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BOSTON REDEVELOPMENT AUTHORITY

REPORT FOR PARCEL P-3 ROXBURY, MA RTN 3-15009

PHASE II -COMPREHENSIVE SITE ASSESSMENT AND PHASE III-REMEDIAL ACTION PLAN

**APRIL 2002** 



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### EXECUTIVE SUMMARY

The Boston Redevelopment Authority (BRA) contracted Weston & Sampson Engineers, Inc., to perform a Phase II - Comprehensive Site Assessment and Phase III -- Identification, Evaluation, and Selection of Remedial Alternatives (Phase II/III) report for BRA's Parcel P-3, which is located at the intersection of Whittier and Tremont Streets in Roxbury, Massachusetts.

Between November 1996 and March 1997, during a Phase I Initial Site Investigation (Phase I) at Parcel P-3, total petroleum hydrocarbons (TPH), certain polynuclear aromatic hydrocarbons (PAHs) and lead were detected in soil samples at concentrations in excess of applicable reportable concentrations (RCs); however, contaminants detected in groundwater were all below RCs. BRA submitted a Release Notification Form (RNF) to the Department of Environmental Protection (DEP) on April 14, 1997. DEP issued release tracking number (RTN) 3-15009 to this release, which was Tier Classified in April 1998 as Tier II with a Numerical Ranking Scoresheet score of 143.

The data presented in this Phase II report indicate that the extent of soil contamination the ("Site") is limited to the urban fill unit at two areas in the northern portion of Parcel P-3: Area 1 and Area 2. Lead concentrations exceeded Upper Concentration Limits (UCL) in two samples and the Toxicity Characteristic Leaching Procedure (TCLP) hazardous waste threshold in one sample. In addition, a lead impacted soil hot spot was identified in Area 2. Groundwater sampling results presented in this Phase II report indicate that contaminants in groundwater were all detected at concentrations below Method 1 Standards.

A Method 1 Risk Characterization and a Method 3 Risk Characterization screening was conducted using the Phase I and Phase II data. The Method 3 screening results were similar to the Method 1 findings, therefore we have included a Method 1 Risk Characterization in this report. The results of the risk characterization indicate that a condition of No Significant Risk does not exist at the Site due to the hot spot in Area 2 and limited EPH-contaminated soil in Area 1. Area 1 soil also contained lead and PAH concentrations similar to those typically found in urban fill. Although these contaminants were not included in the risk characterization, if residences are to be placed in Area 1, there would be a significant risk due to current soil contaminant concentrations.

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Therefore, the Phase II concluded that to achieve a condition of No Significant Risk, at a minimum, the hot spot should be excavated and disposed off-Site. An Activity and Use Limitation (AUL) restricting future residential use may then be placed on Area 1. However, if future residential development of Area 1 is desired, then several remedial options are available, including excavation of all contaminated soil in Area 1, or a combination of limited excavation coupled with placement of a cap to provide adequate separation. Therefore, to attain site closure, we recommend Alternative 2, hot spot excavation in Area 2 and an AUL to identify Site use and activities that are consistent with maintaining a condition of No Significant Risk in Area 1.

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### 1.0 INTRODUCTION

### 1.1 General

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Weston & Sampson Engineers, Inc., has prepared this Phase II - Comprehensive Site Assessment and Phase III – Identification, Evaluation, and Selection of Remedial Alternatives (Phase II/III) report on behalf of the Boston Redevelopment Authority (BRA) in accordance with the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000 (Sections 40.0830 and 40.0850). The Department of Environmental Protection (DEP) issued Release Tracking Number (RTN) 3-15009 on May 28, 1997 to BRA's Parcel P-3 Facility (Parcel P-3), located at the intersection of Whittier and Tremont Streets in Roxbury, Massachusetts (Figure 1 – Locus Map). The release was associated with the detection of total petroleum hydrocarbons (TPH), polynuclear aromatic hydrocarbons (PAHs) and lead in soil above MCP reportable concentrations (RCs). The goal of this Phase II/III investigation was to further assess the nature and extent of oil and/or hazardous materials (OHM) in subsurface soil and groundwater, to evaluate the potential risk to human health, safety, public welfare, and the environment during current and future uses, and to evaluate remedial alternatives. This report is subject to the Limitations in Section 8.0.

## 1.2 Property Location and Description

Parcel P-3 consists of three subparcels totaling approximately 384,500 square feet (8.8 acres) and is located in the Campus High School Urban Renewal Area in Roxbury, Massachusetts (see Figure 2, Site Plan). Parcel P-3 is bounded by Tremont Street to the north, Whittier Street and residential apartments to the east, Downing Street to the south and Linden Park Street to the west. The Madison Park High School abuts a portion of Parcel P-3's western boundary.

The geographical location for the Parcel P-3 is described as follows:

UTM Coordinates:	N E	4,688,700 m 327,800 m
Latitude/Longitude:		42°20'03" N 71°05'21" W

Parcel P-3 currently contains one structure, the Whittier Street Health Center (WSHC), located on the northeastern portion of Parcel P-3. From 1997 until approximately two years ago, the building

was an active day-health clinic. The building is currently unoccupied. Connolly's Tavern, a single story structure located at the northern corner of Parcel P-3, was demolished in April 1998. The central and northern portions of the parcel are overgrown and undeveloped, and crossed by two currently obstructed and unused streets (Hampshire and Vernon). The southern portion of Parcel P-3 consists of a large asphalt-paved parking area and is used by the adjacent Madison Park High School. A plan showing existing utilities across Parcel P-3 is included in Appendix A. For discussion purposes, Parcel P-3 has been divided into three areas: Area 1 (unpaved area behind the former Connelly's Tavern), Area 2 (behind the former WSHC) and Area 3 (western portion of Parcel P-3). In addition, Parcel P-3 includes the former WSHC (see Figure 2).

The WSHC is a four-story building with basement. It is connected to municipal water and sewer and is heated by oil. A vaulted underground storage tank (UST) is located in the basement of the health center. The northwest portion of Parcel P-3 is a vacant area containing approximately 5 feet of fill above street grade. In general, Parcel P-3 topography is flat, with the exception of the filled area behind the former Connolly's Tavern. With the exception of the filled area and landscaping, the rest of the parcel is paved. With the exception of the portion used by the High School as a parking lot, Parcel P-3 is surrounded with a 6-foot high security fence to restrict access. The fenced area includes the areas of soil contamination identified in the Phase I.

Solid waste, consisting mainly of construction and demolition debris, was observed in the paved area behind the Whittier Street Health Center. In addition, approximately 300 cubic yards of fill and an abandoned vehicle were dumped in this paved area. Based on our observations, the additional fill appears to have been dumped in this area between January and March 1997.

## 1.3 **Property Ownership and History**

The BRA is the current owner of Parcel P-3. Historically, Parcel P-3 formerly consisted of over 50 smaller commercial, industrial and residential lots for over 100 years. Entities that have occupied Parcel P-3 have included Boston Edison, St. John's Church, the Roxbury Crossing Station, a United States Postal Office, the Tremont Iron Foundry, an Electric Cable Manufacturer and the Roxbury Carpet Company.

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### 1.4 Property Topography and Surface Water Drainage

In general the topography at Parcel P-3 slopes gently toward the northeast; however, the northeast corner of Parcel P-3 contains a raised land surface, which is approximately 5 to 10 feet above surrounding pavement (Figure 2). Because Parcel P-3 and the surrounding area are predominantly paved, surface water runoff is collected in catch basins and routed to the City sewer.

No surface water or drainage swales were observed on Parcel P-3. The Stony Brook Culvert, which is completely enclosed, borders Parcel P-3 and lies beneath Downing Street and Whittier Street (formerly Culvert Street). The Stony Brook Culvert ultimately discharges to the Muddy River, approximately ½-mile north-northwest of Parcel P-3, which in turn discharges to the Charles River.

## 1.5 Area Public Health and Sensitive Environmental Receptors

Weston & Sampson prepared Figure 3 - Area Receptors Map using Massachusetts Geographic Information System (MassGIS) data. Figure 3 includes 500-foot and ½-mile radii from the center of Parcel P-3.

### 1.5.1 Drinking Water Supplies

According to Figure 3, Parcel P-3 is not underlain by an Interim Wellhead Protection Area (IWPA), Zone II or potentially productive medium- or high-yield aquifer. The structure on Parcel P-3 and the surrounding area are served by municipal water. No public water supply wells are located within a mile of Parcel P-3. No private water supplies are located within 500 feet of Parcel P-3.

### 1.5.2 Potential Human and Environmental Receptors

Parcel P-3 is bordered by a residential neighborhood and a public school. In addition a vacant former health care facility (Whittier Street Health Center) is located within Parcel P-3 boundary. Parcel P-3 is located in the Charles River Basin; however, Figure 3 does not identify any surface water bodies, wetlands or any potential productive aquifers within ½-mile of Parcel P-3. The Stony Brook Culvert, currently underground, borders Parcel P-3 and is located below Whittier and Downing Streets. The nearest regulated open spaces are within 500-feet of Parcel P-3, located northwest of Tremont Street and some additional small patches adjacent to Whittier Street. No other environmental receptors are shown within ½-mile of Parcel P-3. There are no institutions within ½-mile of Parcel P-3, however, the nearest day school is the Madison Park High School, which abuts

Parcel P-3 to the south and west. The western portion of Parcel P-3 serves as one of the school's parking areas.

### 1.6 MCP Method 1 Soil and Groundwater Classification

## 1.6.1 Soil

In accordance with 310 CMR 40.0933, soil is classified as S-2 and S-3, depending on whether the soil is covered with pavement or the depth that contaminants were encountered. Parcel P-3 is both paved (western and southeastern portion) and unpaved (behind the former Connolly's Tavern). BRA has placed fencing to restrict access to Area 1. Contaminated soil is between 0 and 15 feet below the paved and unpaved ground surface, and is therefore considered both "accessible" and "potentially accessible." The frequency and intensity of use by children and adults is low.

## 1.6.2 Groundwater

Parcel P-3 is not within a Current or Potential Drinking Water Source Area, and therefore does not meet the GW-1 criteria in 310 CMR 40.0932(4). Most of Parcel P-3 area is greater than 30 feet from existing buildings. Portions of Parcel P-3, where groundwater is less than 15 feet and within 30 feet of the Whittier Street Health Center, met the GW-2 criteria when the Health Center structure was occupied, as defined in 310 CMR 40.0932(6). Groundwater across the rest of Parcel P-3 is classified as GW-3 in accordance with 310 CMR 40.0932(2).

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## 2.0 RELEASE HISTORY AND RESPONSE ACTIONS

## 2.1 General

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No environmental studies had been conducted for Parcel P-3 prior to the Preliminary Assessment and Phase I Initial Site Investigation, which began in November/December 1996. No releases had been reported prior to April 1997. A chronological summary of the DEP-reported releases, including associated field activities, sampling results, and response actions is presented below.

## 2.2 Preliminary Assessment and Phase I Initial Site Investigation

Between November 1996 and March 1997, Weston & Sampson performed the following field activities at Parcel P-3 as part of a preliminary environmental assessment and subsequent Phase I Initial Site Investigation:

- 7 test pit excavations (TP-1 through TP-7);
- 31 soil boring and 12 groundwater monitoring well installations (WS-1 through WS-12, B-1, B-2 and B-101 through B-117);
- Groundwater elevation survey; and
- Soil and groundwater sample collection and analysis.

Sample locations are shown on Figure 2.

The test pits, excavated up to 19 feet below grade using a backhoe, showed that two fill units are present. The first unit was present between 0 and 14 feet below grade and consisted of brown fine to coarse sand with debris that included concrete, brick, wood, metal, asphalt, glass, and rubber tires. Below this fill layer was either native soils (peat, clay, or sand) or a lower fill unit, which consisted of light to dark brown fine to coarse sand and burnt debris (cinders, brick, wood, and slag). This lower fill unit, observed at test pits TP-4, TP-5, TP-6 and TP 7, varied in depth between 7 and 19 feet below grade.

During the test pitting and drilling activities, Weston & Sampson collected soil samples and screened them for the presence of total volatile organic compounds (TVOCs) using a photo-ionization detector (PID). TVOC screening results are shown in Table 1. Selected soil samples were submitted for laboratory analysis of one or more of the following parameters: Volatile Organic Compounds (VOCs) by EPA Method 8260; TPH GC/FID scan by modified EPA Method 8100; PAHs by EPA

Method 8100; RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver); and, Polychlorinated Biphenyls (PCBs).

Weston & Sampson also collected groundwater samples from the twelve monitoring wells (WS-1 through WS-12) for laboratory analysis of VOCs by EPA Method 8260; TPH GC/FID scan by modified EPA Method 8100; PAHs by EPA Method 8100; and, dissolved RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver). Soil and groundwater sampling results are summarized in Tables 2 and 3, respectively.

The sampling results indicated that concentrations of TPH, PAH and lead were detected in soil above applicable RCs at borings WS-8, WS-10 and WS-12 in the fill area located southwest of the former Connolly's Tavern (Figure 2). Consequently, the BRA submitted a release notification form (RNF) to DEP on April 14, 1997. The DEP subsequently issued RTN 3-15009 and a Notice of Responsibility dated May 28, 1997 for this release. DEP correspondences are included in Appendix B. No parameters were detected above RCs in groundwater.

The findings of the preliminary environmental assessment and additional field work were used to complete the Phase I Initial Site Investigation report (Phase I) and prepare a Tier Classification (TC). Parcel P-3 was classified as Tier II based on a Numerical Ranking Score of 143. The Phase I and TC were submitted to DEP in April 1998. Prior to Phase II field work, the BRA submitted a notification of delay letter to DEP explaining the reasons for delay in this Phase II/III report.

