issues
B-16 3-5'	7196	Elevated method reporting limit due to intense color of sample

Prepared by: Mbradley **Date:** 7/30/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet E: CAM, Pre-CAM, Non-CAM

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/12/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0290		

CAM, Non-CAM and Pre-CAM

Were all analytical methods CAM methods? **Yes** [X] **No** [ ] For **NO**, identify samples/analyses that are non-CAM

Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses	
Sample	**Analysis**	**Sample**	**Analysis**	**Sample**	**Analysis**

CAM Analyses

Do CAM analyses meet the requirements for Presumptive Certainty? **Yes** [ ] **No** [X] For **NO**, provide further details below.

Do all samples meet QC perform. standards and recomm.? **Yes** [ ] **No** [ ] For **NO**, provide further details below.

Presumptive Certainty Exception		
Sample	**Analysis**	**Description of Presumptive Certainty Exception**
B-16 (3-5')	7196	Elevated method reporting limit due to intense color of sample
MS-1, MS-2, MSD1	7196	Matrix Spike Hex Cr (74.5, 66.8, 57.6%, rspectively) RPD were outside recovery limits of 75-125%.
MS-1	8082	Matrix Spike Aroclor 1016 (1760%), Aroclor 1016(2C) (2240%), Aroclor 1260 (456%) and Aroclor 1260 (2C)(656%)
		RPD were outside recovery limits of 40-140%.
MSD1	8082	Matrix Spike Aroclor 1016 (1440%), Aroclor 1016(2C) (1800%), Aroclor 1260 (413%) and Aroclor 1260 (2C)(412%)
		RPD were outside recovery limits of 40-140%.
B-16 5-7' and 7-9'	8260	The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte
B-15 0-3', B-15 3-5'		concentration and/or matrix interferences for analytes Decachlorobiphenyl, Decachlorobiphenyl [2C],
		Tetrachloro-m-xylene and Tetrachloro-m-xylene [2C].

Prepared by: Mbradley **Date:** 7/30/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/23/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0624		

	CAM Methodology									
Analytical Method	**VOCs (8260B)**	**SVOCs (8270C)**	**Metals (6010B)**	**Mercury (7470A / 7471A)**	**Metals (7000)**	**Metals (6020A)**	**VPH (MADEP-VPH)**	**EPH (MADEP)**	**PCBs (8082)**	**Chlorinated Pesticides (8081A)**
CAM Revision	**4**	**5**	**5**	**5**	**4**	**2**	**3**	**3**	**4**	**4**
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**
Revision Date	**5/28/2004**	**12/20/2007**	**5/28/2004**	**8/13/2004**	**8/13/2004**	**8/13/2004**	**9/10/2004**	**9/10/2004**	**8/20/2004**	**8/20/2004**
Notes										
Soils										
No. Samples		1	1	1					1	
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

	CAM Methodology					Non-CAM Methodology				
Analytical Method	**Chlorinated Herbicides (8151A)**	**Aromatic / Chlorinated VOCs (8021B)**	**Total Cn & PAC (9014)**	**Hexavalent Chromium (7196A)**	**Nitroaromatics and Nitroamines (8330)**	**pH (9045)**	**2540 %Solids**	**1010 Flashpoint**	**1030 Ignitability**	**9014 Cyanide**
CAM Revision	**2**	**2**	**2**	**3**	**2**					
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**					
Revision Date	**5/28/2004**	**5/28/2004**	**8/13/204**	**8/20/2004**	**8/27/2004**					
Notes										
Soils										
No. Samples						1	1	1	1	1
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/23/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0624		

	CAM Methodology		Non-CAM Methodology							
Analytical Method	**VOCs (TO-15)**	**APH (MADEP-APH)**		**9030A Sulfide**						
CAM Revision	**1**	**1**								
CAM Status	**Draft**	**Draft**								
Revision Date	**11/5/2009**	**11/9/2009**								
Notes										
Indoor Air										
No. Samples				1						
Duplicates										
Trip Blanks										
Outdoor air sample										
Soil Vapor										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										

Notes:

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/23/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0624		

Description of Samples Collected Inconsistent with GEC's Work Plan and / or Standard Operating Procedures

No description of how sample was collected

Sample methodology, sample locations / depths, equipment failure, trip blanks, duplicates, sample preservation, screening protocols, etc.

Description of Field Screening and Field Screening Data

None Noted

Field screening methodology, equipment, data (attach data or provide reference to data), how screening data was used in decision making in the field.

Preparation of Chain of Custody

None Noted
Sample analyzed from previously submitted samples. Analysis requested by email, which was included in lab report

Sample ID, type, date and time collected, collectors name, preservation, filtration, and relinquished signatures, correct analyt method, requested detection limits.
Note any analyses that were performed outside of submitted COC, provide explanation for why.

Prepared by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/23/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0624		

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet C: Sample Conditions, Holding Times, Sample Duplicates and Field Blanks

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/23/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0624		

Sample Conditions

Were there any issues with samples received by laboratory?	**Yes**		**No**	X
Were there any issues with sample preservation?	**Yes**		**No**	X
Were there any issues with type of sample container?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

Sample Condition Issues

Sample	Analysis	Description of Sample Condition Issue

Holding Times

Were any extraction / sample preparation holding times exceeded?	**Yes**	X	**No**	
Were any analytical holding times exceeded?	**Yes**	X	**No**	
Any evidence of gross failure for any sample (> 2 times holding time)?	**Yes**	X	**No**	

For any **Yes** answers, provide further details below.

NA = Not Applicable // NI = No Information

Holding Time Issues

Sample	Analysis	Description of Holding Time Issue
WC-1	9045	Exceeded Hold Time

Field Blanks / Field Duplicates / Matrix Spike

Were any drinking water samples analyzed?	**Yes**		**No**	X
If YES, were field duplicates, trip blanks, and / or matrix spikes collected and analyzed as required?	**Yes**		**No**	

Prepared by: Mbradley **Date:** 8/1/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/23/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0624		

Analytical Parameters

Were results for all analyte-list compounds/elements for specified method(s) reported?	**Yes**		**No**	X

For **NO**, identify samples/analyses and provide reason why.

Analyte Issues

Sample	Analysis	Description of Analyte Issue
All	6010	Only RCRA 8 metals reported as requested

Sample Quality Control

Were any surrogate recoveries outside QC Limits for a sample?	**Yes**		**No**	
Was recovery data unavailable for any sample?	**Yes**	X	**No**	

For any **Yes** answers, provide further details below.

Sample Quality Control Issues

Sample	Analysis	Description of Sample Quality Control Issue
WC-1	8082	This sample's surrogate recovery was not measurable due to 50-fold dilution of sample.

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/23/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0624		

Laboratory Control Samples (LCS) and Method Blanks

Were any LCS or LCSD Limits exceeded for a LCS?	**Yes**		**No**	X
Were any surrogate recoveries outside QC Limits for a LCS?	**Yes**		**No**	X
Were any analytes detected in a Method Blank?	**Yes**		**No**	X
Were any surrogate recoveries outside QC Limits for a Method Blank?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

LCS and Method Blank Issues

Samples Affected	Analysis	Description of LCS or Method Blank Issues

Other Issues for Laboratory Report / Data Set

Are there any other issues for this laboratory report or data set?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

Other Issues (e.g., Analytes or concentrations detected that are inconsistent with Site History or Conceptual Site Model; Analytical method modifications, etc.)

Sample	Analysis	Description of Other Issues

Prepared by: MBRadley **Date:** 8/1/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet E: CAM, Pre-CAM, Non-CAM

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/23/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0624		

CAM, Non-CAM and Pre-CAM

Were all analytical methods CAM methods? **Yes** ☐ **No** ☐ For **NO**, identify samples/analyses that are non-CAM

Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses	
Sample	**Analysis**	**Sample**	**Analysis**	**Sample**	**Analysis**

CAM Analyses

Do CAM analyses meet the requirements for Presumptive Certainty? **Yes** ☐ **No** ☐ For **NO**, provide further details below.

Do all samples meet QC perform. standards and recomm.? **Yes** ☐ **No** ☐ For **NO**, provide further details below.

Presumptive Certainty Exception		
Sample	**Analysis**	**Description of Presumptive Certainty Exception**
WC-1	8270	Elevated reporting limit due to sample matrix interference. MA CAM reporting limit not met.
WC-1	9045	Exceeded Hold Time
All	6010	Only RCRA 8 metals reported as requested
WC-1	8082	This sample's surrogate recovery was not measurable due to 50-fold dilution of sample.

Prepared by: Mbradley **Date:** 8/1/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/26/2013
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0793		

	CAM Methodology									
Analytical Method	**VOCs (8260B)**	**SVOCs (8270C)**	**Metals (6010B)**	**Mercury (7470A / 7471A)**	**Metals (7000)**	**Metals (6020A)**	**VPH (MADEP-VPH)**	**EPH (MADEP)**	**PCBs (8082)**	**Chlorinated Pesticides (8081A)**
CAM Revision	**4**	**5**	**5**	**5**	**4**	**2**	**3**	**3**	**4**	**4**
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**
Revision Date	**5/28/2004**	**12/20/2007**	**5/28/2004**	**8/13/2004**	**8/13/2004**	**8/13/2004**	**9/10/2004**	**9/10/2004**	**8/20/2004**	**8/20/2004**
Notes										
Soils										
No. Samples			1							
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

	CAM Methodology					Non-CAM Methodology				
Analytical Method	**Chlorinated Herbicides (8151A)**	**Aromatic / Chlorinated VOCs (8021B)**	**Total Cn & PAC (9014)**	**Hexavalent Chromium (7196A)**	**Nitroaromatics and Nitroamines (8330)**	**TCLP 1311**				
CAM Revision	**2**	**2**	**2**	**3**	**2**					
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**					
Revision Date	**5/28/2004**	**5/28/2004**	**8/13/204**	**8/20/2004**	**8/27/2004**					
Notes										
Soils										
No. Samples						1				
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/26/2013
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0793		

	CAM Methodology		Non-CAM Methodology							
Analytical Method	**VOCs (TO-15)**	**APH (MADEP-APH)**								
CAM Revision	**1**	**1**								
CAM Status	**Draft**	**Draft**								
Revision Date	**11/5/2009**	**11/9/2009**								
Notes										
Indoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor air sample										
Soil Vapor										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										

Notes:

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/26/2013
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0793		

Description of Samples Collected Inconsistent with GEC's Work Plan and / or Standard Operating Procedures

Waste Characterization sample WC-1 collected from B-6 1-5'

Sample methodology, sample locations / depths, equipment failure, trip blanks, duplicates, sample preservation, screening protocols, etc.

Description of Field Screening and Field Screening Data

Soils headspaced screenned with PID equipped with unknown photoionization lamp

Field screening methodology, equipment, data (attach data or provide reference to data), how screening data was used in decision making in the field.

Preparation of Chain of Custody

None noted by lab. Method 1311 not requested on COC, but authorized via email from GEC to conduct waste characterization analysis and to conduct TCLP if any metal exceeds 20x rule.

Only WC-1 run for TCLP. Samples on COC analyzed previously and included in earlier report

Sample ID, type, date and time collected, collectors name, preservation, filtration, and relinquished signatures, correct analyt method, requested detection limits. Note any analyses that were performed outside of submitted COC, provide explanation for why.

Prepared by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/26/2013
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0793		

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet C: Sample Conditions, Holding Times, Sample Duplicates and Field Blanks

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/26/2013
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0793		

Sample Conditions

Were there any issues with samples received by laboratory?	**Yes**		**No**	X
Were there any issues with sample preservation?	**Yes**		**No**	X
Were there any issues with type of sample container?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

Sample Condition Issues

Sample	Analysis	Description of Sample Condition Issue

Holding Times

Were any extraction / sample preparation holding times exceeded?	**Yes**		**No**	X
Were any analytical holding times exceeded?	**Yes**		**No**	X
Any evidence of gross failure for any sample (> 2 times holding time)?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

NA = Not Applicable // NI = No Information

Holding Time Issues

Sample	Analysis	Description of Holding Time Issue

Field Blanks / Field Duplicates / Matrix Spike

Were any drinking water samples analyzed?	**Yes**		**No**	X
If YES, were field duplicates, trip blanks, and / or matrix spikes collected and analyzed as required?	**Yes**		**No**	

Prepared by: Mbradley **Date:** 8/5/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/26/2013
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0793		

Analytical Parameters

Were results for all analyte-list compounds/elements for specified method(s) reported? **Yes** [ ] **No** [X]

For **NO**, identify samples/analyses and provide reason why.

Analyte Issues

Sample	Analysis	Description of Analyte Issue
WC-1	6010/1311	Only Lead Reported

Sample Quality Control

Were any surrogate recoveries outside QC Limits for a sample? **Yes** [ ] **No** [X]

Was recovery data unavailable for any sample? **Yes** [ ] **No** [X]

For any **Yes** answers, provide further details below.

Sample Quality Control Issues

Sample	Analysis	Description of Sample Quality Control Issue

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/26/2013
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0793		

Laboratory Control Samples (LCS) and Method Blanks

Were any LCS or LCSD Limits exceeded for a LCS?	**Yes**		**No**	X
Were any surrogate recoveries outside QC Limits for a LCS?	**Yes**		**No**	X
Were any analytes detected in a Method Blank?	**Yes**		**No**	X
Were any surrogate recoveries outside QC Limits for a Method Blank?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

LCS and Method Blank Issues

Samples Affected	Analysis	Description of LCS or Method Blank Issues

Other Issues for Laboratory Report / Data Set

Are there any other issues for this laboratory report or data set?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

Other Issues (e.g., Analytes or concentrations detected that are inconsistent with Site History or Conceptual Site Model; Analytical method modifications, etc.)

Sample	Analysis	Description of Other Issues

Prepared by: Mbradley **Date:** 8/5/2013

Reviewed by: **Date:**

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet E: CAM, Pre-CAM, Non-CAM

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/26/2013
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0793		

CAM, Non-CAM and Pre-CAM

Were all analytical methods CAM methods? **Yes** [ ] **No** [X] For **NO**, identify samples/analyses that are non-CAM

Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses	
Sample	**Analysis**	**Sample**	**Analysis**	**Sample**	**Analysis**
WC-1	1311				

CAM Analyses

Do CAM analyses meet the requirements for Presumptive Certainty? **Yes** [ ] **No** [ ] For **NO**, provide further details below.

Do all samples meet QC perform. standards and recomm.? **Yes** [ ] **No** [ ] For **NO**, provide further details below.

Presumptive Certainty Exception		
Sample	**Analysis**	**Description of Presumptive Certainty Exception**
WC-1	6010/1311	Only Lead Reported

Prepared by: Mbradley **Date:** 8/5/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	12/4/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0826		

	CAM Methodology									
Analytical Method	**VOCs (8260B)**	**SVOCs (8270C)**	**Metals (6010B)**	**Mercury (7470A / 7471A)**	**Metals (7000)**	**Metals (6020A)**	**VPH (MADEP-VPH)**	**EPH (MADEP)**	**PCBs (8082)**	**Chlorinated Pesticides (8081A)**
CAM Revision	**4**	**5**	**5**	**5**	**4**	**2**	**3**	**3**	**4**	**4**
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**
Revision Date	**5/28/2004**	**12/20/2007**	**5/28/2004**	**8/13/2004**	**8/13/2004**	**8/13/2004**	**9/10/2004**	**9/10/2004**	**8/20/2004**	**8/20/2004**
Notes										
Soils										
No. Samples									5	
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

	CAM Methodology					Non-CAM Methodology				
Analytical Method	**Chlorinated Herbicides (8151A)**	**Aromatic / Chlorinated VOCs (8021B)**	**Total Cn & PAC (9014)**	**Hexavalent Chromium (7196A)**	**Nitroaromatics and Nitroamines (8330)**	**pH (9045)**	**2540 %Solids**			
CAM Revision	**2**	**2**	**2**	**3**	**2**					
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**					
Revision Date	**5/28/2004**	**5/28/2004**	**8/13/204**	**8/20/2004**	**8/27/2004**					
Notes										
Soils										
No. Samples							5			
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	12/4/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0826		

	CAM Methodology		Non-CAM Methodology							
Analytical Method	**VOCs (TO-15)**	**APH (MADEP-APH)**								
CAM Revision	**1**	**1**								
CAM Status	**Draft**	**Draft**								
Revision Date	**11/5/2009**	**11/9/2009**								
Notes										
Indoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor air sample										
Soil Vapor										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										

Notes:

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	12/4/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0826		

Description of Samples Collected Inconsistent with GEC's Work Plan and / or Standard Operating Procedures

Samples collected for lab analysis not indicated in field notes

Sample methodology, sample locations / depths, equipment failure, trip blanks, duplicates, sample preservation, screening protocols, etc.

Description of Field Screening and Field Screening Data

Soils headspaced screenned with PID equipped with unknown photoionization lamp

No VOCs detected via headspace screening

Field screening methodology, equipment, data (attach data or provide reference to data), how screening data was used in decision making in the field.

Preparation of Chain of Custody

None reported by lab

Samples originally submitted on 10-9-2012 for lab hold. 11-26-2012 Lauren Mckinlay sends email to have select samples analyzed.

Sample ID, type, date and time collected, collectors name, preservation, filtration, and relinquished signatures, correct analyt method, requested detection limits. Note any analyses that were performed outside of submitted COC, provide explanation for why.

Prepared by: Mbradley **Date:** 8/5/2013

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	12/4/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0826		

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet C: Sample Conditions, Holding Times, Sample Duplicates and Field Blanks

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	12/4/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0826		

Sample Conditions

	Yes	No
Were there any issues with samples received by laboratory?		
Were there any issues with sample preservation?		
Were there any issues with type of sample container?		

For any **Yes** answers, provide further details below.

Sample Condition Issues

Sample	Analysis	Description of Sample Condition Issue

Holding Times

	Yes	No
Were any extraction / sample preparation holding times exceeded?	X	
Were any analytical holding times exceeded?	X	
Any evidence of gross failure for any sample (> 2 times holding time)?	X	

For any **Yes** answers, provide further details below.

NA = Not Applicable // NI = No Information

Holding Time Issues

Sample	Analysis	Description of Holding Time Issue
All	8082	14 Day Holding time (samples collected on 10-5-2013). Analysis request email submitted on 11-26-2012)
		-Not noted in Lab report as exceeding hold time

Field Blanks / Field Duplicates / Matrix Spike

	Yes	No
Were any drinking water samples analyzed?		X
If YES, were field duplicates, trip blanks, and / or matrix spikes collected and analyzed as required?		

Prepared by: Mbradley **Date:** 8/5/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	12/4/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0826		

Analytical Parameters

Were results for all analyte-list compounds/elements for specified method(s) reported? **Yes** [ ] **No** [X]

For **NO**, identify samples/analyses and provide reason why.

Analyte Issues

Sample	Analysis	Description of Analyte Issue
B-37 3-5', B-26 9-12'	8082	Sample was diluted 5-fold prior to analysis to keep all target analytes within calibration.

Sample Quality Control

Were any surrogate recoveries outside QC Limits for a sample? **Yes** [ ] **No** [X]

Was recovery data unavailable for any sample? **Yes** [X] **No** [ ]

For any **Yes** answers, provide further details below.

Sample Quality Control Issues

Sample	Analysis	Description of Sample Quality Control Issue
B-35 5-7',	8082	This sample's surrogate recovery was not measurable due to 250-fold dilution of sample.
B-35 7-9'	8082	This sample's surrogate recovery was not measurable due to 50-fold dilution of sample.

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	12/4/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0826		

Laboratory Control Samples (LCS) and Method Blanks

Were any LCS or LCSD Limits exceeded for a LCS?	**Yes**		**No**	
Were any surrogate recoveries outside QC Limits for a LCS?	**Yes**		**No**	
Were any analytes detected in a Method Blank?	**Yes**		**No**	
Were any surrogate recoveries outside QC Limits for a Method Blank?	**Yes**		**No**	

For any **Yes** answers, provide further details below.

LCS and Method Blank Issues

Samples Affected	Analysis	Description of LCS or Method Blank Issues

Other Issues for Laboratory Report / Data Set

Are there any other issues for this laboratory report or data set?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

Other Issues (e.g., Analytes or concentrations detected that are inconsistent with Site History or Conceptual Site Model; Analytical method modifications, etc.)

Sample	Analysis	Description of Other Issues

Prepared by: Mbradley **Date:** 8/5/2013

Reviewed by: **Date:**

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet E: CAM, Pre-CAM, Non-CAM

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	12/4/2012
Laboratory:	ConTest	**Sample Date(s):**	10/5/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0826		

CAM, Non-CAM and Pre-CAM

Were all analytical methods CAM methods? **Yes** [ ] **No** [X] For **NO**, identify samples/analyses that are non-CAM

Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses	
Sample	**Analysis**	**Sample**	**Analysis**	**Sample**	**Analysis**
All	2540				

CAM Analyses

Do CAM analyses meet the requirements for Presumptive Certainty? **Yes** [ ] **No** [X] For **NO**, provide further details below.

Do all samples meet QC perform. standards and recomm.? **Yes** [X] **No** [ ] For **NO**, provide further details below.

Presumptive Certainty Exception		
Sample	**Analysis**	**Description of Presumptive Certainty Exception**
All	8082	14 Day Holding time (samples collected on 10-5and 9-2013. Analysis request email submitted on 11-26-2012)
		-Not noted in Lab report as exceeding hold time
B-37 3-5', B-26 9-12'	8082	Sample was diluted 5-fold prior to analysis to keep all target analytes within calibration.
B-35 5-7',	8082	This sample's surrogate recovery was not measurable due to 250-fold dilution of sample.
B-35 7-9'	8082	This sample's surrogate recovery was not measurable due to 50-fold dilution of sample.

Prepared by: MBRadley **Date:** 8/5/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/23/2012
Laboratory:	ConTest	**Sample Date(s):**	10/9/2013
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0625		

	CAM Methodology									
Analytical Method	**VOCs (8260B)**	**SVOCs (8270C)**	**Metals (6010B)**	**Mercury (7470A / 7471A)**	**Metals (7000)**	**Metals (6020A)**	**VPH (MADEP-VPH)**	**EPH (MADEP)**	**PCBs (8082)**	**Chlorinated Pesticides (8081A)**
CAM Revision	**4**	**5**	**5**	**5**	**4**	**2**	**3**	**3**	**4**	**4**
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**
Revision Date	**5/28/2004**	**12/20/2007**	**5/28/2004**	**8/13/2004**	**8/13/2004**	**8/13/2004**	**9/10/2004**	**9/10/2004**	**8/20/2004**	**8/20/2004**
Notes										
Soils										
No. Samples	1	1	1	1					1	
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

	CAM Methodology					Non-CAM Methodology				
Analytical Method	**Chlorinated Herbicides (8151A)**	**Aromatic / Chlorinated VOCs (8021B)**	**Total Cn & PAC (9014)**	**Hexavalent Chromium (7196A)**	**Nitroaromatics and Nitroamines (8330)**	**pH (9045)**	**2540 %Solids**	**2510B Conductivity**	**1010 Flashpoint**	**1030 Ingnitability**
CAM Revision	**2**	**2**	**2**	**3**	**2**					
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**					
Revision Date	**5/28/2004**	**5/28/2004**	**8/13/204**	**8/20/2004**	**8/27/2004**					
Notes										
Soils										
No. Samples						1	1	1	1	1
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/23/2012
Laboratory:	ConTest	**Sample Date(s):**	10/9/2013
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0625		

	CAM Methodology		Non-CAM Methodology							
Analytical Method	**VOCs (TO-15)**	**APH (MADEP-APH)**		**8100 TPH**	**9014 cyanide**	**9030A Sulfide Distalation**				
CAM Revision	**1**	**1**								
CAM Status	**Draft**	**Draft**								
Revision Date	**11/5/2009**	**11/9/2009**								
Notes										
Indoor Air										
No. Samples				1	1	1				
Duplicates										
Trip Blanks										
Outdoor air sample										
Soil Vapor										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										

Notes:

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/23/2012
Laboratory:	ConTest	**Sample Date(s):**	10/9/2013
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0625		

Description of Samples Collected Inconsistent with GEC's Work Plan and / or Standard Operating Procedures

No description of how sample was collected

Sample methodology, sample locations / depths, equipment failure, trip blanks, duplicates, sample preservation, screening protocols, etc.

Description of Field Screening and Field Screening Data

None Noted

Field screening methodology, equipment, data (attach data or provide reference to data), how screening data was used in decision making in the field.

Preparation of Chain of Custody

None Noted
Sample analyzed from previously submitted samples. Analysis requested by email, which was included in lab report

Sample ID, type, date and time collected, collectors name, preservation, filtration, and relinquished signatures, correct analyt method, requested detection limits.
Note any analyses that were performed outside of submitted COC, provide explanation for why.

Prepared by: Mbradley **Date:** 8/5/2013

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/23/2012
Laboratory:	ConTest	**Sample Date(s):**	10/9/2013
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0625		

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet C: Sample Conditions, Holding Times, Sample Duplicates and Field Blanks

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/23/2012
Laboratory:	ConTest	**Sample Date(s):**	10/9/2013
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0625		

Sample Conditions

Were there any issues with samples received by laboratory?	**Yes**		**No**	X
Were there any issues with sample preservation?	**Yes**		**No**	X
Were there any issues with type of sample container?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

Sample Condition Issues

Sample	Analysis	Description of Sample Condition Issue

Holding Times

Were any extraction / sample preparation holding times exceeded?	**Yes**	X	**No**	
Were any analytical holding times exceeded?	**Yes**	X	**No**	
Any evidence of gross failure for any sample (> 2 times holding time)?	**Yes**	X	**No**	

For any **Yes** answers, provide further details below.

NA = Not Applicable // NI = No Information

Holding Time Issues

Sample	Analysis	Description of Holding Time Issue
WC-1	9045	Exceeded Hold Time

Field Blanks / Field Duplicates / Matrix Spike

Were any drinking water samples analyzed?	**Yes**		**No**	X
If YES, were field duplicates, trip blanks, and / or matrix spikes collected and analyzed as required?	**Yes**		**No**	

Prepared by: MBRadley **Date:** 8/5/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/23/2012
Laboratory:	ConTest	**Sample Date(s):**	10/9/2013
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0625		

Analytical Parameters

Were results for all analyte-list compounds/elements for specified method(s) reported? **Yes** [ ] **No** [X]

For **NO**, identify samples/analyses and provide reason why.

Analyte Issues

Sample	Analysis	Description of Analyte Issue
WC-2	6010C	Only RCRA 8 Reported

Sample Quality Control

Were any surrogate recoveries outside QC Limits for a sample? **Yes** [X] **No** [ ]

Was recovery data unavailable for any sample? **Yes** [X] **No** [ ]

For any **Yes** answers, provide further details below.

Sample Quality Control Issues

Sample	Analysis	Description of Sample Quality Control Issue
WC-2	8082	This sample's surrogate recovery was not measurable due to 100-fold dilution of sample.

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/23/2012
Laboratory:	ConTest	**Sample Date(s):**	10/9/2013
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0625		

Laboratory Control Samples (LCS) and Method Blanks

	Yes	No	
Were any LCS or LCSD Limits exceeded for a LCS?	X		For any **Yes** answers, provide
Were any surrogate recoveries outside QC Limits for a LCS?		X	further details below.
Were any analytes detected in a Method Blank?		X	
Were any surrogate recoveries outside QC Limits for a Method Blank?		X	

LCS and Method Blank Issues

Samples Affected	Analysis	Description of LCS or Method Blank Issues
	8260	LCS analytes Hexachlorobutadiene (132%) and Methylene Chloride (138%) were detected above recommended QC recovery limits (70-130)%).
	8260	LCS analyte Bromomethane (36.8%) was detected below recommended QC recovery limits (40-160%).
		LCSD analyte Bromomethane (34.8%) was detected below recommended QC recovery limits (40-160%).
	8260	LCSD analyte DIPE (20.7%) was detected below recommended QC recovery limits (70-130%).

Other Issues for Laboratory Report / Data Set

	Yes	No	
Are there any other issues for this laboratory report or data set?		X	For any **Yes** answers, provide further details below.

Other Issues (e.g., Analytes or concentrations detected that are inconsistent with Site History or Conceptual Site Model; Analytical method modifications, etc.)

Sample	Analysis	Description of Other Issues

Prepared by: _____ **Date:** _____

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet E: CAM, Pre-CAM, Non-CAM

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/23/2012
Laboratory:	ConTest	**Sample Date(s):**	10/9/2013
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0625		

CAM, Non-CAM and Pre-CAM

Were all analytical methods CAM methods? **Yes** [ ] **No** [ ] For **NO**, identify samples/analyses that are non-CAM

Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses	
Sample	**Analysis**	**Sample**	**Analysis**	**Sample**	**Analysis**

CAM Analyses

Do CAM analyses meet the requirements for Presumptive Certainty? **Yes** [ ] **No** [X] For **NO**, provide further details below.

Do all samples meet QC perform. standards and recomm.? **Yes** [ ] **No** [X] For **NO**, provide further details below.

Presumptive Certainty Exception		
Sample	**Analysis**	**Description of Presumptive Certainty Exception**
WC-2, BLK1,		Laboratory fortified blank duplicate RPD is outside of control limits. Reduced precision is anticipated for any reported value for
BS1, BSD1		Aroclor-1016, Aroclor-1016 [2C], Aroclor-1260, Aroclor-1260 [2C]
WC-2	8082	This sample's surrogate recovery was not measurable due to 100-fold dilution of sample.
WC-2	8260	Elevated reporting limit for Bromoform, Carbon Disulfide, Methylene Chloride based on lowest point in calibration.
		MA CAM reporting limit not met.
WC-2, BLK1,	8260	Response factor is less than method specified minimum acceptable value. Reduced precision and accuracy are associated
BS1, BSD1		with reported result for 1,4-Dioxane.

Prepared by: _____ **Date:** _____

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/26/2012
Laboratory:	ConTest	**Sample Date(s):**	10/9/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0794		

	CAM Methodology									
Analytical Method	**VOCs (8260B)**	**SVOCs (8270C)**	**Metals (6010B)**	**Mercury (7470A / 7471A)**	**Metals (7000)**	**Metals (6020A)**	**VPH (MADEP-VPH)**	**EPH (MADEP)**	**PCBs (8082)**	**Chlorinated Pesticides (8081A)**
CAM Revision	**4**	**5**	**5**	**5**	**4**	**2**	**3**	**3**	**4**	**4**
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**
Revision Date	**5/28/2004**	**12/20/2007**	**5/28/2004**	**8/13/2004**	**8/13/2004**	**8/13/2004**	**9/10/2004**	**9/10/2004**	**8/20/2004**	**8/20/2004**
Notes										
Soils										
No. Samples			1							
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

	CAM Methodology					Non-CAM Methodology				
Analytical Method	**Chlorinated Herbicides (8151A)**	**Aromatic / Chlorinated VOCs (8021B)**	**Total Cn & PAC (9014)**	**Hexavalent Chromium (7196A)**	**Nitroaromatics and Nitroamines (8330)**	**pH (9045)**	**2540 %Solids**	**1311 TCLP**		
CAM Revision	**2**	**2**	**2**	**3**	**2**					
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**					
Revision Date	**5/28/2004**	**5/28/2004**	**8/13/204**	**8/20/2004**	**8/27/2004**					
Notes										
Soils										
No. Samples								1		
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/26/2012
Laboratory:	ConTest	**Sample Date(s):**	10/9/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0794		

	CAM Methodology		Non-CAM Methodology							
Analytical Method	**VOCs (TO-15)**	**APH (MADEP-APH)**								
CAM Revision	**1**	**1**								
CAM Status	**Draft**	**Draft**								
Revision Date	**11/5/2009**	**11/9/2009**								
Notes										
Indoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor air sample										
Soil Vapor										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										

Notes:

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/26/2012
Laboratory:	ConTest	**Sample Date(s):**	10/9/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0794		

Description of Samples Collected Inconsistent with GEC's Work Plan and / or Standard Operating Procedures

WC-2 (Waste Characterization sample) collected from B-26 2-5'

Sample methodology, sample locations / depths, equipment failure, trip blanks, duplicates, sample preservation, screening protocols, etc.

Description of Field Screening and Field Screening Data

Soils headspaced screenned with PID equipped with unknown photoionization lamp

No detections noted

Field screening methodology, equipment, data (attach data or provide reference to data), how screening data was used in decision making in the field.

Preparation of Chain of Custody

None noted by lab. Method 1311 not requested on COC, but authorized via email from GEC to conduct waste characterization analysis and to conduct TCLP if any metal exceeds 20x rule.

Sample ID, type, date and time collected, collectors name, preservation, filtration, and relinquished signatures, correct analyt method, requested detection limits. Note any analyses that were performed outside of submitted COC, provide explanation for why.

Prepared by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/26/2012
Laboratory:	ConTest	**Sample Date(s):**	10/9/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0794		

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet C: Sample Conditions, Holding Times, Sample Duplicates and Field Blanks

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/26/2012
Laboratory:	ConTest	**Sample Date(s):**	10/9/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0794		

Sample Conditions

Were there any issues with samples received by laboratory?	**Yes**		**No**	X	For any **Yes** answers, provide
Were there any issues with sample preservation?	**Yes**		**No**	X	further details below.
Were there any issues with type of sample container?	**Yes**		**No**	X	

Sample Condition Issues

Sample	Analysis	Description of Sample Condition Issue

Holding Times

Were any extraction / sample preparation holding times exceeded?	**Yes**		**No**	X	For any **Yes** answers, provide
Were any analytical holding times exceeded?	**Yes**		**No**	X	further details below.
Any evidence of gross failure for any sample (> 2 times holding time)?	**Yes**		**No**	X	

NA = Not Applicable // NI = No Information

Holding Time Issues

Sample	Analysis	Description of Holding Time Issue

Field Blanks / Field Duplicates / Matrix Spike

Were any drinking water samples analyzed?	**Yes**		**No**	X
If YES, were field duplicates, trip blanks, and / or matrix spikes collected and analyzed as required?	**Yes**		**No**	

Prepared by: Mbradley **Date:** 8/6/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/26/2012
Laboratory:	ConTest	**Sample Date(s):**	10/9/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0794		

Analytical Parameters

Were results for all analyte-list compounds/elements for specified method(s) reported? **Yes** [ ] **No** [X]

For **NO**, identify samples/analyses and provide reason why.

Analyte Issues

Sample	Analysis	Description of Analyte Issue
WC-2	6010	Only Lead reported per GEC request

Sample Quality Control

Were any surrogate recoveries outside QC Limits for a sample? **Yes** [ ] **No** [X]

Was recovery data unavailable for any sample? **Yes** [ ] **No** [X]

For any **Yes** answers, provide further details below.

Sample Quality Control Issues

Sample	Analysis	Description of Sample Quality Control Issue

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/26/2012
Laboratory:	ConTest	**Sample Date(s):**	10/9/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0794		

Laboratory Control Samples (LCS) and Method Blanks

Were any LCS or LCSD Limits exceeded for a LCS?	**Yes**		**No**	X
Were any surrogate recoveries outside QC Limits for a LCS?	**Yes**		**No**	X
Were any analytes detected in a Method Blank?	**Yes**		**No**	X
Were any surrogate recoveries outside QC Limits for a Method Blank?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

LCS and Method Blank Issues

Samples Affected	Analysis	Description of LCS or Method Blank Issues

Other Issues for Laboratory Report / Data Set

Are there any other issues for this laboratory report or data set?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

Other Issues (e.g., Analytes or concentrations detected that are inconsistent with Site History or Conceptual Site Model; Analytical method modifications, etc.)

Sample	Analysis	Description of Other Issues

Prepared by: MBRadley **Date:** 8/6/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet E: CAM, Pre-CAM, Non-CAM

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/26/2012
Laboratory:	ConTest	**Sample Date(s):**	10/9/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0794		

CAM, Non-CAM and Pre-CAM

Were all analytical methods CAM methods? **Yes** [ ] **No** [ ] For **NO**, identify samples/analyses that are non-CAM

Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses	
Sample	**Analysis**	**Sample**	**Analysis**	**Sample**	**Analysis**

CAM Analyses

Do CAM analyses meet the requirements for Presumptive Certainty? **Yes** [ ] **No** [X] For **NO**, provide further details below.

Do all samples meet QC perform. standards and recomm.? **Yes** [X] **No** [ ] For **NO**, provide further details below.

Presumptive Certainty Exception		
Sample	**Analysis**	**Description of Presumptive Certainty Exception**
WC-2	6010	Only Lead reported per GEC request

Prepared by: Mbradley **Date:** 8/5/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/26/2012
Laboratory:	ConTest	**Sample Date(s):**	10/17/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0765		

	CAM Methodology									
Analytical Method	**VOCs (8260B)**	**SVOCs (8270C)**	**Metals (6010B)**	**Mercury (7470A / 7471A)**	**Metals (7000)**	**Metals (6020A)**	**VPH (MADEP-VPH)**	**EPH (MADEP)**	**PCBs (8082)**	**Chlorinated Pesticides (8081A)**
CAM Revision	**4**	**5**	**5**	**5**	**4**	**2**	**3**	**3**	**4**	**4**
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**
Revision Date	**5/28/2004**	**12/20/2007**	**5/28/2004**	**8/13/2004**	**8/13/2004**	**8/13/2004**	**9/10/2004**	**9/10/2004**	**8/20/2004**	**8/20/2004**
Notes										
Soils										
No. Samples			2						14	
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

	CAM Methodology					Non-CAM Methodology				
Analytical Method	**Chlorinated Herbicides (8151A)**	**Aromatic / Chlorinated VOCs (8021B)**	**Total Cn & PAC (9014)**	**Hexavalent Chromium (7196A)**	**Nitroaromatics and Nitroamines (8330)**	**pH (9045)**	**2540 %Solids**			
CAM Revision	**2**	**2**	**2**	**3**	**2**					
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**					
Revision Date	**5/28/2004**	**5/28/2004**	**8/13/204**	**8/20/2004**	**8/27/2004**					
Notes										
Soils										
No. Samples							14			
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/26/2012
Laboratory:	ConTest	**Sample Date(s):**	10/17/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0765		

	CAM Methodology		Non-CAM Methodology							
Analytical Method	**VOCs (TO-15)**	**APH (MADEP-APH)**								
CAM Revision	**1**	**1**								
CAM Status	**Draft**	**Draft**								
Revision Date	**11/5/2009**	**11/9/2009**								
Notes										
Indoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor air sample										
Soil Vapor										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										

Notes:

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/26/2012
Laboratory:	ConTest	**Sample Date(s):**	10/17/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0765		

Description of Samples Collected Inconsistent with GEC's Work Plan and / or Standard Operating Procedures

Field notes do not include sample collection for laboratory analysis

PID lamp not identified

Sample methodology, sample locations / depths, equipment failure, trip blanks, duplicates, sample preservation, screening protocols, etc.

Description of Field Screening and Field Screening Data

Samles screened for VOCs via PID with unknown photoionization lamp

Range 0-1.7 ppmv

Field screening methodology, equipment, data (attach data or provide reference to data), how screening data was used in decision making in the field.

Preparation of Chain of Custody

B-27A 7-9' submitted for laboratory hold (not analyzed)

B-30 0-3' has time of 0958 on lablel, but 0951 on COC

B-29 3-5' has time of 0958 on lael and 1033 on COC

No label on B-25 5-7'

Sample ID, type, date and time collected, collectors name, preservation, filtration, and relinquished signatures, correct analyt method, requested detection limits. Note any analyses that were performed outside of submitted COC, provide explanation for why.

Prepared by: MBRadley **Date:** 8/7/2013

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/26/2012
Laboratory:	ConTest	**Sample Date(s):**	10/17/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0765		

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet C: Sample Conditions, Holding Times, Sample Duplicates and Field Blanks

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/26/2012
Laboratory:	ConTest	**Sample Date(s):**	10/17/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0765		

Sample Conditions

Were there any issues with samples received by laboratory?	**Yes**		**No**	X
Were there any issues with sample preservation?	**Yes**		**No**	X
Were there any issues with type of sample container?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

Sample Condition Issues

Sample	Analysis	Description of Sample Condition Issue

Holding Times

Were any extraction / sample preparation holding times exceeded?	**Yes**		**No**	X
Were any analytical holding times exceeded?	**Yes**		**No**	X
Any evidence of gross failure for any sample (> 2 times holding time)?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

NA = Not Applicable // NI = No Information

Holding Time Issues

Sample	Analysis	Description of Holding Time Issue

Field Blanks / Field Duplicates / Matrix Spike

Were any drinking water samples analyzed?	**Yes**		**No**	X
If YES, were field duplicates, trip blanks, and / or matrix spikes collected and analyzed as required?	**Yes**		**No**	

Prepared by: MBRADLEY **Date:** 8/7/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/26/2012
Laboratory:	ConTest	**Sample Date(s):**	10/17/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0765		

Analytical Parameters

Were results for all analyte-list compounds/elements for specified method(s) reported? **Yes** [ ] **No** [X]

For **NO**, identify samples/analyses and provide reason why.

Analyte Issues

Sample	Analysis	Description of Analyte Issue
All	6010C	Lab reported only for Lead per GEC request

Sample Quality Control

Were any surrogate recoveries outside QC Limits for a sample? **Yes** [ ] **No** [X]

Was recovery data unavailable for any sample? **Yes** [ ] **No** [X]

For any **Yes** answers, provide further details below.

Sample Quality Control Issues

Sample	Analysis	Description of Sample Quality Control Issue

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/26/2012
Laboratory:	ConTest	**Sample Date(s):**	10/17/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0765		

Laboratory Control Samples (LCS) and Method Blanks

	Yes	No	
Were any LCS or LCSD Limits exceeded for a LCS?		X	For any **Yes** answers, provide
Were any surrogate recoveries outside QC Limits for a LCS?		X	further details below.
Were any analytes detected in a Method Blank?		X	
Were any surrogate recoveries outside QC Limits for a Method Blank?		X	

LCS and Method Blank Issues

Samples Affected	Analysis	Description of LCS or Method Blank Issues

Other Issues for Laboratory Report / Data Set

	Yes	No	
Are there any other issues for this laboratory report or data set?	X		For any **Yes** answers, provide further details below.

Other Issues (e.g., Analytes or concentrations detected that are inconsistent with Site History or Conceptual Site Model; Analytical method modifications, etc.)

Sample	Analysis	Description of Other Issues
B-29 0-3', B-29 3-5'	8082	Samples was diluted 5-fold prior to analysis.
B-29 5-6', B-36 3-5'		
B-36 3-5', B-25 0-3'		
B-25 5-7', B-27A 0-3'		

Prepared by: Mbradley **Date:** 8/7/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet E: CAM, Pre-CAM, Non-CAM

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/26/2012
Laboratory:	ConTest	**Sample Date(s):**	10/17/2012
Data Package Description:	Soil		
Lab Job / Batch Number:	12J0765		

CAM, Non-CAM and Pre-CAM

Were all analytical methods CAM methods? **Yes** ☐ **No** ☐ For **NO**, identify samples/analyses that are non-CAM

Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses	
Sample	**Analysis**	**Sample**	**Analysis**	**Sample**	**Analysis**
2540					

CAM Analyses

Do CAM analyses meet the requirements for Presumptive Certainty? **Yes** ☐ **No** ☐ For **NO**, provide further details below.

Do all samples meet QC perform. standards and recomm.? **Yes** ☐ **No** ☐ For **NO**, provide further details below.

Presumptive Certainty Exception		
Sample	**Analysis**	**Description of Presumptive Certainty Exception**
All	6010C	Lab reported only for Lead per GEC request

Prepared by: Mbradley **Date:** 8/7/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/31/2012
Laboratory:	ConTest	**Sample Date(s):**	10/22/2012
Data Package Description:	Groundwater		
Lab Job / Batch Number:	12J0911		

	CAM Methodology									
Analytical Method	**VOCs (8260B)**	**SVOCs (8270C)**	**Metals (6010B)**	**Mercury (7470A / 7471A)**	**Metals (7000)**	**Metals (6020A)**	**VPH (MADEP-VPH)**	**EPH (MADEP)**	**PCBs (8082)**	**Chlorinated Pesticides (8081A)**
CAM Revision	**4**	**5**	**5**	**5**	**4**	**2**	**3**	**3**	**4**	**4**
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**
Revision Date	**5/28/2004**	**12/20/2007**	**5/28/2004**	**8/13/2004**	**8/13/2004**	**8/13/2004**	**9/10/2004**	**9/10/2004**	**8/20/2004**	**8/20/2004**
Notes										
Soils										
No. Samples										
No. Duplicates										
Trip Blanks										
Water										
No. Samples		4						4		
No. Duplicates										
Trip Blanks										

	CAM Methodology					Non-CAM Methodology				
Analytical Method	**Chlorinated Herbicides (8151A)**	**Aromatic / Chlorinated VOCs (8021B)**	**Total Cn & PAC (9014)**	**Hexavalent Chromium (7196A)**	**Nitroaromatics and Nitroamines (8330)**	**pH (9045)**	**2540 %Solids**			
CAM Revision	**2**	**2**	**2**	**3**	**2**					
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**					
Revision Date	**5/28/2004**	**5/28/2004**	**8/13/204**	**8/20/2004**	**8/27/2004**					
Notes										
Soils										
No. Samples										
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/31/2012
Laboratory:	ConTest	**Sample Date(s):**	10/22/2012
Data Package Description:	Groundwater		
Lab Job / Batch Number:	12J0911		

	CAM Methodology		Non-CAM Methodology							
Analytical Method	**VOCs (TO-15)**	**APH (MADEP-APH)**								
CAM Revision	**1**	**1**								
CAM Status	**Draft**	**Draft**								
Revision Date	**11/5/2009**	**11/9/2009**								
Notes										
Indoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor air sample										
Soil Vapor										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										

Notes:

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/31/2012
Laboratory:	ConTest	**Sample Date(s):**	10/22/2012
Data Package Description:	Groundwater		
Lab Job / Batch Number:	12J0911		

Description of Samples Collected Inconsistent with GEC's Work Plan and / or Standard Operating Procedures

Due to slow recharge GEC-2 was purged dry via polyethylene disposable bailer. (Aproved by LM)
GEC-2 was very turbid with Silt. GEC requested Lab Filter. Sample time or analyis not indicated in notes

GEC-1 monitored for physical parameters prior to sampling. Sample for dissolved EPH field filtered via unknown filter.
GEC-1 analysis for total EPH not indicated

Sample methodology, sample locations / depths, equipment failure, trip blanks, duplicates, sample preservation, screening protocols, etc.

Description of Field Screening and Field Screening Data

See above

Field screening methodology, equipment, data (attach data or provide reference to data), how screening data was used in decision making in the field.

Preparation of Chain of Custody

GEC-2 lab filtered was received w/out preservations for lab filtration

Sample ID, type, date and time collected, collectors name, preservation, filtration, and relinquished signatures, correct analyt method, requested detection limits.
Note any analyses that were performed outside of submitted COC, provide explanation for why.

Prepared by: Mbradley **Date:** 8/7/2013

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/31/2012
Laboratory:	ConTest	**Sample Date(s):**	10/22/2012
Data Package Description:	Groundwater		
Lab Job / Batch Number:	12J0911		

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet C: Sample Conditions, Holding Times, Sample Duplicates and Field Blanks

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/31/2012
Laboratory:	ConTest	**Sample Date(s):**	10/22/2012
Data Package Description:	Groundwater		
Lab Job / Batch Number:	12J0911		

Sample Conditions

	Yes	No	
Were there any issues with samples received by laboratory?		X	For any **Yes** answers, provide
Were there any issues with sample preservation?		X	further details below.
Were there any issues with type of sample container?		X	

Sample Condition Issues

Sample	Analysis	Description of Sample Condition Issue

Holding Times

	Yes	No	
Were any extraction / sample preparation holding times exceeded?		X	For any **Yes** answers, provide
Were any analytical holding times exceeded?		X	further details below.
Any evidence of gross failure for any sample (> 2 times holding time)?		X	

NA = Not Applicable // NI = No Information

Holding Time Issues

Sample	Analysis	Description of Holding Time Issue

Field Blanks / Field Duplicates / Matrix Spike

	Yes	No
Were any drinking water samples analyzed?		X
If YES, were field duplicates, trip blanks, and / or matrix spikes collected and analyzed as required?		

Prepared by: Mbradley **Date:** 8/7/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/31/2012
Laboratory:	ConTest	**Sample Date(s):**	10/22/2012
Data Package Description:	Groundwater		
Lab Job / Batch Number:	12J0911		

Analytical Parameters

Were results for all analyte-list compounds/elements for specified method(s) reported? **Yes** [ ] **No** [X]

For **NO**, identify samples/analyses and provide reason why.

Analyte Issues

Sample	Analysis	Description of Analyte Issue
All	8270	only a select list of PAH compounds were analyzed and reported in order to achieve lower detection limits than possible with the EPH analysis.

Sample Quality Control

Were any surrogate recoveries outside QC Limits for a sample? **Yes** [ ] **No** [X]

Was recovery data unavailable for any sample? **Yes** [ ] **No** [X]

For any **Yes** answers, provide further details below.

Sample Quality Control Issues

Sample	Analysis	Description of Sample Quality Control Issue

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/31/2012
Laboratory:	ConTest	**Sample Date(s):**	10/22/2012
Data Package Description:	Groundwater		
Lab Job / Batch Number:	12J0911		

Laboratory Control Samples (LCS) and Method Blanks

	Yes	No	
Were any LCS or LCSD Limits exceeded for a LCS?	X		For any **Yes** answers, provide
Were any surrogate recoveries outside QC Limits for a LCS?		X	further details below.
Were any analytes detected in a Method Blank?		X	
Were any surrogate recoveries outside QC Limits for a Method Blank?		X	

LCS and Method Blank Issues

Samples Affected	Analysis	Description of LCS or Method Blank Issues
LCS	EPH	LCS analytes n-decane(34.1%) and n-nonnae (26.3%) were detected below recommended QC recovery limits (40 - 140)%).
		Remaining 31 analytes were within recommended QC limits.
LCSD	EPH	LCSD analytes n-decane(32.1%) and n-nonnae (24.3%) were detected below recommended QC recovery limits (40 - 140)%).
		Remaining 31 analytes were within recommended QC limits.

Other Issues for Laboratory Report / Data Set

	Yes	No	
Are there any other issues for this laboratory report or data set?			For any **Yes** answers, provide further details below.

Other Issues (e.g., Analytes or concentrations detected that are inconsistent with Site History or Conceptual Site Model; Analytical method modifications, etc.)

Sample	Analysis	Description of Other Issues
GEC-1	8270	Benzo(a)Anthracene was detected in blank as well as the sample
GEC-1 Filtered		
GEC-2		
GEC-2 Lab Filtered		
BS-1		
BSD-1		
BLk-1		

Prepared by: Mbradley **Date:** 8/7/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet E: CAM, Pre-CAM, Non-CAM

Site Name:	Boot Mills	**Project No.:**	911JR-2110
Client:	Winn	**Laboratory Report Date:**	10/31/2012
Laboratory:	ConTest	**Sample Date(s):**	10/22/2012
Data Package Description:	Groundwater		
Lab Job / Batch Number:	12J0911		

CAM, Non-CAM and Pre-CAM

Were all analytical methods CAM methods? **Yes** [X] **No** [ ] For **NO**, identify samples/analyses that are non-CAM

Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses	
Sample	**Analysis**	**Sample**	**Analysis**	**Sample**	**Analysis**

CAM Analyses

Do CAM analyses meet the requirements for Presumptive Certainty? **Yes** [ ] **No** [X] For **NO**, provide further details below.

Do all samples meet QC perform. standards and recomm.? **Yes** [ ] **No** [X] For **NO**, provide further details below.

Presumptive Certainty Exception		
Sample	**Analysis**	**Description of Presumptive Certainty Exception**
GEC-1	8270	Benzo(a)Anthracene was detected in blank as well as the sample
GEC-1 Filtered		
GEC-2		
GEC-2 Lab Filtered		
BS-1		
BSD-1		
BLk-1		
LCS	EPH	LCS analytes n-decane(34.1%) and n-nonnae (26.3%) were detected below recommended QC recovery limits (40 - 140)%).
		Remaining 31 analytes were within recommended QC limits.
LCSD	EPH	LCSD analytes n-decane(32.1%) and n-nonnae (24.3%) were detected below recommended QC recovery limits (40 - 140)%).
		Remaining 31 analytes were within recommended QC limits.

Prepared by: Mbradley **Date:** 8/7/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	5/17/2013
Laboratory:	ConTest	**Sample Date(s):**	5/8&9/2013
Data Package Description:	Soil		
Lab Job / Batch Number:	13E0387		

	CAM Methodology									
Analytical Method	**VOCs (8260B)**	**SVOCs (8270C)**	**Metals (6010B)**	**Mercury (7470A / 7471A)**	**Metals (7000)**	**Metals (6020A)**	**VPH (MADEP-VPH)**	**EPH (MADEP)**	**PCBs (8082)**	**Chlorinated Pesticides (8081A)**
CAM Revision	**4**	**5**	**5**	**5**	**4**	**2**	**3**	**3**	**4**	**4**
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**
Revision Date	**5/28/2004**	**12/20/2007**	**5/28/2004**	**8/13/2004**	**8/13/2004**	**8/13/2004**	**9/10/2004**	**9/10/2004**	**8/20/2004**	**8/20/2004**
Notes										
Soils										
No. Samples									14	
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

	CAM Methodology					Non-CAM Methodology				
Analytical Method	**Chlorinated Herbicides (8151A)**	**Aromatic / Chlorinated VOCs (8021B)**	**Total Cn & PAC (9014)**	**Hexavalent Chromium (7196A)**	**Nitroaromatics and Nitroamines (8330)**	**pH (9045)**	**2540 %Solids**			
CAM Revision	**2**	**2**	**2**	**3**	**2**					
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**					
Revision Date	**5/28/2004**	**5/28/2004**	**8/13/204**	**8/20/2004**	**8/27/2004**					
Notes										
Soils										
No. Samples							14			
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	5/17/2013
Laboratory:	ConTest	**Sample Date(s):**	5/8&9/2013
Data Package Description:	Soil		
Lab Job / Batch Number:	13E0387		

	CAM Methodology		Non-CAM Methodology							
Analytical Method	**VOCs (TO-15)**	**APH (MADEP-APH)**								
CAM Revision	**1**	**1**								
CAM Status	**Draft**	**Draft**								
Revision Date	**11/5/2009**	**11/9/2009**								
Notes										
Indoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor air sample										
Soil Vapor										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										

Notes:

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	5/17/2013
Laboratory:	ConTest	**Sample Date(s):**	5/8&9/2013
Data Package Description:	Soil		
Lab Job / Batch Number:	13E0387		

Description of Samples Collected Inconsistent with GEC's Work Plan and / or Standard Operating Procedures

Weather not noted
Type of PID not noted
Site sketch not included (assume that sample locations prescribed on sampling plan). Field notes indicate sampling was conducted based on a grid system

Sample methodology, sample locations / depths, equipment failure, trip blanks, duplicates, sample preservation, screening protocols, etc.

Description of Field Screening and Field Screening Data

Headspace screening values not available for all sample intervals (possible PID malfunction)

Screenings ranged from 0-172 ppmv. Highest reading at B-63 0-3'

Field screening methodology, equipment, data (attach data or provide reference to data), how screening data was used in decision making in the field.

Preparation of Chain of Custody

No issues noted by lab

No MCP Form Requested

Sample ID, type, date and time collected, collectors name, preservation, filtration, and relinquished signatures, correct analyt method, requested detection limits.
Note any analyses that were performed outside of submitted COC, provide explanation for why.

Prepared by: Mbradley **Date:** 8/7/2013

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	5/17/2013
Laboratory:	ConTest	**Sample Date(s):**	5/8&9/2013
Data Package Description:	Soil		
Lab Job / Batch Number:	13E0387		

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet C: Sample Conditions, Holding Times, Sample Duplicates and Field Blanks

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	5/17/2013
Laboratory:	ConTest	**Sample Date(s):**	5/8&9/2013
Data Package Description:	Soil		
Lab Job / Batch Number:	13E0387		

Sample Conditions

Were there any issues with samples received by laboratory?	**Yes**		**No**	X
Were there any issues with sample preservation?	**Yes**		**No**	X
Were there any issues with type of sample container?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

Sample Condition Issues

Sample	Analysis	Description of Sample Condition Issue

Holding Times

Were any extraction / sample preparation holding times exceeded?	**Yes**		**No**	X
Were any analytical holding times exceeded?	**Yes**		**No**	X
Any evidence of gross failure for any sample (> 2 times holding time)?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

NA = Not Applicable // NI = No Information

Holding Time Issues

Sample	Analysis	Description of Holding Time Issue

Field Blanks / Field Duplicates / Matrix Spike

Were any drinking water samples analyzed?	**Yes**		**No**	X
If YES, were field duplicates, trip blanks, and / or matrix spikes collected and analyzed as required?	**Yes**		**No**	

Prepared by: Mbradley **Date:** 8/7/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	5/17/2013
Laboratory:	ConTest	**Sample Date(s):**	5/8&9/2013
Data Package Description:	Soil		
Lab Job / Batch Number:	13E0387		

Analytical Parameters

Were results for all analyte-list compounds/elements for specified method(s) reported? **Yes** [X] **No** [ ]

For **NO**, identify samples/analyses and provide reason why.

Analyte Issues

Sample	Analysis	Description of Analyte Issue

Sample Quality Control

Were any surrogate recoveries outside QC Limits for a sample? **Yes** [ ] **No** [X]

Was recovery data unavailable for any sample? **Yes** [X] **No** [ ]

For any **Yes** answers, provide further details below.

Sample Quality Control Issues

Sample	Analysis	Description of Sample Quality Control Issue
B-38 0-9'	8082	This sample's surrogate recovery was not measurable due to 250-fold dilution of sample.
Composite 1 0-5'	8082	This sample's surrogate recovery was not measurable due to 50-fold dilution of sample.
Composite 4 0-3'	8082	This sample's surrogate recovery was not measurable due to 100-fold dilution of sample.
Composite 6 0-3'	8082	This sample's surrogate recovery was not measurable due to 25-fold dilution of sample.

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	5/17/2013
Laboratory:	ConTest	**Sample Date(s):**	5/8&9/2013
Data Package Description:	Soil		
Lab Job / Batch Number:	13E0387		

Laboratory Control Samples (LCS) and Method Blanks

Were any LCS or LCSD Limits exceeded for a LCS?	**Yes**	**No**
Were any surrogate recoveries outside QC Limits for a LCS?	**Yes**	**No**
Were any analytes detected in a Method Blank?	**Yes**	**No**
Were any surrogate recoveries outside QC Limits for a Method Blank?	**Yes**	**No**

For any **Yes** answers, provide further details below.

LCS and Method Blank Issues

Samples Affected	Analysis	Description of LCS or Method Blank Issues
LCS, LCSD	8082	Matrix spike and/or spike duplicate recovery bias high due to contribution of other Aroclors present in the source sample.
		for compunds Aroclor 1016 and Aroclor 1260

Other Issues for Laboratory Report / Data Set

Are there any other issues for this laboratory report or data set? **Yes** **No**

For any **Yes** answers, provide further details below.

Other Issues (e.g., Analytes or concentrations detected that are inconsistent with Site History or Conceptual Site Model; Analytical method modifications, etc.)

Sample	Analysis	Description of Other Issues
Composite 1 0-5'	8082	Sample fingerprint does not match standard exactly. Sample was quantitated against the closest matching standard for Aroclor 1248.
Composite 4 3-9'	8082	Sample fingerprint does not match standard exactly. Sample was quantitated against the closest matching standard for Aroclor 1248.

Prepared by: Mbradley **Date:** 8/7/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet E: CAM, Pre-CAM, Non-CAM

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	5/17/2013
Laboratory:	ConTest	**Sample Date(s):**	5/8&9/2013
Data Package Description:	Soil		
Lab Job / Batch Number:	13E0387		

CAM, Non-CAM and Pre-CAM

Were all analytical methods CAM methods? **Yes** [ ] **No** [X] For **NO**, identify samples/analyses that are non-CAM

Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses	
Sample	**Analysis**	**Sample**	**Analysis**	**Sample**	**Analysis**
All	2540				

CAM Analyses

Do CAM analyses meet the requirements for Presumptive Certainty? **Yes** [ ] **No** [X] For **NO**, provide further details below.

Do all samples meet QC perform. standards and recomm.? **Yes** [ ] **No** [X] For **NO**, provide further details below.

Presumptive Certainty Exception		
Sample	**Analysis**	**Description of Presumptive Certainty Exception**
c	8082	This sample's surrogate recovery was not measurable due to 250-fold dilution of sample.
Composite 1 0-5'	8082	This sample's surrogate recovery was not measurable due to 50-fold dilution of sample.
Composite 4 0-3'	8082	This sample's surrogate recovery was not measurable due to 100-fold dilution of sample.
Composite 6 0-3'	8082	This sample's surrogate recovery was not measurable due to 25-fold dilution of sample.
Composite 1 0-5'	8082	Sample fingerprint does not match standard exactly. Sample was quantitated against the closest matching standard.
Composite 4 3-9'	8082	Sample fingerprint does not match standard exactly. Sample was quantitated against the closest matching standard.

Prepared by: Mbradley **Date:** 8/7/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	5/17/2013
Laboratory:	ConTest	**Sample Date(s):**	5/8/2013
Data Package Description:	Soil		
Lab Job / Batch Number:	13E0875		

	CAM Methodology									
Analytical Method	**VOCs (8260B)**	**SVOCs (8270C)**	**Metals (6010B)**	**Mercury (7470A / 7471A)**	**Metals (7000)**	**Metals (6020A)**	**VPH (MADEP-VPH)**	**EPH (MADEP)**	**PCBs (8082)**	**Chlorinated Pesticides (8081A)**
CAM Revision	**4**	**5**	**5**	**5**	**4**	**2**	**3**	**3**	**4**	**4**
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**
Revision Date	**5/28/2004**	**12/20/2007**	**5/28/2004**	**8/13/2004**	**8/13/2004**	**8/13/2004**	**9/10/2004**	**9/10/2004**	**8/20/2004**	**8/20/2004**
Notes										
Soils										
No. Samples									6	
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

	CAM Methodology					Non-CAM Methodology				
Analytical Method	**Chlorinated Herbicides (8151A)**	**Aromatic / Chlorinated VOCs (8021B)**	**Total Cn & PAC (9014)**	**Hexavalent Chromium (7196A)**	**Nitroaromatics and Nitroamines (8330)**	**pH (9045)**	**2540 %Solids**			
CAM Revision	**2**	**2**	**2**	**3**	**2**					
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**					
Revision Date	**5/28/2004**	**5/28/2004**	**8/13/204**	**8/20/2004**	**8/27/2004**					
Notes										
Soils										
No. Samples							6			
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	5/17/2013
Laboratory:	ConTest	**Sample Date(s):**	5/8/2013
Data Package Description:	Soil		
Lab Job / Batch Number:	13E0875		

	CAM Methodology		Non-CAM Methodology							
Analytical Method	**VOCs (TO-15)**	**APH (MADEP-APH)**								
CAM Revision	**1**	**1**								
CAM Status	**Draft**	**Draft**								
Revision Date	**11/5/2009**	**11/9/2009**								
Notes										
Indoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor air sample										
Soil Vapor										
No. Samples										
Duplicates										
Trip Blanks										
Outdoor Air										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										
Other Media										
No. Samples										
Duplicates										
Trip Blanks										

Notes:

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	5/29/2013
Laboratory:	ConTest	**Sample Date(s):**	5/8/2013
Data Package Description:	Soil		
Lab Job / Batch Number:	13E0875		

Description of Samples Collected Inconsistent with GEC's Work Plan and / or Standard Operating Procedures

Weather not noted
Type of PID not noted
Site sketch not included (assume that sample locations prescribed on sampling plan). Field notes indicate sampling was conducted based on a grid system

Samples stored at GEC after collection on 5-8-2013 and submitted to lab on 5-24-2013

Sample methodology, sample locations / depths, equipment failure, trip blanks, duplicates, sample preservation, screening protocols, etc.

Description of Field Screening and Field Screening Data

Headspace screening values not available for all sample intervals (possible PID malfunction)

Screenings ranged from 0-172 ppmv. Highest reading at B-63 0-3'

Field screening methodology, equipment, data (attach data or provide reference to data), how screening data was used in decision making in the field.

Preparation of Chain of Custody

No issues noted by lab

No MCP Form Requested

Sample ID, type, date and time collected, collectors name, preservation, filtration, and relinquished signatures, correct analyt method, requested detection limits.
Note any analyses that were performed outside of submitted COC, provide explanation for why.

Prepared by: Mbradley **Date:** 8/7/2013

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	5/29/2013
Laboratory:	ConTest	**Sample Date(s):**	5/8/2013
Data Package Description:	Soil		
Lab Job / Batch Number:	13E0875		

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet C: Sample Conditions, Holding Times, Sample Duplicates and Field Blanks

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	5/17/2013
Laboratory:	ConTest	**Sample Date(s):**	5/8/2013
Data Package Description:	Soil		
Lab Job / Batch Number:	13E0875		

Sample Conditions

Were there any issues with samples received by laboratory?	**Yes**		**No**	X
Were there any issues with sample preservation?	**Yes**		**No**	X
Were there any issues with type of sample container?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

Sample Condition Issues

Sample	Analysis	Description of Sample Condition Issue

Holding Times

Were any extraction / sample preparation holding times exceeded?	**Yes**		**No**	X
Were any analytical holding times exceeded?	**Yes**		**No**	X
Any evidence of gross failure for any sample (> 2 times holding time)?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

NA = Not Applicable // NI = No Information

Holding Time Issues

Sample	Analysis	Description of Holding Time Issue

Field Blanks / Field Duplicates / Matrix Spike

Were any drinking water samples analyzed?	**Yes**		**No**	X
If YES, were field duplicates, trip blanks, and / or matrix spikes collected and analyzed as required?	**Yes**		**No**	

Prepared by: Mbradley **Date:** 8/7/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	5/17/2013
Laboratory:	ConTest	**Sample Date(s):**	5/8/2013
Data Package Description:	Soil		
Lab Job / Batch Number:	13E0875		

Analytical Parameters

Were results for all analyte-list compounds/elements for specified method(s) reported?	**Yes**	X	**No**	For **NO**, identify samples/analyses and provide reason why.

Analyte Issues		
Sample	**Analysis**	**Description of Analyte Issue**

Sample Quality Control

Were any surrogate recoveries outside QC Limits for a sample?	**Yes**		**No**	X
Was recovery data unavailable for any sample?	**Yes**	X	**No**	

For any **Yes** answers, provide further details below.

Sample Quality Control Issues		
Sample	**Analysis**	**Description of Sample Quality Control Issue**
B-49 0-3'	8082	This sample's surrogate recovery was not measurable due to 50-fold dilution of sample.
B-50 0-3'	8082	This sample's surrogate recovery was not measurable due to 100-fold dilution of sample.

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	5/17/2013
Laboratory:	ConTest	**Sample Date(s):**	5/8/2013
Data Package Description:	Soil		
Lab Job / Batch Number:	13E0875		

Laboratory Control Samples (LCS) and Method Blanks

Were any LCS or LCSD Limits exceeded for a LCS?	**Yes**		**No**	X
Were any surrogate recoveries outside QC Limits for a LCS?	**Yes**		**No**	X
Were any analytes detected in a Method Blank?	**Yes**		**No**	X
Were any surrogate recoveries outside QC Limits for a Method Blank?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

LCS and Method Blank Issues

Samples Affected	Analysis	Description of LCS or Method Blank Issues

Other Issues for Laboratory Report / Data Set

Are there any other issues for this laboratory report or data set?	**Yes**	X	**No**	

For any **Yes** answers, provide further details below.

Other Issues (e.g., Analytes or concentrations detected that are inconsistent with Site History or Conceptual Site Model; Analytical method modifications, etc.)

Sample	Analysis	Description of Other Issues
B-39 0-3', B-39 3-9'	8082	Sample contains two incompletely resolved aroclors. Aroclor with the closest matching pattern is reported.
		for Aroclor 1254

Prepared by: Mbradley **Date:** 8/7/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet E: CAM, Pre-CAM, Non-CAM

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	5/17/2013
Laboratory:	ConTest	**Sample Date(s):**	5/8/2013
Data Package Description:	Soil		
Lab Job / Batch Number:	13E0875		

CAM, Non-CAM and Pre-CAM

Were all analytical methods CAM methods? **Yes** [ ] **No** [X] For **NO**, identify samples/analyses that are non-CAM

Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses	
Sample	**Analysis**	**Sample**	**Analysis**	**Sample**	**Analysis**
All	2540				

CAM Analyses

Do CAM analyses meet the requirements for Presumptive Certainty? **Yes** [ ] **No** [X] For **NO**, provide further details below.

Do all samples meet QC perform. standards and recomm.? **Yes** [ ] **No** [X] For **NO**, provide further details below.

Presumptive Certainty Exception		
Sample	**Analysis**	**Description of Presumptive Certainty Exception**
B-49 0-3'	8082	This sample's surrogate recovery was not measurable due to 50-fold dilution of sample.
B-50 0-3'	8082	This sample's surrogate recovery was not measurable due to 100-fold dilution of sample.
B-39 0-3', B-39 3-9'	8082	Sample contains two incompletely resolved aroclors. Aroclor with the closest matching pattern is reported.

Prepared by: Mbradley **Date:** 8/7/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0168		

	CAM Methodology									
Analytical Method	**VOCs (8260B)**	**SVOCs (8270C)**	**Metals (6010B)**	**Mercury (7470A / 7471A)**	**Metals (7000)**	**Metals (6020A)**	**VPH (MADEP-VPH)**	**EPH (MADEP)**	**PCBs (8082A) with 3540 Soxhlet Extraction**	**Chlorinated Pesticides (8081A)**
CAM Revision	4	5	5	5	4	2	3	3	4	4
CAM Status	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final
Revision Date	5/28/2004	12/20/2007	5/28/2004	8/13/2004	8/13/2004	8/13/2004	9/10/2004	9/10/2004	8/20/2004	8/20/2004
Notes										
Soils										
No. Samples									17	
No. Duplicates									2	
Trip Blanks									0	
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

	CAM Methodology					Non-CAM Methodology				
Analytical Method	**Chlorinated Herbicides (8151A)**	**Aromatic / Chlorinated VOCs (8021B)**	**Total Cn & PAC (9014)**	**Hexavalent Chromium (7196A)**	**Nitroaromatics and Nitroamines (8330)**	**pH (9045)**	**2540 %Solids**	**PCBs (3450)**		
CAM Revision	2	2	2	3	2					
CAM Status	Final	Final	Final	Final	Final					
Revision Date	5/28/2004	5/28/2004	8/13/204	8/20/2004	8/27/2004			1996		
Notes										
Soils										
No. Samples										
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0168		

Trip Blanks										

Notes:

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0168		

Description of Samples Collected Inconsistent with GEC's Work Plan and / or Standard Operating Procedures

No issues noted

Sample methodology, sample locations / depths, equipment failure, trip blanks, duplicates, sample preservation, screening protocols, etc.

Description of Field Screening and Field Screening Data

Samples were collected in 5 foot intervals. GEC calculated the appropriate sample depths based upon recovery. GEC screened headspace of each 5 foot interval with a 10.6 eV PID
Several samples had slighlty elevated headspace reading, but were atributed residual de-con solution (capsur)used by the drilling contractor

Field screening methodology, equipment, data (attach data or provide reference to data), how screening data was used in decision making in the field.

Preparation of Chain of Custody

None noted

GEC requested method 3450 be conducted, but method 8082A with 3450 Soxhlet extraction was completed.

Sample ID, type, date and time collected, collectors name, preservation, filtration, and relinquished signatures, correct analyt method, requested detection limits.
Note any analyses that were performed outside of submitted COC, provide explanation for why.