### 2.3 Flooded Basement of the Whittier Street Health Center

In 2001, a ruptured pipe flooded the basement at the Whittier Street Health Center resulting in the tank floating and dislodging pipe fittings. Some oil was released to the basement. BRA obtained a NPDES exclusion permit and pumped out the oily water and discharged it via carbon canisters to a nearby storm drain. Following an inspection of the basement for cracks, etc., we understand that the release was completely contained within the basement and therefore no release to the environment occurred. No release tracking number has been issued as it appears that there was no release to the environment. Therefore the flooded basement condition is <u>not</u> part of the disposal site for RTN 3-15009 and is not discussed further in this report. In September 2001, Weston & Sampson re-sampled

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WS-2 for volatile and extractable petroleum hydrocarbons (VPH/EPH) to evaluate if there was petroleum contamination in groundwater and to establish Site boundaries. The results are included in Section 4.3.4.

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#### 3.0 PHASE II SUBSURFACE INVESTIGATION

#### 3.1 General

#### 3.1.1 Conceptual Site Model

Results from the various investigations were used to develop a conceptual site model for Parcel P-3. The site includes various layers of fill including recent (area behind Connolly's Tavern) and historic (whole parcel) phases of filling. Fill overlays organic silt and clay. Groundwater at the site appears to flow radially to the south and east and may be controlled by the Stony Brook Culvert. Groundwater is not a resource and data from the Phase I indicated that groundwater has not been impacted. The Phase I study focused primarily on the unpaved area located behind the former Connolly's Tavern ("Area 1"). This approximately 1.5-acre area is covered with a mound of urban fill to an elevation of approximately 6 feet above street grade.

Phase I sampling results indicated that elevated TPH, PAH and lead concentrations are present in subsurface soil above Method 1 Standards and the source of some of the PAH contamination may be attributed to the fill material. The source of the lead is unknown and may be due to historic site use, including the former Tremont Iron Foundry. Although there were no indications of discrete source areas and the contaminant concentrations appeared to be fairly randomly distributed, both horizontally and vertically, throughout this area, the detection of contaminants did not meet notification exemptions under the MCP. Consequently portions of Parcel P-3 became a DEP-listed disposal site. No surficial soil samples were collected from Area 1 during the Phase I investigation.

Several PAHs also exceeded Method 1 Standards in soil samples B-116 and B-117 between 0 and 3 feet below pavement in the 1-acre paved area located behind the Whittier Street Health Center ("Area 2"). The soil in these samples also contained urban fill similar to that was observed in Area 1. Area 2 also contained soil stockpiles from unknown sources that had not been characterized during the Phase I investigation.

The soil and groundwater data obtained from the 5.5-acre western portion of Parcel P-3 ("Area 3"), currently being used as a parking lot for the Madison Park High School, indicated that contaminant

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concentrations were below Method 1 Standards. Therefore the "Site" is now defined as the portion of Parcel P-3 known as Areas 1 and 2, as shown on Figures 2 and 7.

The overall objective of the Phase II subsurface investigation was to evaluate the nature and extent of contamination in unpaved surficial soil in Area 1 and subsurface soil in Area 2. The soil stockpiles in Area 2 were also sampled during the Phase II investigation. In summary, the Phase II field investigation included the following activities:

- Collection of four surficial soil samples (SS-1 to SS-4) from Area 1.
- Advancement of 12 soil borings in Area 2 (B-201 to B-212).
- Installation of monitoring well WS-13 in Area 2.
- Collection of 4 soil samples (SP-1 through SP-4) from the stockpile in Area 2.

The only nearby surface water body is the Stony Brook Culvert that is below Whittier Street. Since the Brook is enclosed there does not appear to be a pathway for soil to impact the enclosed Brook. The soil stockpiles are heavily vegetated and there is no evidence of erosion to catchbasins in the streets.

A summary of activities performed for the Phase II investigation is detailed below and sampling locations are shown on Figure 2.

## 3.1.2 Quality Assurance Project Plan

Prior to implementing the Phase II investigation, Weston & Sampson developed a Brownfields Quality Assurance Project Plan (QAPP) as required under the Federal Brownfields Economic Redevelopment Initiative. The purpose of this QAPP was to provide the specific field and analytical procedures to meet EPA data quality requirements for the Phase II investigation. The QAPP was submitted to the Region I Environmental Protection Agency (EPA) in November 2000 and subsequently approved on December 1, 2000 (see Appendix B for approval letter).

## 3.2 Soil Boring Advancement

On January 10 and 11, 2001, Earth Exploration, Inc., of Hopkinton, Massachusetts, advanced 7 soil borings at Parcel P-3 at locations shown in Figure 2 under the oversight of a Weston & Sampson

geologist. One boring (B-201(D)) was advanced near the former Connolly's Tavern to evaluate the vertical extent of soil contamination in this area. Three borings were advanced in the area behind the Whittier Street Health Center (B-202(S), B-203(S), B-204(S)) and three borings were advanced in the western portion (B-205, B-206, B-207) to evaluate the horizontal extent of soil contamination.

On September 5, 2001, Earth Exploration, Inc., advanced 5 additional soil borings (B-208 through B-212) at locations shown in Figure 2 to further evaluate the extent of elevated lead detected in soil in this area. Weston & Sampson documented soil boring activities. One boring, B-209, was advanced adjacent to boring B-202(S) to evaluate the vertical extent of soil contamination in this area. This boring was completed as groundwater monitoring well WS-13. Four borings, B-208, B-210, B-211 and B-212, were advanced around B-209 to evaluate the horizontal extent of lead contamination in soil.

Borings were advanced using 3.25-inch or 4.25-inch inner diameter hollow stem augers (HSA) as specified in DEP Publication #WSC-310-91, *Standard References for Monitoring Wells*. During drilling, soil samples were collected at 5-foot depth intervals using a 2-foot split-spoon sampler and classified by a Weston & Sampson geologist using the Modified Burmister Soil Classification System. The samples were field-screened with a PID fitted with a 10.2 electron volt (eV) lamp, with a minimum detection limit of 0.2 parts per million vapor (ppmv). TVOC concentrations were measured using the jar headspace method outlined in DEP Waste Site Cleanup Policy #WSC-94-400 entitled *Interim Remediation Waste Management Policy for Petroleum Contaminated Soils*.

All drilling equipment was steam-cleaned prior to advancing each boring. No oil, grease, or other petroleum-based products were used to lubricate augers or rods. Soil cuttings did not exhibit visual or olfactory signs of contamination and were backfilled into each boring. Soil boring logs are provided in Appendix C.

3.3 Soil Sampling and Analysis

Soil samples were selected for analysis based on TVOC headspace results, visual and olfactory field observations, and depth to groundwater. Weston & Sampson submitted a total of 15 soil samples to AMRO Environmental Laboratories Corporation (AMRO) in Merrimack, New Hampshire, for

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analysis of lead and extractable petroleum hydrocarbons (EPH) including target PAH compounds, using the DEP-approved method.

Soil samples were collected in accordance with procedures specified in the QAPP. All soil samples were submitted using standard chain-of-custody procedures. Two soil samples collected on September 5, 2001 were additionally analyzed for the Toxicity Characteristic Leaching Procedure (TCLP) for lead.

## 3.4 Surface Soil and Stockpile Soil Sampling and Analysis

On March 29, 2001, Weston & Sampson collected 4 surface soil samples at Parcel P-3 using decontaminated scoops and shovels. The surface soil samples were collected from the area behind former Connolly's Tavern (SS-1 through SS-4) from the top 6-inches of soil. These samples were submitted for laboratory analysis of lead and EPH including target compounds. One duplicate lead sample (DUP) was collected at SS-4.

Four soil samples (SP-1, SP-2, SP-3 and duplicate of SP-1, DUP2) were also collected from an existing soil stockpile behind the Whittier Street Health Center. Samples were collected from 2 feet below the stockpile surface. These samples were submitted for laboratory analysis of volatile petroleum hydrocarbons (VPH) including target VOCs, EPH including target PAHs, PCBs and RCRA 8 metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver). Samples collected for VPH analysis were preserved in the field with methanol in accordance with the DEP-approved method. Refer to Figure 2 for the surface soil sampling locations and Section 4.0 for the surface soil analytical results.

## 3.5 Groundwater Sampling and Analysis

On February 6, 2001, Weston & Sampson collected groundwater samples from 6 monitoring wells (WS-3, WS-5, WS-7, WS-8, WS-10, WS-12) and on September 10, 2001, Weston & Sampson collected groundwater samples from 2 monitoring wells (WS-2 and WS-13). Groundwater samples were collected using procedures detailed in the Environmental Protection Agency's (EPA's) low-flow sampling standard operating procedure (*EPA Region I Low Stress (low flow) Purging and* 

Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells, July 30, 1996).

Prior to sampling, Weston & Sampson measured the depth to groundwater and total well depth in each well. During well purging, groundwater samples from each well were screened in the field for pH, temperature, specific conductance, turbidity, oxidation-reduction potential, and dissolved oxygen. Once groundwater field parameters stabilized, groundwater was sampled. Weston & Sampson's groundwater sampling field notes are included in Appendix C. Monitoring well samples were submitted for laboratory analysis of VPH/EPH parameters with target VOCs and PAHs, and dissolved lead. Weston & Sampson collected dissolved lead samples by filtering the groundwater with 0.45-micron filters prior to preserving the sample.

After they were collected, groundwater samples were kept on ice and transported to AMRO using standard chain-of-custody procedures. A VPH/VOC trip blank accompanied each cooler to the laboratory.

## 3.6 Survey

On March 29, September 5 and September 10, 2001, Weston & Sampson surveyed the horizontal and vertical locations of Phase II surface soil, soil boring, groundwater monitoring well and stockpile soil sample locations. The locations were measured by a tape survey using existing structures (e.g., wells, building corner, and fence). Elevations were surveyed using sight and stadia rod equipment and were referenced to existing known elevations at wells WS-9, WS-3 and WS-5.

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## 4.0 SUBSURFACE INVESTIGATION RESULTS

## 4.1 Surficial Geology

Five geologic units were encountered during the Phase I and Phase II investigations. These included, in stratigraphic succession from youngest (shallowest) to oldest (deepest):

<u>Urban Fill:</u>	Heterogeneous dark brown to dark gray fine to coarse sand, trace silt and fine to coarse gravel, trace to some brick, glass, coal, wood, metal, asphalt, concrete, tires and cinders.
Sand:	Brown fine to coarse sand, some to little fine to coarse gravel, silt, and cobbles and boulders.
Clay:	Blue-green to gray-green clay with lenses of silt and fine sand.
Organic Silt and Peat	Dark brown organic silt and fibrous peat

Lower Sand: Brown fine to coarse sand, some to trace fine to coarse gravel

Weston & Sampson constructed geologic cross-sections of subsurface geology based on data collected to date. Geologic profiles trending southwest-northeast (A-A') and northwest-southeast (B-B') are shown in Figures 4 and 5, respectively. The units above are described in further detail below.

Urban fill was encountered at all drilling locations from immediately below the ground surface or pavement, up to 17 feet below grade in Areas 1 and 2 (defined in Section 3.1). Boring logs indicate that urban fill is likely to extend deeper than 17 feet at borings WS-5, WS-6 and WS-7, which are located in Area 3. Trace brick, glass, coal, wood, metal, asphalt, concrete, tires and cinders were observed in the urban fill.

Sand was encountered between 8.5 and 17 feet below grade at some drilling locations between the urban fill and clay, organic silt and peat. The vertical extent of sand is unknown in Area 2 and Area 3, namely at WS-5, WS-6, WS-7, WS-10 and WS-11. No anthropogenic materials were observed to be present in the sand unit.

Clay was observed at three locations (TP-5/B-8, B-201(D), TP-6/B-9) in Area 1, suggesting that the layer is discontinuous. Clay ranged in depth from 15.5 to 18 feet below grade. Weston & Sampson did not observe the Boston Blue Clay that is encountered below other areas of Boston.

Organic silt and peat was encountered at several locations beneath urban fill or clay, between 7.5 and 27 feet below grade. Boring logs from TP-2/B-2, TP-3/B-1/B-3 and WS-1 indicate that the organic silt and peat unit is 9 to 12.5 feet thick in Area 1; however, the unit becomes thinner (5 feet thick) at boring WS-4, in Area 2. Not enough information exists to evaluate the horizontal and vertical extent of the confining units (clay and organic silt and peat) in Area 3.

The lower sand unit was observed to underlie the organic silt and peat unit between 13.5 and 61 feet below grade at four drilling locations in Area 1 and Area 2. The vertical limit of this lower sand unit was not encountered, and is therefore unknown.

During the Phase I and Phase II investigations, the depth to bedrock was not determined and no bedrock outcrops were observed at or near Parcel P-3. According to the USGS Bedrock Geologic Map of Massachusetts (Zen *et al.*,1983) Parcel P-3 is underlain by Roxbury Conglomerate. This unit is typically a conglomerate, sandstone, siltstone, argillite and melaphyre, consisting of the Brookline, Dorchester and Squantum members.

#### 4.2 Hydrogeology

Regional groundwater is assumed to follow topography and flow to the northwest, towards the Muddy River. However, the Stony Brook Culvert, located beneath Whittier and Downing Streets east and southeast of Parcel P-3, appears to influence the local groundwater flow direction.

#### 4.2.1 Groundwater Elevations

All wells, except WS-13, were gauged on December 5, 6 and 12, 1996. Well WS-13 was gauged on September 10, 2001. Well gauging and groundwater elevation data are presented in Table 4. The groundwater gradient across Parcel P-3 is very flat with groundwater elevations varying by up to 2.87 feet. On December 5, 1996, groundwater elevations ranged from a maximum of 86.62 in WS-12 to a minimum of 83.75 in WS-2. Groundwater elevations were consistently highest in WS-12 and

were lowest in either WS-2 or WS-5 during the well gauging events. December 1996 data were used to create the groundwater contours in Figure 6. Figure 6 shows that in general, groundwater flows southeast across Parcel P-3. The more recent rounds show that generally flow directions are consistent with the 1996 data.