Prepared by: Mbradley **Date:** 7/5/2014

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0168		

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet C: Sample Conditions, Holding Times, Sample Duplicates and Field Blanks

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0168		

Sample Conditions

Were there any issues with samples received by laboratory?	**Yes**		**No**	X	For any **Yes** answers, provide
Were there any issues with sample preservation?	**Yes**		**No**	X	further details below.
Were there any issues with type of sample container?	**Yes**		**No**	X	

Sample Condition Issues

Sample	Analysis	Description of Sample Condition Issue

Holding Times

Were any extraction / sample preparation holding times exceeded?	**Yes**		**No**	X	For any **Yes** answers, provide
Were any analytical holding times exceeded?	**Yes**		**No**	X	further details below.
Any evidence of gross failure for any sample (> 2 times holding time)?	**Yes**		**No**	X	

NA = Not Applicable // NI = No Information

Holding Time Issues

Sample	Analysis	Description of Holding Time Issue

Field Blanks / Field Duplicates / Matrix Spike

Were any drinking water samples analyzed?	**Yes**		**No**	X
If YES, were field duplicates, trip blanks, and / or matrix spikes collected and analyzed as required?	**Yes**		**No**	

Prepared by: Mbradley **Date:** 7/8/2014

Reviewed by: **Date:**

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0168		

Analytical Parameters

Were results for all analyte-list compounds/elements for specified method(s) reported? **Yes** [X] **No** [ ]

For **NO**, identify samples/analyses and provide reason why.

Analyte Issues

Sample	Analysis	Description of Analyte Issue

Sample Quality Control

Were any surrogate recoveries outside QC Limits for a sample? **Yes** [ ] **No** [X]

Was recovery data unavailable for any sample? **Yes** [X] **No** [ ]

For any **Yes** answers, provide further details below.

Sample Quality Control Issues

Sample	Analysis	Description of Sample Quality Control Issue
B49A 1-2', B49A 2-3', B50A 1-2', B50A 2-3', B50 2-3' DUP, B2A 2-3' DUP, B2A 3-4', B2A 4-5', B2A 4-5' DUPB16Q 2-3' and B16A3-4'	PCBs 8082	Sample fingerprint does not match standard exactly for analyte Aroclor 1248 and 1248 (2C). Sample was quantitated against the closest matching standard.
B50A 2-3', B502A DUP, B2A 4-5', B2a 4-5' DUP, B16A 3-4'	PCBs 8082	The surrogate recovery for Decachlorobiphenyl, Decachlorobiphenyl , Tetrachloro-m-xylene and Tetrachloro-m-xylene is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0168		

Laboratory Control Samples (LCS) and Method Blanks

	Yes	No	
Were any LCS or LCSD Limits exceeded for a LCS?		X	For any **Yes** answers, provide
Were any surrogate recoveries outside QC Limits for a LCS?	X		further details below.
Were any analytes detected in a Method Blank?		X	
Were any surrogate recoveries outside QC Limits for a Method Blank?		X	

LCS and Method Blank Issues

Samples Affected	Analysis	Description of LCS or Method Blank Issues
B091490-MS1, B091490-MSD1		Matrix spike and matrix spike duplicate recoveries are outside of control limits. Data validation is not affected since results for this compound in this sample are "not detected", and recovery bias is on the high side.

Other Issues for Laboratory Report / Data Set

	Yes	No	
Are there any other issues for this laboratory report or data set?			For any **Yes** answers, provide further details below.

Other Issues (e.g., Analytes or concentrations detected that are inconsistent with Site History or Conceptual Site Model; Analytical method modifications, etc.)

Sample	Analysis	Description of Other Issues

Prepared by: Mbradley **Date:** 8/7/2013

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet E: CAM, Pre-CAM, Non-CAM

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0168		

CAM, Non-CAM and Pre-CAM

Were all analytical methods CAM methods? **Yes** X **No** For **NO**, identify samples/analyses that are non-CAM

Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses	
Sample	**Analysis**	**Sample**	**Analysis**	**Sample**	**Analysis**

CAM Analyses

Do CAM analyses meet the requirements for Presumptive Certainty? **Yes** **No** X For **NO**, provide further details below.

Do all samples meet QC perform. standards and recomm.? **Yes** **No** X For **NO**, provide further details below.

Presumptive Certainty Exception		
Sample	**Analysis**	**Description of Presumptive Certainty Exception**
B49A 1-2', B49A 2-3', B50A 1-2', B50A 2-3', B50 2-3' DUP, B2A 2-3' DUP, B2A 3-4', B2A 4-5', B2A 4-5' DUPB16Q 2-3' and B16A3-4'	PCBs 8082	Sample fingerprint does not match standard exactly for analyte Aroclor 1248 and 1248 (2C). Sample was quantitated against the closest matching standard.
B50A 2-3', B502A DUP, B2A 4-5', B2a 4-5' DUP, B16A 3-4'	PCBs 8082	The surrogate recovery for Decachlorobiphenyl, Decachlorobiphenyl , Tetrachloro-m-xylene and Tetrachloro-m-xylene is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.
B091490-MS1, B091490-MSD1		Matrix spike and matrix spike duplicate recoveries are outside of control limits. Data validation is not affected since results for this compound in this sample are "not detected", and recovery bias is on the high side.

Prepared by: Mbradley **Date:** 7/8/2014

Reviewed by: **Date:**

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0169		

	CAM Methodology									
Analytical Method	**VOCs (8260B)**	**SVOCs (8270C)**	**Metals (6010B)**	**Mercury (7470A / 7471A)**	**Metals (7000)**	**Metals (6020A)**	**VPH (MADEP-VPH)**	**EPH (MADEP)**	**PCBs (8082A) with 3540 Soxhlet Extraction**	**Chlorinated Pesticides (8081A)**
CAM Revision	4	5	5	5	4	2	3	3	4	4
CAM Status	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final
Revision Date	5/28/2004	12/20/2007	5/28/2004	8/13/2004	8/13/2004	8/13/2004	9/10/2004	9/10/2004	8/20/2004	8/20/2004
Notes										
Soils										
No. Samples									17	
No. Duplicates									3	
Trip Blanks									0	
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

	CAM Methodology					Non-CAM Methodology				
Analytical Method	**Chlorinated Herbicides (8151A)**	**Aromatic / Chlorinated VOCs (8021B)**	**Total Cn & PAC (9014)**	**Hexavalent Chromium (7196A)**	**Nitroaromatics and Nitroamines (8330)**	**pH (9045)**	**2540 %Solids**	**PCBs (3450)**		
CAM Revision	2	2	2	3	2					
CAM Status	Final	Final	Final	Final	Final					
Revision Date	5/28/2004	5/28/2004	8/13/204	8/20/2004	8/27/2004			1996		
Notes										
Soils										
No. Samples										
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0169		

Trip Blanks										

Notes:

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0169		

Description of Samples Collected Inconsistent with GEC's Work Plan and / or Standard Operating Procedures

No issues noted

Sample methodology, sample locations / depths, equipment failure, trip blanks, duplicates, sample preservation, screening protocols, etc.

Description of Field Screening and Field Screening Data

Samples were collected in 5 foot intervals. GEC calculated the appropriate sample depths based upon recovery. GEC screened headspace of each 5 foot interval with a 10.6 eV PID
Several samples had slighlty elevated headspace reading, but were atributed residual de-con solution (capsur)used by the drilling contractor

Field screening methodology, equipment, data (attach data or provide reference to data), how screening data was used in decision making in the field.

Preparation of Chain of Custody

None noted

GEC requested method 3450 be conducted, but method 8082A with 3450 Soxhlet extraction was completed.

Sample ID, type, date and time collected, collectors name, preservation, filtration, and relinquished signatures, correct analyt method, requested detection limits.
Note any analyses that were performed outside of submitted COC, provide explanation for why.

Prepared by: Mbradley **Date:** 7/5/2014

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0169		

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet C: Sample Conditions, Holding Times, Sample Duplicates and Field Blanks

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0169		

Sample Conditions

Were there any issues with samples received by laboratory?	**Yes**		**No**	X	For any **Yes** answers, provide
Were there any issues with sample preservation?	**Yes**		**No**	X	further details below.
Were there any issues with type of sample container?	**Yes**		**No**	X	

Sample Condition Issues

Sample	Analysis	Description of Sample Condition Issue

Holding Times

Were any extraction / sample preparation holding times exceeded?	**Yes**		**No**	X	For any **Yes** answers, provide
Were any analytical holding times exceeded?	**Yes**		**No**	X	further details below.
Any evidence of gross failure for any sample (> 2 times holding time)?	**Yes**		**No**	X	

NA = Not Applicable // NI = No Information

Holding Time Issues

Sample	Analysis	Description of Holding Time Issue

Field Blanks / Field Duplicates / Matrix Spike

Were any drinking water samples analyzed?	**Yes**		**No**	X
If YES, were field duplicates, trip blanks, and / or matrix spikes collected and analyzed as required?	**Yes**		**No**	

Prepared by: Mbradley **Date:** 7/8/2014

Reviewed by: **Date:**

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0169		

Analytical Parameters

Were results for all analyte-list compounds/elements for specified method(s) reported? **Yes** [X] **No** [ ]

For **NO**, identify samples/analyses and provide reason why.

Analyte Issues

Sample	Analysis	Description of Analyte Issue

Sample Quality Control

Were any surrogate recoveries outside QC Limits for a sample? **Yes** [ ] **No** [X]

Was recovery data unavailable for any sample? **Yes** [X] **No** [ ]

For any **Yes** answers, provide further details below.

Sample Quality Control Issues

Sample	Analysis	Description of Sample Quality Control Issue
B11A 0-0.5', B11A 0-0.5' DUP, B11A 0.5-1', B20A 1-2', B20A1-2' DUP and B-21A 1-2'	PCBs 8082	Sample fingerprint does not match standard exactly for analyte Aroclor 1248 and 1248 (2C). Sample was quantitated against the closest matching standard.
B10A 0-0.5'		Matrix spike duplicate RPD is outside of control limits. Reduced precision is anticipated for reported result for this Aroclor 1016 in this sample
B10A 2-3', B10A 2-3' DUP, B20A2-3' and B21A 2-3'		The surrogate recovery for Decachlorobiphenyl, Decachlorobiphenyl (2C) , Tetrachloro-m-xylene and Tetrachloro-m-xylene (2C) is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0169		

Laboratory Control Samples (LCS) and Method Blanks

Were any LCS or LCSD Limits exceeded for a LCS?	**Yes**		**No**	X	For any **Yes** answers, provide
Were any surrogate recoveries outside QC Limits for a LCS?	**Yes**	X	**No**		further details below.
Were any analytes detected in a Method Blank?	**Yes**		**No**	X	
Were any surrogate recoveries outside QC Limits for a Method Blank?	**Yes**		**No**	X	

LCS and Method Blank Issues

Samples Affected	Analysis	Description of LCS or Method Blank Issues
MSD-1		Matrix spike duplicate RPD is outside of control limits. Reduced precision is anticipated for reported result for this Aroclor 1016 in this sample

Other Issues for Laboratory Report / Data Set

Are there any other issues for this laboratory report or data set?	**Yes**		**No**	X	For any **Yes** answers, provide further details below.

Other Issues (e.g., Analytes or concentrations detected that are inconsistent with Site History or Conceptual Site Model; Analytical method modifications, etc.)

Sample	Analysis	Description of Other Issues

Prepared by: Mbradley **Date:** 7/8/2014

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet E: CAM, Pre-CAM, Non-CAM

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0169		

CAM, Non-CAM and Pre-CAM

Were all analytical methods CAM methods? **Yes** X **No** For **NO**, identify samples/analyses that are non-CAM

Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses	
Sample	**Analysis**	**Sample**	**Analysis**	**Sample**	**Analysis**

CAM Analyses

Do CAM analyses meet the requirements for Presumptive Certainty? **Yes** **No** X For **NO**, provide further details below.

Do all samples meet QC perform. standards and recomm.? **Yes** **No** X For **NO**, provide further details below.

Presumptive Certainty Exception		
Sample	**Analysis**	**Description of Presumptive Certainty Exception**
B11A 0-0.5', B11A 0-0.5' DUP, B11A 0.5-1', B20A 1-2', B20A1-2' DUP and B-21A 1-2'	PCBs 8082	Sample fingerprint does not match standard exactly for analyte Aroclor 1248 and 1248 (2C). Sample was quantitated against the closest matching standard.
B10A 0-0.5'		Matrix spike duplicate RPD is outside of control limits. Reduced precision is anticipated for reported result for this Aroclor 1016 in this samp
B10A 2-3', B10A 2-3' DUP, B20A2-3' and B21A 2-3'		The surrogate recovery for Decachlorobiphenyl, Decachlorobiphenyl (2C) , Tetrachloro-m-xylene and Tetrachloro-m-xylene (2C) is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.
MSD-1		Matrix spike duplicate RPD is outside of control limits. Reduced precision is anticipated for reported result for this Aroclor 1016 in this samp

Prepared by: Mbradley **Date:** 7/8/2014

Reviewed by: **Date:**

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0170		

	CAM Methodology									
Analytical Method	**VOCs (8260B)**	**SVOCs (8270C)**	**Metals (6010B)**	**Mercury (7470A / 7471A)**	**Metals (7000)**	**Metals (6020A)**	**VPH (MADEP-VPH)**	**EPH (MADEP)**	**PCBs (8082A) with 3540 Soxhlet Extraction**	**Chlorinated Pesticides (8081A)**
CAM Revision	4	5	5	5	4	2	3	3	4	4
CAM Status	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final
Revision Date	5/28/2004	12/20/2007	5/28/2004	8/13/2004	8/13/2004	8/13/2004	9/10/2004	9/10/2004	8/20/2004	8/20/2004
Notes										
Soils										
No. Samples									20	
No. Duplicates									1	
Trip Blanks									0	
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

	CAM Methodology					Non-CAM Methodology				
Analytical Method	**Chlorinated Herbicides (8151A)**	**Aromatic / Chlorinated VOCs (8021B)**	**Total Cn & PAC (9014)**	**Hexavalent Chromium (7196A)**	**Nitroaromatics and Nitroamines (8330)**	**pH (9045)**	**2540 %Solids**	**PCBs (3450)**		
CAM Revision	2	2	2	3	2					
CAM Status	Final	Final	Final	Final	Final					
Revision Date	5/28/2004	5/28/2004	8/13/204	8/20/2004	8/27/2004			1996		
Notes										
Soils										
No. Samples										
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0170		

Trip Blanks									

Notes:

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0170		

Description of Samples Collected Inconsistent with GEC's Work Plan and / or Standard Operating Procedures

No issues noted

Sample methodology, sample locations / depths, equipment failure, trip blanks, duplicates, sample preservation, screening protocols, etc.

Description of Field Screening and Field Screening Data

Samples were collected in 5 foot intervals. GEC calculated the appropriate sample depths based upon recovery. GEC screened headspace of each 5 foot interval with a 10.6 eV PID
Several samples had slighlty elevated headspace reading, but were atributed residual de-con solution (capsur)used by the drilling contractor

Field screening methodology, equipment, data (attach data or provide reference to data), how screening data was used in decision making in the field.

Preparation of Chain of Custody

None noted

GEC requested method 3450 be conducted, but method 8082A with 3450 Soxhlet extraction was completed.

Sample ID, type, date and time collected, collectors name, preservation, filtration, and relinquished signatures, correct analyt method, requested detection limits.
Note any analyses that were performed outside of submitted COC, provide explanation for why.

Prepared by: Mbradley **Date:** 7/5/2014

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0170		

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet C: Sample Conditions, Holding Times, Sample Duplicates and Field Blanks

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0170		

Sample Conditions

Were there any issues with samples received by laboratory?	**Yes**		**No**	X	For any **Yes** answers, provide
Were there any issues with sample preservation?	**Yes**		**No**	X	further details below.
Were there any issues with type of sample container?	**Yes**		**No**	X	

Sample Condition Issues

Sample	Analysis	Description of Sample Condition Issue

Holding Times

Were any extraction / sample preparation holding times exceeded?	**Yes**		**No**	X	For any **Yes** answers, provide
Were any analytical holding times exceeded?	**Yes**		**No**	X	further details below.
Any evidence of gross failure for any sample (> 2 times holding time)?	**Yes**		**No**	X	

NA = Not Applicable // NI = No Information

Holding Time Issues

Sample	Analysis	Description of Holding Time Issue

Field Blanks / Field Duplicates / Matrix Spike

Were any drinking water samples analyzed?	**Yes**		**No**	X
If YES, were field duplicates, trip blanks, and / or matrix spikes collected and analyzed as required?	**Yes**		**No**	

Prepared by: Mbradley **Date:** 7/8/2014

Reviewed by: **Date:**

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0170		

Analytical Parameters

Were results for all analyte-list compounds/elements for specified method(s) reported? **Yes** [X] **No** [ ]

For **NO**, identify samples/analyses and provide reason why.

Analyte Issues

Sample	Analysis	Description of Analyte Issue

Sample Quality Control

Were any surrogate recoveries outside QC Limits for a sample? **Yes** [ ] **No** [X]

Was recovery data unavailable for any sample? **Yes** [X] **No** [ ]

For any **Yes** answers, provide further details below.

Sample Quality Control Issues

Sample	Analysis	Description of Sample Quality Control Issue
B48A 1-2', b48A 2-3', Comp1A 1-2', Comp1A 2-3', Comp!A 4-5', Comp5A 0-.5', Comp5A 0.5-1', Comp 6A 0.5-1' Comp6A 2-3' and Comp2A 0-0.5'	PCBs 8082	Sample fingerprint does not match standard exactly for analyte Aroclor 1248, 1248 (2C), 1254 and 1254 (2C). Sample was quantitated against the closest matching standard.
Comp1A 2-3', Comp1A 3-4', Comp2A 0.5-1' and Comp6A 2-3'	PCBs 8082	The surrogate recovery for Decachlorobiphenyl, Decachlorobiphenyl (2C) , Tetrachloro-m-xylene and Tetrachloro-m-xylene (2C) is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0170		

Laboratory Control Samples (LCS) and Method Blanks

	Yes	No	
Were any LCS or LCSD Limits exceeded for a LCS?		X	For any **Yes** answers, provide
Were any surrogate recoveries outside QC Limits for a LCS?	X		further details below.
Were any analytes detected in a Method Blank?		X	
Were any surrogate recoveries outside QC Limits for a Method Blank?		X	

LCS and Method Blank Issues

Samples Affected	Analysis	Description of LCS or Method Blank Issues

Other Issues for Laboratory Report / Data Set

	Yes	No	
Are there any other issues for this laboratory report or data set?		X	For any **Yes** answers, provide further details below.

Other Issues (e.g., Analytes or concentrations detected that are inconsistent with Site History or Conceptual Site Model; Analytical method modifications, etc.)

Sample	Analysis	Description of Other Issues

Prepared by: Mbradley **Date:** 7/8/2014

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet E: CAM, Pre-CAM, Non-CAM

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0170		

CAM, Non-CAM and Pre-CAM

Were all analytical methods CAM methods? **Yes** X **No** For **NO**, identify samples/analyses that are non-CAM

Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses	
Sample	**Analysis**	**Sample**	**Analysis**	**Sample**	**Analysis**

CAM Analyses

Do CAM analyses meet the requirements for Presumptive Certainty? **Yes** **No** X For **NO**, provide further details below.

Do all samples meet QC perform. standards and recomm.? **Yes** **No** X For **NO**, provide further details below.

Presumptive Certainty Exception		
Sample	**Analysis**	**Description of Presumptive Certainty Exception**
B48A 1-2', b48A 2-3', Comp1A 1-2', Comp1A 2-3', Comp!A 4-5', Comp5A 0-.5', Comp5A 0.5-1', Comp 6A 0.5-1' Comp6A 2-3' and Comp2A 0-0.5'	PCBs 8082	Sample fingerprint does not match standard exactly for analyte Aroclor 1248, 1248 (2C), 1254 and 1254 (2C). Sample was quantitated against the closest matching standard.
Comp1A 2-3', Comp1A 3-4', Comp2A 0.5-1' and Comp6A 2-3'	PCBs 8082	The surrogate recovery for Decachlorobiphenyl, Decachlorobiphenyl (2C) , Tetrachloro-m-xylene and Tetrachloro-m-xylene (2C) is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.

Prepared by: Mbradley **Date:** 7/8/2014

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0171		

	CAM Methodology									
Analytical Method	**VOCs (8260B)**	**SVOCs (8270C)**	**Metals (6010B)**	**Mercury (7470A / 7471A)**	**Metals (7000)**	**Metals (6020A)**	**VPH (MADEP-VPH)**	**EPH (MADEP)**	**PCBs (8082)**	**Chlorinated Pesticides (8081A)**
CAM Revision	**4**	**5**	**5**	**5**	**4**	**2**	**3**	**3**	**4**	**4**
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**
Revision Date	**5/28/2004**	**12/20/2007**	**5/28/2004**	**8/13/2004**	**8/13/2004**	**8/13/2004**	**9/10/2004**	**9/10/2004**	**8/20/2004**	**8/20/2004**
Notes										
Soils										
No. Samples										
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

	CAM Methodology					Non-CAM Methodology				
Analytical Method	**Chlorinated Herbicides (8151A)**	**Aromatic / Chlorinated VOCs (8021B)**	**Total Cn & PAC (9014)**	**Hexavalent Chromium (7196A)**	**Nitroaromatics and Nitroamines (8330)**	**pH (9045)**	**2540 %Solids**	**PCB Cogeners 8270M**		
CAM Revision	**2**	**2**	**2**	**3**	**2**					
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**					
Revision Date	**5/28/2004**	**5/28/2004**	**8/13/204**	**8/20/2004**	**8/27/2004**			1996		
Notes										
Soils										
No. Samples								8		
No. Duplicates								1		
Trip Blanks								0		
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0171		

Notes:

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0171		

Description of Samples Collected Inconsistent with GEC's Work Plan and / or Standard Operating Procedures

No issues noted

Sample methodology, sample locations / depths, equipment failure, trip blanks, duplicates, sample preservation, screening protocols, etc.

Description of Field Screening and Field Screening Data

Samples were collected in 5 foot intervals. GEC calculated the appropriate sample depths based upon recovery. GEC screened headspace of each 5 foot interval with a 10.6 eV PID
Several samples had slighlty elevated headspace reading, but were atributed residual de-con solution (capsur)used by the drilling contractor

Field screening methodology, equipment, data (attach data or provide reference to data), how screening data was used in decision making in the field.

Preparation of Chain of Custody

None noted

Sample ID, type, date and time collected, collectors name, preservation, filtration, and relinquished signatures, correct analyt method, requested detection limits.
Note any analyses that were performed outside of submitted COC, provide explanation for why.

Prepared by: Mbradley **Date:** 7/5/2014

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0171		

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet C: Sample Conditions, Holding Times, Sample Duplicates and Field Blanks

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0171		

Sample Conditions

Were there any issues with samples received by laboratory?	**Yes**		**No**	X	For any **Yes** answers, provide
Were there any issues with sample preservation?	**Yes**		**No**	X	further details below.
Were there any issues with type of sample container?	**Yes**		**No**	X	

Sample Condition Issues

Sample	Analysis	Description of Sample Condition Issue

Holding Times

Were any extraction / sample preparation holding times exceeded?	**Yes**		**No**	X	For any **Yes** answers, provide
Were any analytical holding times exceeded?	**Yes**		**No**	X	further details below.
Any evidence of gross failure for any sample (> 2 times holding time)?	**Yes**		**No**	X	

NA = Not Applicable // NI = No Information

Holding Time Issues

Sample	Analysis	Description of Holding Time Issue

Field Blanks / Field Duplicates / Matrix Spike

Were any drinking water samples analyzed?	**Yes**		**No**	X
If YES, were field duplicates, trip blanks, and / or matrix spikes collected and analyzed as required?	**Yes**		**No**	

Prepared by: Mbradley **Date:** 7/8/2014

Reviewed by: **Date:**

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0171		

Analytical Parameters

Were results for all analyte-list compounds/elements for specified method(s) reported? **Yes** [X] **No** [ ]

For **NO**, identify samples/analyses and provide reason why.

Analyte Issues

Sample	Analysis	Description of Analyte Issue

Sample Quality Control

Were any surrogate recoveries outside QC Limits for a sample? **Yes** [ ] **No** [X]

Was recovery data unavailable for any sample? **Yes** [X] **No** [ ]

For any **Yes** answers, provide further details below.

Sample Quality Control Issues

Sample	Analysis	Description of Sample Quality Control Issue
Comp 6A 0-0.5'	8270M	Matrix spike recovery and matrix spike duplicate recovery outside of control limits for Cl5-BZ#105, Cl5-BZ#118. Possibility of sample matrix effects that lead to a high bias for reported result or non-homogeneous sample aliquots cannot be eliminated.

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0171		

Laboratory Control Samples (LCS) and Method Blanks

Were any LCS or LCSD Limits exceeded for a LCS?	**Yes**		**No**	X
Were any surrogate recoveries outside QC Limits for a LCS?	**Yes**	X	**No**	
Were any analytes detected in a Method Blank?	**Yes**		**No**	X
Were any surrogate recoveries outside QC Limits for a Method Blank?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

LCS and Method Blank Issues

Samples Affected	Analysis	Description of LCS or Method Blank Issues
B092337-MS1, B092337-MSD1	8270M	Matrix spike recovery and matrix spike duplicate recovery outside of control limits for Cl5-BZ#105, Cl5-BZ#118. Possibility of sample matrix effects that lead to a high bias for reported result or non-homogeneous sample aliquots cannot be eliminated.

Other Issues for Laboratory Report / Data Set

Are there any other issues for this laboratory report or data set?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

Other Issues (e.g., Analytes or concentrations detected that are inconsistent with Site History or Conceptual Site Model; Analytical method modifications, etc.)

Sample	Analysis	Description of Other Issues

Prepared by: Mbradley **Date:** 7/8/2014

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet E: CAM, Pre-CAM, Non-CAM

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	3/13/2014
Laboratory:	ConTest	**Sample Date(s):**	3-4&5-2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14C0171		

CAM, Non-CAM and Pre-CAM

Were all analytical methods CAM methods? **Yes** [ ] **No** [X] For **NO**, identify samples/analyses that are non-CAM

Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses	
Sample	**Analysis**	**Sample**	**Analysis**	**Sample**	**Analysis**
All Samples	Congeners via 8270M				

CAM Analyses

Do CAM analyses meet the requirements for Presumptive Certainty? **Yes** [ ] **No** [X] For **NO**, provide further details below.

Do all samples meet QC perform. standards and recomm.? **Yes** [ ] **No** [X] For **NO**, provide further details below.

Presumptive Certainty Exception		
Sample	**Analysis**	**Description of Presumptive Certainty Exception**
Comp 6A 0-0.5'	8270M	Matrix spike recovery and matrix spike duplicate recovery outside of control limits for Cl5-BZ#105, Cl5-BZ#118. Possibility of sample matrix effects that lead to a high bias for reported result or non-homogeneous sample aliquots cannot be eliminated.
B092337-MS1, B092337-MSD1		

Prepared by: Mbradley **Date:** 7/8/2014

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	6/11/2014
Laboratory:	ConTest	**Sample Date(s):**	6/3/2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14F0128		

	CAM Methodology									
Analytical	**VOCs**	**SVOCs**	**Metals**	**Mercury**	**Metals**	**Metals**	**VPH**	**EPH**	**PCBs (8082A) with 3540 Soxhlet Extraction**	**Chlorinated Pesticides**
Method	**(8260B)**	**(8270C)**	**(6010B)**	**(7470A / 7471A)**	**(7000)**	**(6020A)**	**(MADEP-VPH)**	**(MADEP)**		**(8081A)**
CAM Revision	**4**	**5**	**5**	**5**	**4**	**2**	**3**	**3**	**4**	**4**
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**	**Final**
Revision Date	**5/28/2004**	**12/20/2007**	**5/28/2004**	**8/13/2004**	**8/13/2004**	**8/13/2004**	**9/10/2004**	**9/10/2004**	**8/20/2004**	**8/20/2004**
Notes										
Soils										
No. Samples									40	
No. Duplicates									0	
Trip Blanks									0	
Water										
No. Samples										
No. Duplicates										
Trip Blanks										

	CAM Methodology					Non-CAM Methodology				
Analytical	**Chlorinated Herbicides**	**Aromatic / Chlorinated VOCs**	**Total Cn & PAC**	**Hexavalent Chromium**	**Nitroaromatics and Nitroamines**	**pH**	**2540**	**PCB Cogeners**		
Method	**(8151A)**	**(8021B)**	**(9014)**	**(7196A)**	**(8330)**	**(9045)**	**%Solids**	**8270M**		
CAM Revision	**2**	**2**	**2**	**3**	**2**					
CAM Status	**Final**	**Final**	**Final**	**Final**	**Final**					
Revision Date	**5/28/2004**	**5/28/2004**	**8/13/204**	**8/20/2004**	**8/27/2004**			1996		
Notes										
Soils										
No. Samples										
No. Duplicates										
Trip Blanks										
Water										
No. Samples										
No. Duplicates										

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet A

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	6/11/2014
Laboratory:	ConTest	**Sample Date(s):**	6/3/2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14F0128		

Trip Blanks										

Notes:

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	6/11/2014
Laboratory:	ConTest	**Sample Date(s):**	6/3/2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14F0128		

Description of Samples Collected Inconsistent with GEC's Work Plan and / or Standard Operating Procedures

No issues noted

Sample methodology, sample locations / depths, equipment failure, trip blanks, duplicates, sample preservation, screening protocols, etc.

Description of Field Screening and Field Screening Data

Borings were advanced to the prescribed depth for sample collection and GEC made the determination of sampling intervals based on recoveries
GEC screened headspace at each sampling interval with a 10.6 eV PID

A few samples had slighlty elevated headspace reading, but GEC did not note the presence of any odors.

Field screening methodology, equipment, data (attach data or provide reference to data), how screening data was used in decision making in the field.

Preparation of Chain of Custody

None noted

Sample ID, type, date and time collected, collectors name, preservation, filtration, and relinquished signatures, correct analyt method, requested detection limits.
Note any analyses that were performed outside of submitted COC, provide explanation for why.

Prepared by: Mbradley **Date:** 7/8/2014

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet B: Prepared by Field Workers

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	6/11/2014
Laboratory:	ConTest	**Sample Date(s):**	6/3/2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14F0128		

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet C: Sample Conditions, Holding Times, Sample Duplicates and Field Blanks

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	6/11/2014
Laboratory:	ConTest	**Sample Date(s):**	6/3/2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14F0128		

Sample Conditions

Were there any issues with samples received by laboratory?	**Yes**		**No**	X
Were there any issues with sample preservation?	**Yes**		**No**	X
Were there any issues with type of sample container?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

Sample Condition Issues

Sample	Analysis	Description of Sample Condition Issue

Holding Times

Were any extraction / sample preparation holding times exceeded?	**Yes**		**No**	X
Were any analytical holding times exceeded?	**Yes**		**No**	X
Any evidence of gross failure for any sample (> 2 times holding time)?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

NA = Not Applicable // NI = No Information

Holding Time Issues

Sample	Analysis	Description of Holding Time Issue

Field Blanks / Field Duplicates / Matrix Spike

Were any drinking water samples analyzed?	**Yes**		**No**	X
If YES, were field duplicates, trip blanks, and / or matrix spikes collected and analyzed as required?	**Yes**		**No**	

Prepared by: Mbradley **Date:** 7/8/2014

Reviewed by: **Date:**

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	6/11/2014
Laboratory:	ConTest	**Sample Date(s):**	6/3/2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14F0128		

Analytical Parameters

Were results for all analyte-list compounds/elements for specified method(s) reported? **Yes** [X] **No** [ ]

For **NO**, identify samples/analyses and provide reason why.

Analyte Issues

Sample	Analysis	Description of Analyte Issue

Sample Quality Control

Were any surrogate recoveries outside QC Limits for a sample? **Yes** [ ] **No** [X]

Was recovery data unavailable for any sample? **Yes** [X] **No** [ ]

For any **Yes** answers, provide further details below.

Sample Quality Control Issues

Sample	Analysis	Description of Sample Quality Control Issue
ASC-1, ASC-4, ASC-5, ASC-6, B-51B 1-2', B51B (2-3), B-52B (1-2), B-52B (2-3), B-55B (2-3), B-55BB (3-5), B-56B (2-3), B-57B (1-2), B-57B (3-5), B-70 (2-5) B-72 (1-2)	8082	Sample fingerprint does not match standard exactly for Aroclor-1248, Aroclor-1248 [2C]. Sample was quantitated against the closest
B-69 (2-5) and B-71(1-2)	8082	The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration of Decachlorobiphenyl, Decachlorobiphenyl [2C], Tetrachloro-m-xylene, Tetrachloro-m-xylene [2C] and/or matrix interferences.

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet D: Analytical Parameters, Quality Control Parameters

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	6/11/2014
Laboratory:	ConTest	**Sample Date(s):**	6/3/2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14F0128		

Laboratory Control Samples (LCS) and Method Blanks

Were any LCS or LCSD Limits exceeded for a LCS?	**Yes**		**No**	X
Were any surrogate recoveries outside QC Limits for a LCS?	**Yes**		**No**	X
Were any analytes detected in a Method Blank?	**Yes**		**No**	X
Were any surrogate recoveries outside QC Limits for a Method Blank?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

LCS and Method Blank Issues

Samples Affected	Analysis	Description of LCS or Method Blank Issues

Other Issues for Laboratory Report / Data Set

Are there any other issues for this laboratory report or data set?	**Yes**		**No**	X

For any **Yes** answers, provide further details below.

Other Issues (e.g., Analytes or concentrations detected that are inconsistent with Site History or Conceptual Site Model; Analytical method modifications, etc.)

Sample	Analysis	Description of Other Issues

Prepared by: Mbradley **Date:** 7/8/2014

Reviewed by: _____ **Date:** _____

Goldman Environmental Consultants, Inc.
Data Enhancement Worksheet E: CAM, Pre-CAM, Non-CAM

Site Name:	Boot Mills	**Project No.:**	911JR-3117
Client:	Winn	**Laboratory Report Date:**	6/11/2014
Laboratory:	ConTest	**Sample Date(s):**	6/3/2014
Data Package Description:	Soil		
Lab Job / Batch Number:	14F0128		

CAM, Non-CAM and Pre-CAM

Were all analytical methods CAM methods? **Yes** [X] **No** [ ] For **NO**, identify samples/analyses that are non-CAM

Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses		Non-CAM or Pre-CAM Analyses	
Sample	**Analysis**	**Sample**	**Analysis**	**Sample**	**Analysis**

CAM Analyses

Do CAM analyses meet the requirements for Presumptive Certainty? **Yes** [ ] **No** [X] For **NO**, provide further details below.

Do all samples meet QC perform. standards and recomm.? **Yes** [ ] **No** [X] For **NO**, provide further details below.

Presumptive Certainty Exception		
Sample	**Analysis**	**Description of Presumptive Certainty Exception**
ASC-1, ASC-4, ASC-5, ASC-6, B-51B 1-2', B51B (2-3), B-52B (1-2), B-52B (2-3), B-55B (2-3), B-55BB (3-5), B-56B (2-3), B-57B (1-2), B-57B (3-5), B-70 (2-5) B-72 (1-2)	8082	Sample fingerprint does not match standard exactly for Aroclor-1248, Aroclor-1248 [2C]. Sample was quantitated against the closest
B-69 (2-5) and B-71(1-2)	8082	The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration of Decachlorobiphenyl, Decachlorobiphenyl [2C], Tetrachloro-m-xylene, Tetrachloro-m-xylene [2C] and/or matrix interferences.