## 4.2.2 Hydraulic Gradients

The hydraulic gradient (I) across Parcel P-3 was calculated using groundwater elevations collected on December 12, 1996. According to the Phase I report, the horizontal gradient across Parcel P-3 is least in the southwestern portion of Parcel P-3 (parking lot of Madison Park High School) and the fill area and central part of Parcel P-3 (Figure 6), with the hydraulic gradient estimated to be 0.0028 in the southwestern portion and 0.02 in the northern portion, behind the former Connolly's Tavern.

## 4.2.3 Hydraulic Conductivity and Groundwater Velocity

Assuming a geologic unit of fine to coarse sand (the shallow overburden water table unit) and using conservative tabulated hydraulic conductivity (K) value of 0.28 feet/day (Freeze and Cherry, 1979), an average porosity value of 0.2 (Driscoll, 1989) and the I range shown above, the estimated groundwater velocity across Parcel P-3 varies from approximately 12 feet/year to 100 feet/year. This is below the 200 feet/year threshold for substantial release migration as defined in 310 CMR 40.0413 (2). All calculations are presented in Appendix D.

### 4.3 Sampling Analytical Results

## 4.3.1 Quality Assurance/Quality Control

The soil and groundwater analytical data obtained during the Phase II investigation was reviewed by Weston & Sampson for representativeness, completeness, comparability and sensitivity as part of the Phase II investigation. No unexpected, unusual or anomalous results were discovered. All analytical results met project quantitation limits specified in the QAPP (soil and groundwater laboratory method detection limits were below the MCP Method 1 Standards), and all laboratory quality assurance samples verified the project analytical accuracy requirements. No data limitations were discovered after Weston & Sampson reviewed the surrogate recovery, laboratory control samples, duplicates, field blanks, trip blanks and temperature blanks. In summary, the data met the 90 percent minimum completeness goal.

The field duplicate relative percent difference (RPD) was calculated for duplicate samples analyzed for this project. Most RPDs were within the <50% range for soils; no duplicate samples were collected for water as part of this project. The RPD for stockpiled soil sample duplicate PAH results were generally above the 50% target. This is attributed to the heterogeneous nature of the soil matrix, and not to sampling or analytical error.

### 4.3.2 Soil Results

PID measurements from soil samples obtained during Phase II drilling activities are included on the boring logs in Appendix C-1 and summarized in Table 5. The highest PID reading (21 ppmv) was measured in a soil sample from B-208 at 0 to 2 feet below grade. All remaining PID readings were equal to or less than 2.4 ppmv.

The Phase II soil analytical results are presented in Tables 6, 7 and 8. Analytical laboratory reports are provided in Appendix E. Stockpile soil analytical results are discussed in Section 4.3.3. For discussion purposes, analytical results are discussed by Area.

## Area 1: Unpaved Area Behind Former Connolly's Tavern

- <u>EPH:</u> EPH concentrations were below laboratory method detection limits (MDLs) or below applicable Method 1 Standards.
- <u>PAHs:</u> PAH concentrations ranged from below laboratory MDLs to 19 mg/kg of benzo(b)fluoranthene at B-201(D), 10-12 foot depth. Six PAH compounds, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenzo(a,h)anthracene and ideno(1,2,3-cd)pyrene, were detected above Method 1 Standards at one soil boring location (B-201(D)) and at four surface soil locations (SS-1 through SS-4). These soil samples were collected from the urban fill unit.
- <u>Total Lead</u>: Total lead was detected above Method 1 Standards in soil. Lead concentrations at B-201(D) and at SS-1 through SS-4 were between 74 and 620 mg/kg.

## Area 2: Paved Area Behind WSHC

- <u>EPH:</u> EPH concentrations were below laboratory MDLs or below applicable Method 1 Standards.
- PAHs: PAH concentrations ranged from below laboratory MDLs to 19 mg/kg of

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benzo(a)anthracene at B-202(S). Five PAH compounds, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene and ideno(1,2,3-cd)pyrene, were detected above Method 1 Standards at B-202(S), B-203(S) and B-204(S). These soil samples were collected from the urban fill unit.

• <u>Total and TCLP Lead</u>: Total lead was detected above Method 1 Standards and Upper Concentration Levels at B-202(S) and B-211 with concentrations of 7,000 mg/kg and 13,000 mg/kg, respectively. The lead TCLP result at B-211 was 8.3 mg/l, which is above the TCLP threshold for hazardous waste of 5 mg/l for lead. These were the highest lead concentrations detected in soil at Parcel P-3 to date.

## Area 3: Western Portion

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- EPH: All EPH concentrations were below laboratory MDLs.
- <u>PAHs:</u> Most PAH concentrations were below laboratory MDLs. One PAH, benzo(a)pyrene, was detected above the Method 1 Standard between 3 and 5 feet below grade at borings B-206(S) and B-207(S). These soil samples were collected from the urban fill unit.
- <u>Total Lead</u>: Lead was detected above MDLs in soil, however, concentrations were below Method 1 Standards.

The Phase II investigation soil results show that urban fill in Areas 1 and 2 contains TPH, PAHs, and lead at concentrations at or above applicable S-2 or S-3 Method 1 Standards, as shown in Tables 6, 7a and 8. Lead concentrations in Area 2 have been detected above the UCL and above the TCLP threshold. Little to no soil contamination was observed in borings in Area 3, or in other geologic units at Parcel P-3.

## 4.3.3 Stockpile Soil

Samples collected during the Phase II investigation from soil stockpiles in Area 2 contained PAHs at concentrations above applicable S-2 Method 1 Standards, as shown in Table 7b. The four PAHs that were detected above Method 1 Standards include benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene and ideno(1,2,3-cd)pyrene. Concentrations of these PAHs ranged from 1.2 to 5.1 mg/kg. Stockpile soil was also tested for VPH, VOCs, EPH, PCBs and RCRA 8 metals; these parameters were either not detected or were detected at concentrations were below Method 1 Standards. It must also be noted that the soil piles are heavily vegetated and there was no evidence of erosion of soil to the nearby streets.

#### 4.3.4 Groundwater

The Phase I groundwater data did not detect any contaminants in excess of Method 1 standards. No separate phase petroleum product was detected on groundwater during well sampling in 2001. Contaminants detected in groundwater (EPH only) in February 2001 and September 2001 were below Method 1 Standards. Therefore the only contaminants detected in groundwater were all below Method 1 Standards. The laboratory reports are included in Appendix E. Phase II results are shown in Tables 9 and 10.

Field parameter data on Tables 9 and 10 show fairly consistent pH, ranging from 6.24 in WS-10 to 6.85 in WS-13. Elevated specific conductance readings (>1,000  $\mu$ S/cm) were detected in groundwater in WS-2, WS-3, WS-5, WS-7, WS-9, WS-10 and WS-12. Dissolved oxygen concentrations varied from 0.22 mg/l in WS-13 to 1.93 mg/l in WS-5.

### 4.4 Nature and Extent of Contamination

For the purposes of this MCP report, the "Site" is defined as the raised fill area southwest of the Former Connolly's Tavern (Area 1) and the paved area to the rear (southwest) of the Whittier Street Health Center (Area 2). Note that because of potential impacts to groundwater discussed in Sections 2.3 and 4.3.4, the "Site" does not include the area immediately surrounding the Whittier Street Health Center building. Area 3, the paved western portion of Parcel P-3, is not included in this "Site" definition because analytical and field results do not indicate that contaminants are present at concentrations that would pose a risk (see Section 5.0). The disposal site area (Site) and the three "Areas" are shown on Figure 7.

### 4.4.1 Soil

Based on data collected during preliminary, Phase I and Phase II investigations, the contaminants detected in soil are TPH, PAHs and lead, which have been detected at concentrations above applicable S-2 and S-3 Method 1 Standards, and for lead, the UCL and the TCLP hazardous waste threshold. These soil contaminants appear to be associated with the heterogeneous urban fill unit at the Site. The presence of these contaminants is consistent with Parcel P-3's historical use of mixed commercial, industrial and residential use since the early 1900s.

The data presented in this Phase II report show that the extent of soil contamination is limited to the urban fill unit at two areas in the northern portion of Parcel P-3: Area 1 and Area 2. Analytical results show that the highest TPH, PAH and lead contaminant concentrations in Area 1 are generally 3.5-19 feet below grade at and between WS-10, B-112, B-201(D) and TP-6. The most frequently detected contaminants in Area 1 are PAHs, however lead is detected above Method 1 Standards at various depths also in borings WS-9, B-105, B-110, B-111, B-114 and B-115. The highest levels of PAH and lead contaminant concentrations in Area 2 are approximately 5-7 feet below grade at and between B-202(S), B-203(S) and B-211. Contaminant concentrations in Area 2 appear to diminish to the east, as shown in PAH and lead results from B-203(S) and B-204(S). Lead at two soil samples (B-202(S) and B-211) was detected above the UCL and lead at B-211 was above the TCLP hazardous waste threshold.

## 4.4.2 Stockpile Soil

PAHs in soil stockpiled in Area 2 were detected above Method 1 Standards. Contaminants detected in the stockpiled soil were of similar type and concentration, regardless of the sampling location, suggesting a similar source of contamination and a fairly homogeneous matrix. The history of these stockpiles is unknown.

## 4.4.3 Groundwater

Groundwater sampling results presented in this Phase II report show that groundwater does not appear to be impacted by a release of oil and/or hazardous materials (OHM), with the contaminants in groundwater all detected at concentrations below Method 1 Standards. The most recent groundwater sampling rounds, conducted by Weston & Sampson in February and September 2001, indicate that the groundwater contaminant concentrations are below Method 1 Standards. Although leachable lead (as defined by TCLP) was detected in soil at boring location B-211, results show that groundwater does not contain detectable concentrations of dissolved lead.

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#### 5.0 **RISK CHARACTERIZATION**

#### 5.1 General

A Method 1 Risk Characterization was performed to evaluate whether contaminants at Parcel P<sup>2</sup>3 pose a condition of No Significant Risk to human health, public welfare, and the environment for proposed future use conditions. Weston & Sampson also conducted a screening of the data to evaluate if a Method 3 Risk Characterization would yield significantly different results. Based on the screening, we concluded that Method 1 was most applicable at the time. Weston & Sampson evaluated risk under different development scenarios for all three Areas of Parcel P-3 (Area 1, 2 and 3). In accordance with 310 CMR 40.0942 and 310 CMR 40.0971, a Method 1 risk characterization was considered applicable for evaluating human health risk at Parcel P-3 based on the following criteria:

- Soil is the only exposure media. Groundwater does not appear to be impacted by the release, and there are no surface water bodies or sediments located at or near Parcel P-3. Contaminants at the Site consist primarily of EPH parameters, PAHs and lead, all of which are relatively non-volatile. Therefore, volatilization to air is not a likely migration pathway for contaminants.
- None of the contaminants identified within the top 2 feet of ground surface are known to bioaccumulate.
- Numerical standards for each contaminant in soil and groundwater can be found in the MCP Method 1 Standards (310 CMR 40.0974(2) – 310 CMR 40.0975(6)(c)).

The Method 1 Risk Characterization presented in this report is a preliminary screening intended to, in addition to meeting MCP requirements, provide a preliminary evaluation of future redevelopment options for Parcel P-3 with respect to human health risk. The Method 1 Risk Characterization was performed in accordance with 310 CMR 40.0970 and 310 CMR 40.0990 of the MCP, and the DEP guidance document "Guidance for Disposal Site Risk Characterization – In Support of the Massachusetts Contingency Plan" dated July 1995. The components of the risk characterization presented in this section include: Hazard Identification; Groundwater and Soil Exposure-Point Concentrations; and Comparison of EPCs to Applicable Method 1 Standards.

### 5.2 Data Evaluation

### 5.2.1 Risk Characterization Data Set

For this risk characterization, each of the areas identified in Sections 3.0 and 4.0 were evaluated separately as follows:

- Area 1: 1.5-acre unpaved lot behind former Connolly's Tavern.
- Area 2: 1-acre paved area behind Whittier Street Health Center.
- Area 3: 5.5-acre western portion of Parcel P-3.

In total, approximately 80 soil samples were collected and analyzed for petroleum parameters from Parcel P-3 during the Phase I and II investigations. Of these, 6 samples were collected at depths greater than 15 feet below grade and, therefore, were not included in the risk characterization because they are considered to be inaccessible for exposure purposes. Soil data from an additional 6 samples collected at 8.5 to 12 feet below grade during the Phase I (WS-1, WS-2 and WS-4 through WS-7) were not included in the risk characterization because all petroleum concentrations were below MDLs.

## 5.2.2 Identification of Hot Spots

A hot spot is defined as a discrete area having a substantially higher concentration than surrounding areas. In accordance with the MCP, a hot spot cannot be combined with other areas of the Site and must be evaluated as separate exposure point in the risk characterization (310 CMR 40.0924(2)).

In Area 1, elevated lead concentrations ranging from 620 to 5,000 mg/kg were detected in 9 samples at various depths from 1 to 19 feet below grade. As shown in Figure 7, the concentrations appear to be randomly distributed throughout Area 1 and are generally less than or within an order-of-magnitude of concentrations in surrounding sample locations. Similarly, elevated PAH concentrations were also detected in B-112 through B-114 within Area 1. The concentrations, however, were within the same order-of-magnitude as other samples. This variation in contaminant concentrations is characteristic of heterogeneous urban fill material, therefore, these samples were not identified as hot spots.

In Area 2, elevated lead concentrations were detected in two borings located within 25 feet of each other. The lead concentrations in B-202 and B-211 (7,000 and 13,000 mg/kg, respectively) at the 5 to 7-foot depth exceeded UCLs and were significantly higher (by a factor greater than 100) than those detected at all other sample locations across the Site. Because these two borings are located within 25 feet of each other, the area surrounding B-202 and B-211 was identified as a hot spot and evaluated as a separate exposure point for lead. Petroleum concentrations reported in the hot spot samples (B-202 and B-211) were relatively high, but were included in the risk characterization to provide a more conservative estimate of risk.

No hot spots were identified in Area 3.

## 5.3 Hazard Identification

This section of the risk characterization identifies the contaminants-of-concern (COCs) to be evaluated in the human health risk characterization. Consistent with DEP risk assessment guidance (DEP, July 1995), a compound that was detected can be eliminated from consideration as a contaminant-of-concern (COC) based on any one of the following three criteria:

- 1) The compound is present at a low frequency of detection and at low concentrations.
- 2) The compound is a laboratory or field contaminant.
- 3) The compound is consistent with background concentrations <u>and</u> there is no evidence that the presence of the chemical is related to activities at a site.

During the Phase I investigation, VOCs were detected below MDLs in all samples submitted for analysis (12 total) except for TP-1 at 11.5 to 12 feet below grade. The total VOC concentration in this sample was 2.1 mg/kg and the PID reading was 34 ppmv, the highest of approximately 70 samples screened in the field (all other PID measurements were less than 4.4 ppmv). VOCs were, therefore, eliminated as COCs based on low detection frequency and concentrations (Criteria 1).

In Areas 1 and 2, PAHs and lead (excluding the lead hot spot) were compared to urban background concentrations to evaluate if these compounds could be eliminated from the risk characterization (Criteria 3). The "urban background" concentrations used for comparison were derived from data compiled by MassHighway during the field characterization phase of the Central Artery/Tunnel

(CA/T) project in Boston, Massachusetts. The data and statistical summary is based on over 800 samples collected in Boston and the results were presented in a draft report "*Background Soil Contaminant Assessment*," prepared by Camp Dresser & McKee Inc. in April 1996.

In Areas 1 and 2, the lead and PAH concentrations were evaluated statistically to derive a 95<sup>th</sup> upper percentile mean (UPM) for comparison to the 95<sup>th</sup> UPM urban background concentrations. The data set in Area 3 was not evaluated statistically due to the relatively low number of samples collected from this area. Instead, the maximum concentration detected in that data set was compared directly to the urban background concentrations.

Soil concentrations throughout the Site were assumed to be normally distributed since the presence of PAHs and metals in soil are likely attributed to the fill material and not the result of an OHM "release". The 95<sup>th</sup> UPM was calculated is follows:

 $= x \pm t (s/n^{1/2})$ 

Where:

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nere: = sample data set mean (average concentration) = t-statistic ( $\alpha = 0.05$  for 95<sup>th</sup> confidence limit) = standard deviation = number of samples in data set

95th UPM

The 95<sup>th</sup> UPM was selected for comparison to provide a more conservative estimate since statistically, 95% of the data will be at or below the values shown. All concentrations reported as MDLs were assumed to be equal to one-half the MDL. The data and statistical summary tables for each Area are included in Appendix F. The results are summarized in Table 11. All PAH and lead concentrations were consistent with urban background concentrations, therefore, these contaminants could be eliminated as COCs in the risk characterization. For non-residential future uses, the lead and PAHs were eliminated as COCs in the risk characterization. If either area is developed for residential use, it is assumed that an AUL would be required to reduce or eliminate exposure to soil in these areas and achieve a condition of No Significant Risk.

There are no published background concentrations for EPH parameters; consequently, the only COC retained for the risk characterization was  $C_{11}$ - $C_{22}$  aromatics. The TPH parameter analyzed by EPA

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Method 8100 was assumed to be equivalent to  $C_{11}$ - $C_{22}$  aromatics since there is no risk-based health standard for TPH.

## 5.4 Exposure-Point Concentrations and Comparison to Method 1 Standards

The exposure-point concentrations (EPCs) were assumed to be equivalent to the 95<sup>th</sup> UPM concentration of  $C_{11}$ - $C_{22}$  aromatics in Areas 1 and 2. The concentrations of  $C_{11}$ - $C_{22}$  aromatics in all Area 3 samples were below MDLs. The statistical summaries are included in the tables presented in Appendix F and the EPCs are summarized below for each Area.

Area	Depth	$C_{11}$ - $C_{22}$ aromatics EPC, mg/kg
, 1	0 to 3	323
	4 to 15	1,668
2	0 to 15	307
·3	0 to 15	<55
	Method 1 Standards	
,	S-1/GW-2 and 3	800
	S-2/GW-2 and 3	2,000

The EPCs were compared to applicable S-2 Method 1 soil standards (2,000 mg/kg) and to the more stringent S-1 standards (800 mg/kg), which are considered to be protective of human health for future residential use. All EPCs in Areas 1 through 3 were below the applicable S-2 Method 1 standards. Consequently, all soil possibly could be left in place under future use conditions where S-2 and S-3 soil categories apply in accordance with 310 CMR 40.0933. An AUL would be required, however, to restrict future residential in Area 1 as described below. An AUL would not be required in Areas 2 or 3.

To further evaluate risk for Area 1, a Method 3 preliminary residential risk screening was performed using the DEP's No.2/Fuel Oil residential shortform based on a  $C_{11}$ - $C_{22}$  aromatics EPC of 1,668 mg/kg. The results indicated that the non-cancer risk for a residential receptor exceeds DEP's acceptable limit of 1.0 due to long-term (chronic) ingestion of homegrown vegetables. Consequently, a condition of No Significant Risk does not exist for future residential use.

Additionally, if residential use is proposed for Area 1, as a conservative approach, we would not

recommend eliminating lead and PAHs as COCs in the risk characterization, even if the presence of these contaminants is due to urban fill background. Referring to Appendix F, the 95<sup>th</sup> UPM concentrations of PAHs and lead in Area 1 were significantly above S-1 Method 1 Standards. Therefore, an AUL would be required to restrict exposure to PAHs and lead, in addition to  $C_{11}$ - $C_{22}$  aromatics. For residential purposes, the existing soil in Area 1 would either have to be removed or, at a minimum, be covered with a minimum of 3 feet of clean fill to meet category S-2 or S-3 soil requirements.

In accordance with 310 CMR 40.0994 of the MCP, a condition of No Significant Risk of harm to public welfare exists if the following conditions are met for current and reasonably foreseeable uses of a Site:

- 1) Nuisance conditions (e.g., odors, fires, flooding) are not present as a result of the release of oil and/or hazardous material at a site.
- 2) There is no loss of active or passive property use as a result of the release of oil and/or hazardous material at a site.
- 3) All soil and groundwater EPCs are below the Upper Concentration Limits (UCL) established in 310 CMR 40.0996(7).

The concentrations in hot spot area B-202 and B-211 exceed UCLs. Therefore, a condition of No Significant Risk to public welfare does not exist for current or proposed future Site use.

## 5.6 Characterization of Risk to Safety

The conditions that constitute a risk of harm to safety are described in 310 CMR 40.0960 of the MCP. Such conditions include a threat of fire or explosion, the presence of uncontained materials that exhibit characteristics of hazardous waste, and the presence of dangerous structures such as open pits, lagoons, corroded drums, etc. None of these conditions are present at the Site; therefore, future use conditions would not pose a risk of harm to safety.

## 5.7 Characterization of Risk to the Environment

A condition of No Significant Risk to environmental receptors exists based on the absence of contaminants in groundwater. Additionally, the nearest surface water is in an enclosed culvert below

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Whittier Street. There is not a transport mechanism for soils to impact the surface water as there does not appear to be erosion of soils at the site.

#### 5.8 Risk Assessment Conclusions

*Human Health*: A condition of Significant Risk does exist as soil contaminants exceed Method 1 standards. Additionally, using the Method 3 screening, for a residential user due to long-term chronic exposure via ingestion of homegrown vegetables. The non-cancer risk exceeds the DEP acceptable limit of 1.0, see Appendix F.

Safety: A condition of No Significant Risk exists to Safety.

**Public Welfare:** A condition of Significant Risk does exist due to the presence of lead hot spots at B-202 and B-211 in Area 2.

Environment: A condition of No Significant Risk exists to environmental receptors.

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#### 6.0 PHASE III REMEDIAL ACTION PLAN (RAP)

#### 6.1 General

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Weston & Sampson performed a Phase III - Identification, Evaluation and Selection of Comprehensive Remedial Action Alternatives for the Site. The Phase III results are documented in this Remedial Action Plan (RAP), which has been prepared in accordance with 310 CMR 40.0861 of the MCP. The overall objective of the Phase III study is to identify, evaluate and select remedial alternatives that will achieve a condition of No Significant Risk at the Site.

#### 6.2 Identification and Evaluation of Alternatives

The results of the risk assessment indicate the following:

- A condition of No Significant Risk to human health and public welfare does not exist for current and future Site uses due to the lead hot spot in Area 2 at borings B-202 and B-211. This hot spot is assumed to be rectangular shaped (40' long by 20' wide) and extends to an approximate depth of 9 feet.
- A condition of No Significant Risk to human health does not exist for future residential Site use in Area 1 based on the assumption that residual contaminants at the site should not be compared to urban background for a residential scenario.

Remediation of the Site will likely occur as part of site development and consequently the type of remediation selected will be based on the type of development proposed at the Site. For example, for a commercial development with limited exposure to Site soil, the contaminants in Area 1 could be considered as background and therefore no additional risk. However, development including residences may require limited soil removal, management of soil exposure through engineering design and/or restricting certain land use or development via an AUL.

Therefore, in the absence of a final development plan for the Site, we evaluated the following remedial action alternatives:

#### Alternative Description

- 1. No Action
- 2. Hot Spot Soil Excavation in Area 2, Off-Site Disposal, and AUL
- 3. Area 1 (0 to 15 feet) and Hot Spot Soil Excavation in Area 2, and Off-Site Disposal

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4. Area 1 (0 to 8 feet) and Hot Spot Soil Excavation in Area 2, Off-Site Disposal, Capping, and AUL\*

\* = A cap can be placed over Area 1 at any elevation however 0-8 feet of soil excavation was selected as a likely development scenario as 8-feet of soil would meet surrounding grade.

These alternatives were evaluated for technical feasibility and cost based on the following criteria:

- The alternative must be a demonstrated, proven technology that can be implemented at the site in a short period of time.
- The alternative results in the reuse, recycling, destruction, and/or treatment of OHM present at the site.
- The alternative will not pose a significant risk to human health, safety, public welfare, or the environment.
- The alternative will result in the reduction and/or elimination of contamination in soil.

#### 6.2.1 Alternative No. 1: No Action

The results of the Phase II investigation and risk characterization indicate that a condition of Significant Risk to human health and public welfare exists at the Site under current and future Site uses. Therefore, this alternative is not suitable and will not be retained for further evaluation.

### 6.2.2 Alternative No. 2: Hot Spot Soil Excavation, Off-Site Disposal, and Activity and Use Limitation

Soil excavation is recommended for accessible contaminated soil which, following removal, can be recycled or disposed of at an off-site facility. The excavation is then backfilled with clean soil to eliminate potential future exposures. In this alternative, the hot spot of lead-contaminated soil at borings B-202 and B-211 would be excavated and transported to an off-site disposal facility. Due to the elevated TCLP-lead concentrations detected at boring B-211, this material would be considered a hazardous waste and would require stabilization prior to landfilling. As stated in Section 6.2, the dimensions of the hot spot are approximately 40' x 20' x 9', which equals approximately 270 cubic yards.

This alternative will result in the reduction and/or elimination of exposure to contaminated soil, and will also reduce or eliminate actual contaminant concentrations in on-Site soils. With regard to the

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evaluation criteria above, soil excavation and off-Site disposal is a widely used, proven technology that can be implemented in a short period of time without prior studies or engineering design. Following hot spot excavation, an AUL would be placed on Area 1 to identify site use and activities that are consistent with maintaining a condition of No Significant Risk. A Class A RAO may be obtained if soil concentrations left in place pose a condition of No Significant Risk to human health, safety, public welfare, and the environment. This alternative will be retained for further evaluation.

6.2.3 Alternative No. 3: Area 1 (0 to 15 Feet) and Hot Spot Soil Excavation, and Off-Site Disposal

As described above, soil excavation and off-Site disposal of soil is an alternative that meets the evaluation criteria listed in Section 6.2. In addition to excavation of the hot spot, the soil in Area 1 found to contain urban fill contaminated with lead and petroleum compounds would be excavated and disposed off-Site. The dimensions of the soil to be excavated from Area 1 are approximately 300' x 220' x 15', which equals approximately 37,000 cubic yards. The estimated volume of the lead hot spot is 270 cubic yards. This alternative would require shoring of the excavation and dewatering. Following completion of the alternative, a condition of No Significant Risk to human health, safety, public welfare, and the environment will have been achieved. Also, potential future uses of the Site would be unrestricted. This alternative will be retained for further evaluation.

#### 6.2.4 Alternative No. 4: Area 1 (0 to 8 Feet) and Hot Spot Soil Excavation, Off-Site Disposal, Capping, and AUL

As described above, soil excavation and off-Site disposal of soil is an alternative that meets the evaluation criteria listed in Section 6.2. In addition to excavation of the hot spot, the top 8 feet of soil in Area 1 found to contain elevated concentrations of lead and petroleum compounds would be excavated and disposed off-Site. This amount of soil to be excavated was chosen as a development option that would meet surrounding grade. The dimensions of the soil to be excavated from Area 1 are approximately 300' x 220' x 8', which equals approximately 20,000 cubic yards. The estimated volume of the lead hot spot is 270 cubic yards.

Following excavation, a geotextile filter fabric would be installed on the subgrade and 3 feet of clean backfill would be placed on top. Following completion of the cap, an AUL would be placed on Area l restricting future residential use. A Class A RAO may then be obtained if soil concentrations left

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in place pose a condition of No Significant Risk to human health, safety, public welfare, and the environment. This alternative will be retained for further evaluation.

#### 6.3 Detailed Evaluation of Remedial Action Alternatives

This section presents a more detailed evaluation of Alternatives No. 2 through 4 based on the criteria presented in 310 CMR 40.0858 of the MCP.

#### 6.3.1 Effectiveness

Alternative No. 2 – Hot Spot Soil Excavation, Off-Site Disposal, and AUL: Excavation and off-Site disposal is most effective when the extent of contaminated soil is well-defined. In this instance, the hot spot is defined by borings B-202 and B-211 only. The surrounding soil samples were found to contain significantly (2 orders of magnitude) lower concentrations of lead. This alternative will likely result in a permanent solution (Class A RAO), although an AUL restricting/maintaining future residential use or exposure would be required for Area 1.