Prepared by: Mbradley **Date:** 7/8/2014

Reviewed by: _____ **Date:** _____

ATTACHMENT 6

Soil Management Plan, Boott Mills, Remediation of PCB Soils in Excavation #1, Excavation #2 and Excavation #3, dated September 10, 2014

Soil Management Plan
Boott Mills – Exterior Courtyard PCB Release
Remediation of PCB Hot Spots
130 Foot of John Street
Lowell, Massachusetts
MADEP RTN: 3-26688

September 10, 2014

Introduction

This document describes a program for the excavation, processing and proper disposition of soil located in the exterior courtyard of 130 Foot of John Street in Lowell, Massachusetts. This document comports with the corrective action design plan outlined in the Release Abatement Measure Plan (RAM) Modification and Application for Risk-Based Cleanup of PCBs submitted to MADEP and USEPA Region I on September 10, 2014, and approved or presumptively approved by both. The exterior courtyard is the location of a release of polychlorinated biphenyls (PCBs) and heavy metals, especially lead. Polycyclic aromatic hydrocarbons (PAHs) are also present in the soils and are attributed to the presence of gasified coal and coal ash in the soils. PCBs are located in soils throughout the exterior courtyard, but three areas of elevated PCB contamination are present within the courtyard. This soil management plan is intended to: (1) support the excavation, handling, transport and disposal of the soils (i.e., remediation waste) excavated from the three areas, identified as PCB Hot Spot #1, PCB Hot Spot #2 and PCB Hot Spot #3; and (2) support the removal, handling, transport and disposal of asphalt and underlying base material from the entire exterior courtyard. Figure 7A, attached, depicts the exterior courtyard, known subsurface structures and the three proposed excavation areas.

Cleanup Standards for PCBs and Lead in Soils

Site-specific cleanup standards have been calculated for PCBs and lead in soils. These two contaminants of concern contributed the most to the cancer and / or non-cancer risk estimates. The lead exposure point concentrations were calculated as the mean concentration, with the highest lead exposure point concentration being 419 mg/kg. The levels of lead account for 50% or less of the total cancer and non-cancer risk estimates. The presence of lead is considered for this Soil Management Plan, because the risk attributable to lead is significant enough to impact the cleanup standard for PCBs. The site-specific cleanup standards for lead are provided in the table below.

Lead Cleanup Standard

450 mg/kg	This cleanup standard is not directly applied during remediation of the three PCB Hot Spots, because the remediation does not focus on reducing lead levels. It is calculated only because its presence reduces the possible level of the PCB cleanup levels.

The three PCB Hot Spots, described below, have levels of PCBs that require remediation. The remedial goals for PCBs are provided in the table below.

PCB Cleanup Standard

10 mg/kg	Following remediation, the exposure point concentration for PCBs must be no more than 10 mg/kg, with the exposure point concentration calculated as the 95th percentile upper confidence limit on the mean. This concentration also presumes that the TCDD Toxic Equivalent is 1.22E-05 mg/kg.
50 mg/kg	No individual soil sample can contain more than 50 mg/kg PCB, which is the Toxic Substances and Control Act (TSCA) risk limit maximum of 50 mg/kg when a cap is present for a low occupancy setting.

Protection of Nearby Receptors

The baseline risk assessment assumed that protections would be put in place during the remedial excavations to limit residential exposure to the exposed soils once the asphalt pavement is removed. Therefore, this plan must provide protections to ensure residential exposure is limited.

Following the completion of soil excavation, each excavation hole will be backfilled clean fill brought onto the site. The PCB release area will be subject to a Notice of Activity and Use Limitation following completion of remediation. The Notice of Activity and Use Limitation requires the maintenance of a protective barrier over the soils of the exterior courtyard. Therefore, immediately after completing the PCB Hot Spot remediation, including backfilling excavation, the exposed soils must be covered by a TSCA cap, consisting of six inches of asphalt underlain by six inches of processed gravel. Specifications for how the cap must be construction are provided in Section 4.2 of the Release Abatement Measure (RAM) Plan Modification Report and Application for Risk-Based Cleanup of Polychlorinated Biphenyls (PCBs), dated September 10, 2014.

Three PCB Hot Spot Areas

PCB Hot Spot #1 is located on the north side of the exterior courtyard, immediately north of the water line and immediately west of the fire hydrant. It is located along a portion of the south wall of Mill Building #5. It has a dimension of approximately 10 feet wide on the east-west axis to approximately 7 feet long on the north-south axis, and extends to 4 feet deep. Soil located in Hot Spot #1 from 0-4 feet below ground surface will be excavated and live loaded for transport and disposal. The estimated volume of soils to be excavated from this area for transport and disposal is 10 cubic yards. The levels of PCBs detected in soil samples collected from this area to be excavated for transport and disposal range up to 121 mg/kg.

PCB Hot Spot #2 is located on the southwest side of the exterior courtyard, immediately west of the stormwater system. It has a dimension of approximately 9 to 12 feet long on the south-north axis to approximately 12 feet wide on the north end of the east-west axis, and extends to 7 feet deep. Soil located in Hot Spot #2 from 0-7 feet below ground surface will be excavated and live loaded for transport and disposal. The

estimated volume of soils to be excavated from this area for transport and disposal is 32cubic yards. The levels of PCBs detected in soil samples collected from this area to be excavated for transport and disposal range up to 128.5 mg/kg. Utility lines (sewer and stormwater including a catch basin) are known or suspected to traverse this area and the stormwater system is located at the eastern edge of the planned excavation. Mill Building #3 is located on the southern edge of the proposed excavation area.

PCB Hot Spot #3 is located on the north side of the courtyard, immediately west of PCB Hot Spot #1. It is located along a portion of the south wall of Mill Building #5. It has a dimension of approximately 19 feet long on the south-north axis to approximately 10 feet wide on the north end of the east-west axis and 18 feet wide on the south end of the east-west axis, and extends to 5 feet deep. Soil located in Hot Spot #3 from 0-5 feet below ground surface will be excavated and live loaded for transport and disposal. The estimated volume of soils to be excavated from this area for transport and disposal is 43 cubic yards. The levels of PCBs detected in soil samples collected from this area to be excavated range up to 63.7 mg/kg. A utility line (water) is known or suspected to traverse through PCB Hot Spot #3 in an east-west direction.

The utility lines may need to be removed, diverted or supported during soil excavation. The foundation walls of the Mill Buildings and / or the stormwater system may need to be supported during soil excavation. The locations of each excavation are depicted on Figure 7A, attached. For each excavation, the horizontal and vertical boundaries of the excavations are known. The horizontal and vertical boundaries of the excavations have been determined based on previously collected soil samples where PCB concentrations were less than 50 mg/kg, the Site-specific cleanup standard. This value is intended to be consistent with the Toxic Substances Control Act (TSCA) risk limit maximum of 50 mg/kg when a cap is present.

Prior to excavation, soil samples were collected from each area to be excavated for disposal criteria testing. Based on the results of this testing, excavated soils from PCB Hot Spots #1 to #3 (PCBs > 50 mg/kg) will be tentatively sent to Waste Management Model City in Model City, New York for disposal. Final approval from this facility will be obtained after the USEPA Region I grants permission to perform the remedial work. Consistent with the requirements of TSCA, the soils will be excavated and live loaded for transport to the receiving facilities.

Within the exterior courtyard, the depth to groundwater is approximately 11 to 15 feet below grade. Therefore, de-watering of the excavations is not expected, except perhaps during a rain event.

Following the completion of excavation, confirmatory soil samples will be collected in accordance with Section 4.3 of the Release Abatement Measure (RAM) Plan Modification Report and Application for Risk-Based Cleanup of Polychlorinated Biphenyls (PCBs), dated September 10, 2014. After confirmatory sample collection the excavation will be lined with polyethylene sheeting to mark the extents of the excavation prior to backfilling the excavation with clean fill imported to the site. If confirmatory sampling indicates additional soils require removal, the clean fill will be excavated from the excavation to the polyethylene sheeting and placed aside for later re-use and additional excavation activities will be conducted followed by another round of confirmatory sampling. Once all excavations have been backfilled and the top one foot layer of asphalt/soil has been stripped across the entire exterior courtyard, a TSCA cap,

which will act as a protective barrier, must be installed over the soils of the exterior courtyard. This TSCA cap must be comprised of six inches of asphalt pavement underlain by a six inch base layer.

Asphalt Removal and Associated Base Material

The asphalt top will be removed from the entire exterior courtyard. The asphalt top is estimated to be between 4 and 6 inches thick. The underlying base layer will also be removed, because it will be difficult to ensure no soils are removed at the same time the asphalt is removed. Four asphalt/soil samples were collected from the top 12 inches in each of six areas of the exterior courtyard. For each area, designated ACS-1 to ACS-6, the asphalt/soil samples were composited and analyzed for PCBs. The composited asphalt/soil samples contained between 0.17 and 7.68 mg/kg PCBs. Two asphalt/soil composited samples, collected from the east end of the courtyard, contained more than 2 mg/kg PCB. Refer to Figure 5E, attached, for the distribution of PCB in the composited samples.

Based on the results of this testing, asphalt/soil removed from the top 12 inches of ACS-1 to ACS-4 will be sent for recycling to an asphalt batching plant. Asphalt/soil from the top 12 inches of ACS-5 and ACS-6 will be sent as PCBs < 50 mg/kg to Waste Management Turnkey in Rochester, New Hampshire. Final approval from the asphalt batching facility and Waste Management Turnkey will be obtained after the USEPA Region I grants permission to perform the remedial work. Consistent with the requirements of TSCA, the asphalt/soil material will be excavated and live loaded for transport to the asphalt batching facility or Waste Management Turnkey.

Program for Soil Excavation, Live Loading, and Management

The program described below will be implemented during the process of excavating soils from the three areas to be excavated and during the stripping of the top 12 inches of asphalt/soil across the entire exterior courtyard. All soils excavated from the hot spots and asphalt/soil stripped from areas ACS-1 thru ACS-6 will be live loaded for transport to three off-Site receiving facilities. This program will be overseen by Brian T. Butler, a duly Licensed Site Professional (LSP) and GEC.

A	**Site Preparation and Initial Authorizations**
(1)	Each receiving facility must authorize the acceptance of the remediation waste before beginning soil excavation and asphalt/soil stripping. Initial preparation of the Hazardous Waste Manifest and Bill of Lading must be started before soil excavation and/or asphalt/soil stripping begins.
(2)	Hay bales will be placed around storm water catch basins to mitigate soils entering the storm drains.
(3)	Access to the exterior courtyard or portion of the exterior courtyard will be limited through the use of temporary fences during the course of the project, until the soils of the excavation area are replaced and the protective barrier is installed. The fencing may be removed during actual work.
B	**Sequence of Excavation/Stripping Events**
(1)	Excavation of the hot spot areas will be conducted first. Each hot spot will be excavated independently, in no particular order. Excavation of the remediation

	waste from within each hotspot to the designated depths and extents as described below in Part C will be conducted. Live loading of remediation waste is required. Therefore, a staging area will be set up for loading trucks with excavated soils and for cleaning the trucks prior to leaving the site. Refer to the Decontamination Procedures document attached for specifics on how the staging/decontamination areas should be set up and how trucks should be cleaned prior to leaving the Site.
(2)	After excavation is completed to the depths and extents described in Part C, confirmatory soil samples will be collected in accordance with Section 4.3 of the Release Abatement Measure (RAM) Plan Modification Report and Application for Risk-Based Cleanup of Polychlorinated Biphenyls (PCBs), dated September 10, 2014.
(3)	Following confirmatory soil sampling each hot spot excavation will be lined with polyethylene sheeting to note the extents of the excavation and backfilled with clean fill brought onto the site to reduce the risk of someone contacting the soils or falling into the excavation.
(4)	After excavation of Hot Spots #1 thru #3 are complete, all equipment used during the excavation activities must be decontaminated. An equipment decontamination area will be established for cleaning the backhoe shovel (and treads, if applicable), trucks and other equipment that was used in the excavation activities. Refer to the Decontamination Procedures document attached for specifics pertaining to decontaminating equipment.
(5)	The pavement and underlying base (combined top 12 inches) will be removed from the exterior courtyard to allow installation of the TSCA cap. Stripping of the asphalt/soil from areas ACS-5 and ACS-6 will be conducted first. Asphalt/soil removed from areas ACS-5 and ACS-6 will be live loaded for transport and disposal.
(6)	After stripping asphalt/soil from areas ACS-5 and ACS-6, all equipment used during the stripping activities must be decontaminated. An equipment decontamination area will be established for cleaning the backhoe shovel (and treads, if applicable), trucks and other equipment that was used in the stripping activities. Refer to the Decontamination Procedures document attached for specifics pertaining to decontaminating equipment.
(7)	Stripping of the asphalt/soil from areas ACS-1 thru ACS-4 will be conducted next. Live loading of the removed asphalt/soil from areas ACS-1 thru ACS-4 is required.
(8)	After stripping asphalt/soil from areas ACS-1 thru ACS-4, all equipment used during the stripping activities must be decontaminated. An equipment decontamination area will be established for cleaning the backhoe shovel (and treads, if applicable), trucks and other equipment that was used in the stripping activities. Refer to the Decontamination Procedures document attached for specifics pertaining to decontaminating equipment.
(9)	The TSCA cap must be installed. The TSCA cap, will be comprised of six inches of asphalt pavement over six inches of a processed gravel base layer, and will be installed over the entire courtyard.

C.	**Controlled Excavation**
(1)	Soils will be excavated from PCB Hot Spots #1 to #3. During the soil excavation program, shoring or other engineering controls may be used to protect the building foundations, stormwater system and utility lines. If needed, the utility lines may be temporarily relocated or supported to allow for access to the soils.
(2)	PCB Hot Spot #1: Excavation must include the areas of test borings B-10 and B-10A. PCB Hot Spot #1 will be excavated to the east up to the fire hydrant and its supply line, to the southern wall of the Mill #5 building, to near boring B-17 on the west where PCB concentrations are known to be non-detect in soil samples collected from the 0-3, 3-5 and 5-7 foot intervals, and to near boring B-57B where PCB concentrations are known to be no more than 5.2 mg/kg based on soil samples collected from the 1-2, 2-3 and 3-5 foot intervals. PCB Hot Spot #1 will be excavated to a depth of 4 feet below grade, below which PCB concentrations are known to be less than 50 mg/kg based on previously collected soil sample (B-10 3-6' = 1.1 mg/kg PCB). The water line will servicing the fire hydrant may have to be supported or temporarily removed to allow excavation.
(3)	PCB Hot Spot #2: Excavation must include the areas of test borings B-4, B-26, B-72 and B-73. PCB Hot Spot #2 will be excavated to the western edge of the stormwater system, to the northern wall of the Mill #3 building, to near boring B-8 to the west, and to borings B-38, B-38A and B-71 where PCB concentrations are known to be less than 50 mg/kg based on previously collected soil samples. PCB Hot Spot #2 will be excavated to a depth of 7 feet below grade where PCB concentrations are known to be less than 50 mg/kg based on previously collected soil samples (B-26 7-9', and B-38 9-12').
(4)	PCB Hot Spot #3: Excavation must include the areas of test borings B-2, B-2A, B-20 and B-20A. Excavation #3 will be excavated to the southern wall of the Mill #5 building to the north, to the stormwater system to the south, to borings B-9, B-16 and B-16A to the east where PCB concentrations are known to be less than 50 mg/kg, and to near borings B-48 and B-48A to the west where PCB concentrations are known to be less than 50 mg/kg based on previously collected soil samples. PCB Hot Spot #3 will be excavated to a depth of 5 feet below grade where PCB concentrations are known to be less than 50 mg/kg based on previously collected soil samples (B-16 5-7', 7-9' and 9-12').
D.	**Off-Site Transportation of Remediation Waste**
(1)	Temporary on-Site storage of soils excavated from the hot spots is not allowed. As discussed above, all soils excavated from Hot Spot #1 to #3 will be live loaded. Asphalt/soil removed from areas ACS-1 to ACS-6 will be live loaded as discussed above.
(2)	Live loading of all soils excavated from the hot spots and all asphalt/soil excavated from areas ACS-1 thru ACS-6 will be conducted. The loads in all trucks will be covered and trucks decontaminated in accordance with the attached Decontamination Procedures at the truck cleaning area before leaving the site. Truck cleaning will be utilized by all vehicles to minimize off-site road mud.
E.	**Temporary Work Stoppage**
(1)	At the end of each work day, the excavation will be covered with metal plates or a

	temporary fencing will be placed around the excavation to reduce the risk of someone contacting the soils or falling into the excavation. The metal plates or temporary fencing will be maintained until the protective barrier is re-installed. At the end of each work day during asphalt/stripping activities; the courtyard must be fenced off to prevent someone from contacting the soils. The fencing must be maintained until the protective barrier is re-installed.
F.	**Confirmatory Soil Sampling Plan**
(1)	Following the completion of soil excavation within each excavation area (i.e., PCB Hot Spot #1, #2 and #3), soil samples will be collected in accordance with Section 4.3 of the Release Abatement Measure (RAM) Plan Modification Report and Application for Risk-Based Cleanup of Polychlorinated Biphenyls (PCBs), dated September 10, 2014. The soil samples will be properly preserved in accordance with MADEP CAM and submitted under chain-of-custody documentation for analysis of PCBs via EPA Method 8082A, with Soxhlet extraction. Extraction and analysis timelines will be in accordance with the EPA methodology and CAM requirements.
G.	**Backfill of Excavation Areas and Installation of TSCA Cap**
(1)	Following the completion of excavation activities as described in Section C – Controlled Excavation, the excavations will be backfilled with clean fill brought onto the site. Prior to backfilling, each excavation will be lined with polyethylene sheeting to note the extents of the excavation incase confirmatory samples indicate additional excavation is needed.
(2)	A TSCA cap, comprised of six inches of asphalt pavement over six inches of a processed gravel base layer, will be installed over the entire courtyard. This TSCA cap will be a protective barrier that must be inspected and maintained into the future.
H.	**Construction Mitigation Measures and Monitoring**
(1)	Dust suppression and control shall be maintained in accordance with the Dust Monitoring Procedures, attached. At the end of each work day and prior to repaving the courtyard, the openings in the pavement shall be covered by a weighted tarp and the courtyard fenced off to prevent someone from contacting the soils. The use of water to decontaminate trucks, clean the pavement or to wet the soils must be monitored carefully so that runoff does not impact storm drain basins.
(2)	Although significant volatile contamination is not known to be present in the soils of the exterior courtyard; air monitoring of volatile organic compounds during soil excavation will be conducted. Dust suppression measures and dust monitoring should be conducted in accordance with the Dust Monitoring Procedures, attached.
(3)	Excavation activities shall be limited to daylight hours.

DECONTAMINATION PROCEEDURES

Decontamination of field equipment is necessary to minimize the potential for the release of contamination beyond the exclusion zone of the site, reducing health hazards associated with the spread of contaminants; and to ensure the quality of samples by preventing cross-contamination. The following decontamination procedures are based on EPA regulations 40 CFR § 761.360, Subpart S.

REQUIRED SUPPLIES

Large Equipment Decontamination: drill rig, excavator, backhoe/loader, etc.

- Decontamination pad with a foot-print larger that the equipment to be decontaminated, and capable of retaining all removed contaminated material and wash water.
- Simple Green All Purpose Cleaner/Degreaser
- Methanol
- 2- to 5- gal manual-pump sprayer (pump sprayer material must be compatible with the solution used).
- Absorbent pads and stiff-bristle brushes that are not dissolved by the solvents/cleaners used, and that do not shred, crumble, or leave visible fragments on the surface.
- Gloves, goggles, boots, and other protective clothing that are resistant to the solvents/cleaners used.

Small Equipment Decontamination: split spoon soil sampler, bowls, dredges etc.

- 5-gal plastic buckets and/or troughs big enough to fully contain the sampling equipment.
- Simple Green All Purpose Cleaner/Degreaser
- Methanol
- 2- to 5- gal manual-pump sprayer (pump sprayer material must be compatible with the solution used.
- Absorbent pads and stiff-bristle brushes that are not dissolved by the solvents/cleaners used, and that do not shred, crumble, or leave visible fragments on the surface.
- Gloves, goggles, and other protective clothing that are resistant to the solvents/cleaners used.

PROCEDURES

Same Procedures Apply to Both Heavy Equipment Decontamination and Small Equipment Decontamination

1. Set up a decontamination pad that is large enough to fully contain the equipment to be cleaned and that will contain all wash and rinse water used.
2. **First Wash:**
   a. Cover the entire surface of equipment to be decontaminated with Simple Green All Purpose Cleaner/Degreaser. Contain and collect all cleaning solutions for proper disposal.
   b. Scrub rough surfaces with a stiff-bristle brush, adding cleaning solution such that the surface is always very wet.
      i. Wash each 1 square foot area for one minute.
      ii. Wash any surface <1 square foot for 1 minute.
   c. Wipe smooth surfaces with a cleaning solution soaked disposable absorbent pad
      i. Wash each 1 square foot area for one minute.
      ii. Wash any surface <1 square foot for 1 minute.
   d. Mop up or absorb the residual cleaner solution and suds from all surfaces with clean disposable, absorbent pads until the surface appears dry. *Note: This cleaning should remove any residual dirt, dust, grime, or other absorbent materials left on the surface during the first wash.*
3. **First Rinse:**
   a. Rinse off the wash solution with 1 gallon of clean water per square foot of equipment and capture the rinse water.
   b. Mop up the wet surface with clean, disposable, absorbent pad until the surface appears dry.
4. **Second Wash:**
   a. Cover the entire surface with methanol – contain and collect any runoff solvent for disposal.
   b. Scrub rough surfaces with a stiff-bristle brush, adding methanol such that the surface is always very wet.
      i. Wash each square foot area for 1 minute.
      ii. Wash any surface <1 square foot for 1 minute.
   c. Wipe smooth surfaces with a methanol soaked disposable absorbent pad.
      i. Wash each square foot area for 1 minute.
      ii. Wash any surface <1 square foot for 1 minute.
   d. Mop up or absorb the residual methanol from all surfaces with clean disposable, absorbent pads until the surface appears dry.

5. **Second Rinse:**
    a. Wet the entire surface with clean methanol such that all surfaces are very wet for 1 minute and capture the rinse methanol.
    b. Wipe of the residual methanol from the surfaces using a clean, disposable absorbent pad until no liquid is visible on the surface.
6. **Documenting Decontamination:**
    a. Record equipment type, date, time in logbook and document decontamination with pictures. All decontamination documentation must be maintained for three years.
7. **Cleanup After Decontamination:**
    a. After decontamination activities are completed, collect all contaminated waters, used solvents, plastic sheeting, and disposable gloves, boots, and clothing. Place contaminated items in properly labeled drums for disposal. Liquids and solids must be drummed separately.
        i. All wash water, rinse water, methanol and decontamination solutions that have come in contact with contaminated equipment are to be handled, packaged, labeled, marked, stored, and disposed of as hazardous waste.
        ii. All solids, (i.e., plastic sheeting, scrub brushes, absorbent pads, disposable gloves, boots and clothing that have come in contact with contaminated equipment are to be handled, packaged, labeled, marked, stored, and disposed of as hazardous waste.

DUST MONITORING PROCEDURES

Dust monitoring is necessary to minimize the potential for exposure to contamination within and beyond the exclusion zone of the site, reducing health hazards, and to prevent fugitive migration of contamination.

GENERAL STANDARD OPERATING PROCEDURS

Notify Interested Parties and Plan for Emergencies

- Communicate the goals, type, and length of projects and specific behavior rules to the affected groups (onsite workers and residence).
- Have an emergency contact list (hospitals, police, etc.).
- Prevent unauthorized persons from entering the site.

Take General Protective Measures

- Ensure workers are properly trained.
- Choose the method that minimizes the amount of dust generated.
- Choose methods that protect workers, building users, passersby, and the surroundings of the remediation project.
- Use proper containers to hold excavated material.
- Use gloves and skin protection.
- Use eye goggles during windy conditions.
- Do not smoke, drink, or eat in the work area.
- Wash hands prior to breaks.

Exterior Areas

- Mark off the work areas to keep non-workers away.
- Cover any plants with heavy plastic sheeting.
- Close windows and doors near the work area.
- Cover the excavate material prior to off-site disposal.

Leave the Work Area Clean

- Put trash and debris in heavy-duty plastic bags.
- Ensure tools, equipment, and workers, are free of dust and debris before leaving the work area.
- Remind residents to stay out of the work area. When the job is complete:
    - Remove any plastic sheeting carefully, mist with water, fold dirty side in, tape shut, and dispose of it.
    - Check the work area for dust. If any dust or debris is present, then wet the area to reduce the potential for dust from being picked up by the wind.

SITE SPECIFIC PROCEDURES

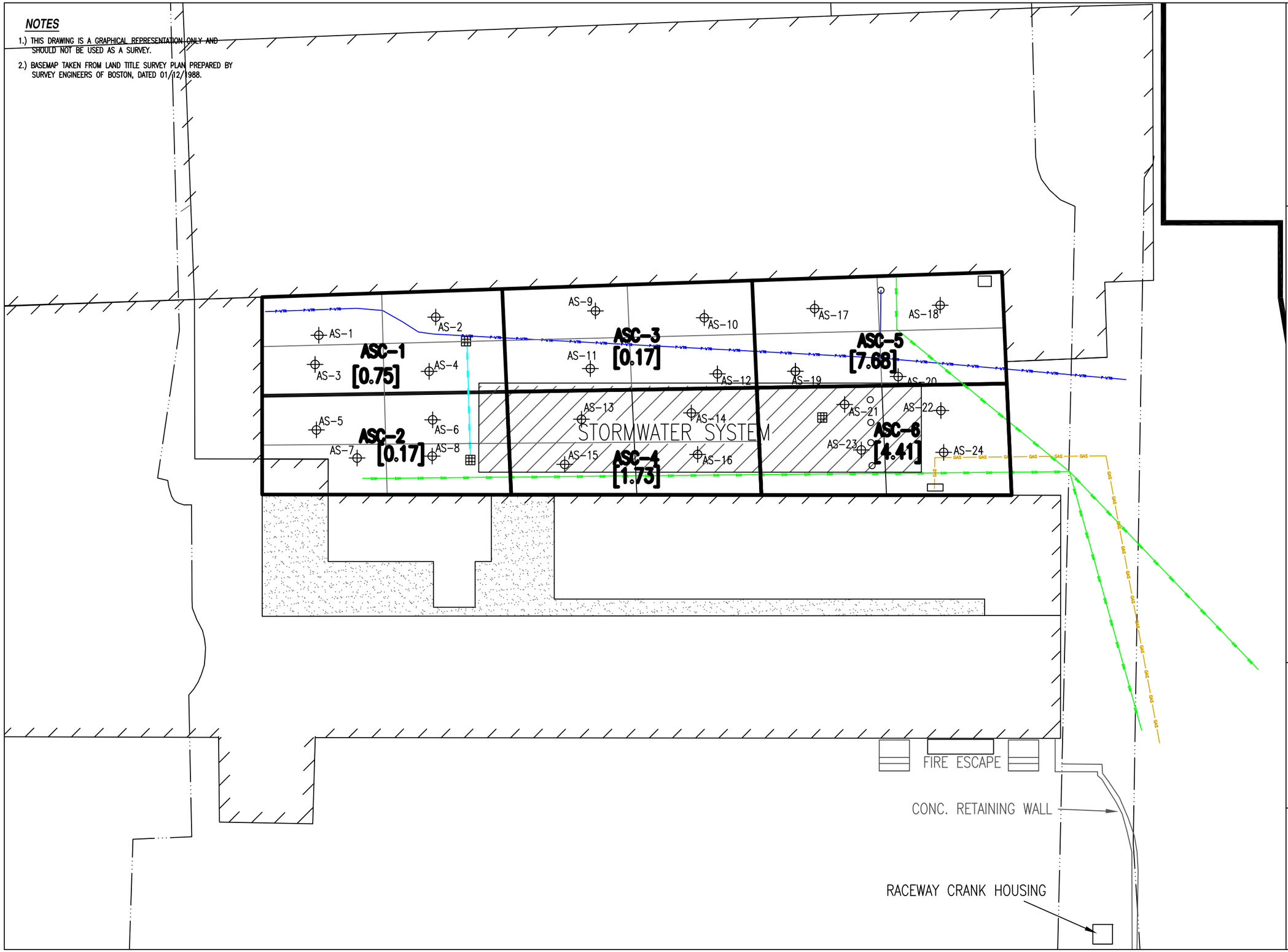
Same Procedures Apply to Soil Excavation, Loading, and Backfill

1. Once the asphalt is removed and the soils are exposed, lightly spray the surface with water to prevent dust generation. Continue to monitor the soil moisture and apply water to the excavation area and the excavate material as needed, and if the soils are dry during windy conditions.
2. If site conditions become windy, and excessive dust generation is likely, stop work and apply water to the area, including any stockpiled or loaded soil in trucks.
3. During overnight work stoppage, cover the excavation and excavate material with polyethylene sheets. Once a truck has been loaded for off-site transport of the material, cover the soil within the truck with a heavy tarp.
4. Once the excavation work has been completed, shovel, sweep or wash residual soil/dust on the pavement into the excavation.
5. Dust suppression and control shall be maintained in the excavation areas, and off-site haul roads by keeping surfaces wet and clean to prevent wind-blown dust and road mud and debris from occurring during excavation. The nearest access road and access gate area shall be kept clean during excavation activities. If necessary use street sweepers and wet by sprinkling the road surfaces with a tank, gauges, pressure pump and nozzle spray bar. Water shall be dispersed through the nozzle under a minimum pressure of 20 pounds per square inch pressure gauge. Water shall be free from oil, acid and alkali or vegetative matter and shall not be salt or brackish.
6. Air monitoring shall be provided continuously during excavation activities for PM-10 in real time data. Air monitoring shall be coordinated by GEC. Handheld monitors (Thermo Scientific personal DataRAM pDR-1000AN, or similar equipment) shall be used and placed on site down gradient of the established prevailing wind direction prior to initiating excavation activities. Daily fugitive dust levels shall be recorded and assessed to determine the effectiveness of the dust suppression measures and necessary additional mitigation measures.
7. If significant airborne dust is identified, all construction activities shall be temporarily stopped until additional dust suppression (water) is applied to any open excavations or stockpiled material.
8. Organic compounds shall also be monitored during excavation activities using handheld photo ionization detectors (PID). Recorded levels of organic vapor and visual olfactory screening shall be used to determine total organic vapor (TOV) levels during excavation.

NOTES

1.) THIS DRAWING IS A GRAPHICAL REPRESENTATION ONLY AND SHOULD NOT BE USED AS A SURVEY.

2.) BASEMAP TAKEN FROM LAND TITLE SURVEY PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON, DATED 01/12/1988.



Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Shallow Asphalt Sample
- [0.75] Combined PCB Concentration (mg/kg)

Site Plan
(Eastern Courtyard showing Combined Asphalt/Soil PCB Concentrations - 2014 Data)

Boott Mills
130 John Street
Lowell, Massachusetts

GEC Project Number 911-3117
GEC File Number 071414A

FIGURE 5E

SCALE
0 10' 20'

N

NOTES

1.) THIS DRAWING IS A GRAPHICAL REPRESENTATION ONLY AND SHOULD NOT BE USED AS A SURVEY.

2.) BASEMAP TAKEN FROM LAND TITLE SURVEY PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON, DATED 01/12/1988.

RESIDENTIAL UNITS

EXTERIOR (EASTERN) COURTYARD

RACEWAY #2

RACEWAY #6, 7, 8

HOT SPOT #3 (2-5 FEET)

HOT SPOT #1 (2-4 FEET)

HOT SPOT #2 (2-7 FEET)

STORMWATER SYSTEM

PATIO

DIRT

(BOILER ROOM)

(WOOD FLOORING)

MILL #3

FIRE ESCAPE

CONC. RETAINING WALL

RACEWAY CRANK HOUSING

GAS METER

HYDRANT

W.G.

B-1, B-2/GEC-1, B-2A, B-3, B-4/GEC-2, B-5/GEC-3, B-6, B-7, B-8, B-9, B-10/GEC-5, B-11, B-11A, B-12/GEC-6, B-13, B-14, B-15, B-16, B-16A, B-17, B-18, B-19, B-20, B-20A, B-21, B-21A, B-22, B-23, B-25, B-26, B-27, B-27A, B-28, B-29, B-30, B-31, B-32, B-33, B-34, B-35, B-36, B-37, B-38, B-39, B-40, B-41, B-41A, B-42, B-42A, B-43, B-44, B-44A, B-45, B-45A, B-46, B-46A, B-47, B-47A, B-48, B-48A, B-49, B-49A, B-50, B-50A, B-51, B-51A, B-51B, B-52, B-52A, B-52B, B-53, B-54, B-55, B-55A, B-55B, B-56, B-56A, B-56B, B-57, B-57A, B-57B, B-58, B-58A, B-59, B-59A, B-60, B-60A, B-61, B-61A, B-63, B-64, B-65, B-66, B-67, B-68, B-69, B-70, B-71, B-72, B-73, SV-1, SV-2

Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Soil Boring/ Monitoring Well
- Soil Boring
- Catch Basin
- Wall-Mounted Transformer
- Soil Vapor Point
- Hot Spot Area > 50 ppm PCBs

Eastern Courtyard Plan
Excavation Areas to Achieve 50 mg/kg PCB Cleanup Standard

Boott Mills
130 John Street
Lowell, Massachusetts

GEC Project Number 911-3117
GEC File Number 071414A

FIGURE 7A

SCALE 0 10' 20'

N

ATTACHMENT 7

Soil Management Plan, Boott Mills, Post-Permanent Solution Utility Repair Projects, dated July 6, 2014

Soil Management Plan
Boott Mills – Exterior Courtyard PCB Release
for "Post-Permanent Solution with Conditions" Utility Repair Projects
130 Foot of John Street
Lowell, Massachusetts
MADEP RTN: 3-26688

July 6, 2014

Introduction

This document describes a program for the excavation, processing and proper disposition of soil located in the exterior courtyard release area of 130 Foot of John Street in Lowell, Massachusetts. This document comports with the requirements of the Permanent Solution with Conditions and provisions of the Notice of Activity and Use Limitation for the exterior courtyard release area. The Notice of Activity and Use Limitation is recorded at the Middlesex North Registry of Deeds at Book ____, Page ____ on XXXX, __, 2014. The Permanent Solution was submitted to the Massachusetts Department of Environmental Protection on XXXX __, 2014. The boundaries of the area subject to the Soil Management Plan are the same as the area subject to the Notice of Activity and Use Limitation, and include the entire exterior courtyard and the land beneath Mill Building #5. These boundaries are depicted in Figure 3D, attached.

This Soil Management Plan is intended for use during utility line repair, maintenance or installation, where no more than 20 cubic yards of soils will be excavated and all soils will be returned to the utility trench upon completion of the project. For construction projects and all other utility projects where more than 20 cubic yards of soil will be excavated or soils will be transported off-Site, a separate project-specific Soil Management Plan will be required.

The soils of the Exterior Courtyard area are contaminated with PCBs and heavy metals, in particular lead. Based on the results of a Method 3 Risk Characterization, exposure to residents must be limited during soil excavation. Therefore, this plan must provide protections to ensure residential exposure is limited.

The depth to groundwater is approximately 11 to 15 feet below grade. Therefore, de-watering of the excavation is not expected, except perhaps during a rain event.