Alternative No. 3 – Area 1 (0 to 15 Feet) and Hot Spot Soil Excavation, and Off-Site Disposal: In addition to removing the hot spot, this alternative will remove all potentially-accessible contaminated soil from Area 1 and thereby eliminate the need for an AUL. Therefore, this alternative will achieve a Permanent Solution and a Class A RAO may be obtained for the Site.

Alternative No. 4 – Area 1 (0 to 8 Feet) and Hot Spot Soil Excavation, Off-Site Disposal, Capping, and AUL: In addition to removing the hot spot, this alternative will remove the top 8 feet of potentially-accessible contaminated soil from Area 1. Following removal, a cap (including a geotextile filter fabric base) will be installed preventing exposure to residual contaminated soil. An AUL would be required on Area 1 to restrict future residential use. Therefore, this alternative will achieve a Permanent Solution and a Class A RAO may be obtained for the Site.

#### 6.3.2 Short-Term and Long-Term Reliability

Alternative No. 2 – Hot Spot Soil Excavation, Off-Site Disposal, and AUL: There is a relatively high degree of certainty that this alternative will successfully reduce contaminants in the hot spot area to levels that will achieve a condition of No Significant Risk. Any residual wastes generated during this alternative can be effectively managed. Excavated soil would be stockpiled on and

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covered with polyethylene sheeting to prevent further contamination at the Site.

Alternative No. 3 – Area 1 (0 to 15 Feet) and Hot Spot Soil Excavation, and Off-Site Disposal: There is a relatively high degree of certainty that this alternative will successfully reduce contaminants across the Site to levels that will achieve a condition of No Significant Risk. Any residual wastes generated during this alternative can be effectively managed. Excavated soil would be stockpiled on and covered with polyethylene sheeting to prevent further contamination at the Site.

#### Alternative No. 4 - Area 1 (0 to 8 Feet) and Hot Spot Soil Excavation, Off-Site Disposal, Capping,

and AUL: There is a relatively high degree of certainty that this alternative will successfully reduce contaminants across the Site to levels that will achieve a condition of No Significant Risk. Excavated soil would be stockpiled on and covered with polyethylene sheeting to prevent further contamination at the Site. In addition, capping is a reliable short-term and long-term measure that will prevent future exposures and potential migration of contaminants. The cap can be easily maintained and repaired over the long-term. Any residual wastes generated during this alternative can be effectively managed. Once Area 1 is capped, potential exposures will be eliminated for current and future-use conditions.

#### 6.3.3 Difficulty in Implementing Each Alternative

*Alternative No. 2 – Hot Spot Soil Excavation, Off-Site Disposal, and AUL:* This alternative could be implemented with low to moderate difficulty. Equipment and technology are readily available and the amount of soil to be excavated would not require a large stockpiling and staging area.

#### Alternative No. 3 – Area 1 (0 to 15 Feet) and Hot Spot Soil Excavation, and Off-Site Disposal:

This alternative could be implemented with moderate to high difficulty. Equipment and technology are readily available; however, because of the amount of soil to be excavated, the area required for equipment staging, soil stockpiling and transferring soil to vehicles for off-Site disposal would be extensive. Due to the excavation depth (15 feet), shoring or steel sheeting would be necessary to prevent excavation collapse. Excavation dewatering and treatment, if necessary, would be required to access soils located between 12 and 15 feet below grade.

Alternative No. 4 – Area 1 (0 to 8 Feet) and Hot Spot Soil Excavation, Off-Site Disposal, Capping, and AUL: This alternative could be implemented with moderate to high difficulty. Equipment and technology are readily available; however, because of the amount of soil to be excavated, the area required for equipment staging, soil stockpiling and transferring soil to vehicles for off-Site disposal would be extensive. Due to the excavation depth (8 feet), shoring or steel sheeting may be necessary to prevent excavation collapse. The capping portion of this alternative can be easily implemented since the technology is widely available and would require readily available equipment and materials. Long-term monitoring is not required to maintain the cap other than periodic inspection.

#### 6.3.4 Costs

Alternative No. 2 – Hot Spot Soil Excavation, Off-Site Disposal, and AUL: The lead hot spot soil would be shipped off-Site as a RCRA hazardous waste for stabilization and landfilling. The volume of the hot spot is estimated to be 270 cubic yards. Using a 1.5 tons per cubic yard multiplier, the weight of the hot spot soil is approximately 405 tons. This material could be shipped off-Site for stabilization and landfilling at a cost of \$300 per ton, or \$121,500.

Alternative No. 3 – Area 1 (0 to 15 Feet) and Hot Spot Soil Excavation, and Off-Site Disposal: We have evaluated the data for soil in Area 1 and we anticipate that the majority of the soil could be shipped for off-Site recycling. Approximately 5% of the soil in Area 1 would likely require disposal as a RCRA hazardous waste due to elevated lead concentrations. Costs for this alternative are estimated to range between \$2,500,000 and \$3,000,000 for equipment, labor, and materials. Cost components include engineering design, excavation shoring, dewatering, and placement of clean backfill in Area 1.

Alternative No. 4 – Area 1 (0 to 8 Feet) and Hot Spot Soil Excavation, Off-Site Disposal, Capping, and AUL: The majority of the soil in Area 1 could be shipped for off-Site recycling and approximately 5% would likely require disposal as a RCRA hazardous waste due to elevated lead concentrations. Costs for this alternative are estimated to range between \$1,500,000 and \$2,000,000 for equipment, labor, and materials. Cost components include engineering design, excavation shoring, installation of the geotextile filter fabric, and placement of 3 feet of clean backfill in Area 1 as a cap. Please note that the costs for Alternative 4 are driven by soil excavation and disposal costs.

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Reducing the amount of soil excavated or simply placing the cap on top of existing grade, assuming that the development could support the grade difference, would significantly reduce costs and may make this a more effective solution.

#### 6.3.5 Risks

Alternative No. 2 – Hot Spot Soil Excavation, Off-Site Disposal, and AUL: During excavation activities, any risk to construction workers would likely be attributed to ingestion of lead-contaminated soil. Exposure to soil can be reduced, however, through dust control measures and the use of personal protective equipment. These measures would be specified in the construction plans and specifications.

Alternative No. 3 – Area 1 (0 to 15 Feet) and Hot Spot Soil Excavation, and Off-Site Disposal: This alternative will pose risks similar to those in Alternative No. 1.

Alternative No. 4 – Area 1 (0 to 8 Feet) and Hot Spot Soil Excavation, Off-Site Disposal, Capping, and AUL: This alternative will pose risks similar to those in Alternative No. 1. Also, capping will pose minimal risks during and after implementation. Fugitive dust emissions may occur during installation of the cap, but this can be addressed through dust control measures and personal protective equipment. Installation of a cap will not increase risks over current conditions and the AUL will serve to restrict activities that could result in unacceptable risk to human health.

#### 6.3.6 Benefits

Alternative No. 2 – Hot Spot Soil Excavation, Off-Site Disposal, and AUL: This alternative will remove the lead-contaminated hot spot from the Site, thereby reducing the potential for exposure in that location. The AUL will maintain a level of No Significant Risk from other urban fill contaminants.

Alternative No. 3 – Area 1 (0 to 15 Feet) and Hot Spot Soil Excavation, and Off-Site Disposal: This alternative will remove the contaminated soil from the Site, thereby reducing the potential for exposure.

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Alternative No. 4 – Area 1 (0 to 8 Feet) and Hot Spot Soil Excavation, Off-Site Disposal, Capping, and AUL: This alternative will remove the hot spot and the top 8 feet of contaminated soil in Area 1 from the Site, thereby reducing the potential for exposure in those locations. Capping Area 1 will provide immediate benefits in that potential exposure will be eliminated.

#### 6.3.7 Timeliness

Alternative No. 2 – Hot Spot Soil Excavation, Off-Site Disposal, and AUL: Excavation of the hot spot, off-Site disposal, and attachment of an AUL to the deed for Area 1 can be implemented relatively quickly and is estimated to take approximately 6 to 12 months to complete.

Alternative No. 3 – Area 1 (0 to 15 Feet) and Hot Spot Soil Excavation, and Off-Site Disposal: Excavation and off-Site disposal of the hot spot and Area 1 (0 to 15 feet) can be performed in approximately 1 to 2 years. Plans and specifications would have to be prepared for construction of excavation shoring and the dewatering system.

Alternative No. 4 – Area 1 (0 to 8 Feet) and Hot Spot Soil Excavation, Off-Site Disposal, Capping, and AUL: Excavation and off-Site disposal of the hot spot and Area 1 (0 to 8 feet), construction of a cap, and attachment of an AUL to the deed for Area 1 can be accomplished in approximately 1 to 2 years. Plans and specifications would have to be prepared for construction of excavation shoring and the cap.

#### 6.4 Selection of Remedial Action Alternative

A comparative evaluation of alternatives was described in the preceding section. Table 12 provides a relative scoring of the alternatives with respect to each of the criteria. For each criterion, the alternatives were scored relative to each other on a scale of 1 (best) to 3 (worst). Alternative No. 2 - Hot Spot Soil Excavation, Off-Site Disposal, and AUL received the lowest scoring (total score = 12) and, therefore, was selected as the remedial action alternative for the Site.

#### 5.5 Feasibility of Permanent Solutions

#### 6.5.1 Feasibility of Restoration to Background

The selected remedial action alternative, Alternative No. 2 – Hot Spot Soil Excavation, Off-Site Disposal, and AUL, meets most of the following criteria of 310 CMR 40.0860(5):

- The selected remedial technology is technically feasible.
- The cost of implementing the alternative is justified by the benefits.
- Individuals with the expertise required to implement the alternative are available.
- The alternative does not require land disposal of OHM materials for which there are no current facilities available to accept such materials.
- The alternative will be implemented at the source to reduce and/or eliminate source area contamination.

The reduction of contaminant concentrations in soil to background levels will not occur under the selected remedial alternative. The primary objective of hot spot removal and implementation of an AUL is to limit exposure to contaminants. Additional remediation or excavation to achieve background will cost orders-of-magnitude higher and would take much longer to implement. These costs would clearly be disproportionate to the marginal incremental benefit which further remediation might provide. Given that the selected remedial action alternative will result in a condition of No Significant Risk for current and future Site uses, further reduction of contaminant levels would not provide significant benefits relative to risk reduction. Therefore, the achievement of background concentrations in soil does not appear to be warranted for this Site. Also, the Site is situated in an area where much of the subsurface has been impacted with urban fill, consequently, benefits associated with "environmental restoration" which would result from further remediation are negligible.

#### 6.6 Phase III Completion Statement

A copy of the Phase III Completion Statement is provided in Appendix G. In accordance with 310 CMR 40.1403, a Notice of a Remedial Plan was submitted to the City of Boston Chief Municipal Official and Board of Health. Copies of this notice are included in Appendix G. A copy of the legal notice is included in Appendix G.

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#### 7.0 CONCLUSIONS AND RECOMMENDATIONS

#### 7.1 Conclusions

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Based on data collected to-date, the contaminants detected in soil included TPH, PAHs and lead, which have been detected at concentrations above applicable S-2 and S-3 Method 1 Standards. The data presented in this Phase II report indicate that the extent of soil contamination is limited to the urban fill unit at two areas in the northern portion of Parcel P-3: Area 1 and Area 2 (Figures 2 and 7). Lead concentrations also exceeded UCLs at two locations and the TCLP hazardous waste threshold in one sample. A lead impacted soil hot spot was identified in Area 2.

Groundwater sampling results presented in this Phase II report indicate that groundwater does not appear to be impacted by a release of OHM, with the contaminants in groundwater all detected at concentrations below Method 1 Standards. A release of oil to the basement of the former Whittier Street Health Center does not appear to have impacted the environment and is not part of this disposal site.

The results of the Method 1 risk characterization indicate that a condition of No Significant Risk does not exist at the Site due to the hot spot in Area 2 and EPH-contaminated soil detected at one location in Area 1. Area 1 soil also contained lead and PAH concentrations similar to those typically found in urban fill. Therefore, these contaminants were not included in the risk characterization. However, if residences are to be placed in Area 1, there is a significant risk due to current soil contaminant concentrations.

The Phase II concluded that to achieve a condition of No Significant Risk, at a minimum, the hot spot in Area 2 should be excavated and disposed off-Site. An AUL restricting future residential use and/or to identify site use and activities which are consistent with maintaining a condition of No Significant Risk may then be placed on Area 1. If future residential development of Area 1 is desired then several remedial options are available. These options include excavation of all contaminated soil in Area 1, or a combination of limited excavation (to meet grades for

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development) coupled with placement of a geotextile and a 3-foot earthen cap or barrier to provide adequate separation.

Therefore, although we recommend Alternative 2 (hot spot excavation in Area 2 and an AUL to restrict residential development of Area 1), site closure will likely occur during the development of Parcel P-3 and be amended to reflect the desired development for the Site.

#### 7.2 Recommendations

Based on the findings presented in this report, Weston & Sampson recommends that the BRA:

- 1) Extend Site fencing to prohibit trespasser access to Area 2 and prevent new dumping.
- 2) Implement Remedial Alternative No. 2, which is excavation of the hot spot in Area 2 and placement of an AUL on the deed to identify site use and activities, which are consistent with maintaining a condition of No Significant Risk in Area 1.
- 3) Conduct necessary response actions to achieve MCP compliance and site closure.

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#### 8.0 LIMITATIONS

This report was prepared on behalf of and for the exclusive use of the Boston Redevelopment Authority for use in evaluating the environmental conditions at Parcel P-3. The findings provided by Weston & Sampson in this report are based solely on the information reported in this document. Soil and groundwater data are representative of the samples collected at the locations specified and at the time of collection. Future investigations, and/or information that were not available to Weston & Sampson at the time of the investigation, may result in a modification of the findings stated in this report.

Should additional information become available concerning Parcel P-3 or neighboring properties in the future, the information should be made available to Weston & Sampson Engineers, Inc. for review so that the conclusions presented in this report may be modified as necessary. The conclusions of this report are based solely on the data collected by Weston & Sampson personnel at the time of the investigation(s) discussed herein. The information collected has not been used to assess if contaminants from Parcel P-3 have migrated to other nearby properties, or if contaminants from potential off-site sources have impacted Parcel P-3. This report has been prepared in accordance with generally accepted engineering and geological practices. No other warranty, express or implied, is made.

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	B-207(S) PARCEL "C" LINE (AS SHOWN ON RECORDED PLAN 10, 17973-2 SUFFOLK COUNTY REGISTRY OF DEDS)
	BOSTON EDISON ≈ 5.5 ACRE WESTERN PORTION
	BRICK BUILDING
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$\backslash$	PARCEL P-1 LINE
$\backslash$	SUFFOLK DUNTY REG
	HIGH SCHOOL
LEGEND	·
	SOIL BORING
₩ <b>5</b> =1	GROUNDWATER MONITORING WELL
⊗ SS–1	SURFICIAL SOIL SAMPLING LOCATION
⊗ sp–1	STOCKPILE SOIL SAMPLE
⊕ B−201(D)	DEEP SOIL BORING
	SHALLOW SOIL BORING
<b>■</b> TP-6	TEST PIT
A A'	GEOLOGIC CROSS-SECTION
	P-3 PARCEL BOUNDARY
EW(1= 40	CHAIN LINK FENCE
ELP-3N	DISPOSAL SITE BOUNDARY
Тураяс	APPROXIMATE LIMITS OF SURFICIAL SOIL STOCKPILE
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#### TABLE 1

#### PHASE I PID FIELD SCREENING RESULTS TEST PITS AND SOIL BORINGS BRA PARCEL P-3

Boring	Sample	Sample Depth	PID Reading
		(feet)	(ppm)
TP-1/WS-12		11.5 - 12	34
	S-1	17 - 19	NS
TP-2/B-2		13.5 - 14	3.7
	S-1	29 - 31	0.4
	S-2	34 - 36	0.8
	S-3	39 - 41	0.8
	S-4	44 - 46	0.9
	S-5	49 - 49.1	0.8
	S-6	54 - 56	0.9
	S-7	59 - 61	1
TP-3/B-1		15.5 - 16	2.6
	S-1	19 - 21	1.6
	S-2	24 - 26	2.6
	S-3	29 - 31	2.3
	S-4	34 - 36	2.7
	S-5	39 - 41	1
	S-6	44 - 46	1.9
	S-7	49 - 51	1.7
	S-8	54 - 56	1.2
	S-9	59 - 61	1.4
TP-4/WS-9		18.5 - 19	5.5
	S-1	19 - 21	1.2
	S-2	23 - 25	0.5
TP-5/WS-8		17 - 17.5	2
	S-1	18 - 20	ND
	S-2	23 - 25	0.8
TP-6	S-1	15.5 - 16	1.1
TP-7/WS-10		17.5 - 18	0.5
	S-1	<u> 19 - 21</u>	4.4

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#### Notes:

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PID = Photoionization Detector Photovac Microtip Model HL-2000.

ppm = parts per million.

ND = Not Detected or less than Background.

NS = Not Screened.

Background concentrations (ND) = <0.2 ppm.

(--) indicates no sample recovered.

PID readings were measured between November 27 and December 5, 1996.

#### **TABLE 1 - Continued**

#### PHASE I PID FIELD SCREENING RESULTS SOIL BORINGS BRA PARCEL P-3

Boring	Sample	Sample Depth	PID Reading
		(feet)	(ppm)
	S-1	0-2	ND
	S-2	3.5 - 5.5	ND
	S-3	8.5 - 10.5	1.4
	S-4	13.5 - 15.5	ND
	S-5	18.5 - 20.5	ND
WS-1	<b>S</b> -6	13.5 - 25.5	ND
	S-7	28 - 30	ND
	S-8	33 - 35	ND
	S-9	38 - 40	ND
	S-10	43 - 45	ND
	S-11	48 - 50	ND
	S-12	53 - 55	ND
	S-13	58 - 60	ND
	S-1	1 - 3	ND
WS-2	S-2	5 - 7	ND
	S-3	10 - 12	ND
	S-4	15 - 17	ND
	S-1	0 - 2	ND
WS-3	S-2	5-6	_
	S-3	10 - 12	ND
	S-4	15 - 17	ND
	S-1	0 - 2	ND
WS-4	S-2	5-7	ND
	S-3	10 - 12	ND
	<u>S-4</u>	15 - 17	ND
	S-1	0 - 2	0.3
ws-5	S-2	5-7	0.6
	S-3	10 - 12	0.5
	<u>S-4</u>	15-1/	0.6
11/0 0	5-1	0-2	0.5
WS-6	5-2	5-7	ND
	5-3	10 - 12	0.8
	5-4	15-1/	0.5
14/0 7	S-1	0-2	
WS-7	5-2	5-7	
	5-3	10-12	0.7
	0-4 0 1	15-1/	0.2
W/S.11	0-1 0-1	5 7	1.2
**3*11	0-2	10 12	16
	S-3	15 17	
	S-5	20 - 22	17

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PID = Photoionization Detector Photovac Microtip Model HL-2000.

#### ppm = parts per million.

ND = Not Detected or less than Background.

NS = Not Screened.

Background concentrations = ND - 0.2 ppm.

(-) indicates no sample recovered.

PID readings were measured between December 3 and 5, 1996.

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TABLE 2

PHASE I SOIL SAMPLING RESULTS BRA PARCEL P-3 November 27 to December 5, 1996

								Camp	a Iriantifi	ne noter	Somnla	Danth /f	100			Γ
Parameter		Method 1 Cleanup	Method 1 Cleanup	Upper	WS-1	WS-2	WS-3	WS-4	WS-5	WS-6	WS-7	WS-8	MS-9	WS-10	WS-11	WS-12
	Units	Standards S-2 (GW-2/GW-3)	Standards S-3 (GW-2/GW-3)	Concentration Level (UCL)	8.5-10.5	10-12	15-17	10-12	10-12	10-12	10-12	TP-5 17-17.5	TP-4 18.5-19	TP-7 17.5-18	20-22	TP-1 11.5-12
VOLATILE ORGANIC COM	POUNDS*							1	1							
Benžene	mg/kg	60	100	2,000	<0.025	0.070	<0.047	<0.070	<0.027	<0.024	<0.027	€0.030	0.087	<0.027	<0.027	<0.034
Isopropylbenzene	вубш	SN	SN	SN	<0.025	<0.070	60.047	<0.070 070	<0.027 0.027	0.024	<0.027	0.030	<0.026	<0.027	<0.027	0.33
n-Propylbenzene	6y/6E	S SS	SN SN	20000F	40.0Z	0.070	<0.047	0/0/0	20.02	47.0.24	<0.027	020.02 020.02	970.02P	120.02	20.02	0.032
Ayrenes (lotal)		S Z	e vi	non N	40.025	<0.020 AD 070	<0.047	010.02	\$0.027	<0.024	<0.027	<0.030	<0.026	<0.027	<0.027	0.036
sec-Butybenzene	a More	SN	SN SN	SZ	40.025	<0.070	<0.047	<0.070	-0.027	<0.024	<0.027	<0:030	<0.026	<0.027	<0.027	0.27
n-ButMbenzene	ma/ka	SN	SN	SN	<0.025	<0.070	<0.047	<0.070	-0.027	<0.024	<0.027	<0.030	<0.026	<0.027	<0.027	0.47
Naphthalene		1,000	1,000	10,000	<0.025	<0.070	<0.047	<0.070	<0.027	<0.024	<0.027	0.15	<0.028	0.15	<0.027	0.16
1,2,4-Trimethylbenzene	mg/kg	SN	NS	NS	<0.025	<0.070	<0.047	<0.070	<0.027	<0.024	<0.027	<0:030	<0.026	<0.027	<0.027	0.070
Total BTEX	вувш	1	:	I	Q	g	â	Q	Q	Q	Q	g	0.087	Ŷ	Ð	0.032
Total VOCs	mg/kg	:	1	:	g	g	Ð	Ð	Q	9	Q	0.15	0.087	0.15	£	2.1
TOTAL PETROLEUM HYDF	ROCARBO	NS**														
Gasoline	mg/kg	:	1	;	<b>5</b> 2	<110	<86	<110	<54	<45	<51	<59	<58	€52	<47	<72
Kerosene	толка	I	:	;	€52	<110	466	<110	ŝ	<45	<51	<del>6</del> 59	\$28	\$52	<47	<72
Mineral Spirits	шаука	1	;	1	€2	<110 <	<b>8</b> 6 ∧	110	ŝ	<45	<51	€\$3	\$SB	83	<47	<72
Fuel Oil #2/Diesel	mg/kg	1	:	3	\$	÷10	98	₽ V	Ŷ	<45	\$1	\$ \$	\$2 V	150-	4	8,400°
Fuel Oil #4	вувш	1	;	ı	¥	4110 4110	999	410 416	Ş,	£9 €9	5	6 <u>6</u>	₽, {	8 F	4	
Fuel Oil #6	6y/6w	:	1	1		82	5			8					ş ;	
Motor Oi/Hydraulic Oil	6y6u	1 4	: .		Ş		99 99 9		\$ 5	64 64	5 9	006	₿ 9	1020	₹₹	
TOTAL TPH	mg/kg	5,000	000'9	000,000,01	P		N	R	R	R	R		 N	1,0/0		0,400
POLYNUCLEAR AROMATI(	C HYDROC	CARBONS ***														
Naphthalene	mg/kg	1,000	1,000	10.000	A	<0.057	<0.025	٩N	AN	AN	AN	8.2	0.13	A	<0.028	0.1
2-MelhyInaphIhalene	6y6u	2,500	1,000	10,000	AN S	<0.057	<0.025	ž	¥:	¥2	A N	6.4 6.4	0.060	¥:	<0.028	23
Acenaphthylene	mg/kg	1.000	1,000	10,000	¥ ¥	100.02	40.02 20.02	Z Z	X X			D, C		¥ A	870'0Y	0.50
Acenaphthene	D D VG	2,500	1,000	10,000	A A	20.05	670'02				A N	1 -	0.00		070.02 0.028	1 0 1 0
Phonene		2,000	000't			250.05	20.02		A A	X A	A N	- 68	2 4		40.02B	; =
Anthracene	ma/ka	2.500	5.000	10.000	¥.	<0.057	<0.025	A Z	Ž	Ă	A	5	0.44	Ą	<0.028	2.7
Fluoranthene	ma/ka	1.000	1.000	10,000	¥	<0.057	<0.025	٩N	¥	AN	AN	92	1.6	AN	<0.028	4.1
Pyrene	mg/kg	2,000	5,000	10,000	٩	<0.057	<0.025	٩	٩	AN	٩N	82	4.1	AN	<0.028	4.1
Benzo(a)anthracene	mg/kg	÷	4	100	٩	<0.057	<0.025	A	٩	٨A	AN	38	0.63	٩N	<0.028	1.5
Chrysene	mg/kg	10	40	400	AN N	<0.057	<0.025	٩	٩N	AN	AN	44	0.69	٩	<0.028	1.7
Benzo(b)fluoranthene	mg/kg	-	4	100	٩N	<0.057	<0.025	¥	٩N	٩N	٩z	34	0.56	٩	<0.028	1.2
Benzo(k)Iluoranlhene	mg/kg	10	40	400	٩N	<0.057	<0.025	AA	¥	Ą	¥	35	0.55	¥	€0.026	1.3
Benzo(a)pyrene	mg/kg	0.7	0.7	100	٩N	<0.057	<0.025	A	NA N	A	 ₹	39	0.61	¥	€0.02B	4.
Dibenzo(a,h)anthracene	աց/kg	0.7	0.6	100	Ā	<b>6</b> .11	<0.050	¥	٩Z	¥	I ≨	4.7	<0.012	ž	€0.058	<0.072
Benzo{g,h,i)perylene	mg/kg	2,500	2.500	10,000	A N	¢0.11	<0.050	A Z	¥Z :	¥ :	₹	<u>5</u>	0.19	¥ i	€0.056	<0.072
Indeno(1,2,3-cd)pyrene	mg/kg	-	4	100	A	<b>6</b> .1	00:0>	AA	¥	¥	- V	14	0.20	¥	<0.056	\$0.072
METALS						,				1	:	c r	0			
Arsenic, Total	mg/kg	30	30	300	¥ :	5.6	21	¥.	¥2	ž	¥.	n. 6	ρ. (1 2	¥.	5	4.6
Bartum, Total	ш0 kg	2,500	000'6	000		207	200			ž			20		2	2 8
Chromium Total	more a	2 500	5.000	10.000	AN N	3	1	× ×	A N	Ā	AN	23	4	AN	i ‡	22
Lead. Total	morka	600	600	6.000	AN	5	9.6	٩N	٩N	٩	٩N	520	980	AN	51	120
Mercury Tolat	ma/ka	60	60	600	AN	<0.033	0.059	AN	٩N	AN	AN	3.07	0.204	¥	<0.015	¢0.022
Selenium. Total	ma/kg	2,500	2,500	10,000	Ą	<5.5	<4.2	AN	٩N	¥	٩	<2.6	<2.7	AN	4.2	<3.3
Silver, Total	mg/kg	200	200	2,000	٩N	<5.2	4	Ă	٩N	AN	٩N	<2.8	<b>^2.6</b>	AN	4.5	63.3 6
	,						1		1		ð	Harweeler BR	V/200317/Resu	te-Tathev(Sol	Samping Tabl	2.xte jeed
Notes:																
ND = Not Detected	- = Not Apt	blicable		Weathered TPH												
NA = Not Analyzed	mg/kg = mi. ••/ka = mic	ligrams per kilogram (p	arts per million) Parts per billion)		exceeds a	nolicable N	Aethod 1 C	teanup St	andard out	Mished In S	HD CMR -	40 0000 (1	0/29/99)			
No - No clained COS7 = not detected, i.e., bell	ow delectio	in limit of 0.057.			exceeds L	Ipper Conc	centration	imit publis	hed in 310	0 CMR 40.	0000 (10/2	29/99).	1			