Program for Soil Excavation, Backfilling and Management

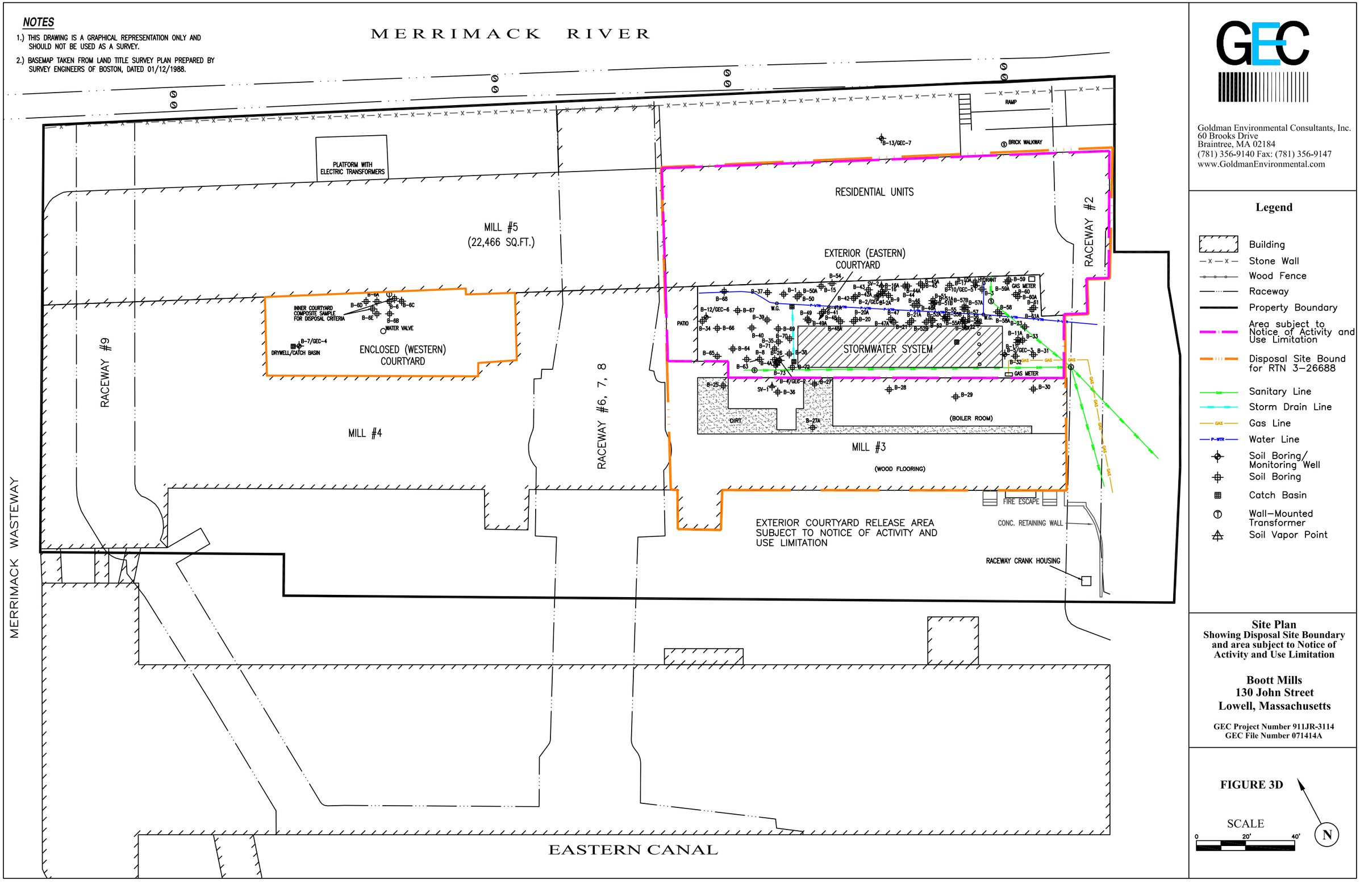
The program described below will be implemented during utility repair, maintenance or installation activities. This Soil Management Plan has been prepared under the direction of Brian T. Butler, a duly Licensed Site Professional (LSP) and GEC. This Soil Management Plan must be kept on-Site in case emergency utility repair is required.

A	**Initial Activities**
(1)	The Licensed Site Professional must be contacted prior to initiating non-emergency utility repair, maintenance or installation work, to ensure the requirements of the Soil Management Plan are followed.
(2)	During an emergency utility repair, the Licensed Site Professional must be contacted as soon as possible.
(3)	Hay bales will be placed around storm water catch basins to mitigate soils entering the storm drains. In the case of an emergency utility repair, the hay bales will be placed as soon as practical.
(4)	Access to the exterior courtyard or portion of the exterior courtyard will be limited through the use of temporary fences or signs during the course of the project, until the soils of the excavation area are replaced and the protective barrier is re-installed. The fencing may be removed during actual work.
(5)	An area should be designated for temporary storage of excavated soils. Either tarps or container(s) capable of holding up to 20 cubic yards of soils should be obtained.
(6)	LSP Contact Information: Brian T. Butler, Goldman Environmental Consultants, Inc. Work: 781-356-9140 x113 Cell: 781-799-0385 Email: bbutler@goldmanenvironmental.com
B.	**Controlled Excavation**
(1)	Remove the portion of the protective barrier (i.e., pavement or foundation floor) from the area where the utility trench will be located. Remove soils from the utility trench and either place soils in one or more containers, or stockpile soils on a tarp.
C.	**Off-Site Transportation of Remediation Waste**
(1)	Off-site transport of excavated soils (i.e., remediation waste) is not allowed under this Soil Management Plan.
D.	**Temporary Work Stoppage**
(1)	If the project is not completed in one day, at the end of each work day, the utility trench will be covered with tarp, and temporary fencing will be placed around the work area (including trench and stockpiled or containerized soils) to reduce the risk of someone contacting the soils or falling into the trench. The tarp and temporary fencing will also be kept in place until the protective barrier is re-installed.
(2)	If the project is not completed in one day, at the end of the day, if excavated soils are stockpiled on a tarp, the stockpile must be covered with a weighted tarp, or if excavated soils are located in containers, the containers must be covered, to minimize the chance of direct contact, fugitive dusts and surficial runoff during a rain event.
E.	**Confirmatory Soil Sampling Plan**
(1)	No confirmatory soil sampling is required.
F.	**Backfill of Utility Trench and Repair of TSCA Cap**
(1)	Following completion of the utility project, the stockpiled or containerized soils should be returned to the utility trench.
(2)	The asphalt removed to allow utility repair work is part of a TSCA cap (over exterior courtyard) or protective barrier (beneath Mill Building #5). Therefore, the portion of the cap or protective barrier removed for the utility project should be re-installed. For the exterior courtyard, the TSCA cap must be six (6) inches of asphalt pavement underlain by six inches of a processed gravel base layer. For the building foundation floor, the protective barrier must be concrete at the same thickness as the existing floor.

NOTES

1.) THIS DRAWING IS A GRAPHICAL REPRESENTATION ONLY AND SHOULD NOT BE USED AS A SURVEY.

2.) BASEMAP TAKEN FROM LAND TITLE SURVEY PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON, DATED 01/12/1988.



Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184
(781) 356-9140 Fax: (781) 356-9147
www.GoldmanEnvironmental.com

Legend

- Building
- Stone Wall
- Wood Fence
- Raceway
- Property Boundary
- Area subject to Notice of Activity and Use Limitation
- Disposal Site Bound for RTN 3-26688
- Sanitary Line
- Storm Drain Line
- Gas Line
- Water Line
- Soil Boring/ Monitoring Well
- Soil Boring
- Catch Basin
- Wall-Mounted Transformer
- Soil Vapor Point

Site Plan
Showing Disposal Site Boundary and area subject to Notice of Activity and Use Limitation

Boott Mills
130 John Street
Lowell, Massachusetts

GEC Project Number 911JR-3114
GEC File Number 071414A

FIGURE 3D

SCALE
0 20' 40'

N

ATTACHMENT 8

Feasibility Evaluation of PCB Remedial Alternatives

GEC Project No. 911-3117

FEASIBILITY EVALUATION FOR PCB REMEDIAL ALTERNATIVES EASTERN EXTERIOR COURTYARD

BOOTT MILLS
130 FOOT of JOHN STREET
LOWELL, MASSACHUSETTS
MADEP RTN: 3-26688

September 2014

Prepared For:
Boott Mill Developer LLC
6 Faneuil Hall Marketplace
Boston, MA 02109

Submitted to:
Massachusetts Department of Environmental Protection
Northeast Regional Office
205 B Lowell Street
Wilmington, Massachusetts 01887

and

EPA New England, Region 1
5 Post Office Square - Suite 100
Boston, MA 02109-3912

GEC Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA 02184-3839
781-356-9140 FAX 781-356-9147
www.goldmanenvironmental.com

TABLE OF CONTENTS

SECTION		PAGE
1.0	INTRODUCTION & BACKGROUND	1
2.0	REMEDIAL GOALS	1
3.0	PERFORMANCE STANDARDS	2
4.0	IDENTIFICATION AND SCREENING OF TECHNOLOGIES	3
	4.1 Identification and Initial Screening of Technologies/Process Options	3
	4.2 Findings of Initial Screening of Technologies/Process Options	10
	4.3 Detailed Evaluation of Remedial Alternatives	11
	4.4 Summary of Appropriate Technologies	12
5.0	COMPARISON AND SELECTION OF REMEDIAL ALTERNATIVES	13
6.0	FEASIBILITY OF ACHIEVING OR APPROACHING BACKGROUND	16
7.0	SCHEDULE FOR IMPLEMENTATION OF REMEDIAL ALTERNATIVES	17
8.0	WARRANTY	18

TABLES

Table 1: Comparative Evaluation of Remedial Alternatives

Table 2: Estimated PCB Concentrations Post-Excavation of Three Areas

1.0 INTRODUCTION & BACKGROUND

Goldman Environmental Consultants, Inc. (GEC) on behalf of Boott Mill Developer, LLC, the property owner, prepared this Feasibility Evaluation of Remedial Alternatives to support a *Revised Release Abatement Measure (RAM) Plan Modification Report and Application for Risk-Based Cleanup of Polychlorinated Biphenyls (PCBs)* for the release of oil and hazardous materials (OHM) to soil located at 130 Foot of John Street in Lowell, Massachusetts. The release is mostly within two courtyards associated with 130 Foot of John Street. The eastern exterior courtyard is impacted by a release of PCBs and lead. The western interior courtyard is impacted by a release of lead. The PCB release is assigned release tracking numbers (RTN) 3-26688, which is the primary RTN for the property. RTN 3-30667 is a secondary RTN linked to RTN 3-26688, and is associated with the lead release.

The following report was prepared to support the decision to conduct a partial excavation of contaminated soils and to place a cap over the eastern courtyard. The cap will comply with TSCA regulations. Based on the results of the Method 3 Risk Characterization, documented in the *Revised RAM Plan Modification Report and Application for Risk-Based Cleanup of PCBs,* the function of the cap is to be a protective cover, limiting direct contact to soils of the eastern courtyard, except during utility work in the future. This report was prepared in accordance with the Phase III provisions of Massachusetts General Law (M.G.L.) Chapter 21E and the MCP, 310 CMR 40.0000.

2.0 REMEDIAL GOALS

GEC derived Site-specific PCB cleanup standards in the initial *RAM Plan Modification and Application for Risk-Based Cleanup of PCBs*. Based on additional investigations conducted in response to EPA Region I's comments on the Application, a larger portion of the exterior courtyard was determined to have one or more soil samples with levels of PCB exceeding 10 mg/kg (i.e., the cleanup standard derived in the initial *RAM Plan Modification and Application for Risk-Based Cleanup of PCBs*). EPA Region I recommended trying to justify a 50 mg/kg PCB clean-up standard presuming the installation of a TSCA cap and including a feasibility evaluation justifying the remediation of PCB-contaminated soils to 50 mg/kg rather than 10 mg/kg. This feasibility evaluation serves as justification to remediate PCB-contaminated soils to 50 mg/kg rather than 10 mg/kg. Based on this recommendation, new Site-specific cleanup standards for PCB were derived, as documented in the *Revised Release Abatement Measure (RAM) Plan Modification Report and Application for Risk-Based Cleanup of Polychlorinated Biphenyls (PCBs).*

A site-specific risk-based clean-up standard of 10 mg/kg PCB was derived, for comparison to the exposure point concentrations for utility / construction worker exposure to soils consistent with the MCP. The 10 mg/kg PCB clean-up standard is also consistent with the TSCA >1 to 10 mg/kg PCB clean-up standard for High Occupancy limit assuming the presence of a cap over the soils. This standard is compared to the exterior courtyard exposure point concentrations, which include confirmatory soil data following remediation of all three PCB Hot Spots. The exposure point concentration for PCB is the 95th percentile upper confidence limit on the mean. A PCB cleanup standard for individual confirmatory samples was also identified. The cleanup standard for individual confirmatory samples is 50 mg/kg, which is the TSCA Low Occupancy limit assuming the presence of a cap over the soils.

An assumption is made that a deed restriction (i.e., Notice of Activity and Use Limitation (AUL)) would be implemented to maintain the cap. See Attachment 2 of the RAM Plan Modification for the Method 3 Risk Characterization.

A second, alternative remedial goal could be to reduce PCB concentrations of soils in the eastern courtyard to levels less than 10 mg/kg consistent with the TSCA >1 to 10 mg/kg PCB clean-up standard for High Occupancy limit assuming the presence of a cap over the soils. A Notice of AUL would still be needed for this alternative.

A third, alternative remedial goal could be to reduce PCB concentrations to levels less than 1 mg/kg, which is the remedial goal that is necessary to not require a cap or protective barrier over the soils.

A fourth alternative remedial goal could be to reduce PCB concentrations to levels that approach or achieve background conditions. Consideration of this remedial goal is not required by TSCA, but is a Phase III requirement under the MCP. It is documented separately in Section 6.0, below.

The relative feasibility of all four remedial goals will be considered below, in Sections 4 and 5.

3.0 PERFORMANCE STANDARDS

The feasibility of remediating PCB-contaminated soils will be evaluated according to the MCP Phase III requirements specified at 310 CMR 40.0853. According to this citation, a Phase III shall result in:

1. the identification and evaluation of remedial action alternatives which are reasonably likely to achieve a level of No Significant Risk considering the oil and hazardous material present, media contaminated, and site characteristics; and

2. the recommendation of a remedial action alternative that is a Permanent or Temporary Solution, where a Permanent Solution includes measures that reduce, to the extent feasible, the concentrations of oil and hazardous material in the environment to levels that achieve or approach background.

In addition, 310 MCR 40.0853(2) states "A Phase III Remedial Action Plan shall describe and document the information, reasoning and results used to identify and evaluate remedial action alternatives in sufficient detail to support the selection of the proposed remedial action alternative."

The objective of remedial response actions conducted in accordance with the MCP is to achieve a condition of No Significant Risk of harm and a Permanent Solution. As defined in the MCP, a Permanent Solution means a measure or combination of measures that will, when implemented, ensure attainment of a level of control of each identified substance of concern at a disposal site or in the surrounding environment such that no substance of concern will present a significant risk of damage to health, safety, public welfare, or the environment during any foreseeable period of time (310 CMR 40.0006). In addition, in accordance with the requirements of the Phase III, the feasibility of achieving or approaching background levels of OHM shall be evaluated in accordance with 310 CMR 40.0860 for all disposal sites where remedial actions are or have been taken to achieve a Permanent Solution and background levels are not achieved.

4.0 IDENTIFICATION AND SCREENING OF TECHNOLOGIES

4.1 Identification and Initial Screening of Technologies / Process Options

This section identifies remedial alternatives and technologies (remedial action alternatives) that are likely to achieve a Permanent Solution or Temporary Solution and for which persons with expertise are available to implement the remedial alternative. Potential alternatives have been identified based on GEC's experience and site-specific considerations including the contaminants present, the impacted media and the receptors identified during the risk characterization. The purpose of the initial screening is to identify those remedial action alternatives that are reasonably likely to be feasible and achieve a level of No Significant Risk and a Permanent Solution. Remedial action alternatives that, based on the initial screening, may be considered appropriate candidates are further evaluated as part of the Detailed Evaluation of Remedial Action Alternatives (Section 5.2.1), and are described below. For the purpose of this evaluation, GEC presumes that the Site will not be changed in configuration or use in the foreseeable future. GEC recognizes that it is possible that the Site might be altered in the future

if the Site-use changes. As such, certain remedial alternatives that are not considered feasible now might become feasible in the future.

Each remedial alternative is evaluated with respect to its ability to reduce contaminant concentrations such that a condition of No Significant Risk for all future uses is achieved; and to reduce contaminant concentrations to below Upper Concentrations Limits (UCLs). Typically, each remedial alternative would also be evaluated with respect to its ability to mitigate contamination such that one contaminated medium does not act as a source of additional contamination to other environmental media. However, at this Site, the only medium requiring remediation is soils, and the soil contamination is not a source of contaminant leaching to groundwater or volatilization of vapor to the vadose zone, indoor air or outdoor air. The soil contamination at this Site is not a source of contamination to other environmental media.

The remedial goals are based on the results of the Method 3 Risk Characterization (Attachment 2), and are identified in Section 2.0, above. Both the primary remedial goal (reduce individual soil sample PCB concentrations to less than 50 mg/kg, reduce exposure point concentrations throughout the courtyard to less than 10 mg/kg, cover soils with a cap (protective cover) and implement a Notice of AUL requiring maintenance of the cap) and the two alternative remedial goals would result in Permanent Solutions: (1) reduce individual soil sample PCB concentrations in soils to less than 10 mg/kg, cover soils with a cap and implement a Notice of AUL; and (2) reduce individual soil sample PCB concentrations in soils to less than 1 mg/kg (no cap or Notice of AUL would be needed).

A Permanent Solution is a remedial measure that is conducted to accomplish one or more of the following: (a) achieve a level of No Significant Risk; (b) eliminate or control any source of oil and/or hazardous materials; and (c) where feasible, reduce to the extent possible, the level of oil and/or hazardous material concentrations in the environment to background. A Significant Risk exists at the Site because of the levels of PCBs present in soils. The PCBs in soils are not a source of contamination to other media. The feasibility of achieving or approaching background conditions is evaluated in Section 6.0. Within section 6.0 GEC demonstrates that it is not feasible to reduce PCB levels to achieve or approach background. Therefore to achieve a Permanent Solution, at a minimum, the levels of exposure point concentrations of PCBs in soils must be reduced such that a conservative average concentration is less than 10 mg/kg, individual soil sample PCB concentrations are reduced to less than 50 mg/kg, a cap is installed over the eastern courtyard, and a Notice of AUL is implemented that requires the maintenance of the cap. Alternatively, a Permanent Solution could be achieved by reducing individual soil sample PCB concentrations in soils to less than 10 mg/kg, covering soils with a cap and implementing a Notice of AUL.

Requirements of a Temporary Solution include the following: (1) the elimination of any Substantial Hazard; and (2) the identification, characterization, and, to the extent feasible, the elimination, control or mitigation of any source of oil and / or hazardous material. TSCA specifies regulatory goals that are the same as a Permanent Solution under the MCP. No additional remedial alternatives will be evaluated for the feasibility to achieve a Temporary Solution.

Included in the following paragraphs is a summary of those Remedial Action Alternatives evaluated as part of the initial screening process. Most of these remedial action alternatives were identified using the Federal Remediation Technologies Roundtable's (FRTR) *Remediation Technologies Screening Matrix and Reference Guide*, Table 3-2: Treatment Technologies Screening Matrix for halogenated semi-volatile organic compounds (SVOCs), which include PCBs. See www.frtr.gov/matrix2/section3/table3_2.pdf.

Also included below are brief descriptions of each alternative and discussions of the likelihood that the remedial action alternative would achieve a Permanent Solution. Finally, based on the information presented, each remedial action alternative is either considered for further evaluation or is eliminated as being a candidate for further evaluation. Those remedial action alternatives, identified on Table 3-2: Treatment Technologies Screening Matrix as having average or above average chances of success, were usually identified for further evaluation. Those identified in Table 3-2 as having a less than average or uncertain chance of success were not selected for further evaluation.

4.1.1 No Action

"No Action" is an alternative where no remedial action is conducted for a disposal site. Because Significant Risk of harm exists at the disposal site, "No Action" will not result in a Permanent Solution. Therefore, the "No Action" alternative is not considered appropriate for this Site and will not be evaluated further.

4.1.2 Activity and Use Limitation

A Notice of AUL is an institutional control (also a deed restriction) over the use of the Site. An AUL does not involve any physical remedial efforts or work at the Site. Rather an AUL restricts certain site activities and uses or requires maintenance of certain conditions of the Site in order to assure that unacceptable exposure to contaminants does not occur.

By itself, a Notice of AUL is not an appropriate remedial option for this disposal site. However, if the PCB-contaminated soils are remediated to a point where between 1 and less than

10 or between 10 and less than 50 mg/kg PCBs remain and a cap is installed, a Notice of AUL may be an applicable remedial action alternative. This alternative will be evaluated in conjunction with other remedial alternatives.

4.1.3 In-Situ Physical/Chemical Treatment

The following in-situ physical/chemical treatment methods were identified in Table 3-2 as having above average to average chance of success and are further evaluated for remediating the PCB-contaminated soils: (1) chemical oxidation; (2) electrokinetic separation; (3) fracturing; (4) soil flushing; and (5) solidification/stabilization. In-situ soil vapor extraction is unlikely to be successful at remediating PCB-contaminated soils, and was not evaluated further.

Brief descriptions of each of these treatment methods were obtained from FRTR's website (many of the sentences provided below are direct quotes from FRTR). Chemical oxidation results in the complete or partial destruction of organic chemicals, and is usually accomplished using peroxide, ozone or permanganate. The electrokinetic separation process removes metals and organic contaminants from low permeability soil, mud, sludge, and marine dredging. It desorbs then removes metals and polar organics. Fracturing is an enhancement technology that increases the efficiency of other treatment technologies. Cracks are developed by fracturing beneath the surface in low permeability and over-consolidated sediments to open new passageways that increase the effectiveness of many in situ processes and enhance extraction efficiencies. In-situ soil flushing is the extraction of contaminants from the soil with water or other suitable aqueous solutions. Soil flushing is accomplished by passing the extraction fluid through in-place soils using an injection or infiltration process. Extraction fluids must be recovered from the underlying aquifer and, when possible, they are recycled. Solidification/stabilization (S/S) reduces the mobility of hazardous substances and contaminants in the environment through both physical and chemical means. Unlike other remedial technologies, S/S seeks to trap or immobilize contaminants within their "host" medium (i.e., the soil, sand, and/or building materials that contain them) instead of removing them through chemical or physical treatment.

4.1.4 In-Situ Thermal Treatment

The following in-situ thermal treatment method was identified as having average or above-average potential for success and is further evaluated for remediating the PCB-contaminated soils: (1) thermal treatment. Thermally enhanced soil vapor extraction (SVE) is a full-scale technology that uses electrical resistance/electromagnetic/fiber optic/radio frequency

heating or hot-air/steam injection to increase the volatilization rate of semi-volatiles and facilitate extraction. The process is otherwise similar to standard SVE, but requires heat resistant extraction wells.

4.1.5 Ex-Situ Biological Treatment (Assuming Soil Excavation)

The following ex-situ biological treatment method was identified as having average or above average potential for success and is further evaluated for remediating the PCB-contaminated soils: (1) land farming. The following ex-situ biological treatment methods were not further evaluated, because they are less likely to be successful at remediating PCB-contaminated soils: (1) biopiles; (2) composting; and (3) slurry phase biological treatment. Land farming is a full-scale bioremediation technology, which usually incorporates liners and other methods to control leaching of contaminants, which requires excavation and placement of contaminated soils, sediments, or sludges. Contaminated media is applied into lined beds and periodically turned over or tilled to aerate the waste.

4.1.6 Ex-Situ Physical/Chemical Treatment (Assuming Soil Excavation)

The following ex-situ physical/chemical treatment methods were identified as having average or above average potential for success in remediating PCB-contaminated soils and were evaluated further: (1) chemical extraction; (2) dehalogenation; (3) chemical reduction/oxidation; (4) separation; (5) soil washing; and (6) solidification/stabilization. No ex-situ physical/chemical treatment methods were eliminated from further evaluation based on unlikelihood of success.

Chemical extraction does not destroy wastes but is a means of separating hazardous contaminants from soils, sludges, and sediments, thereby reducing the volume of the hazardous waste that must be treated. The technology uses an extracting chemical and differs from soil washing, which generally uses water or water with wash-improving additives.

Dehalogenation process is either base-catalyzed decomposition or glycolate/alkaline polyethylene glycol treatment. Contaminated soil is screened, processed with a crusher and pug mill, and mixed with reagents. The mixture is heated in a reactor. The dehalogenation process is achieved by either the replacement of the halogen molecules or the decomposition and partial volatilization of the contaminants.

Reduction/oxidation chemically converts hazardous contaminants to non-hazardous or less toxic compounds that are more stable, less mobile, and/or inert. The oxidizing agents most commonly used are ozone, hydrogen peroxide, hypochlorites, chlorine, and chlorine dioxide.

The separation processes are used for removing contaminated concentrates from soils, to leave relatively uncontaminated fractions that can then be regarded as treated soil. Ex-situ separation can be performed by many processes. Gravity separation and sieving/physical separation are two well-developed processes that have long been primary methods for treating municipal wastewaters. Magnetic separation, on the other hand, is a much newer separation process that is still being tested.

Soil washing is a water-based process for scrubbing soils ex-situ to remove contaminants. The process removes contaminants from soils in one of the following two ways:

- By dissolving or suspending them in the wash solution (which can be sustained by chemical manipulation of pH for a period of time); or
- By concentrating them into a smaller volume of soil through particle size separation, gravity separation, and attrition scrubbing (similar to those techniques used in sand and gravel operations).

During ex-situ solidification/stabilization, contaminants are physically bound or enclosed within a stabilized mass (solidification), or chemical reactions are induced between the stabilizing agent and contaminants to reduce their mobility (stabilization).

4.1.7 Ex-Situ Thermal Treatment (Assuming Soil Excavation)

The following ex-situ thermal treatment methods were evaluated for remediating the PCB-contaminated soils: (1) pyrolysis; (2) thermal desorption; and (3) incineration. Pyrolysis has above average capital costs, operation and maintenance requirements, system reliability and maintenance issues, and high relative costs. It will not be evaluated further. Ex-situ thermal desorption and incineration will be evaluated further. The following ex-situ thermal treatment methods have below average or uncertain potential for success and were not evaluated further: (1) hot gas decontamination; and (2) open burn/open detonation.

Pyrolysis transforms hazardous organic materials into gaseous components, small quantities of liquid, and a solid residue (coke) containing fixed carbon and ash. Pyrolysis of organic materials produces combustible gases, including carbon monoxide, hydrogen and methane, and other hydrocarbons. If the off-gases are cooled, liquids condense producing an oil/tar residue and contaminated water. Pyrolysis typically occurs under pressure and at operating temperatures above 430 °C (800 °F). The pyrolysis gases require further treatment. The off-gases may be treated in a secondary combustion chamber, flared, and partially condensed. Particulate removal equipment such as fabric filters or wet scrubbers are also required.

Thermal desorption is a physical separation process and is not designed to destroy organics. Wastes are heated to volatilize water and organic contaminants. A carrier gas or

vacuum system transports volatilized water and organics to the gas treatment system. The bed temperatures and residence times designed into these systems will volatilize selected contaminants but will typically not oxidize them.

For incineration, high temperatures, 870 to 1,200 °C (1,400 to 2,200 °F), are used to volatilize and combust (in the presence of oxygen) halogenated and other refractory organics in hazardous wastes. Often auxiliary fuels are employed to initiate and sustain combustion. The destruction and removal efficiency (DRE) for properly operated incinerators exceeds the 99.99% requirement for hazardous waste and can be operated to meet the 99.9999% requirement for PCBs and dioxins. Off gases and combustion residuals generally require treatment.

4.1.8 On-Site Containment and/or On-Site Re-Use

This method entails installation of a landfill cap on-Site, with or without enhancements or modifications. This remedial alternative by itself will not result in a Permanent Solution, because areas of the Site contain more than 50 mg/kg PCBs in soils, which is too high even with a cap on-Site. This remedial alternative may be appropriate, if one of the following apply: (1) the PCB exposure point concentrations in soils are reduced to no more than 10 mg/kg, as a conservative average concentration, and PCB concentrations in individual soil samples are reduced to no more than 50 mg/kg; (2) the PCB concentrations in individual soil samples are reduced to no more than 10 mg/kg; or (3) the PCB concentrations in individual soil samples are reduced to no more than 1 mg/kg. This remedial alternative will be evaluated further, in conjunction with other remedial alternatives.

This alternative could also include the on-Site re-use of some removed material (i.e., PCB-contaminated asphalt/gravel base material) as backfill following hot spot excavation prior to installing a landfill cap.

4.1.9 Soil Excavation and Off-Site Treatment, Disposal or Recycling

This method entails excavation of soils and transportation to a permitted off-Site treatment, disposal or recycling facility. Treatment may be required prior to disposal. Alternatively, the soils could be recycled via asphalt batching. This method may achieve a Permanent Solution, by itself or in conjunction with a cap and Notice of AUL. This remedial alternative will be evaluated further.

4.1.10 Monitored Natural Attenuation

Monitored natural attenuation, as used in this context, includes the monitored documentation of natural contaminant attenuating processes. Processes considered part of natural attenuation include advection, dilution, dispersion, sorption (adsorption/absorption), and biodegradation. Natural attenuation differs from the "No Action" alternative in that it includes a long-term monitoring plan and represents a considered evaluation of the degree to which natural attenuating process are occurring. In addition, natural attenuation differs from enhanced biodegradation or bioremediation in that it does not involve injecting bacteria or phytoorganisms into the soils, but instead utilizes indigenous bacteria and nutrients to degrade contaminants.

Natural attenuation does not involve active pumping of groundwater or air as is required for many other remedial technologies. Instead natural attenuation involves the natural flow of groundwater through the soil matrix and the interaction of contaminated groundwater with uncontaminated groundwater, naturally occurring microbiota and chemical processes to decrease contaminant concentrations.

The soil contamination is largely located above the water table and the soil contamination is not leaching to groundwater. Advection, dilution and dispersion processes are not applicable to the PCB-contaminated soils under current Site conditions. The PCB contamination is already adsorbed to soils. Naturally occurring biodegradation, to the extent it is occurring is likely slow, and would not result in the attainment of a Permanent Solution within the next several years. Monitored natural attenuation will not be evaluated further because it will not achieve a Permanent Solution in the short term.

4.2 Findings of Initial Screening of Technologies / Process Options

Pursuant to 310 CMR 40.0856, alternatives must be further evaluated if they are considered reasonably likely to be achieve a Permanent or Temporary Solution (based on the oil and/or hazardous material present, media contaminated, and site characteristics), and if individuals with the expertise needed to effectively implement the solutions are available. None of the screened alternatives was eliminated as a potential remedy because of the unavailability of expert individuals. Given the Site conditions, the TSCA clean-up requirements will result in the achievement of a Permanent Solution under the MCP. Therefore, each remedial alternative will not be reviewed for its ability to achieve a Temporary Solution, only a Permanent Solution. The following alternatives were eliminated because they will not or are unlikely to achieve a Permanent Solution: 1)"No Action"; 2) monitored natural attenuation; 3) in-situ bioventing; 4)

in-situ enhanced bioremediation; 5) in-situ phytoremediation; 6) in-situ soil vapor extraction; 7) ex-situ biopiles; 8) ex-situ composting; 9) ex-situ slurry phase biological treatment; 10) ex-situ hot gas decontamination; and 11) ex-situ open burn/open detonation. Ex-situ pyrolysis was also eliminated because of operation and maintenance costs, capital expenses, system reliability and maintenance issues, and high relative costs. In-situ solidification/stabilization was eliminated because it would not reduce PCB concentrations to no more than 1 or 10 mg/kg, which is necessary to achieve Site closure without and with a Notice of AUL, respectively.

Initial Screening of Remedial Alternatives indicates that the following remedial alternatives should be considered for detailed evaluation, either as individual alternatives or in combination with other alternatives: 1) in-situ chemical oxidation; 2) in-situ electrokinetic separation; 3) in-situ fracturing; 4) in-situ soil flushing; 5) in-situ thermal treatment; 6) one or more ex-situ technologies, such as land farming, chemical reduction/oxidation, separation, soil washing, solidification/stabilization, chemical extraction, dehalogenation, incineration or thermal desorption; 7) off-Site landfilling or recycling; 8) on-Site cap or protective cover installation; and 9) implementation of Notice of AUL. The remedial alternatives targeted for detailed evaluation have the potential to result in a Permanent Solution. The ex-situ remedial alternatives require soil excavation. There is insufficient available space on the property to treat the excavated soils prior to re-use on-Site. Therefore, the ex-situ remedial alternatives will only be reviewed in the context of those available at permitted off-Site treatment facilities, followed by off-Site landfill disposal by the permitted facility. The treatment alternatives readily available at local permitted off-Site treatment facilities include the following: thermal desorption and chemical oxidation.

4.3 Detailed Evaluation of Remedial Alternatives

In this section, the remedial alternatives that passed the initial screening are further evaluated considering the criteria specified at 310 CMR 40.0858. For each of the Remedial Alternatives, GEC evaluated the comparative effectiveness in terms of: (a) achieving a Permanent (or Temporary Solution); (b) reusing, recycling, destroying, detoxifying or treating contaminants present at the Site; and (c) reducing levels of untreated contaminants at the Site to concentrations that achieve or approach background. GEC also evaluated the short- and long-term reliability of the alternatives, including the degree of certainty that the alternative will be successful and the effectiveness of any measures required to manage residues or remaining wastes or control emissions or discharges to the environment. Lastly, GEC evaluated each of the remedial alternatives with respect to the comparative difficulty of implementing each alternative, the costs associated with each alternative, the risks of each alternative, and the benefits of each alternative.

GEC's detailed screening is presented in the Table 1. For clarity of presentation and ease of interpretation, the evaluation of each alternative is presented in a tabular format. The table format mimics the format presented at 310 CMR 40.0858. With respect to each criterion the remedial alternative was graded relative to the other remedial alternatives.

4.4 Summary of Appropriate Technologies

As a result of the detailed evaluation of remedial alternatives, the following seven remedial alternatives were eliminated as appropriate alternatives:

(1) In-situ electrokinetic separation is an enhancement technology used to separate metals and polar organics from soils or sediments and/or to concentrate metals or polar organics in one location for treatment or collection. This technology works best in low permeability, saturated soils. The PCB contamination is mostly located in unsaturated soils, above the water table. The presence of buried metallic material (e.g., utility lines) may interfere with its operation. There are too many utility lines and other subsurface materials in the eastern courtyard.

(2) In-situ fracturing is an enhancement technology used with other technologies. By itself it will not work. In-situ fracturing may damage the underground utility lines, foundation walls and the storm drain system in the eastern courtyard. There are limited vendors offering this technology. The fractures will close in non-clayey soils.

(3) In-situ soil flushing is an enhancement technology used with other technologies. By itself it will not work. According to FRTR, water or water containing an additive to enhance contaminant solubility is applied to soils or injected into groundwater to raise the groundwater table into the contaminated soil zone. The contamination is leached into groundwater, which is extracted and treated. This method is likely technically infeasible for this Site because the soil contamination exists mostly one to nine feet below grade, and the water table is at least eleven feet below grade. Water injection is unlikely to sufficiently raise the water table to result in sufficient leaching to reach the clean-up goal of 1 mg/kg. In addition, the presence of stormwater system and subsurface utility lines will complicate the implementation of this remedy.

(4) In-site thermal treatment is an enhancement technology used with other technologies, such as soil vapor extraction. The goal of the treatment is to desorb and volatilize the PCBs. Because of the location of the contamination next to a residential building, there is a potential for the volatilized PCBs to enter the residential building as vapor. The potential for short-term risk to existing residents is too high. In addition, the thermal treatment is complicated by the presence of subsurface utility lines and other subsurface

structures in the eastern courtyard. The presence of these utility lines could facilitate PCB vapor migration into the nearby mill buildings, and may result in uneven heating of the soils.

(5) Complete excavation and off-Site treatment and re-use / recycling of soils is not feasible for the Site because it would entail the removal of all subsurface utility lines and storm drain system within the eastern courtyard, which would significantly disrupt the residents and commercial businesses within the mill buildings. It also may significantly compromise the integrity of the mill building foundation walls. If the utility lines and storm drain system are left in place, sufficient soils may not be removed to achieve the clean up objective and a cap/protective cover may be needed anyways.

(6) Complete excavation and off-Site landfilling approach has the same limitations as complete excavation and off-Site treatment and re-use/recycling.

(7) Partial excavation and off-Site treatment and re-use or recycling of soils, installation of a cap or protective cover over the eastern courtyard, and recording a Notice of AUL requiring the existence and maintenance of the cap / protective cover over the eastern courtyard. Only one treatment facility was identified relatively close to the Site (i.e., EMSI in Loudon, New Hampshire). It treats soils by thermal desorption and, if needed, chemical oxidation at its facility. However, it is not permitted to accept PCB remedial wastes as defined by 40 CFR 260.10.

The remaining remedial alternatives will be evaluated further in Section 5.0.