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### TABLE 2 - Continued

# PHASE I SOIL SAMPLING RESULTS BRA PARCEL P-3 March 24 to 26, 1997

		Method 1	Method 1					Sample	Identific	ation and	I Sample	Depth (	(eet)			Γ
Parameter		Cleanup	Cleanup	Upper		B-101			B-102			3-103			B-104	
	Units	Standards	Standards	Concentration	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	ŝ
		S-2 (GW-2/GW-3)	S-3 (GW-2/GW-3)	Level (UCL)	1-2.5	4.5-6.5	7-9	13	4-6	7-9	13	4-6 6	6-2	1.3	4 <b>-6</b>	7-9
TOTAL PETROLEUM HYDROCARBONS																
Gasoline	mg/kg	,	1	1	<56	<53	<61	<56	<55	<56	<55	<56	<55	<54	<56	<55
Kerosene	mg/kg	1	1	I	<56	ŝ	<61	<56	<55	<58	<55	<58	<55	\$5	\$2	<55
Mineral Spirits	mg/kg	;	1	I	<56	<53	<61	<56	<55	<56	<55	56	<55	\$5	<58 <	<55
Fuel Oil #2/Dieset	ma/ka	1	1	;	<56	<53	<61	<56	<55	<56	<55	<56	<55	\$54 \$54	~2£	<55
Fuel Oil #4	mg/kg	1	I	I	<56	<53	<61	<56	<55	<56	<55	<56	<55	\$54	<56	<55
Fuet Oil #6	mg/kg	ł	1	I	<110	<110	<120	<110	<110	<110	<110	<110	<110	<110	<110	<110
Motor Oil/Hydraulic Oil	mg/kg	1	I	ł	<56	350	<61	440	380	560	160	270	120	320	240	490
Unidentified Hydrocarbons	mg/kg	1	1	:	500	Q	QN	QN	QN	QN	QN	Q	Ð	â	Q	Q
TOTAL TPH	mg/kg	5,000	5,000	10,000,000	500	350	Q	440	380	560	160	270	120	320	240	490
POLYNUCLEAR AROMATIC HYDROCARBO	SN															
Naphthatene	mg/kg	1,000	1,000	10,000	<0.14	0.28	<0.030	0.55	0.28	0.25	0.061	0.19	0.048	0.70	0.051	0.61
2-Methylnaphthalene	mg/kg	2,500	1,000	10,000	<0.14	0.32	<0.030	<0.28	0.15	0.16	0.055	0.12	0.032	0.40	0.033	0.26
Acenaphthylene	mg/kg	1,000	1,000	10,000	<0.14	0.22	<0.030	<0.28	0.096	0.14	0.055 <	0.055 <	:0.027	0.24	0.041	0.24
Acenaphthene	mg/kg	2,500	4,000	10.000	0.30	0.58	<0.030	0.80	0.41	0.47	0.20	0.45	:0.027	1.0	0,14	<b>1</b> .1
Fluarene	mg/kg	2,000	4,000	10,000	0.24	0.64	<0.030	0.82	0.42	0.51	0.16	0.35 <	:0.027	1,1	0.15	1.1
Phenanthrene	mg/kg	100	100	10,000	3.2	5.4	0.060	7.9	4.6	6.0	1.8	4.6	0.19	9.6	1.2	12
Anthracene	mg/kg	2,500	5,000	10,000	0.67	1.3	<0.030	2.1	0.87	1.2	0.40	0.81	0.030	2.0	0.36	2.3
Fluoranthene	mg/kg	1,000	1,000	10,000	3.6	5.7	0.42	9.6	5.6	7.4	2.0	5.2	0.18	12	2.0	13
Pyrene	шд/кд	2,000	5,000	10,000	3.8	5.8	0.38	8.7	4.3	5.8	2.1	4.2	0.16	9	1.9	13
Benzo(a)anthracene	шд/кд	-	4	100	1.8	2.8	<0.030	4.3	1.9	2.5	1.0	1.8	0.064	5.5	0.68	6.0
Chrysene	тв/ка	10	40	400	1.9	2.9	<0.030	4.3	1.9	2.4	1.1	1.8	0.094	5.7	0.84	6.3
Benzo(b)fluoranthene	mg/kg	-	4	100	1.3	1.7	<0.030	2.9	1.2	1.6	0.65	1.2	0.050	4.2	0.96	4.2
Benzo(k)fluoranthene	mg/kg	10	40	400	1.5	1.9	<0.030	2.9	1.3	1.6	0.68	1.3	0.039	4.5	1.0	5.0
Benzo(a)pyrene	mg/kg	0.7	0.7	100	1.8	2.6	<0.030	4.0	1.8	2.3	0.98	1.7	0.048	5.6	0.89	5.9
Dibenzo(a,h)anthracene	mg/kg	0.7	0.6	100	0.48	0.75	<0.030	1.1	0.50	0.57	0.25	0.40 <	0.055	0.65	0.078	0.67
Benzo(g,h,i)perylene	mg/kg	2,500	2,500	10,000	1.6	2.2	<0.030	2.8	4.1	1.4	0.64	0.97 <	0.055	1.4	0.19	1.5
Indeno(1,2,3-cd)pyrene	mg/kg	1	4	100	1.3	1.8	<0.030	3.2	1.3	1.4	0.62	0.98	0.055	1.5	0.20	1.6
POLYCHLORINATED BIPHENYLS	mg/kg	2	2	100	NA	AN	AN	NA	AA	AN	AN	AN	NA 0	.030***	<0.028	<0.027
METALS																
Arsenic, Totał	mg/kg	30	30	300	Ą	ΨZ	ΑN	AN	AN	AN	AN	AN	AN	AN	AN	AN
Cadmium, Total	mg/kg	80	80	800	AN	AN	AN	AN	AN	AN	AN	AN	٩N	AN	AN	AN
Chromium, Total	mg/kg	2,500	5,000	10,000	AN	¥	AN	AN	AN	AN	AN	AN AN	AN	AN	AN	AN
Lead, Total	mg/kg	600	600	6,000	210	360	46.0	200	150	200	170	110-	57	270	270	86
Lead, TCLP	mg/l	5****	5****	AN	<0.20	<0.20	AN	<0.20	0.27	<0.20	¢0.20	0.28	¥	0.24	<0.20	AN
Mercury, Total	т9/кд	60	60	600	AN	¥	AN	AN	NA	AN	AN	AN	AN	AN	AN	AN

mg/kg = milligrams per kilogram (parts per million) μg/kg = micrograms per kilogram (parts per billion) Notes: ND = Not Detected NA = Not Analyzed NS = No Standard -- = Not Applicable

\*\*\*\* PCB identified as #1242 \*\*\* PCB identified as #1260

The section Level
 BOLD - exceeds applicable Method 1 cleanup Standard published in 310 CMR 40.0000 (10/29/99).
 BOLD - exceeds Upper Concentration Limit published in 310 CMR 40.0000 (10/29/99).
 CO.057 = not detected, i.e., below detection limit of 0.057.

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Uterwate/BRA/200317Peaults-Tables/Sol Sampling Table2.xts[sol

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TABLE 2 - Continued

### PHASE I SOIL SAMPLING RESULTS BRA PARCEL P-3 March 24 to 28, 1997

		Method 1	Method 1					Samp	e Identif	ication a	od Sampl	e Depth	(feet)			
Parameter		Cleanup	Cleanup	Upper		B-105			B-106			<b>B-107</b>			B-108	
	Units	Standards S-2 (GW-2/GW-	Standards S-3 (GW-2)/GW-	Concentration	S1 1-3	\$2 4-6	53 7-9	S1 1-3	52 4-6	\$3 7-9	s.	52 4.6	53 7-0	S1	S2 4.F	S3 7-6
TOTAL PETROLEUM HYDROCARBONS						;			2	2	2	;	2	2	2	2
Gasoline	mg/kg	1	1	1	<54	<57	<56	<56	<57	<560	<55	<280	<59	<57	<120	<56
Kerosene	mg/kg	I	:	;	<54	<57	<56	<56	<57	<580	<55	<280	<59	<57	<120	<56
Mineral Spirits	mg/kg	1	1	I	ŝ5	<57	<56	<56	<57	<560	<55	<280	<59	<57	<120	<56
Fuel Oil #2/Diesel	mg/kg	I	ţ	:	<54	<57	<56	<56	<57	<560	<55	<280	<59	<57	<120	<56
Fuel Oil #4	mg/kg	ı	1	:	<54	<57	<56	<56	<57	<560	<55	<280	<59	<57	<120	<56
Fuel Oil #6	mg/kg	:	I	I	<110	<110	<110	<110	<110	<1,100	<110	<560	<120	<110	<240	<110
Motor Oll/Hydraulic Oil	mg/kg	ı	I	1	140	230	180	450	700	6,700	140	2,300	700	220	1,600	110
Unidentified Hydrocarbons	mg/kg	I	1	:	Q	Q	Q	Q	Q	Q	Ð	Q	Q	QN	Q	Q
TOTAL TPH	mg/kg	5,000	5,000	10,000,000	140	230	180	450	700	6,700	140	2,300	700	220	1,600	110
POLYNUCLEAR AROMATIC HYDROCARBON	NS															
Naphthalene	mg/kg	1,000	1,000	10,000	1.6		0.071	0.25	0.56	0.27	0.085	0.20	0.40	0.070	0.19	<0.055
2-Methylnaphthalene	mg/kg	2,500	1,000	10,000	0.82	0.51	<0.055	0.15	0.30	0.15	<0.058	0.14	0.29	<0.058	0.096	<0.055
Acenaphthylene	mg/kg	1,000	1,000	10,000	0.35	<0.28	<0.055	0.11	0.16	0.11	<0.056	<0.11	0.12	<0.058	060.0	<0.055
Acenaphthene	mg/kg	2,500	4,000	10,000	1.9	1.3	0.091	0.39	0.91	0.47	0.17	0.41	1.0	0.22	0.21	0.057
Fluorene	mg/kg	2,000	4,000	10,000	1.9	1.5	0.11	0.41	0.82	0.44	0.14	0.38	0.88	0.18	0.22	<0.055
Phenanthrene	mg/kg	100	100	10,000	15	÷	1.2	5.1	8.9	4.6	1.7	4.0	9.7	1.8	3.0	0.60
Anthracene	mg/kg	2,500	5,000	10,000	3.9	2.8	0.29	0.96	1.7	96.0	0.39	0.98	4.9	0.43	0.40	0,15
Fluoranthene	mg/kg	1,000	1,000	10,000	16	11	1.4	5.8	9.7	5.3	2.1	4.1	÷	2.3	3.6	0.67
Pyrene	mg/kg	2,000	5,000	10,000	14	9.1	1.3	4.8	7.9	4.6	1.9	3.7	9.0	2.0	2.8	0.57
Benzo(a)anthracene	mg/kg	-	4	100	8.1	4.9	0.67	1.9	3.8	6.1	1.1	2.1	4.5	÷-	1.1	0.35
Chrysene	mg/kg	5	40	400	8.7	4.8	0.70	1.9	4.0	- - -	<del>1</del> .1	2.1	4	÷	1.2	0.37
Benzo(b)fluoranthene	mg/kg	÷	4	100	5.3	3.2	0.45	1.2	2.0	1.2	0.73	1.4	2.4	0.79	0.80	0.25
Benzo(k)fluoranthene	mg/kg	0	40	400	5.5	3.3	0.53	1.3	2.1	1.3	0.74	1.5	2.5	0.78	0.82	0.27
Benzo(a)pyrene	mg/kg	0.7	0.7	100	7.5	4.1	0.64	1.8	3.6	1.8	1.0	1.9	4.1	1.1	1.1	0.34
Dibenzo(a,h)anthracene	mg/kg	0.7	0.8	100	2.0	1.0	0.14	0.41	0.64	0.34	0.21	0.33	0.66	0.20	0.19	<0.11
Benzo(g,h,i)perylene	mg/kg	2,500	2,500	10,000	5.8	2.8	0.50	0,97	1.5	0.79	0.48	0.73	1.5	0.47	0.14	0.11
Indeno(1,2,3-cd)pyrene	mg/kg	-	4	100	4.8	2.5	0.41	0.98	1.5	0.80	51	0.81	1.6	0.51	0.48	0.12
POLYCHLORINATED BIPHENYLS	mg/kg	2	2	100	NA	NA	NA	AA	AN	AN	AN	NA	AA	AN	AN	AN
NETALS																
Arsenic, Total	mg/kg	ନ	30	300	7.8	6.2	2.6	AN	AN	AA	AN	AN	- AN	AA	AN	AA
Cadmium, Totat	mg/kg	80	80	800	2.4	<2.5	<2.5	Ą	٩N	AN	A	AA	¥	AA	AN	AN
Chromium, Total	mg/kg	2,500	5,000	10,000	38	8	14	AN	٩N	AN	AN	AN	AN	AN	AN	AN
Lead, Totai	mg/kg	600	600	6,000	940	330	49	150	330	350	280	290	190	450	190	110
Lead, TCLP	∏g/	2	5****	NA	0.65	0.27	AN	0.30	0.32	0.70	0.23	0.62	0.31	0.24	0.23	<0.20
Mercury, Total	mg/kg	60	60	600	0.321	0.475	0.332	٩N	AN	AN	AN	AN	AN	AN	AN	AN
											G'Ha	waate/89A/2	0011/Result	B-Tablen\Sol	Sempling Teb	e2.xis/sol

Notes: ND = Not Detected NA = Not Analyzed NS = No Standard -- = Not Applicable mg/kg = millgrams per kilogram (parts per million) μg/kg = micrograms per kilogram (parts per billion)