5.0 COMPARISON AND SELECTION OF REMEDIAL ALTERNATIVES

A feasibility evaluation of remedial alternatives was conducted to support the RAM Plan Modification and Application for Risk-Based Cleanup of PCBs, to which this evaluation is attached, because a cap or protective cover will be placed over the eastern courtyard. The feasibility evaluation was conducted consistent the Phase III requirements specified in the MCP. The remedial goal is one of the following: (1) to reduce levels of PCB exposure point concentrations to no more than 10 mg/kg and levels of PCBs in individual samples to no more than 50 mg/kg in a TSCA High Occupancy Area, with the implementation of a cap and Notice of AUL; (2) to reduce levels of PCBs to no more than 10 mg/kg in individual samples in a TSCA High Occupancy Area, with the implementation of a cap and Notice of AUL; or (3) to reduce levels of PCBs to no more than 1 mg/kg in individual samples (no TSCA cap or Notice of AUL is needed).

The following remedial alternatives were evaluated for the feasibility of achieving a Permanent Solution, with a remedial goal of reducing PCB levels to no more than 1 mg/kg:

1. In-situ chemical oxidation,

The following remedial alternatives were evaluated for the feasibility of achieving a Permanent Solution, with a remedial goal of reducing PCB levels in individual soil samples to no more than 10 mg/kg:

1. Partial excavation and off-Site landfilling of soils, installation of a cap or protective cover over the eastern courtyard, and recording a Notice of AUL requiring the existence and maintenance of the cap / protective cover over the eastern courtyard.

The following remedial alternatives were evaluated for the feasibility of achieving a Permanent Solution, with a remedial goal of reducing PCB exposure point concentrations to no more than 10 mg/kg and levels of PCBs in individual samples to no more than 50 mg/kg:

1. Partial excavation and off-Site landfilling of soils, installation of a cap or protective cover over the eastern courtyard, and recording a Notice of AUL requiring the existence and maintenance of the cap / protective cover over the eastern courtyard.

Although in-situ chemical oxidation is the only remedial alternative with a feasibility of reducing PCB levels to less than 1 mg/kg, its likelihood of success is low, multiple rounds of treatment would likely be required along with an extensive number of confirmatory samples which drives the costs associated with in-situ chemical oxidation to be the highest of the three remedial alternatives. Given the high costs and uncertainty of success this was eliminated as a remedial alternative.

The last alternative, partial excavation and off-Site landfilling, installation of a cap or protective cover over the eastern courtyard, and recording a Notice of AUL will provide a high success rate in comparison to in-situ chemical oxidation which was eliminated as a remedial alternative due to its uncertainity of success. Therefore, partial excavation and off-Site landfilling, installation of a cap or protective cover over the eastern courtyard, and recording a Notice of AUL has been chosen as the method of remediation.

The volumes of soils estimated to contain greater than 10 mg/kg PCBs in individual samples and greater than 50 mg/kg PCBs in individual samples are estimated to be 235 cubic yards and 85 cubic yards, respectively. Costs to conduct partial excavation of soils with PCB levels greater than 10 mg/kg and dispose at an off-Site landfill are estimated to be $230,000. This assumes PCB concentrations in 181 cubic yards of soil are less than 50 mg/kg and PCB concentrations in 54 cubic yards of soil are greater than 50 mg/kg. This also assumes that 130 cubic yards of asphalt is disposed at an aggregate recycling facility and that 72 cubic yards of asphalt is disposed of as <50 mg/kg PCB contaminated material. Costs to conduct partial

excavation of soils with PCB levels greater than 50 mg/kg and dispose at an off-Site landfill are estimated to be $165,000. This assumes PCB concentrations in all 85 cubic yards of soil are greater than 50 mg/kg. This also assumes that 117 cubic yards of asphalt is disposed at an aggregate recycling facility, and that 69 cubic yards of asphalt is disposed of as <50 mg/kg PCB contaminated material. Costs for soil excavation, shoring, asphalt removal, transportation and disposal of soil and asphalt, waste characterization samples, and backfilling/restoring the Site are included in the above costs. Costs to install a cap over the eastern courtyard, and record a Notice of AUL are not included in the feasibility costs as these costs would be the same under both scenerios. Based on the cost being almost one and one-half time greater to remediate to 10 mg/kg verses 50 mg/kg, it is not cost effective to conduct additional remediation to achieve the 10 mg/kg PCB cleanup standard. Therefore, individual soil samples will be remediated to no more than 50 mg/kg with the overall PCB exposure point concentration being reduced to no more than 10 mg/kg.

Soils will be excavated from three hot spot areas identified on Figure 7A. Soils excavated from Hot Spots #1 to #3 will be transported to a disposal facility permitted to accept contaminated soils with PCB concentrations greater than 50 mg/kg (tentatively identified as Waste Management Model City, in Model City, New York). Final approval will be sought upon EPA Region I's permission to proceed with the remedial action. Following the completion of soil excavation activities, a TSCA cap of six inches of asphalt pavement over six inches of a processed gravel base layer will be placed across the exterior courtyard.

To install the TSCA cap, approximately 12 inches of asphalt and gravel base (comprising the existing pavement of the exterior courtyard) will have to be removed. Based on analysis of composite samples of asphalt and gravel base, most of the material is suitable for recycling at an asphalt batching facility, because the levels of PCBs are less than 2 mg/kg. The asphalt/gravel base composite samples for slightly more than one-third of the pavement contained levels of PCBs that exceed 2 mg/kg and are not suitable for recycling at an asphalt batching plant. Therefore, these materials will be transported offsite to Waste Management Turnkey, in Rochester, New Hampshire for disposal.

The selected remedy entails the following:

1. partial excavation of the most contaminated areas so that conservative representative average exposure point concentrations (i.e., 95th percentile upper confidence limit on the mean) of PCBs are below 10 mg/kg and individual soil sample concentrations of PCBs are below 50 mg/kg;
2. live loading of excavated soils and transportation of the excavated soils to approved landfill;
3. backfilling the excavation with clean fill brought onto the site;

4. live loading of asphalt / gravel base containing greater than 2 mg/kg and less than 50 mg/kg PCBs to approved landfill;
5. live loading of asphalt / gravel base containing less than 2 mg/kg PCBs to an approved asphalt batching plant for recycling;
6. installation of a TSCA cap over the entire eastern courtyard;
7. preparing and recording a Plan of Land showing the location of the cap; and
8. preparing and recording a Notice of AUL requiring the inspection and maintenance of the cap.

6.0 FEASIBILITY OF ACHIEVING OR APPROACHING BACKGROUND

The evaluation of the feasibility of achieving or approaching background is described in 310 CMR 40.0860. In 2004, MADEP issued a document, entitled *Conducting Feasibility Evaluations under the MCP* (Policy #WSC-04-160), which provides policy for conducting feasibility evaluations regarding achieving or approaching background conditions. The disposal site is approximately 5,500 square feet in area. The contamination is comprised of PCB and lead contaminated soils. Little to no dissolved-phase groundwater or soil vapor contamination is present. No non-aqueous phase liquid has been observed.

The selected remedy entails partial excavation with landfilling, installation of a TSCA cap. The remedial goal is to reduce the levels of PCBs in areas of the eastern courtyard with the highest levels of contamination, so that the residual levels of PCB exposure point concentrations across the eastern courtyard are less than 10 mg/kg and levels of PCBs in individual soil samples is less than 50 mg/kg. Following partial soil excavation, for the 0-3, 0-6 and 0-15 foot intervals, the average PCB concentration for the remaining soils will be approximately 5.75, 4.79 and 3.67 mg/kg, respectively. For these same soil intervals, the PCB 95th percentile upper confidence limit on the mean will be 8.33, 6.99 and 5.21 mg/kg, respectively. Refer to Table 2 of this attachment for the calculations of the estimated PCB concentrations post-excavation.

To achieve background conditions, the levels of PCBs would have to be reduced to below detectable limits. To approach background conditions, the levels of PCBs would have to be reduced to one-half the Method 1 S-1 concentration (e.g., to less than 1 mg/kg). For the remaining PCBs, the levels of PCBs are distributed throughout the courtyard, without any clear pattern of distribution. To achieve or approach background, it would require excavation of soils throughout the entire courtyard, which is complicated by the presence of numerous subsurface utility lines, the stormwater system and foundation walls to the mill buildings. It would result in significant disruption to residents and businesses in the mill buildings, due to disrupted utility

lines. The cost for doing the extra excavation is significantly greater than that for the selected remedy.

Based on Section 9.3.2.2 of *Conducting Feasibility Evaluations under the MCP*, it is infeasible to remediate PCBs to levels that achieve or approach background because it would be interrupt utility services (i.e., sewer, water and gas) to a large number of the public (i.e., those people residing in the residences and/or working in the commercial businesses in the mill buildings).

7.0 SCHEDULE FOR IMPLEMENTATION OF SELECTED ALTERNATIVES

The selected alternative is partial excavation to reduce the exposure point concentration levels of PCBs to no more than 10 mg/kg and to reduce individual soil sample PCB levels to no more than 50 mg/kg, off-Site landfilling of the excavated soils, backfilling the excavation with asphalt/gravel base removed containing more than 2 mg/kg PCBs, installation of a TSCA cap over the eastern courtyard, preparing and recording a Plan of Land showing the location of the cap, and preparing and recording a Notice of AUL requiring the inspection and maintenance of the cap. The remedy will be implemented after the EPA Region I approves and the MADEP approves or presumptively approves the *Revised RAM Plan Modification and Application for Risk-Based Cleanup of PCBs*. GEC estimates that it will take approximately three to four months to complete the project, including the recording of the Plan of Land and Notice of AUL with the registry of deeds.

8.0 WARRANTY

The conclusions and recommendations contained in this report are based on the information available to GEC and upon the current regulatory climate as of September 2014. The conclusions and recommendations may require revision if future regulatory changes occur. GEC provides no warranties on information provided by third parties and contained herein. Data compiled was in accordance with GEC's existing procedures and consistent with the MCP, and should not be construed beyond its limitations. Any interpretations or use of this report other than those expressed herein are not warranted.

The use, partial use, or duplication of this report without the written consent of Goldman Environmental Consultants, Inc. is strictly prohibited. This report is subject to GEC's Contract for Consulting Services with the client.

Respectfully submitted,
Goldman Environmental Consultants, Inc.

Eileen Furlong

Eileen A. Furlong	Brian T. Butler, LSP
Principal, Sr. Risk Assessor	Sr. V.P., Operations

P:\Projects\911-Winn Management\911-3117 Boott Mills\EPA Submittal 7-2014\Attach 8 Feas Eval Remedial Alter READY TO EDIT\Feasibility Evaluation for PCB Remedial Alternatives EF rev 7-12-2014.docx

Table 1
Comparative Evaluation of Remedial Alternatives

Clean-up Goal: Reduce PCB Levels to Less than 1 mg/kg without Cap or Notice of Activity and Use Limitation (Permanent Solution)	**Remedial Alternatives**	
Remedy and disposal alternative:	**In-Situ Chemical Oxidation to reduce PCB levels to less than 1 mg/kg, with no On-Site Cap and no AUL**	**In-Situ Electrokinetic Separation**
Comparative Effectiveness		
Achieving permanent solution (See Note 1)	+++	+ (not by itself)
Achieving temporary solution (See Note 1)	Not Evaluated	Not Evaluated
Re-use, recycling, destroying, detoxifying, and treating OHM	+++++	+
Reducing to levels that achieve or approach background	Yes, if effective	No, not by itself
Comparative Short-term and Long-term Reliability of Alternatives		
Degree of certainty of success	Low: due to no. of subsurface structures, PCB depth, contamination above water table	Low: best in saturated, low permeability soils. Metallic structures (e.g., utility lines) may interfere
Effectiveness of measures to manage residues or remaining wastes or to control emissions or discharges	Uncertain: may produce heat, gas and toxic byproducts	Uncertain: by itself it is not effective
Comparative Difficulty of Implementation of Alternative		
Technical complexity	More: subsurface structures/oxidant demand	
Integration into existing facility operations	+++	
Necessary monitoring, operations, maintenance or site access requirements or limitations	More monitoring / many injection points needed	
Availability of necessary services, materials, equipment or specialists	Available	
Availability, capacity and location of necessary off-site treatment, storage and disposal facilities	N/A	
Alternative meets regulatory requirements for any likely approvals, permits or licenses	Yes	
Comparative Costs of Alternatives (in thousands of dollars)		
Costs of implementation to achieve NSR or TSCA Clean-up objectives	$250,000 - $500,000*	
Costs of environmental restoration	None	
Costs of implementation to approach background conditions	$250,000 - $500,000	
Costs of implementation to achieve background conditions	$250,000 - $500,000	
Relative consumption of energy resources	Moderate	
Comparative Risks of Alternatives		
Short-term on-site and off-site risks	On-Site: relatively high	
Longer-term on-site and off-site risks	Moderate / Uncertain	
Potential of risk of harm following completion of remedy	Moderate / Uncertain	
Comparative Benefits of Alternatives		
Benefit of restoring natural resources	N/A	
Providing for productive reuse of the site	++++	
Avoided costs of relocating people, businesses, or providing alternative water supplies	++++	

Avoided lost value of the site	Better	
Comparative Timeliness of Alternatives	Short-Term: <1 Year	
Relative Effect of Alternative on Non-Pecuniary Interests	+++	
Clean-up Goal: Reduce PCB Levels to Less than 1 mg/kg without Cap or Notice of Activity and Use Limitation (Permanent Solution)	**Remedial Alternatives**	
Remedy and disposal alternative:	**In-Situ Fracturing**	**In-Situ Soil Flushing**
Comparative Effectiveness		
Achieving permanent solution (See Note 1)	+ (not by itself)	+ (not by itself)
Achieving temporary solution (See Note 1)	Not Evaluated	Not Evaluated
Re-use, recycling, destroying, detoxifying, and treating OHM	+	+
Reducing to levels that achieve or approach background	No – not by itself	No – not by itself
Comparative Short-term and Long-term Reliability of Alternatives		
Degree of certainty of success	Low: Best in silty, clayey soils, shale, rock; may damage utility lines and underground structures (foundations or storm drain system)	Low: Will not raise water table sufficient to leach contaminants into groundwater, for recovery
Effectiveness of measures to manage residues or remaining wastes or to control emissions or discharges	Uncertain: By itself it is not effective	Uncertain: By itself it is not effective
Comparative Difficulty of Implementation of Alternative		
Technical complexity		
Integration into existing facility operations		
Necessary monitoring, operations, maintenance or site access requirements or limitations		
Availability of necessary services, materials, equipment or specialists		
Availability, capacity and location of necessary off-site treatment, storage and disposal facilities		
Alternative meets regulatory requirements for any likely approvals, permits or licenses		
Comparative Costs of Alternatives (in thousands of dollars)		
Costs of implementation to achieve NSR or TSCA Clean-up objectives		
Costs of implementation to approach background conditions		
Costs of implementation to achieve background conditions		
Costs of environmental restoration		
Relative consumption of energy resources		
Comparative Risks of Alternatives		
Short-term on-site and off-site risks		
Longer-term on-site and off-site risks		
Potential of risk of harm following completion of remedy		
Comparative Benefits of Alternatives		
Benefit of restoring natural resources		
Providing for productive reuse of the site		
Avoided costs of relocating people, businesses, or providing alternative water supplies		
Avoided lost value of the site		
Comparative Timeliness of Alternatives		
Relative Effect of Alternative on Non-Pecuniary Interests		

Clean-up Goal: Reduce PCB Levels to Less than 1 mg/kg without Cap or Notice of Activity and Use Limitation (Permanent Solution)	**Remedial Alternatives**	
Remedy and disposal alternative:	**In-Situ Thermal Treatment**	
Comparative Effectiveness		
Achieving permanent solution (See Note 1)	+ (not by itself)	
Achieving temporary solution (See Note 1)	Not Evaluated	
Re-use, recycling, destroying, detoxifying, and treating OHM	+	
Reducing to levels that achieve or approach background	No – not by itself	
Comparative Short-term and Long-term Reliability of Alternatives		
Degree of certainty of success	Low: Presence of subsurface structures likely to complicate success	
Effectiveness of measures to manage residues or remaining wastes or to control emissions or discharges	Uncertain: By itself it is not effective	
Comparative Difficulty of Implementation of Alternative		
Technical complexity		
Integration into existing facility operations		
Necessary monitoring, operations, maintenance or site access requirements or limitations		
Availability of necessary services, materials, equipment or specialists		
Availability, capacity and location of necessary off-site treatment, storage and disposal facilities		
Alternative meets regulatory requirements for any likely approvals, permits or licenses		
Comparative Costs of Alternatives (in thousands of dollars)		
Costs of implementation to achieve NSR or TSCA Clean-up objectives		
Costs of environmental restoration		
Relative consumption of energy resources		
Comparative Risks of Alternatives		
Short-term on-site and off-site risks	Potentially, high (PCB vapor to indoor air)	
Longer-term on-site and off-site risks		
Potential of risk of harm following completion of remedy		
Comparative Benefits of Alternatives		
Benefit of restoring natural resources		
Providing for productive reuse of the site		
Avoided costs of relocating people, businesses, or providing alternative water supplies		
Avoided lost value of the site		
Comparative Timeliness of Alternatives		
Relative Effect of Alternative on Non-Pecuniary Interests		

Clean-up Goal: Reduce PCB Levels to Less than 10 mg/kg with Cap and Notice of Activity and Use Limitation (Permanent Solution); or Reduce PCB Levels to Less than 50 mg/kg with Cap and Notice of Activity and Use Limitation (Permanent Solution)	**Remedial Alternatives**	
Remedy and disposal alternative:	**Partial Excavation to reduce PCB levels to less than 10 mg/kg, Off-Site Treatment then Re-Use / Recycling of Treated Soils, On-Site Cap and Notice of Activity and Use Limitation**	**Partial Excavation to reduce PCB levels to less than 50 mg/kg, Off-Site Treatment then Re-Use / Recycling of Treated Soils, On-Site Cap and Notice of Activity and Use Limitation**
Comparative Effectiveness		
Achieving permanent solution (See Note 1)	+++++	+++++
Achieving temporary solution (See Note 1)	Not Evaluated	Not Evaluated
Re-use, recycling, destroying, detoxifying, and treating OHM	+++	+++
Reducing to levels that achieve or approach background	++	++
Comparative Short-term and Long-term Reliability of Alternatives		
Degree of certainty of success	++++	++++
Effectiveness of measures to manage residues or remaining wastes or to control emissions or discharges	++++	+++
Comparative Difficulty of Implementation of Alternative		
Technical complexity	Facility identified for thermal treatment cannot accept remediation waste as defined by 40 CFR 260.10 therefore this is eliminated as an approach	Facility identified for thermal treatment cannot accept remediation waste as defined by 40 CFR 260.10 therefore this is eliminated as an approach
Integration into existing facility operations		
Necessary monitoring, operations, maintenance or site access requirements or limitations		
Availability of necessary services, materials, equipment or specialists		
Availability, capacity and location of necessary off-site treatment, storage and disposal facilities		
Alternative meets regulatory requirements for any likely approvals, permits or licenses		
Comparative Costs of Alternatives (in thousands of dollars)		
Costs of implementation to achieve NSR or TSCA Clean-up objectives		
Costs of implementation to approach background conditions		
Costs of implementation to achieve background conditions		
Costs of environmental restoration		
Relative consumption of energy resources		
Comparative Risks of Alternatives		
Short-term on-site and off-site risks		
Longer-term on-site and off-site risks		
Potential of risk of harm following completion of remedy		
Comparative Benefits of Alternatives		
Benefit of restoring natural resources		
Providing for productive reuse of the site		
Avoided costs of relocating people, businesses, or providing alternative water supplies		
Avoided lost value of the site		
Comparative Timeliness of Alternatives		

Relative Effect of Alternative on Non-Pecuniary Interests		
Clean-up Goal: Reduce PCB Levels to Less than 10 mg/kg with Cap and Notice of Activity and Use Limitation (Permanent Solution); or Reduce PCB Levels to Less than 50 mg/kg with Cap and Notice of Activity and Use Limitation (Permanent Solution)	**Remedial Alternatives**	
Remedy and disposal alternative:	**Partial Excavation to reduce PCB levels to less than 10 mg/kg, Off-Site Landfilling of Excavated Soils, On-Site Cap and Notice of Activity and Use Limitation**	**Partial Excavation to reduce PCB levels to less than 50 mg/kg, Off-Site Landfilling of Excavated Soils, On-Site Cap and Notice of Activity and Use Limitation**
Comparative Effectiveness		
Achieving permanent solution (See Note 1)	+++++	+++++
Achieving temporary solution (See Note 1)	Not Evaluated	Not Evaluated
Re-use, recycling, destroying, detoxifying, and treating OHM	+++	++
Reducing to levels that achieve or approach background	++	++
Comparative Short-term and Long-term Reliability of Alternatives		
Degree of certainty of success	++++	++++
Effectiveness of measures to manage residues or remaining wastes or to control emissions or discharges	+++	+++
Comparative Difficulty of Implementation of Alternative		
Technical complexity		
Integration into existing facility operations	Moderate- may disrupt some utilities / parking	Moderate – may disrupt some utilities / parking
Necessary monitoring, operations, maintenance or site access requirements or limitations		
Availability of necessary services, materials, equipment or specialists	Available	Available
Availability, capacity and location of necessary off-site treatment, storage and disposal facilities	N/A	N/A
Alternative meets regulatory requirements for any likely approvals, permits or licenses	Yes	Yes
Comparative Costs of Alternatives (in thousands of dollars)		
Costs of implementation to achieve NSR or TSCA Clean-up objectives	$230,000 #	$165,000 #
Costs of implementation to approach background conditions	N/A	N/A
Costs of implementation to achieve background conditions	N/A	N/A
Costs of environmental restoration	None	None
Relative consumption of energy resources	Moderate	Moderate
Comparative Risks of Alternatives		
Short-term on-site and off-site risks	Low – phys haz / transport	Low – phys haz./transport
Longer-term on-site and off-site risks	Low – managed with cap	Low – managed with cap
Potential of risk of harm following completion of remedy	Low – managed with cap	Low – managed with cap
Comparative Benefits of Alternatives		
Benefit of restoring natural resources	N/A	N/A
Providing for productive reuse of the site	++++	++++
Avoided costs of relocating people, businesses, or providing alternative water supplies	+++	+++
Avoided lost value of the site	Moderate	Moderate
Comparative Timeliness of Alternatives	Short-Term: <4 months	Short-Term: <4 months
Relative Effect of Alternative on Non-Pecuniary Interests	+++	+++

Notes:

1. Remedial Alternatives are only evaluated for the potential to achieve a Permanent Solution, because the TSCA regulations provide clean-up standards consistent with achieving a Permanent Solution, not a Temporary Solution.

* Costs will vary depending on the number of injection rounds needed to cleanup to desired level and the number of confirmatory sampling rounds conducted following injection rounds.

\# . Costs to scrape off and dispose or reuse the top 12 inches of asphalt/asphalt base, and restore the Site are included in the above costs. These costs do not include costs for shoring during excavation activities. Presumably shoring costs to remediate to 10 mg/kg would be significantly more as a significant amount of excavation under the remediate to 10 mg/kg scenario would be conducted along mill building walls and the stormwater system. Costs to install a cap over the eastern courtyard, and record a Notice of AUL are also not included in the feasibility costs as these costs would be the same under both scenerios.

TABLE 2
ESTIMATED PCB CONCENTRATIONS POST-EXCAVATON OF THREE AREAS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1

TABLE 2
ESTIMATED PCB CONCENTRATIONS POST-EXCAVATON OF THREE AREAS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1
Exterior Courtyard: Remainder (0-3 Foot Interval)											
B-1 1-5'	06/06/2011	EPA 8082	BRL	0.084	0.57	0.084	0.53	0.084	**1.142**	1.142	Representative of B-1
B-2A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative of B-2 / B-2A
B-8 0-1'	09/01/2011	EPA 8082	BRL	0.034	0.119	0.034	0.149	0.034	0.2851	0.2851	Representative of B-8
B-9 1-3'	09/01/2011	EPA 8082	BRL	0.719	4.86	0.719	3.35	0.719	***8.5695***	8.5695	Representative of B-9
B-10A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	2.0	0.43	1.50	0.43	**3.715**	3.715	Representative of B-10A
B-11 0-3'	09/01/2011	EPA 8082	BRL	0.731	6.14	0.731	5.05	0.731	***11.5555***	11.5555	Representative of B-11 / B-11A
B-12 0-3'	09/01/2011	EPA 8082	BRL	0.037	0.0649	0.037	0.184	0.037	0.26745	0.26745	Representative of B-12
B-15 0-3'	10/05/2012	EPA 8082A	BRL	1.1	5.8	1.1	4.0	1.1	***10.35***	10.35	Representative of B-15
B-16A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	0.59	0.41	0.95	0.41	**1.745**	1.745	Representative of B-16 / B-16A
B-17 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative of B-17
B-20A 1-2' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.27	0.10	0.21	0.10	0.53	0.53	Representative of B-20A
B-21A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	1.1	4.0	1.1	7.5	1.1	***12.05***	12.05	Representative of B-21 / B-21A
B-23 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative of B-23
B-31 0-3'	10/09/2012	EPA 8082A	BRL	0.11	0.12	0.11	0.15	0.11	0.325	0.325	Representative of B-31
B-32 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative of B-32
B-37 0-3'	10/05/2012	EPA 8082A	BRL	0.11	0.66	0.11	0.44	0.11	**1.155**	1.155	Representative of B-37
B-48A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.45	2.5	0.45	2.6	0.45	***5.325***	5.325	Representative of B-48 / B-48A
B-69 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.57	1.80	0.57	2.90	0.57	***4.985***	4.985	Representative of B-69
B-70 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.65	0.11	0.44	0.11	**1.145**	1.145	Representative of B-70
B-71 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.10	5.30	1.10	4.10	1.10	***9.95***	9.95	Representative of B-71
B-72 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	1.20	0.12	0.76	0.12	**2.02**	2.02	Representative of B-72
B-73 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.40	0.11	1.10	0.11	**1.555**	1.555	Representative of B-73
COMP 1A 2-3'	03/05/2014	EPA 8082A / EPA 3540	BRL	1.1	8.6	1.1	6.3	1.1	***15.45***	15.45	Representative of Composite 1 / COMP 1A
COMP 2A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	2.1	BRL	2.1	6.8	2.1	***8.9***	8.9	Representative of Composite 2 / COMP 2A
Composite 3 0-3'	05/08/2013	EPA 8082A	BRL	0.11	0.14	0.11	0.26	0.11	0.455	0.455	Representative of Composite 3
B-39 0-3'	05/08/2013	EPA 8082A	BRL	0.10	BRL	0.10	0.42	0.10	0.52	0.52	Representative of B-39
B-49 0-3'	05/08/2013	EPA 8082A	BRL	1.1	8.9	1.1	9.8	1.1	***19.25***	19.25	Representative of B-49 / B-49A
B-50 0-3'	05/08/2013	EPA 8082A	BRL	2.2	14	2.2	22	2.2	***37.1***	37.1	Representative of B-50 / B-50A
Composite 5 0-3'	05/09/2013	EPA 8082A	BRL	0.11	0.81	0.11	1.2	0.11	**2.065**	2.065	Representative of Composite 5 / COMP 5A
B-51B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.20	8.60	1.20	7.60	1.20	***16.8***	16.8	Representative of B-51B
B-52B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.55	4.40	0.55	4.90	0.55	***9.575***	9.575	Representative of B-52B
B-55B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.47	0.11	0.45	0.11	0.975	0.975	Representative of B-55B
B-56B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.78	0.12	1.20	0.12	**2.04**	2.04	Representative of B-56B
B-57B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.59	1.70	0.59	3.20	0.59	***5.195***	5.195	Representative of B-57B
Derivation of Exposure Point Concentration: 0-3 Foot Interval											
Mean Concentration										5.754545588	
Number Data Points										34	
Standard Deviation of Population										7.648886662	
95th confidence interval										2.571028307	
95th confidence limit on the mean										8.33	
Method to Derive EPC										95% UCL on mean	

Prepared By:
Reviewd By: EAF
Revision Date: 06/23/2014

TABLE 2
ESTIMATED PCB CONCENTRATIONS POST-EXCAVATON OF THREE AREAS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1
Exterior Courtyard: Remainder 0-6 Foot Interval)											
B-1 1-5'	06/06/2011	EPA 8082	BRL	0.084	0.57	0.084	0.53	0.084	**1.142**	1.142	Representative of B-1
B-2A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.1575	1/2 Representative of B-2 / B-2A
B-2A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15		1/2 Representative of B-2 / B-2A
B-8 0-1'	09/01/2011	EPA 8082	BRL	0.034	0.119	0.034	0.149	0.034	0.2851	0.133133333	1/3 Representative of B-8
B-8 1-3'	09/01/2011	EPA 8082	BRL	0.038	BRL	0.038	BRL	0.038	0.05715		2/3 Representative of B-8
B-9 0-1'	09/01/2011	EPA 8082	BRL	0.036	BRL	0.036	BRL	0.036	0.0546	5.7312	1/3 Representative of B-9
B-9 1-3'	09/01/2011	EPA 8082	BRL	0.719	4.86	0.719	3.35	0.719	***8.5695***		2/3 Representative of B-9
B-10A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15	1.4807	1/10 Representative of B-10A
B-10A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.15	0.11	0.32	0.11	0.525		1/10 Representative of B-10A
B-10A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	2.0	0.43	1.50	0.43	**3.715**		1/5 Representative of B-10A
B-10 3-6'	09/01/2011	EPA 8082	BRL	0.426	BRL	0.426	0.691	0.426	**1.117**		3/5 Representative of B-10
B-11 0-3'	09/01/2011	EPA 8082	BRL	0.731	6.14	0.731	5.05	0.731	***11.5555***	5.80475	1/2 Representative of B-11 / B-11A
B-11 3-6'	09/01/2011	EPA 8082	BRL	0.036	BRL	0.036	BRL	0.036	0.054		1/2 Representative of B-11 / B-11A
B-12 0-3'	09/01/2011	EPA 8082	BRL	0.037	0.0649	0.037	0.184	0.037	0.26745	0.161325	1/2 Representative of B-12
B-12 3-6'	09/01/2011	EPA 8082	BRL	0.037	BRL	0.037	BRL	0.037	0.0552		1/2 Representative of B-12
B-15 0-3'	10/05/2012	EPA 8082A	BRL	1.1	5.8	1.1	4.0	1.1	***10.35***	9.185833333	1/2 Representative of B-15
B-15 3-5'	10/05/2012	EPA 8082A	BRL	1.1	6.3	1.1	5.1	1.1	***11.95***		2/6 Representative of B-15
B-15 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/6 Representative of B-15
WC-1 (B-16 1-5')	10/05/2012	EPA 8082A	BRL	1.1	7.4	1.1	7.6	1.1	***15.55***	15.55	Representative of B-16 / B-16A
B-17 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.17	1/2 Representative of B-17
B-17 3-5'	10/05/2012	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/6 Representative of B-17
B-17 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/6 Representative of B-17
B-20A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	1.03125	1/8 Representative of B-20A
B-20A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/8 Representative of B-20A
B-20A 1-2' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.27	0.10	0.21	0.10	0.53		1/4 Representative of B-20A
B-20 5-7'	10/05/2012	EPA 8082A	BRL	0.11	0.95	0.11	0.71	0.11	**1.715**		1/2 Representative of B-20
B-21 0-3'	10/05/2012	EPA 8082A	BRL	0.55	3.1	0.55	3.1	0.55	***6.475***	4.359	3/5 Representative of B-21 / B-21A
B-21 3-5'	10/05/2012	EPA 8082A	BRL	0.11	0.63	0.11	0.50	0.11	**1.185**		2/5 Representative of B-21
B-22 3-5'	10/05/2012	EPA 8082A	BRL	0.22	0.90	0.22	1.9	0.22	**2.91**	1.5375	1/2 Representative of B-22
B-22 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of B-22
B-23 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	3/5 Representative of B-23
B-23 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/5 Representative of B-23
WC-2 (B-26 2-5')	10/09/2012	EPA 8082A	BRL	2.3	15	2.3	17	2.3	***33.15***	30.73	3/5 Representative of B-26
B-26 5-7'	10/09/2012	EPA 8082A	BRL	2.2	14	2.2	12	2.2	***27.1***		2/5 Representative of B-26
B-31 0-3'	10/09/2012	EPA 8082A	BRL	0.11	0.12	0.11	0.15	0.11	0.325	0.255	3/5 Representative of B-31
B-31 3-5'	10/09/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15		2/5 Representative of B-31
B-32 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	3/5 Representative of B-32
B-32 3-5'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/5 Representative of B-32
B-34 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative of B-34
B-35 0-3'	10/05/2012	EPA 8082A	BRL	0.21	1.6	0.21	1.4	0.21	**3.105**	15.4775	1/2 Representative of B-35
B-35 3-5'	10/05/2012	EPA 8082A	BRL	1.1	9.3	1.1	8.0	1.1	***17.85***		2/6 Representative of B-35
B-35 5-7'	10/05/2012	EPA 8082A	BRL	5.7	18	5.7	27	5.7	***47.85***		1/6 Representative of B-35

TABLE 2
ESTIMATED PCB CONCENTRATIONS POST-EXCAVATON OF THREE AREAS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1
B-37 0-3'	10/05/2012	EPA 8082A	BRL	0.11	0.66	0.11	0.44	0.11	**1.155**	0.759	3/5 Representative of B-37
B-37 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/5 Representative of B-37
B-48A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	BRL	0.43	BRL	0.43	0.645	1.817916667	1/12 Representative of B-48 / B-48A
B-48A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615		1/12 Repesentative of B-48 / B-48A
B-48A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.45	2.5	0.45	2.6	0.45	***5.325***		1/6 Representative of B-48 / B-48A
B-48A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.44	1.5	0.44	1.2	0.44	**2.92**		1/6 Representative of B-48 / B-48A
B-48 3-9'	05/09/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of B-48 / B-48A
B-69 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	21.98833333	1/12 Representative of B-69
B-69 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/12 Representative of B-69
B-69 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.57	1.80	0.57	2.90	0.57	***4.985***		1/6 Representative of B-69
B-69 2-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	2.40	22.00	2.40	19.00	2.40	***42.2***		3/6 Representative of B-69
B-69 5-7'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		1/6 Representative of B-69
B-70 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	1.236666667	1/12 Representative of B-70
B-70 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.65	0.11	0.44	0.11	**1.145**		1/12 Representative of B-70
B-70 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/6 representative of B-70
B-70 2-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	1.10	0.12	0.98	0.12	**2.14**		3/6 Representative of B-70
B-70 5-7'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		1/6 Representative of B-70
B-71 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	5.0575	1/4 Representative of B-71
B-71 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/4 Representative of B-71
B-71 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.10	5.30	1.10	4.10	1.10	***9.95***		1/2 Representative of B-71
B-72 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	1.0925	1/4 Representative of B-72
B-72 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/4 Representative of B-72
B-72 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	1.20	0.12	0.76	0.12	**2.02**		1/2 Representative of B-72
B-73 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18	0.90125	1/4 Representative of B-73
B-73 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.12	0.20	0.12	0.315		1/4 Representative of B-73
B-73 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.40	0.11	1.10	0.11	**1.555**		1/2 Representative of B-73
COMP 1A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	BRL	0.42	BRL	0.42	0.63	8.391	1/10 Representative of COMP 1A
COMP 1A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	BRL	0.42	BRL	0.42	0.63		1/10 Representative of COMP 1A
COMP 1A 1-2'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.44	0.67	0.44	0.77	0.44	**1.66**		1/5 Representative of COMP 1A
COMP 1A 2-3'	03/05/2014	EPA 8082A / EPA 3540	BRL	1.1	8.6	1.1	6.3	1.1	***15.45***		1/5 Representative of COMP 1A
COMP 1A 3-4'	03/05/2014	EPA 8082A / EPA 3540	BRL	1.1	10	1.1	6.5	1.1	***17.05***		1/5 Representative of COMP 1A
COMP 1A 4-5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.53	3.0	0.53	3.9	0.53	***7.165***		1/5 Representative of COMP 1A
COMP 2A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	0.57	0.42	0.64	0.42	**1.42**	5.16	1/2 Representative of COMP 2A
COMP 2A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	2.1	BRL	2.1	6.8	2.1	***8.9***		1/2 Representative of COMP 2A
Composite 3 0-3'	05/08/2013	EPA 8082A	BRL	0.11	0.14	0.11	0.26	0.11	0.455	0.31	1/2 Representative of Composite 3
Composite 3 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of Composite 3
B-39 0-3'	05/08/2013	EPA 8082A	BRL	0.10	BRL	0.10	0.42	0.10	0.52	0.44	1/2 Representative of B-39
B-39 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	0.25	0.11	0.36		1/2 Representative of B-39
B-49 0-3'	05/08/2013	EPA 8082A	BRL	1.1	8.9	1.1	9.8	1.1	***19.25***	9.7075	1/2 Representative of B-49 / B-49A
B-49 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of B-49
B-50 0-3'	05/08/2013	EPA 8082A	BRL	2.2	14	2.2	22	2.2	***37.1***	21.4575	1/2 Representative of B-50 / B-50A
B-50 3-9'	05/08/2013	EPA 8082A	BRL	0.43	3.4	0.43	2.2	0.43	***5.815***		1/2 Representative of B-50 / B-50A
Composite 5 0-3'	05/09/2013	EPA 8082A	BRL	0.11	0.81	0.11	1.2	0.11	**2.065**	1.1225	1/2 Representative of Composite 5 / COMP 5A

TABLE 2
ESTIMATED PCB CONCENTRATIONS POST-EXCAVATON OF THREE AREAS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1
Composite 5 3-9'	05/09/2013	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18		1/2 Representative of Composite 5
COMP 6A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.35	0.11	0.63	0.11	**1.035**	0.74	1/2 Representative of COMP 6A Area
COMP 6A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.18	0.11	0.21	0.11	0.445		1/2 Representative of COMP 6A Area
B-51B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.20	8.60	1.20	7.60	1.20	***16.8***	4.8475	1/4 Representative of B-51B
B-51B 2-3'	06/04/2014	EPA 8082A / EPA 3540	0.58	0.24	1.50	0.24	BRL	0.24	**2.20**		1/4 Representative of B-51B
B-51B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.13	BRL	0.13	BRL	0.13	0.195		2/4 Representative of B-51B
B-52B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.21	1.80	0.21	1.20	0.21	**3.105**	3.2525	1/4 Representative of B-52B
B-52B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.55	4.40	0.55	4.90	0.55	***9.575***		1/4 Representative of B-52B
B-52B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/4 Representative of B-52B
B-55B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	0.14	0.11	0.25	1.31875	1/4 Representative of B-55B
B-55B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.47	0.11	0.45	0.11	0.975		1/4 Representative of B-55B
B-55B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	1.00	0.11	0.97	0.11	**2.025**		2/4 Representative of B-55B
B-56B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.78	0.12	1.20	0.12	**2.04**	1.05	1/4 Representative of B-56B
B-56B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.74	0.12	1.00	0.12	**1.8**		1/4 Representative of B-56B
B-56B 3-4'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/4 Representative of B-56B
B-57B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.33	0.11	0.42	0.11	0.805	2.61	1/4 Representative of B-57B
B-57B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.59	1.70	0.59	3.20	0.59	***5.195***		1/4 Representative of B-57B
B-57B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.76	0.12	1.40	0.12	**2.22**		2/4 Representative of B-57B
Derivation of Exposure Point Concentration: 0-6 Foot Interval											
		Mean Concentration								4.786207906	
		Number Data Points								39	
		Standard Deviation of Population								7.022634909	
		95th confidence interval								2.204021763	
		95th confidence limit on the mean								6.99	
		Method to Derive EPC								95% UCL on mean	
Exterior Courtyard: Remainder (0-15 Foot Interval)											
B-1 1-5'	06/06/2011	EPA 8082	BRL	0.084	0.57	0.084	0.53	0.084	**1.142**	0.646	1/2 Representative of B-1
B-1 10-15'	06/06/2011	EPA 8082	BRL	0.1	BRL	0.1	BRL	0.1	0.15		1/2 Representative of B-1
B-2A 0-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.1575	1/2 Representative of B-2 / B-2A
B-2A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15		1/2 Representative of B-2 / B-2A
B-3 5-10'	06/06/2011	EPA 8082	BRL	0.097	BRL	0.097	BRL	0.097	0.1455	0.1455	Representative of B-3
B-4 12-15'	06/06/2011	EPA 8082	BRL	0.095	BRL	0.095	BRL	0.095	0.1425	0.1425	Representative of B-4
B-5 10-15'	06/06/2011	EPA 8082	BRL	0.1	BRL	0.1	BRL	0.1	0.15	0.15	Representative of B-5
B-8 0-1'	09/01/2011	EPA 8082	BRL	0.034	0.119	0.034	0.149	0.034	0.2851	0.09258125	1/8 Representative of B-8
B-8 1-3'	09/01/2011	EPA 8082	BRL	0.038	BRL	0.038	BRL	0.038	0.05715		2/8 Representative of B-8
B-8 5-10'	09/01/2011	EPA 8082	BRL	0.046	BRL	0.046	BRL	0.046	0.06825		5/8 Representative of B-8
B-9 0-1'	09/01/2011	EPA 8082	BRL	0.036	BRL	0.036	BRL	0.036	0.0546	5.7312	1/3 Representative of B-9
B-9 1-3'	09/01/2011	EPA 8082	BRL	0.719	4.86	0.719	3.35	0.719	***8.5695***		2/3 Representative of B-9
B-10A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	BRL	0.10	BRL	0.10	0.15	1.571625	1/8 Representative of B-10A
B-10A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.15	0.11	0.32	0.11	0.525		1/8 Representative of B-10A
B-10A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	2.0	0.43	1.50	0.43	**3.715**		1/4 Representative of B-10A
B-10 3-6'	09/01/2011	EPA 8082	BRL	0.426	BRL	0.426	0.691	0.426	**1.117**		1/2 Representative of B-10
B-11 0-3'	09/01/2011	EPA 8082	BRL	0.731	6.14	0.731	5.05	0.731	***11.5555***	5.80475	1/2 Representative of B-11 / B-11A

Prepared By:
Reviewd By: EAF
Revision Date: 06/23/2014

TABLE 2
ESTIMATED PCB CONCENTRATIONS POST-EXCAVATON OF THREE AREAS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1
B-11 3-6'	09/01/2011	EPA 8082	BRL	0.036	BRL	0.036	BRL	0.036	0.054		1/2 Representative of B-11 / B-11A
B-12 0-3'	09/01/2011	EPA 8082	BRL	0.037	0.0649	0.037	0.184	0.037	0.26745	0.161325	1/2 Representative of B-12
B-12 3-6'	09/01/2011	EPA 8082	BRL	0.037	BRL	0.037	BRL	0.037	0.0552		1/2 Representative of B-12
B-15 0-3'	10/05/2012	EPA 8082A	BRL	1.1	5.8	1.1	4.0	1.1	***10.35***	7.897142857	3/7 Representative of B-15
B-15 3-5'	10/05/2012	EPA 8082A	BRL	1.1	6.3	1.1	5.1	1.1	***11.95***		2/7 Representative of B-15
B-15 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/7 Representative of B-15
WC-1 (B-16 1-5')	10/05/2012	EPA 8082A	BRL	1.1	7.4	1.1	7.6	1.1	***15.55***	8.662727273	4/11 Representative of B-16 / B-16A
B-16 5-7'	10/05/2012	EPA 8082A	BRL	0.54	4.6	0.54	3.0	0.54	***7.87***		2/11 Representative of B-16 / B-16A
B-16 7-9'	10/05/2012	EPA 8082A	BRL	0.52	2.5	0.52	1.7	0.52	***4.46***		2/11 Representative of B-16 / B-16A
B-16 9-12'	10/05/2012	EPA 8082A	BRL	0.22	1.7	0.22	1.0	0.22	**2.81**		3/11 Representative of B-16 / B-16A
B-17 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.169285714	3/7 Representative of B-17
B-17 3-5'	10/05/2012	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/7 Representative of B-17
B-17 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/7 Representative of B-17
B-20A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	1.03125	1/8 Representative of B-20A
B-20A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/8 Representative of B-20A
B-20A 1-2' DUP	03/04/2014	EPA 8082A / EPA 3540	BRL	0.10	0.27	0.10	0.21	0.10	0.53		1/4 Representative of B-20A
B-20 5-7'	10/05/2012	EPA 8082A	BRL	0.11	0.95	0.11	0.71	0.11	**1.715**		2/4 Representative of B-20
B-21 0-3'	10/05/2012	EPA 8082A	BRL	0.55	3.1	0.55	3.1	0.55	***6.475***	4.359	3/5 Representative of B-21 / B-21A
B-21 3-5'	10/05/2012	EPA 8082A	BRL	0.11	0.63	0.11	0.50	0.11	**1.185**		2/5 Representative of B-21
B-22 3-5'	10/05/2012	EPA 8082A	BRL	0.22	0.90	0.22	1.9	0.22	**2.91**	1.5375	1/2 Representative of B-22
B-22 5-7'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of B-22
B-23 0-3'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	3/5 Representative of B-23
B-23 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/5 Representative of B-23
WC-2 (B-26 2-5')	10/09/2012	EPA 8082A	BRL	2.3	15	2.3	17	2.3	***33.15***	16.042	3/10 Representative of B-26
B-26 5-7'	10/09/2012	EPA 8082A	BRL	2.2	14	2.2	12	2.2	***27.1***		2/10 Representative of B-26
B-26 7-9'	10/09/2012	EPA 8082A	BRL	0.23	1.8	0.23	1.2	0.23	**3.115**		2/10 Representative of B-26
B-26 9-12'	10/09/2012	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18		3/10 Representative of B-26
B-31 0-3'	10/09/2012	EPA 8082A	BRL	0.11	0.12	0.11	0.15	0.11	0.325	0.255	3/5 Representative of B-31
B-31 3-5'	10/09/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15		2/5 Representative of B-31
B-32 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	3/5 Representative of B-32
B-32 3-5'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/5 Representative of B-32
B-34 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative of B-34
B-35 0-3'	10/05/2012	EPA 8082A	BRL	0.21	1.6	0.21	1.4	0.21	**3.105**	18.75722222	3/9 Representative of B-35
B-35 3-5'	10/05/2012	EPA 8082A	BRL	1.1	9.3	1.1	8.0	1.1	***17.85***		2/9 Representative of B-35
B-35 5-7'	10/05/2012	EPA 8082A	BRL	5.7	18	5.7	27	5.7	***47.85***		2/9 Representative of B-35
B-35 7-9'	10/05/2012	EPA 8082A	BRL	1.1	5.8	1.1	7.7	1.1	***14.05***		2/9 Representative of B-35
B-37 0-3'	10/05/2012	EPA 8082A	BRL	0.11	0.66	0.11	0.44	0.11	**1.155**	0.759	3/5 Representative of B-37
B-37 3-5'	10/05/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/5 Representative of B-37
B-38 9-12'	05/08/2013	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18	0.18	Representative of B-38
B-48A 0-0.5'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.43	BRL	0.43	BRL	0.43	0.645	1.096111111	1/18 Representative of B-48 / B-48A
B-48A 0.5-1'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.41	BRL	0.41	BRL	0.41	0.615		1/18 Repesentative of B-48 / B-48A
B-48A 1-2'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.45	2.5	0.45	2.6	0.45	***5.325***		1/9 Representative of B-48 / B-48A
B-48A 2-3'	03/04/2014	EPA 8082A / EPA 3540	BRL	0.44	1.5	0.44	1.2	0.44	**2.92**		1/9 Representative of B-48 / B-48A

TABLE 2
ESTIMATED PCB CONCENTRATIONS POST-EXCAVATON OF THREE AREAS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1
B-48 3-9'	05/09/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		6/9 Representative of B-48 / B-48A
B-69 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	18.87285714	1/14 Representative of B-69
B-69 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/14 Representative of B-69
B-69 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.57	1.80	0.57	2.90	0.57	***4.985***		1/7 Representative of B-69
B-69 2-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	2.40	22.00	2.40	19.00	2.40	***42.2***		3/7 Representative of B-69
B-69 5-7'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/7 Representative of B-69
B-70 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	1.085714286	1/14 Representative of B-70
B-70 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.65	0.11	0.44	0.11	**1.145**		1/14 Representative of B-70
B-70 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/7 representative of B-70
B-70 2-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	1.10	0.12	0.98	0.12	**2.14**		3/7 Representative of B-70
B-70 5-7'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/7 Representative of B-70
B-71 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	5.0575	1/4 Representative of B-71
B-71 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/4 Representative of B-71
B-71 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.10	5.30	1.10	4.10	1.10	***9.95***		1/2 Representative of B-71
B-72 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165	1.0925	1/4 Representative of B-72
B-72 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/4 Representative of B-72
B-72 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	1.20	0.12	0.76	0.12	**2.02**		1/2 Representative of B-72
B-73 0-0.5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18	0.90125	1/4 Representative of B-73
B-73 0.5-1'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.12	0.20	0.12	0.315		1/4 Representative of B-73
B-73 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.40	0.11	1.10	0.11	**1.555**		1/2 Representative of B-73
COMP 1A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	BRL	0.42	BRL	0.42	0.63	8.43453	1/10 Representative of COMP 1A
COMP 1A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	BRL	0.42	BRL	0.42	0.63		1/10 Representative of COMP 1A
COMP 1A 1-2'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.44	0.67	0.44	0.77	0.44	**1.66**		1/5 Representative of COMP 1A
COMP 1A 2-3'	03/05/2014	EPA 8082A / EPA 3540	BRL	1.1	8.6	1.1	6.3	1.1	***15.45***		1/5 Representative of COMP 1A
COMP 1A 3-4'	03/05/2014	EPA 8082A / EPA 3540	BRL	1.1	10	1.1	6.5	1.1	***17.05***		1/5 Representative of COMP 1A
COMP 1A 4-5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.53	3.0	0.53	3.9	0.53	***7.165***		1/5 Representative of COMP 1A
COMP 2A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.42	0.57	0.42	0.64	0.42	**1.42**	5.16	1/2 Representative of COMP 2A
COMP 2A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	2.1	BRL	2.1	6.8	2.1	***8.9***		1/2 Representative of COMP 2A
Composite 3 0-3'	05/08/2013	EPA 8082A	BRL	0.11	0.14	0.11	0.26	0.11	0.455	0.31	1/2 Representative of Composite 3
Composite 3 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of Composite 3
B-39 0-3'	05/08/2013	EPA 8082A	BRL	0.10	BRL	0.10	0.42	0.10	0.52	0.44	1/2 Representative of B-39
B-39 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	0.25	0.11	0.36		1/2 Representative of B-39
B-49 0-3'	05/08/2013	EPA 8082A	BRL	1.1	8.9	1.1	9.8	1.1	***19.25***	9.7075	1/2 Representative of B-49 / B-49A
B-49 3-9'	05/08/2013	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165		1/2 Representative of B-49
B-50 0-3'	05/08/2013	EPA 8082A	BRL	2.2	14	2.2	22	2.2	***37.1***	16.24333333	1/3 Representative of B-50 / B-50A
B-50 3-9'	05/08/2013	EPA 8082A	BRL	0.43	3.4	0.43	2.2	0.43	***5.815***		2/3 Representative of B-50 / B-50A
Composite 5 0-3'	05/09/2013	EPA 8082A	BRL	0.11	0.81	0.11	1.2	0.11	**2.065**	0.808333333	1/3 Representative of Composite 5 / COMP 5A
Composite 5 3-9'	05/09/2013	EPA 8082A	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/3 Representative of Composite 5
COMP 6A 0-0.5'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.35	0.11	0.63	0.11	**1.035**	0.74	1/2 Representative of COMP 6A Area
COMP 6A 0.5-1'	03/05/2014	EPA 8082A / EPA 3540	BRL	0.11	0.18	0.11	0.21	0.11	0.445		1/2 Representative of COMP 6A Area
B-51B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	1.20	8.60	1.20	7.60	1.20	***16.8***	4.8475	1/4 Representative of B-51B
B-51B 2-3'	06/04/2014	EPA 8082A / EPA 3540	0.58	0.24	1.50	0.24	BRL	0.24	**2.20**		1/4 Representative of B-51B
B-51B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.13	BRL	0.13	BRL	0.13	0.195		2/4 Representative of B-51B

TABLE 2
ESTIMATED PCB CONCENTRATIONS POST-EXCAVATON OF THREE AREAS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1
B-52B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.21	1.80	0.21	1.20	0.21	**3.105**	3.2525	1/4 Representative of B-52B
B-52B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.55	4.40	0.55	4.90	0.55	***9.575***		1/4 Representative of B-52B
B-52B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	BRL	0.11	0.165		2/4 Representative of B-52B
B-55B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	BRL	0.11	0.14	0.11	0.25	1.31875	1/4 Representative of B-55B
B-55B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.47	0.11	0.45	0.11	0.975		1/4 Representative of B-55B

TABLE 2
ESTIMATED PCB CONCENTRATIONS POST-EXCAVATON OF THREE AREAS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1
B-55B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	1.00	0.11	0.97	0.11	**2.025**		2/4 Representative of B-55B
B-56B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.78	0.12	1.20	0.12	**2.04**	1.05	1/4 Representative of B-56B
B-56B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.74	0.12	1.00	0.12	**1.8**		1/4 Representative of B-56B
B-56B 3-4'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	BRL	0.12	BRL	0.12	0.18		2/4 Representative of B-56B
B-57B 1-2'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.11	0.33	0.11	0.42	0.11	0.805	2.61	1/4 Representative of B-57B
B-57B 2-3'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.59	1.70	0.59	3.20	0.59	***5.195***		1/4 Representative of B-57B
B-57B 3-5'	06/04/2014	EPA 8082A / EPA 3540	BRL	0.12	0.76	0.12	1.40	0.12	**2.22**		2/4 Representative of B-57B
Derivation of Exposure Point Concentration: 0-15 Foot Interval											
		Mean Concentration								3.669220663	
		Number Data Points								43	
		Standard Deviation of Population								5.166199447	
		95th confidence interval								1.544134164	
		95th confidence limit on the mean								5.21	
		Method to Derive EPC								95% UCL on mean	
Beneath Existing Mill #3 Building											
B-25 0-3'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15	0.15	Representative
B-25 3-5'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	0.13	0.11	0.24	0.24	Representative
B-25 5-7'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15	0.15	Representative
B-27 0-3'	10/09/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative
B-27 3-5'	10/09/2012	EPA 8082A	BRL	0.10	0.20	0.10	0.20	0.10	0.45	0.45	Representative
B-27A 0-3'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative
B-27A 3-5'	10/17/2012	EPA 8082A	BRL	0.10	0.18	0.10	0.20	0.10	0.43	0.43	Representative
B-27A 5-7'	10/17/2012	EPA 8082A	BRL	0.10	0.18	0.10	0.21	0.10	0.44	0.44	Representative
B-28 0-3'	10/17/2012	EPA 8082A	BRL	0.11	0.19	0.11	0.26	0.11	0.505	0.505	Representative

TABLE 2
ESTIMATED PCB CONCENTRATIONS POST-EXCAVATON OF THREE AREAS
BOOTT MILLS
130 Foot of John Street, Lowell, MA
(unit, parts per million [ppm], mg/Kg)

Sample Identification	Sample Date	Analytical Method	Aroclor 1242	RDL	Aroclor 1248	RDL	Aroclor 1254	RDL	Total PCBs [1]	Representative PCB Concentration	Note 1
B-29 3-5'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	BRL	0.10	0.15	0.15	Representative
B-29 5-6'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative
B-30 0-3'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	0.37	0.10	0.47	0.47	Representative
B-30 3-4.5'	10/17/2012	EPA 8082A	BRL	0.10	BRL	0.10	0.11	0.10	0.21	0.21	Representative
B-36 0-3'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	0.12	0.11	0.23	0.23	Representative
B-36 3-5'	10/17/2012	EPA 8082A	BRL	0.11	BRL	0.11	BRL	0.11	0.165	0.165	Representative
Data Evaluation: All Intervals											
		Maximum Concentration								0.51	
		Method to Derive EPC								Maximum	
Selected MCP Soil Standards											
		2014 MA S-1/GW-2							1	1	
		2014 MA S-1/GW-3							1	1	
		2014 MA S-2/GW-2							4	4	
		2014 MA S-2/GW-3							4	4	
		2014 MA S-3/GW-2							4	4	
		2014 MA S-3/GW-3							4	4	
		2014 Upper Concentration Limits							100	100	

Notes:

RDL = Reported Detection Limit
BRL = Below Reporting Limit
NA = Not Analyzed
Bold = Exceeds TSCA Self-Implementing High Occupancy Standard and MA S-1 standards
Bold Italic = Exceeds MA S-2 and MA S-3 standards
Red Bold Italic = Exceeds TSCA Self-Implementing High Occupancy beneath cap
Blue Bold Italic = Exceeds MA UCL

EPA 8082 or 8082A = SW-846 Method 8082 or 8082A analysis for PCBs
EPA 3540 = PCB with Method 3540 Soxhlet Extraction

95% UCL on Mean = 95% Upper Confidence Limit on the Mean
If no Aroclor detected, one-half of summed RDLs (for all three Aroclors) was used as the surrogate representative data point concentration

[1] - The result for Total Polychlorinated Biphenyls (PCBs) is calculated as the sum of all detects plus one-half detection limit for all Aroclors if not detected in a sample for all Aroclors with at least one detection in one sample. Only three Aroclors were detected in any sample.

Composite 1- Soils collected from borings B-41, B-42, B-43 and B-54 and composited
Composite 2- Soils collected from borings B-44, B-45, B-46 and B-47 and composited
Composite 3- Soils collected from borings B-63, B-64, B-65, B-66, B-67, B-68 and B-40 and composited
Composite 4- Soils collected from borings B-39, B-50 and B-49 and composited
Composite 5- Soils collected from borings B-58, B-59, B-60 and B-61 and composited
Composite 6- Soils collected from borings B-51, B-52, B-55, B-56 and B-57 and composited
Composite 1A- Soils collected from borings B-41A and B-42A and composited
Composite 2A- Soils collected from borings B-44A, B-45A, B-46A and B-47A and composited
Composite 5A- Soils collected from borings B-58A, B-59A, B-60A and B-61A and composited
Composite 6A- Soils collected from borings B-51A, B-52A, B-55A, B-56A and B-57A and composited
Composite ASC-1 Asphalt and soils collected from borings AS-1 through AS-4 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-2 Asphalt and soils collected from borings AS-5 through AS-8 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-3 Asphalt and soils collected from borings AS-9 through AS-12 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-4 Asphalt and soils collected from borings AS-13 through AS-16 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-5 Asphalt and soils collected from borings AS-17 through AS-20 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches
Composite ASC-6 Asphalt and soils collected from borings AS-21 through AS-24 to depth of 12 inches; asphalt thickness ranged between 3 and 5 inches

Prepared By:
Reviewd By: EAF
Revision Date: 06/23/2014

ATTACHMENT 9

Certification

Certification

The undersigned certifies that all sampling plans, sample collection procedures, sample preparation procedures, extraction procedures, and instrumental/chemical analysis procedures used to assess or characterize the PCB contamination at the cleanup site, are on file at the offices of Goldman Environmental Consultants, Inc. (GEC), located at 60 Brooks Drive in Braintree, MA 02184.

Both the owner of the property and the party conducting the cleanup is: Boott Mill Developer, LLC.

Signature: _____ Date: 7/17/14

Gilbert Winn
Boott Mill Developer, LLC

Signature: _____ Date: 7/18/14

Brian T. Butler, LSP
Senior V.P., Operations, Goldman Environmental Consultants, Inc.

ATTACHMENT 10

Public Notifications

Goldman
Environmental
Consultants, Inc.

60 Brooks Drive
Braintree, MA 02184

781-356-9140
Fax 781-356-9147
www.goldmanenvironmental.com

September 10, 2014

Mayor Patrick Murphy
City of Lowell Mayor's Office
Lowell City Hall
375 Merrimack Street
Lowell, Massachusetts 01852

RE: Release Abatement Measure Plan Modification
130 Foot of John Street
Lowell, Massachusetts
RTN 3-26688

Dear Mayor Patrick Murphy,

On behalf of Boott Mill Developer, LLC, the current owner of the above-referenced property, Goldman Environmental Consultants, Inc. (GEC) is notifying you, in accordance with 310 CMR 40.1403(3)(d) regarding the planned implementation of a Release Abatement Measure (RAM) Plan Modification. The RAM Plan Modification has two general objectives: (1) conduct soil removal activities, to reduce the concentration of PCB and lead in soils to applicable MCP and TSCA standards; and (2) properly dispose of contaminated soils in accordance with applicable state and federal requirements.

The RAM Plan Modification requires approval from the United States Environmental Protection Agency (USEPA). The RAM Plan Modification will be initiated no later than 30 days after USEPA approval is granted. Work associated with the RAM is expected to finish within approximately 90 days thereafter.

If you have any questions regarding this issue or would like a copy of the above-referenced report, please feel free to contact Boott Mill Developer, LLC, c/o Gilbert Winn at 617-742-4500 or 6 Faneuil Hall Marketplace, Boston, Massachusetts, 02109.

Respectfully submitted,
Goldman Environmental Consultants, Inc.

Brian T. Butler, LSP
Senior V.P., Operations

cc: MADEP, NERO

Goldman
Environmental
Consultants, Inc.

60 Brooks Drive
Braintree, MA 02184

781-356-9140
Fax 781-356-9147
www.goldmanenvironmental.com

September 10, 2014

Mr. Frank Singleton, Director
City of Lowell Board of Health
341 Pine Street
Lowell, Massachusetts 01851

RE: Release Abatement Measure Plan Modification
130 Foot of John Street
Lowell, Massachusetts
RTN 3-26688

Dear Mr. Singleton,

On behalf of Boott Mill Developer, LLC, the current owner of the above-referenced property, Goldman Environmental Consultants, Inc. (GEC) is notifying you, in accordance with 310 CMR 40.1403(3)(d) regarding the planned implementation of a Release Abatement Measure (RAM) Plan Modification. The RAM Plan Modification has two general objectives: (1) conduct soil removal activities, to reduce the concentration of PCB and lead in soils to applicable MCP and TSCA standards; and (2) properly dispose of contaminated soils in accordance with applicable state and federal requirements.

The RAM Plan Modification requires approval from the United States Environmental Protection Agency (USEPA). The RAM Plan Modification will be initiated no later than 30 days after USEPA approval is granted. Work associated with the RAM is expected to finish within approximately 90 days thereafter.

If you have any questions regarding this issue or would like a copy of the above-referenced report, please feel free to contact Boott Mill Developer, LLC, c/o Gilbert Winn at 617-742-4500 or 6 Faneuil Hall Marketplace, Boston, Massachusetts, 02109.

Respectfully submitted,
Goldman Environmental Consultants, Inc.

Brian T. Butler, LSP
Senior V.P., Operations

cc: MADEP, NERO

ATTACHMENT 11

March & June 2014 Boring Logs

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911JR-3117 **Boring Log ID**: B-2A	**Dates of Work**: 3-4-2014 **Sheet:** 1 **of** 1 **Weather:** 20ºF Clear **Boring Location:** adjacent to GEC-1

Boring Contractor: New England Geotech	**Drilling Method:** Geoprobe, Track mounted Rig, Direct Push
Foreman: Maynor	**Sampling:** Continuous in five foot intervals with dedicated acetate sleeves
GEC Engineer: Mike Bradley	**Screening Equipment:** Mini-Rae 2000 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	60/19	0-5’	SILT	0-5’ = 27.2 ppmv	**S-1: (asphalt not included ~3”) (No Odor)** 0-16” Tannish Gray SILT w/ some small to medium Gravel 16-19” Brown SILT	Samples collected for laboratory analysis: **PCB 3500 (see below for sample intervals** **Correction factor=0.32** ****0-1’=0-3.84”** **1-2’ = 3.84-7.68”** **2-3’=7.68-11.52”** **!3-4’=11.52-15.36”** **4-5’=15.36-19”**	
5’								
10’							B-2A not completed as a monitoring well. Soil boring to a depth of 5’ bgs.	
15’								

** Additional Cogener analysis conducted
! - Duplicate sample submitted

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911JR-3117 **Boring Log ID**: B-10A	**Dates of Work**: 3-4-2014 **Sheet:** 1 **of** 1 **Weather:** 20°F and Clear **Boring Location:** Adjacent to GEC-5

Boring Contractor: New England Geotech	**Drilling Method:** Geoprobe, Track mounted Rig, Direct Push
Foreman: Maynor	**Sampling:** Continuous in five foot intervals with dedicated acetate sleeves
GEC Engineer: Mbradley	**Screening Equipment:** Mini-Rae 2000 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	36/18	0-3’	SILT	0-3’ 0.4 ppmv	**S-1: (asphalt not included)** 0-6” Tannish Gray SILT w/ some small to medium Gravel 6-18” Brown SILT w/ trace fine sand and little small Gravel (brick observed)	Samples collected for laboratory analysis: **PCBs 3500 for the following intervals** Conversion factor=0.5 0.5’= 0-3” 0.5-1’=3-6” 1-2’=6-12” !2-3’ = 12-18”	
5’								
10’								
15’							B-10A not completed as a monitoring well Soil boring to a depth of 3’ bgs.	

! - Duplicate sample submitted

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911JR-3117 **Boring Log ID**: B-11A	**Dates of Work**: 3-4-2014 **Sheet:** 1 **of** 1 **Weather:** 20°F and Clear **Boring Location:** 25' East of Southwestern catch basin

Boring Contractor: New England Geotech	**Drilling Method:** Geoprobe, Track mounted Rig, Direct Push
Foreman: Maynor	**Sampling:** Continuous in five foot intervals with dedicated acetate sleeves
GEC Engineer: Mbradley	**Screening Equipment:** Mini-Rae 2000 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	36/33	0-3'	SILT	0-3' 0.4 ppmv	**S-1: (asphalt not included)** 0-12" Tannish Gray SILT w/ little small Gravel and trace fine Sand 12-33" Brown SILT w/ little small Gravel and trace Fine Sand (coal observed)	Samples collected for laboratory analysis: **PCBs 3500 for the following intervals** Conversion factor=0.92 **!0-0.5'= 0-5.52" 0.5-1'=5.52-11.04" 1-2'=11.04-22.08" 2-3' = 22.08-33"	
5'								
10'								
15'							B-11A not completed as a monitoring well Soil boring to a depth of 3' bgs.	

** Additional Cogener analysis conducted
! - Duplicate sample submitted

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911JR-3117 **Boring Log ID**:B-16A	**Dates of Work**: 3-4-2014 **Sheet:** 1 **of** 1 **Weather:** 20ºF Clear **Boring Location:** 3' Northeast of GEC-1

Boring Contractor: New England Geotech	**Drilling Method:** Geoprobe, Track mounted Rig, Direct Push
Foreman: Maynor	**Sampling:** Continuous in five foot intervals with dedicated acetate sleeves
GEC Engineer: Mike Bradley	**Screening Equipment:** Mini-Rae 2000 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	60/24	0-5'	SILT	0-5' = 1.3 ppmv	**S-1: (asphalt not included ~3") No Odor** 0-8" Tan SILT w/ some fine sand and little small to medium Gravel 8-14" small to large GRAVEL w/ little Silt and fine Sand 14-24" Brown SILT w/ little fine Sand	Samples collected for laboratory analysis: **PCB 3500 (see below for sample intervals** **Correction factor=0.4** ****0-1'=0-4.8"** **1-2'=4.8-9.6"** **2-3'=4.6-14.4""** **3-4'=14.4-19.2"** **4-5'=19.2-24"**	
5'								
10'							B-16A not completed as a monitoring well. Soil boring to a depth of 5' bgs.	
15'								

** Additional Cogener analysis conducted

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911JR-3117 **Boring Log ID**: B-20A	**Dates of Work**: 3-4-2014 **Sheet:** 1 **of** 1 **Weather:** 20°F and Clear **Boring Location:** 52' off WSW outside corner of building and 25' from South wall.

Boring Contractor: New England Geotech	**Drilling Method:** Geoprobe, Track mounted Rig, Direct Push
Foreman: Maynor	**Sampling:** Continuous in five foot intervals with dedicated acetate sleeves
GEC Engineer: Mbradley	**Screening Equipment:** Mini-Rae 2000 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	36/33	0-3'	SILT	0-3' 0.4 ppmv	**S-1: (asphalt not included)** 0-11" Tan SILT w/ some fine Sand and small Gravel 11-15" Gray small to large Gravel w/ some fine Sand and Silt 15-33" Brown SILT w/ some fine Sand and Gravel	Samples collected for laboratory analysis: **PCBs 3500 for the following intervals** Conversion factor=0.92 0-0.5'= 0-5.52 0.5-1'=5.52-11.0" 1-2'=11.04-22.08" !2-3' = 22.08-33"	
5'								
10'								
15'							B-20A not completed as a monitoring well Soil boring to a depth of 3' bgs.	

! - Duplicate sample submitted

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911JR-3117 **Boring Log ID**: B-21A	**Dates of Work**: 3-5-2014 **Sheet:** 1 **of** 1 **Weather:** 25ºF and Light Snow **Boring Location:** 75' off WSW outside corner of building and 25' from South wall.

Boring Contractor: New England Geotech	**Drilling Method:** Geoprobe, Track mounted Rig, Direct Push
Foreman: Maynor	**Sampling:** Continuous in five foot intervals with dedicated acetate sleeves
GEC Engineer: Mbradley	**Screening Equipment:** Mini-Rae 2000 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	36/30	0-3'	SILT	0-3'	**S-1: (asphalt not included) no odor** 0-14" Grayish Brown SILT w/ some fine sand and small to medium Gravel 14-30" Brown SILT w/ some fine sand and small to medium Gravel (coal and brick observed)	Samples collected for laboratory analysis: **PCBs 3500 for the following intervals** Correction factor = 0.83 **0.05'=0-5" 0.5-1'= 5-10" 1-2' = 10-20" 2-3' = 20-30"	
5'								
10'							B-21A not completed as a monitoring well Soil boring to a depth of 3' bgs.	
15'								

** Additional Cogener analysis conducted

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911JR-3117 **Boring Log ID**:B-41A	**Dates of Work**: 3-5-2014 **Sheet:** 1 **of** 1 **Weather:** 20ºF and Clear **Boring Location:** 40' off WSW outside corner of building and 26' from South wall.

Boring Contractor: New England Geotech **Foreman:** Maynor **GEC Engineer:** Mbradley	**Drilling Method:** Geoprobe, Track mounted Rig, Direct Push **Sampling:** Continuous in five foot intervals with dedicated acetate sleeves **Screening Equipment:** Mini-Rae 2000 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	60/41	0-5'	SILT	0-5'= 13.2ppmv	**S-1: (asphalt not included) no odor** 0-18" Tannish Gray SILT w. some fine Sand and small to medium Gravel 18-32" Brown SILT w/ some fine Sand 32-27" Tan SILT w/ some fine Sand 27-41" Bronw SILT w/ some fine Sand	Samples collected for laboratory analysis: **For Composite 1A PCBs 3500** Correction factor = 0.68 0-0.5' = 0-4.08" 0.5-1' = 4.08-8.16" 1-2' = 8.16-16.32" 2-3' = 16.32-24.64" 3-4' = 24.48– 32.64" 4-5' = 32.64-41" **Composite 1A includes B-41A and B-42A**	
5'								
10'								
15'							B-41A not completed as a monitoring well Soil boring to a depth of 5' bgs.	

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911JR-3117 **Boring Log ID**:B-42A	**Dates of Work**: 3-5-2014 **Sheet:** 1 **of** 1 **Weather:** 25ºF Light Snow **Boring Location:** 58' off WSW outside corner of building and 33' from South wall.

Boring Contractor: New England Geotech

Foreman: Maynor

GEC Engineer: Mike Bradley

Drilling Method: Geoprobe, Track mounted Rig, Direct Push

Sampling: Continuous in five foot intervals with dedicated acetate sleeves

Screening Equipment: Mini-Rae 2000 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	60/37	0-5'	SILT	0-5' = NA (jar broke)	**S-1: (asphalt not included ~3")** 0-11" Tannish Gray SILT w. some small to large Gravel 11-29" Dense Brown SILT w/ some small to medium Gravel and fine sand (moist) 29-37" Brick and brown SILT w/ little fine Sand	Samples collected for laboratory analysis: **For Composite 1A PCBs 3500** *Correction factor=0.68 0-0.5'=0-4.08" 0.5-1'=4.08-8.16" 1-2'=8.16-24.48" 2-3'=24.48-32.64" 3-4'=24.48-32.64" 4-5'=32.64-40"	
5'								
10'							B-42A not completed as a monitoring well. Soil boring to a depth of 5' bgs.	
15'								

*Note: On 3-4-2014 GEC advanced B-41A in the wrong location therefore was re-done in the prescribed location on 3-5-2014. Since B-41A and B-42A make up sample Composite 1A GEC advanced a boring directly adjacent to the B-42A to collect soil for Composite 1A on 3-5-2014. Sampling intervals above represent the recovery (60/40) for this for secondary boring advanced on 3-5-2014.

Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA

Project:
130 Foot of John Street
Lowell, MA GEC # 911JR-3117

Boring Log ID: B-44A

Dates of Work: 3-4-2014 **Sheet:** 1 **of** 1

Weather: 20°F and Clear

Boring Location: 74' off WSW outside corner of building and 36.5' from South wall.

Boring Contractor: New England Geotech

Foreman: Maynor

GEC Engineer: Mbradley

Drilling Method: Geoprobe, Track mounted Rig, Direct Push

Sampling: Continuous in five foot intervals with dedicated acetate sleeves

Screening Equipment: Mini-Rae 2000 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	12/10	0-5'	SILT	0-1' 161 ppmv	**S-1: (asphalt not included) Mineral Oil Odor Detected (decon solution)** 0-12" Grayish Tan SILT w/ little Fine Sand and some small to medium Gravel	Samples collected for laboratory analysis: **For Composite 2A PCBs 3500** **0-0.05'=0-5"** **0.5-1'= 5-10"** Soil from B-47A also included in this composite sample	
5'								
10'								
15'							B-44A not completed as a monitoring well Soil boring to a depth of 1' bgs.	

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911JR-3117 **Boring Log ID**:B-47A	**Dates of Work**: 3-4-2014 **Sheet:** 1 **of** 1 **Weather:** Periodic showers, upper 50s°F to low 60s°F **Boring Location:** 67' off WSW outside corner of building and 24' from South wall.

Boring Contractor: New England Geotech **Foreman:** Maynor **GEC Engineer:** Mbradley	**Drilling Method:** Geoprobe, Track mounted Rig, Direct Push **Sampling:** Continuous in five foot intervals with dedicated acetate sleeves **Screening Equipment:** Mini-Rae 2000 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	12/12	0-5'	SILT	0-1' 38 ppmv	**S-1: (asphalt not included) no odor** 0-12" Grayish Tan SILT w/ little Fine Sand and some small to medium Gravel	Samples collected for laboratory analysis: **For Composite 2A PCBs 3500** **0-0.05'=0-6"** **0.5-1'= 6-12"** Soil from B-44A also included in this composite sample	
5'								
10'								
15'							B-47A not completed as a monitoring well Soil boring to a depth of 1' bgs.	

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911JR-3117 **Boring Log ID**: B-48A	**Dates of Work**: 3-4-2014 **Sheet:** 1 **of** 1 **Weather:** 20°F and Clear **Boring Location:** 52' off WSW outside corner of building and 25' from South wall.

Boring Contractor: New England Geotech	**Drilling Method:** Geoprobe, Track mounted Rig, Direct Push
Foreman: Maynor	**Sampling:** Continuous in five foot intervals with dedicated acetate sleeves
GEC Engineer: Mbradley	**Screening Equipment:** Mini-Rae 2000 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	36/33	0-3'	SILT	0-3' = NA	**S-1: (asphalt not included)** 0-7" Tan SILT w/ little fine Sand 7-14" Gray small to large Gravel w/ some fine Sand 14-25" Dense Dark Brown SILT w/ trace small Gravel 25-33" Brown SILT	Samples collected for laboratory analysis: **PCBs 3500 for the following intervals** Conversion factor=0.92 !0-0.5'= 0-5.52 0.5-1'=5.52-11.0" 1-2'=11.04-22.08" 2-3' = 22.08-33"	
5'								
10'								
15'							B-48A not completed as a monitoring well Soil boring to a depth of 3' bgs.	

! - Duplicate sample submitted

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911JR-3117 **Boring Log ID**: B-49A	**Dates of Work**: 3-4-2014 **Sheet:** 1 **of** 1 **Weather:** 20°F and Clear **Boring Location:** 35' off WSW outside corner of building and 25' from South wall.

Boring Contractor: New England Geotech	**Drilling Method:** Geoprobe, Track mounted Rig, Direct Push
Foreman: Maynor	**Sampling:** Continuous in five foot intervals with dedicated acetate sleeves
GEC Engineer: Mbradley	**Screening Equipment:** Mini-Rae 2000 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	36/29	0-3'	SILT	0-3' 40 ppmv	**S-1: (asphalt not included) No Odor** 0-7" Tannish Brown SILT w/ some Fine Sand and small to medium Gravel 7-13" Gray small to large Gravel w/ some Silt and fine Sand 13-29" Tan SILT w/ some fine Sand and little small to medium Gravel (brick and coal observed)	Samples collected for laboratory analysis: **PCBs 3500 for the following intervals** Conversion factor=0.92 **0-1' =0-11.04" 1-2'=11.04-22.08" 2-3' = 22.08-33"	
5'								
10'								
15'							B-49A not completed as a monitoring well Soil boring to a depth of 3' bgs.	

** Additional Cogener analysis conducted

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911JR-3117 **Boring Log ID**:B-50A	**Dates of Work**: 3-4-2014 **Sheet:** 1 **of** 1 **Weather:** 20°F and Clear **Boring Location:** 38' off WSW outside corner of building and 35' from South wall.

Boring Contractor: New England Geotech **Foreman:** Maynor **GEC Engineer:** Mbradley	**Drilling Method:** Geoprobe, Track mounted Rig, Direct Push **Sampling:** Continuous in five foot intervals with dedicated acetate sleeves **Screening Equipment:** Mini-Rae 2000 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	60/30	0-5'	SILT	0-5' 8.2 ppmv	**S-1: (asphalt not included) No Odor** 0-11" Tannish Gray SILT w/ some small to large Gravel and little fine sand 11-23" Brown SILT w/ some fine Sand and little small Gravel (brick and coal observed) 23-30" Brown SILT w/ some Fine Sand	Samples collected for laboratory analysis: **PCBs 3500 for the following intervals** **S1** Conversion factor=0.92 **0-1' =0-6" 1-2'=6-12" !2-3' = 12-18" **S2** Conversion factor=0.92 5-7'=0-13.44" 7-9'=13.44-27"	
5'	2	48/27	5-9'		5-9' 8.2 ppmv	**S-2 :** 0-19" Light Tan SILT w/ some Fine Sand and little medium Gravel 19-27" Light Tan SILT w/ some Fine Sand		
10'							B-50A not completed as a monitoring well Soil boring to a depth of 3' bgs.	
15'								

** Additional Cogener analysis conducted
! - Duplicate sample submitted

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911JR-3117 **Boring Log ID**:B-51A	**Dates of Work**: 3-5-2014 **Sheet:** 1 **of** 1 **Weather:** 25ºF Light Snow **Boring Location:** 87' off WSW outside corner of building and 32' from South wall.

Boring Contractor: New England Geotech **Foreman:** Maynor **GEC Engineer:** Mike Bradley	**Drilling Method:** Geoprobe, Track mounted Rig, Direct Push **Sampling:** Continuous in five foot intervals with dedicated acetate sleeves **Screening Equipment:** Mini-Rae 2000 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	36/36	0-3'	SILT	0-3'= NA (broken jar)	**S-1: (asphalt not included ~3") no odor** 0-5" Brown SILT w/ some Fine Sand and small to medium Gravel 5-9" Gray small to medium w/ some Silt 10-14" Brown SILT w/ some Fine Sand and small to medium Gravel 14-19"Brick 19-22" Crushed Rock 22-30" Brown SILT	Samples collected for laboratory analysis: **For Composite 6A PCBs 3500** Correction factor=1 **0-0.5'=0-6" 0.5-1'=6-12" 1-2'=12-24" 2-3'=24-36" Composite 6A includes B-51A, B-52A, B-55A, B-56A and B-57A	
5'								
10'							B-51A not completed as a monitoring well. Soil boring to a depth of 3' bgs.	
15'								

** Additional Cogener analysis conducted

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911-3117B **Boring Log ID**:B-51B	**Dates of Work**: 6/3/2014 **Sheet:** 1 **of** 1 **Weather:** Sunny, upper 70s°F to low 80s°F, light breeze **Boring Location:** Hotspot #1 (see site plan), adjacent to B-51 & B-51A

Boring Contractor: New England Geotech	**Drilling Method:** Direct push, Geoprobe 7822DT, track mounted rig
Foreman: Maynor Mendoza	**Sampling:** Continuous in five foot intervals with dedicated acetate sleeves
GEC Engineer: David Homan	**Screening Equipment:** Ion Science Tiger 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./Rec.	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	60/42	0-5’	ASPHALT SAND GRAVEL SILT CONCRETE SILT	1-2’ = 0.2 ppmv 2-3’ = 0.3 ppmv 3-5’ = 0.1 ppmv	**S-1:** 0”-2” Light gray, crushed ASPHALT 2”-6” Orange-brown, fine to coarse SAND with fine to coarse gravel (subangular), some silt, medium dense, dry 6”-8” Light gray, coarse GRAVEL (subrounded) with fine to coarse sand, loose, dry 8”-14” Tan, SILT with fine to coarse gravel (angular), stiff, dry 14”-18” Dark tan, SILT, little coarse gravel, very stiff, damp 18”-21” Light gray, crushed CONCRETE with crushed brick pieces 21”-26” Dark brown to orange-brown, SILT, little brick pieces, very stiff, damp 26”-42” Medium brown, SILT some fine sand, little brick pieces, very stiff, damp	Samples collected for laboratory analysis: **Composite 1’-2’** **PCB 8082** **Composite 2’-3’** **PCB 8082** **Composite 3’-5’** **PCB 8082**	
5’				B-51B terminated at 5’ bgs			B-51B completed as a soil boring to a depth of 5’ bgs.	
10’								
15’								

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911JR-3117 **Boring Log ID**:B-52A	**Dates of Work**: 3-5-2014 **Sheet:** 1 **of** 1 **Weather:** 25ºF Light Snow **Boring Location:** 85' off WSW outside corner of building and 24' from South wall.

Boring Contractor: New England Geotech	**Drilling Method:** Geoprobe, Track mounted Rig, Direct Push
Foreman: Maynor	**Sampling:** Continuous in five foot intervals with dedicated acetate sleeves
GEC Engineer: Mike Bradley	**Screening Equipment:** Mini-Rae 2000 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	36/36	0-3'	SILT	0-3'= 2.2 ppmv	**S-1: (asphalt not included ~3") no odor** 0-11" Grayish Tan SILT w. some Fine Sand and Small to medium Gravel 11-14" Gray small to medium GRAVEL w/ little Silt and some medium Sand 14-30" Stiff Brown SITL w/ some small to large Gravel 30-34" Crushed Rock 34-36" Stiff Brown SITL w/ some small to large Gravel	Samples collected for laboratory analysis: **For Composite 6A PCBs 3500** Correction factor=1 **0-0.5'=0-6" 0.5-1'=6-12" 1-2'=12-24" 2-3'=24-36" Composite 6A includes B-51A, B-52A, B-55A, B-56A and B-57A	
5'								
10'							B-52A not completed as a monitoring well. Soil boring to a depth of 3' bgs.	
15'								

** Additional Cogener analysis conducted

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911-3117B **Boring Log ID**:B-52B	**Dates of Work**: 6/3/2014 **Sheet:** 1 **of** 1 **Weather:** Sunny, upper 70s°F to low 80s°F, light breeze **Boring Location:** Hotspot #1 (see site plan), adjacent to B-52 & B-52A

Boring Contractor: New England Geotech	**Drilling Method:** Direct push, Geoprobe 7822DT, track mounted rig
Foreman: Maynor Mendoza	**Sampling:** Continuous in five foot intervals with dedicated acetate sleeves
GEC Engineer: David Homan	**Screening Equipment:** Ion Science Tiger 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./Rec.	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	60/32	0-5’	ASPHALT SAND CONCRETE	1-2’ = 0.4 ppmv	**S-1:** 0”-4” Light gray, crushed ASPHALT 4”-11” Light gray to brown, fine to coarse SAND with fine gravel (angular), loose, dry 11”-14” Light gray, crushed CONCRETE, loose, dry 14”-23” Brown, SILT with fine to coarse gravel (angular) including asphalt pieces, medium stiff, damp 23”-32” Light gray, crushed CONCRETE, some silt, loose, dry	Samples collected for laboratory analysis: **Composite 1’-2’** **PCB 8082** **Composite 2’-3’** **PCB 8082** **Composite 3’-5’** **PCB 8082**	
				SILT	2-3’ = 0.2 ppmv			
				CONCRETE	3-5’ = 0.1 ppmv			
5’				B-52B terminated at 5’ bgs			B-52B completed as a soil boring to a depth of 5’ bgs.	
10’								
15’								

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911JR-3117 **Boring Log ID**:B-55A	**Dates of Work**: 3-5-2014 **Sheet:** 1 **of** 1 **Weather:** 25ºF Light Snow **Boring Location:** 91' off WSW outside corner of building and 25' from South wall.

Boring Contractor: New England Geotech **Foreman:** Maynor **GEC Engineer:** Mike Bradley	**Drilling Method:** Geoprobe, Track mounted Rig, Direct Push **Sampling:** Continuous in five foot intervals with dedicated acetate sleeves **Screening Equipment:** Mini-Rae 2000 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	36/36	0-3'	SILT	0-3' =67 ppmv	**S-1: (asphalt not included ~3") slight odor related to Capsur (decon solution)** 0-7" Brown SILT w/ some fine sand and small to medium Gravel 7-12" Gray small to medium GRAVEL w/ some Silt and Fine Sand 12-36" Stiff Brown SILT w/ some small to large Gravel (coal observed)	Samples collected for laboratory analysis: **For Composite 6A PCBs 3500** Correction factor=1 **0-0.5'=0-6" 0.5-1'=6-12" 1-2'=12-24" 2-3'=24-36" Composite 6A includes B-51A, B-52A, B-55A, B-56A and B-57A	
5'								
10'							B-55A not completed as a monitoring well. Soil boring to a depth of 3' bgs.	
15'								

** Additional Cogener analysis conducted

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911-3117B **Boring Log ID**:B-55B	**Dates of Work**: 6/3/2014 **Sheet:** 1 **of** 1 **Weather:** Sunny, upper 70s°F to low 80s°F, light breeze **Boring Location:** Hotspot #1 (see site plan), adjacent to B-55 & B-55A

Boring Contractor: New England Geotech **Foreman:** Maynor Mendoza **GEC Engineer:** David Homan	**Drilling Method:** Direct push, Geoprobe 7822DT, track mounted rig **Sampling:** Continuous in five foot intervals with dedicated acetate sleeves **Screening Equipment:** Ion Science Tiger 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./Rec.	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	60/24	0-5’	ASPHALT SAND CONCRETE	1-2’ = 1.1 ppmv	**S-1:** 0”-4” Dark gray, crushed ASPHALT 4”-8.5” Olive gray, fine to coarse SAND with fine to coarse gavel, loose, dry 8.5”-12” Light gray, crushed CONCRETE, loose, dry 12”-20.5” Brown, SILT with fine to coarse gravel (angular) including asphalt pieces, medium stiff, damp 20.5”-24” Olive gray, fine to coarse SAND with fine to coarse gravel including crushed concrete pieces, some silt, loose, damp, poorly sorted	Samples collected for laboratory analysis: **Composite 1’-2’ PCB 8082** **Composite 2’-3’ PCB 8082** **Composite 3’-5’ PCB 8082**	
				SILT	2-3’ = 0.2 ppmv			
				SAND	3-5’ = 0.4 ppmv			
5’				B-55B terminated at 5’ bgs			B-55B completed as a soil boring to a depth of 5’ bgs.	
10’								
15’								

Goldman Environmental Consultants, Inc.
60 Brooks Drive
Braintree, MA

Project:
130 Foot of John Street
Lowell, MA GEC # 911JR-3117

Boring Log ID: B-56A

Dates of Work: 3-5-2014 **Sheet:** 1 **of** 1

Weather: 25ºF Light Snow

Boring Location: 98' off WSW outside corner of building and 25' from South wall.

Boring Contractor: New England Geotech

Foreman: Maynor

GEC Engineer: Mike Bradley

Drilling Method: Geoprobe, Track mounted Rig, Direct Push

Sampling: Continuous in five foot intervals with dedicated acetate sleeves

Screening Equipment: Mini-Rae 2000 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	36/36	0-3'	SILT	0-3' NA (broken jar)	**S-1: (asphalt not included ~3")** 0-5" Grayish Tan SILT w/ some Fine Sand and small to medium Gravel 5-17" Stiff Brown SILT w/ some small to medium Gravel (Coal Observed) 17-36" Brown SILT w. some large Gravel	Samples collected for laboratory analysis: **For Composite 6A PCBs 3500** Correction factor=1 **0-0.5'=0-6" 0.5-1'=6-12" 1-2'=12-24" 2-3'=24-36" Composite 6A includes B-51A, B-52A, B-55A, B-56A and B-57A	
5'								
10'							B-56A not completed as a monitoring well. Soil boring to a depth of 3' bgs.	
15'								

** Additional Cogener analysis conducted

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911-3117B **Boring Log ID**:B-56B	**Dates of Work**: 6/3/2014 **Sheet:** 1 **of** 1 **Weather:** Sunny, upper 70s°F to low 80s°F, light breeze **Boring Location:** Hotspot #1 (see site plan), adjacent to B-56 & B-56A

Boring Contractor: New England Geotech	**Drilling Method:** Direct push, Geoprobe 7822DT, track mounted rig
Foreman: Maynor Mendoza	**Sampling:** Continuous in five foot intervals with dedicated acetate sleeves
GEC Engineer: David Homan	**Screening Equipment:** Ion Science Tiger 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./Rec.	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	48/37.5	0-4’	ASPHALT CONCRETE	1-2’ = 0.4 ppmv	**S-1:** 0”-3” Light gray, crushed ASPHALT 3”-7.5” Light gray, crushed CONCRETE with fine to coarse sand and fine to coarse gravel (angular), loose, dry 7.5”-23” Orange-brown, SILT, some fine to coarse gravel, little crushed asphalt pieces, very stiff, damp at 11” 23”-37.5” Yellowish-orange, fine SAND with silt and interbedded crushed asphalt, some crushed concrete pieces, little crushed brick, very stiff, damp	Samples collected for laboratory analysis: **Composite 1’-2’ PCB 8082 Composite 2’-3’ PCB 8082 Composite 3’-4’ PCB 8082**	
				SILT	2-3’ = 0.2 ppmv			
				SAND	3-4’ = 0.8 ppmv			
5’				B-56B terminated at 4’ bgs			B-56B completed as a soil boring to a depth of 4’ bgs.	
10’								
15’								

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911JR-3117 **Boring Log ID**:B-57A	**Dates of Work**: 3-5-2014 **Sheet:** 1 **of** 1 **Weather:** 25ºF Light Snow **Boring Location:** 100' off WSW outside corner of building and 29' from South wall.

Boring Contractor: New England Geotech

Foreman: Maynor

GEC Engineer: Mike Bradley

Drilling Method: Geoprobe, Track mounted Rig, Direct Push

Sampling: Continuous in five foot intervals with dedicated acetate sleeves

Screening Equipment: Mini-Rae 2000 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	36/30	0-3'	SILT	0-3'= 13.8 ppmv	**S-1: (asphalt not included ~3") No odor** 0-8" Tannish Gray SILT w/ some Fine Sand and small to large Gravel 8-17" Brown SILT w/ some fine Snad and small to large Gravel 17-30" Brown SILT w/ some Fine Sand and small to large Gravel	Samples collected for laboratory analysis: **For Composite 6A PCBs 3500** Correction factor=0.83 **0-0.5'=0-5" 0.5-1'=5-10" 1-2'=10-20" 2-3'=20-30" Composite 6A includes B-51A, B-52A, B-55A, B-56A and B-57A	
5'								
10'							B-57A not completed as a monitoring well. Soil boring to a depth of 3' bgs.	
15'								

** Additional Cogener analysis conducted

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911-3117B **Boring Log ID**:B-57B	**Dates of Work**: 6/3/2014 **Sheet:** 1 **of** 1 **Weather:** Sunny, upper 70s°F to low 80s°F, light breeze **Boring Location:** Hotspot #1 (see site plan), adjacent to B-57 & B-57A

Boring Contractor: New England Geotech	**Drilling Method:** Direct push, Geoprobe 7822DT, track mounted rig
Foreman: Maynor Mendoza	**Sampling:** Continuous in five foot intervals with dedicated acetate sleeves
GEC Engineer: David Homan	**Screening Equipment:** Ion Science Tiger 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./Rec.	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	60/42	0-5’	ASPHALT CONCRETE SILT ASPHALT SILT CONCRETE SILT	1-2’ = 0.4 ppmv 2-3’ = 0.3 ppmv 3-5’ = 0.3 ppmv	**S-1:** 0”-3.5” Light gray, crushed ASPHALT 3.5”-10” Light gray, crushed CONCRETE with fine to coarse sand and fine to coarse gravel (angular), loose, dry 10”-16” Brown, SILT with fine gravel (angular) including asphalt pieces, medium dense, damp 16”-18.5” Black, crushed ASPHALT, loose, dry 18.5”-21.5” Brown, SILT with fine gravel (angular) including asphalt pieces, medium dense, damp 21.5”-24.5” Light gray, crushed CONCRETE 24.5”-42” Brown, SILT with fine to coarse gravel including asphalt pieces, some fine sand, stiff, damp	Samples collected for laboratory analysis: **Composite 1’-2’ PCB 8082** **Composite 2’-3’ PCB 8082** **Composite 3’-5’ PCB 8082**	
5’				B-57B terminated at 5’ bgs			B-57B completed as a soil boring to a depth of 5’ bgs.	
10’								
15’								

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911JR-3117 **Boring Log ID**:B-58A	**Dates of Work**: 3-5-2014 **Sheet:** 1 **of** 1 **Weather:** 25ºF Light Snow **Boring Location:** 111' off WSW outside corner of building and 27' from South wall.

Boring Contractor: New England Geotech	**Drilling Method:** Geoprobe, Track mounted Rig, Direct Push
Foreman: Maynor	**Sampling:** Continuous in five foot intervals with dedicated acetate sleeves
GEC Engineer: Mike Bradley	**Screening Equipment:** Mini-Rae 2000 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	36/36	0-3'	SILT	0-3'= 4.0 ppmv	**S-1: (asphalt not included ~3")(No Odor)** 0-16" Brownish Gray SILT w/ some fine Sand and small to large Gravel 16-31" Very Stiff Brown SILT w/ little Fine Sand 31-36" Brown SILT w/ some fine Sand and little small to medium Gravel	Samples collected for laboratory analysis: **For Composite 5A PCBs 3500** Correction factor=1 0-0.5'=0-6" 0.5-1'=6-12" 1-2'=12-24" 2-3'=24-36" Composite 5A includes B-58A, B-59A, B-60A and B-61A	
5'								
10'							B-58A not completed as a monitoring well. Soil boring to a depth of 3' bgs.	
15'								

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911JR-3117 **Boring Log ID**:B-59A	**Dates of Work**: 3-5-2014 **Sheet:** 1 **of** 1 **Weather:** 25ºF Light Snow **Boring Location:** 119' off WSW outside corner of building and 40' from South wall.

Boring Contractor: New England Geotech	**Drilling Method:** Geoprobe, Track mounted Rig, Direct Push
Foreman: Maynor	**Sampling:** Continuous in five foot intervals with dedicated acetate sleeves
GEC Engineer: Mike Bradley	**Screening Equipment:** Mini-Rae 2000 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	36/25	0-3'	SILT	0-3'= 4.6 ppmv	**S-1: (asphalt not included ~3") no odor** 0-4" Grayish tan SILT w/ some fine Sand and small to medium Gravel 4-6" Dark Brown SILT w/ some fine to medium Sand 6-10" Tan SILT 10-11" Coal Dust (SILT and coarse Sand) 11-13" Red medium to Coarse SAND w/ some Silt 13-25" Brown SILT w/ some small to medium Gravel	Samples collected for laboratory analysis: **For Composite 5A PCBs 3500** Correction factor=0.81 0-0.5'=0-4.86" 0.5-1'=4.86-9.72" 1-2'=9.72-19.44" 2-3'=19.44-29.16" Composite 5A includes B-58A, B-59A, B-60A and B-61A	
5'								
10'							B-59A not completed as a monitoring well. Soil boring to a depth of 3' bgs.	
15'								

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911JR-3117 **Boring Log ID**:B-60A	**Dates of Work**: 3-5-2014 **Sheet:** 1 **of** 1 **Weather:** 25ºF Light Snow **Boring Location:** 120' off WSW outside corner of building and 34' from South wall.

Boring Contractor: New England Geotech	**Drilling Method:** Geoprobe, Track mounted Rig, Direct Push
Foreman: Maynor	**Sampling:** Continuous in five foot intervals with dedicated acetate sleeves
GEC Engineer: Mike Bradley	**Screening Equipment:** Mini-Rae 2000 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	36/29	0-3'	SILT	0-3'= 0.3ppmv	**S-1: (asphalt not included ~3")** 0-5" Gray Tan SILT w/ some fine Sand and small to medium Gravel 5-7" Dark Brown SILT w/ some fine to medium Sand 7-12" Brown SILT w/ some fine to medium Sand 12-18" Reddish Brown SILT w/ some fine to medium Sand and small to medium Gravel 18-22" Tan SILT 22-29 Orangish tannish SILT	Samples collected for laboratory analysis: **For Composite 5A PCBs 3500** Correction factor=0.81 0-0.5'=0-4.86" 0.5-1'=4.86-9.72" 1-2'=9.72-19.44" 2-3'=19.44-29.16" Composite 5A includes B-58A, B-59A, B-60A and B-61A	
5'								
10'							B-60A not completed as a monitoring well. Soil boring to a depth of 3' bgs.	
15'								

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911JR-3117 **Boring Log ID**:B-61A	**Dates of Work**: 3-5-2014 **Sheet:** 1 **of** 1 **Weather:** 25ºF Light Snow **Boring Location:** 124' off WSW outside corner of building and 31' from South wall.

Boring Contractor: New England Geotech	**Drilling Method:** Geoprobe, Track mounted Rig, Direct Push
Foreman: Maynor	**Sampling:** Continuous in five foot intervals with dedicated acetate sleeves
GEC Engineer: Mike Bradley	**Screening Equipment:** Mini-Rae 2000 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	36/23	0-3'	SILT	0-3'= 8.1ppmv	**S-1: (asphalt not included ~3")No odor** 0-6" Gray SILT w/ some fine Sand and small to medium Gravel 6-7" Black Coarse SAND (Coal) 7-23" Orangish Tan SILT	Samples collected for laboratory analysis: **For Composite 5A PCBs 3500** Correction factor=0.64 0-0.5'=0-3.84" 0.5-1'=3.84-7.67" 1-2'=7.67-16.32" 2-3'=16.32-23" Composite 5A includes B-58A, B-59A, B-60A and B-61A	
5'								
10'							B-61A not completed as a monitoring well. Soil boring to a depth of 3' bgs.	
15'								

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911-3117B **Boring Log ID**:B-69	**Dates of Work**: 6/3/2014 **Sheet:** 1 **of** 1 **Weather:** Sunny, upper 70s°F to low 80s°F, light breeze **Boring Location:** Hotspot #2 (see site plan)

Boring Contractor: New England Geotech **Foreman:** Maynor Mendoza **GEC Engineer:** David Homan	**Drilling Method:** Direct push, Geoprobe 7822DT, track mounted rig **Sampling:** Continuous in five foot intervals with dedicated acetate sleeves **Screening Equipment:** Ion Science Tiger 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./Rec.	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	60/47	0-5’	ASPHALT CONCRETE	0-0.5’ = 3.3 ppmv	**S-1:** 0”-3” Gray, crushed ASPHALT 3”-11.5” Light gray, crushed CONCRETE with fine to coarse sand and fine to coarse gravel (angular), loose, dry 11.5”-23.5” Tan, fine SAND with inter-bedded brown silt and fine to coarse gravel including crushed asphalt pieces, dense, dry 23.5”-47” Brown, fine SAND with fine to coarse gravel (subrounded), little crushed asphalt, dense, damp **S-2:** 1st 12” cave in 12”-34” Light brown, SILT, some fine sand and clay, medium stiff, damp	Samples collected for laboratory analysis: **Composite 0’-0.5’ PCB 8082** **Composite 0.5’-1’ PCB 8082** **Composite 1’-2’ PCB 8082** **Composite 2’-5’ PCB 8082** **Composite 5’-7’ PCB 8082**	
5’				SAND	0.5-1’ = 0.3 ppmv			
					1-2’ = 0.2 ppmv			
	2	24/34	5-7’		2-5’ = 0.1 ppmv			
				SILT				
				B-69 terminated at 7’ bgs	5-7’ = 0.0 ppmv		B-69 completed as a soil boring to a depth of 7’ bgs.	
10’								
15’								

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911-3117B **Boring Log ID**:B-70	**Dates of Work**: 6/3/2014 **Sheet:** 1 **of** 1 **Weather:** Sunny, upper 70s°F to low 80s°F, light breeze **Boring Location:** Hotspot #2 (see site plan)

Boring Contractor: New England Geotech	**Drilling Method:** Direct push, Geoprobe 7822DT, track mounted rig
Foreman: Maynor Mendoza	**Sampling:** Continuous in five foot intervals with dedicated acetate sleeves
GEC Engineer: David Homan	**Screening Equipment:** Ion Science Tiger 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./Rec.	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	60/29	0-5’	ASPHALT SILT CONCRETE	0-0.5’ = 2.9 ppmv 0.5-1’ = 0.8 ppmv 1-2’ = 1.4 ppmv 2-5’ = 0.2 ppmv	**S-1:** 0”-4” Gray, crushed ASPHALT 4”-13” Gray, SILT with fine to coarse sand and fine to coarse gravel (angular to subangular), dry to slightly damp, poorly sorted 13”-21” Tan, SILT with fine sand and fine to coarse gravel (subangular), some crushed asphalt pieces, medium stiff, damp 21”-29” Landscape fabric at 21”, light gray, crushed CONCRETE, dry, loose	Samples collected for laboratory analysis: **Composite 0’-0.5’ PCB 8082** **Composite 0.5’-1’ PCB 8082** **Composite 1’-2’ PCB 8082** **Composite 2’-5’ PCB 8082** **Composite 5’-7’ PCB 8082**	
5’	2	24/27	5-7’	SILT B-70 terminated at 7’ bgs	5-7’ = 0.1 ppmv	**S-2:** 0”-10.5” Light gray, crushed CONCRETE 10.5”-27” Tan, SILT with fine sand, some clay, medium stiff, damp	B-70 completed as a soil boring to a depth of 7’ bgs.	
10’								
15’								

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911-3117B **Boring Log ID**:B-71	**Dates of Work**: 6/3/2014 **Sheet:** 1 **of** 1 **Weather:** Sunny, upper 70s°F to low 80s°F, light breeze **Boring Location:** Hotspot #2 (see site plan)

Boring Contractor: New England Geotech	**Drilling Method:** Direct push, Geoprobe 7822DT, track mounted rig
Foreman: Maynor Mendoza	**Sampling:** Continuous in five foot intervals with dedicated acetate sleeves
GEC Engineer: David Homan	**Screening Equipment:** Ion Science Tiger 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./Rec.	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	24/22	0-2’	ASPHALT CONCRETE	0-0.5’ = 90 ppmv	**S-1:**	Samples collected for laboratory analysis:	
				SILT		0”-3” Gray, crushed ASPHALT	**Composite 0’-0.5’ PCB 8082**	
					0.5-1’ = 3 ppmv	3”-10” Gray, crushed CONCRETE, loose, slightly damp	**Composite 0.5’-1’ PCB 8082**	
				B-71 terminated at 2’ bgs		10”-12” Gray, SILT with fine to coarse sand and fine to coarse gravel, loose, slightly damp	**Composite 1’-2’ PCB 8082**	
5’					1-2’ = 0.7 ppmv	12”-13” Brown, SILT with fine to coarse sand, little fine to medium gravel, little red staining at 13”, medium dense, damp	B-71 completed as a soil boring to a depth of 2’ bgs.	
						13”-16” Light gray-brown, fine to medium SAND, some fine gravel (angular), loose, damp		
10’						16”-22” Brown, SILT with fine to coarse sand, little fine to medium gravel, medium dense, damp		
15’								

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911-3117B **Boring Log ID**:B-72	**Dates of Work**: 6/3/2014 **Sheet:** 1 **of** 1 **Weather:** Sunny, upper 70s°F to low 80s°F, light breeze **Boring Location:** Hotspot #2 (see site plan)

Boring Contractor: New England Geotech	**Drilling Method:** Direct push, Geoprobe 7822DT, track mounted rig
Foreman: Maynor Mendoza	**Sampling:** Continuous in five foot intervals with dedicated acetate sleeves
GEC Engineer: David Homan	**Screening Equipment:** Ion Science Tiger 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./Rec.	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	24/19	0-2’	ASPHALT SAND CONCRETE	0-0.5’ = 80 ppmv	**S-1:**	Samples collected for laboratory analysis: **Composite 0’-0.5’ PCB 8082 Composite 0.5’-1’ PCB 8082 Composite 1’-2’ PCB 8082**	
				SILT	0.5-1’ = 15.6 ppmv	0”-4” Gray, crushed ASPHALT 4”-8” Olive gray, coarse SAND with fine to coarse gravel (angular), some clay, medium dense, moist 8”-10.5” Light gray, crushed CONCRETE, loose, dry 10.5”-19” Olive gray-brown, SILT with fine to coarse sand and fine to medium gravel (subangular), some crushed asphalt, little clay, medium stiff, moist		
5’				B-72 terminated at 2’ bgs	1-2’ = 0.4 ppmv		B-72 completed as a soil boring to a depth of 2’ bgs.	
10’								
15’								

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA	**Project:** 130 Foot of John Street Lowell, MA GEC # 911-3117B **Boring Log ID**:B-73	**Dates of Work**: 6/3/2014 **Sheet:** 1 **of** 1 **Weather:** Sunny, upper 70s°F to low 80s°F, light breeze **Boring Location:** Hotspot #2 (see site plan)

Boring Contractor: New England Geotech	**Drilling Method:** Direct push, Geoprobe 7822DT, track mounted rig
Foreman: Maynor Mendoza	**Sampling:** Continuous in five foot intervals with dedicated acetate sleeves
GEC Engineer: David Homan	**Screening Equipment:** Ion Science Tiger 10.6 eV PID

KEY: = Interval sampled for analysis Cement Seal: Bentonite Seal: Sand Pack: Slotted Screen:

Depth	SAMPLE No.	SAMPLE Pen./Rec.	SAMPLE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	24/14	0-2’	ASPHALT SAND	0-0.5’ = 150 ppmv 0.5-1’ = 26.2 ppmv 1-2’ = 2 ppmv	**S-1:** 0”-3” Gray, crushed ASPHALT 3”-5” Grayish-brown to dark gray, silty fine to coarse SAND with fine to medium gravel, poorly sorted, damp 5”-14” Brown to dark brown, silty fine to coarse SAND with fine to coarse gravel, poorly sorted, moist to wet	Samples collected for laboratory analysis: **Composite 0’-0.5’ PCB 8082** **Composite 0.5’-1’ PCB 8082** **Composite 1’-2’ PCB 8082**	
5’				B-73 terminated at 2’ bgs			B-73 completed as a soil boring to a depth of 2’ bgs.	
10’								
15’								