The PCB Identified as #1260
 The PCB Identified as #1242
 The PCB Identified as #124
 The PCB Identified as #1242
 The PCB Identified as #124

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TABLE 2 • Continued

# PHASE I SOIL SAMPLING RESULTS BRA PARCEL P-3 March 24 to 26, 1997

		Method 1	Mathod 1					Samo	le Identif	ication a	nd Samp	le Depth	1 (feet)			
Parameter		Cleanup	Cleanup	Upper		B-109			B-110			B-111	Ì		B-112	
	Units	Standards	Standards	Concentration	S1	S2	S3	s1	S2	<b>S</b> 3	s1	S2	S3	S1	S2	S3
		S-2 (GW-2/GW-	S-3 (GW-2/GW-	Level (UCL)	1-3	4-6		1-3	4-6	6-7	- 1-3	4-6	7-9	7	4-6 6	7-9
TOTAL PETROLEUM HYDROCARBONS																
Gasoline	mg/kg	:	1	1	<56	<57	<56	<55	<58	\$56	<56	\$ <u>5</u>	<110	<57	<56	<60
Kerosene	тв/кд	1	1	1	\$9	<57	<56	<55	<58	<56	<56	\$5 54	<110	<57	<56	<60
Mineral Spirits	mg/kg	ł	:	1	< <u>5</u> 6	<57	<56	<55	<58	<56	<56	\$	<110	<57	<56	<60
Fuel Oit #2/Diesel	mg/kg	:	:	1	<56	<57	<56	<55	<58	<56	<56	<54	<110	<57	<56	<60
Fuel Oit #4	mg/kg	:	1	;	<56	<57	<56	<55	\$°	<del>5</del> 6	<56	<54	<110	<57	<56	<60
Fuel Oil #6	mg/kg	ı	1	;	<110	<110	<110	<110	<120	<110	<110	<110	<220	<110	<110	<120
Motor Oil/Hydraulic Oil	mg/kg	ı	ł	1	230	330	170	170	140	1,100	190	200	1,300	500	190	970
Unidentified Hydrocarbons	mg/kg	1	1	1	g	Ŷ	Ð	Q	Q	Q	Q	Q	Q	Q	Q	9
TOTAL TPH	mg/kg	5,000	5,000	10,000,000	230	330	170	170	140	1,100	190	200	1,300	500	190	970
POLYNUCLEAR AROMATIC HYDROCARBO	SNC															
Naphthalene	mg/kg	1,600	1,000	10,000	0.28	0.29	0.32	0.11	0.11	<0.29	0.055	<0.27	0.49	0.21	0.077	14
2-Methylnaphthalene	mg/kg	2,500	1,000	10,000	0.17	0.17	0.15	0.069	0.061	<0.29	<0.055	<0.27	<0.29	0.12	0.050	4.1
Acenaphthylene	mg/kg	1,000	1,000	10,000	0.088	0.063	0.092	0.069	0.059	<0.29	<0.055	<0.27	<0.29	0.082	0.042	0.77
Acenaphthene	mg/kg	2,500	4,000	10,000	0.48	0.64	0.44	0.29	0.19	0.49	0.10	0.35	1.0	0.46	0.16	ର
Fluorene	mg/kg	2,000	4,000	10,000	0.48	0.64	0.43	0.26	0.20	0.63	0.086	0.36	0.86	0.45	0.17	17
Phenanthrene	mg/kg	100	100	10,000	5.4	6.7	4.9	2,4	2.3	5.0	1.2	3.7	8.1	5.4	<del>ا</del> ن	110
Anthracene	mg/kg	2,500	5,000	10,000	1.1	1.3	1.0	0.67	0.46	1.2	0.29	0.91	1.7	0.89	0.40	0.59
Fluoranthene	mg/kg	1,000	1,000	10,000	6.0	8.0	5.6	4.5	3.1	5.3	1.9	4.7	9.3	6.2	51	96
Pyrene	mg/kg	2,000	5,000	10,000	5.0	6.3	5.4	4.2	2.8	<b>6</b> .6	1.7	4.1	8.2	5,9	53	80
Benzo(a)anthracene	mg∕kg	-	4	100	2.0	2.7	6.1	1.7		2.5	0.94	20	4.0	2.2	0.84	39
Chrysene	mg/kg	6	40	400	2.0	2.7	2.0	1.8	1.1	2.7	0.96	5.1	4.2	2.3	0.90	40
Benzo(b)fluoranthene	mg/kg	-	4	100	1.3	1.9	1.8	1.8	1.2	2.5	0.65	1.5	2.7	2.2	0.83	29
Benzo(k)fluoranthene	mg/kg	₽	40	400	1.5	2.1	1.8	1.7	1.2	2.7	0.73	1.5	3.0	2.4	0.88	29
Benzo(a)pyrene	mg/kg	0.7	0.7	100	1.9	2.5	2.0	1.7	1.2	2.5	0.94	1,9	3.7	2.2	0.81	35
Dibenzo(a,h)anthracene	mg/kg	0.7	0.8	100	0.29	0.40	0.25	0.21	0.12	<0.58	0.27	0.41	0.90	0.25	0.081	3.0
Benzo(g,h,i)perylene	mg/kg	2,500	2,500	10,000	0.58	0.60	0.55	0.43	0.27	0.52	0.73	1.6	3.0	0.53	0.19	6,4
Indeno(1,2,3-cd)pyrene	mg/kg	-	4	100	0.67	0,92	0.62	0.47	0.29	0.58	0.69	1.3	2.5	0.60	0.21	7.2
POLYCHLORINATED BIPHENYLS	mg/kg	2	2	100	AN	Ą	AN	AN	AN	AN	AN	AN	AN	A	AA	NA
AETALS																
Arsenic, Total	mg/kg	30	30	300	AN	AA	AN	AA	AA	AA	с С	9	9	AN	AN	AN
Cadmium, Total	mg/kg	80	80	800	AN	NA	¥	AN	AN	A	2	2	4	¥	AN	٨
Chromium, Total	mg/kg	2,500	5,000	10,000	٩N	AN	¥2	AN	AA	AA	21	23	23	٩	NA	NA
Lead, Total	mg/kg	600	600	6,000	190	130	280	240	220	670	200	230	1,400	ŝ	970	5,000
Lead, TCLP	пg/	5****	5****	NA	0.22	<0.20	0.35	0.32	0.37	<0.20	<0.20	0.25	0.60	<0.20	0.58	0.77
Mercury, Total	тд/кд	09	60	600	AN	AN	AN	AN	AA	NA	0.206	0.549	0.355	AA	¥Z	AN

Notes:

mg/kg = miligrams per kilogram (parts per milion) μg/kg = micrograms per kilogram (parts per billion) ND = Not Detected NA = Not Analyzed NS = No Standard -- = Not Applicable

PCB identified as #1260
 PCB identified as #1242
 PCB identified as #1242
 PCB identified as #1242
 PCD - exceeds applicable Method 1 cleanup Standard published in 310 CMR 40,0000
 BOLD - exceeds Upper Concentration Limit published in 310 CMR 40,0000 (10/29/99).
 0.057 = not detected, i.e., below detection limit of 0.057.

- exceeds applicable Method 1 cleanup Standard published in 310 CMR 40.0000 (10/29/99).

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G:VHatwaste/BRA/200317/Results-Tables/Soil Sempling Table2.ds]soil

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TABLE 2 - Continued

# PHASE I SOIL SAMPLING RESULTS BRA PARCEL P-3 March 24 to 26, 1997

		Method 1	Method 1					sample l	dentificati	on and S	ample De	Pth (feet			
Parameter		Cleanup	Cleanup	Upper		B-113			B-114			B-115		B-116	B-117
	Units	Standards S-2 (GW-2/GW-	Standards S-3 (GW-2/GW-	Concentration Level (UCL)	S1 1-3	S2 4-6	53 7-9	S1 1-3	S2 4-6	53 7-9	S1 1-3	S2 4-6	S3 7-9	S1 1-3	S1 1-3
TOTAL PETROLEUM HYDROCARBONS															
Gasoline	mg/kg	3	:	1	<54	<55	<53	<58	<56	<55	\$54	<56	<560	<56	\$
Kerosene	mg/kg	I	1	:	<u>2</u>	<55	<53	<58	<56	<55	\$5	<56	<560	<56	\$
Mineral Spirits	mg/kg	;	ł	1	~5 <u>5</u>	<55	<53	<58	<56	<55	\$	<56	<560	<56	\$54
Fuel Oit #2/Diesel	mg/kg	1	;	1	55 25	<55	<53	<58	<56	<55	\$54	<56	<560	<56	\$5
Fuel Oil #4	mg/kg	ı	;	1	\$ <del>5</del>	<55	<53	<58	<56	<55	\$	<56	<560	<56	\$54
Fuel Oil #6	mg/kg	1	1	1	<110	<110	<110	<120	<120	<110	<110	<110	<1,100	<110	<110
Motor Oil/Hydraulic Oil	mg/kg	1	1	I	290	360	730	480	910	450	140	280	2,400	110	110
Unidentified Hydrocarbons	mg/kg	:	1	1	Q	Q	Q	Q	Q	Q	Q	9	Ð	Ð	Ð
TOTAL TPH	mg/kg	5,000	5,000	10,000,000	290	360	730	480	910	450	140	280	2,400	110	110
POLYNUCLEAR AROMATIC HYDROCARBON	S														
Naphthalene	mg/kg	1,000	1,000	10,000	0.36	0.35	<b>1</b> .6	<0.28	4.3	3.0	<0.56	0.43	0.32	0.38	0.42
2-Methylnaphthalene	mg/kg	2,500	1,000	10,000	0.28	0.22	0.78	<0.28	<1.4	1,6	<0.56	0.27	0.21	0.23	0.34
Acenaphthylene	mg/kg	1,000	1,000	10,000	0.29	0.47	0.36	<0.28	<1.4	0.70	<0.56	0.18	0.17	0.17	0.25
Acenaphthene	mg/kg	2,500	4,000	10,000	1.1	0.86	2.6	1.0	9.3	4.4	<0.56		0.51	0.79	1.2
Fluorene	mg/kg	2,000	4,000	10,000	1.0	0.82	2.1	0.85	6.4	4.4	<0.56	0.92	0.54	0.76	1.3
Phenanthrene	mg/kg	100	100	10,000	12	10	20	9.5	53	36	2.2	8.6	4.8	7.2	ŧ
Anthracene	mg/kg	2,500	5,000	10,000	1.9	2.1	4.9	2.0	13	8.8	0.57	2.0	1.2	1.5	2.6
Fluoranthene	mg/kg	1,000	1,000	10,000	13	15	21	9.3	66	36	3.0	9.9	6.2	7.6	1
Pyrene	mg/kg	2,000	5,000	10,000	13	15	20	9.6	48	30	2.8	8.6	5.7	7.3	9.9
Benzo(a)anthracene	mg/kg	-	4	100	6.1	8.4	9.5	4.2	26	15	1.5	4.3	2.7	3.3	5.1
Chrysene	mg/kg	10	40	400	6.6	8.2	10	4,4	26	15	1.6	4.4	з.†	3.5	5.2
Benzo(b)fluoranthene	mg/kg	-	4	100	4.8	5.6	7.6	3.1	20	11	1.1	3.4	2.0	2.4	3.0
Benzo(k)fluoranthene	mg/kg	10	40	400	5.0	6.6	8.5	3.2	21	10	1.1	3.8	2.3	2.7	3.7
Benzo(a)pyrene	mg/kg	0.7	0.7	100	5.6	7.3	8.7	3.9	25	14	1.3	4.0	2.6	3.1	4.5
Dibenzo(a,h)anthracene	mg/kg	0.7	0.8	100	0.49	0.70	0.89	<0.57	5.7	3.5	<1.1	0.42	0.29	0.34	0.48
Benzo(g,h,i)perylene	mg/kg	2,500	2,500	10,000	÷.	1,4	1.8	2.1	16	10	<1.1	0.84	0.65	0.68	0.91
Indeno(1,2,3-cd)pyrene	mg/kg	-	4	100	1.1	1.6	2.1	1.8	15	8.9	<1.1	0.94	0.70	0.79	1.0
POLYCHLORINATED BIPHENYLS	mg/kg	2	2	100	NA	NA	AN	<0.028	<0.028	0.057***	NA	AN	AN	AN	AN
METALS															
Arsenic, Total	mg/kg	30	30	300	AA	AN	AN	AN	AN	AN	AN	AN	AN	NA	NA
Cadmlum, Total	mg/kg	80	80	800	¥	AN	AN	¥	¥	AN	A	AN	A	AN	AN
Chromium, Total	mg/kg	2,500	5,000	10,000	AN	٩N	¥	Ą	AN	AA	A	AN	A	AN	AN
Lead, Total	mg/kg	600	600	6,000	300	230	340	390	790	470	170	290	1,200	300	270
Lead, TCLP	∐g⊓	5	5****	AN	0.31	<0.20	<0.20	0.23	1.2	0.33	<0.20	0.24	0.29	0.22	0.45
Mercury, Totat	mg/kg	60	60	600	¥	٩z	٩	AN	٩N	AN	AN	AN	٩	AN	NA
					1	1	1	1		G.H	AZWARIO'BRA'	200317/Resu	Me-TebleeVSol	Sampling Te	ingladel

Notes: ND = Not Detected NA = Not Analyzed NS = No Standard

 BOLD - exceeds applicable Method 1 cleanup Standard published in 310 CMR 40.0000 (10/29/99).
 BOLD <sup>1</sup> - exceeds Upper Concentration Limit published in 310 CMR 40.0000 (10/29/99).
 <0.057 = not detected, i.e., below detection limit of 0.057.</li> \*\*\* PCB identified as #1260 \*\*\*\* PCB identified as #1242 \*\*\*\* RCRA Action Level

-- Not Applicable
 mg/kg = milligrams per kilogram (parts per mittion)
 μg/kg = micrograms per kilogram (parts per billion)

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TABLE 3

## PHASE I GROUNDWATER SAMPLING RESULTS BRA PARCEL P-3 December 12, 1996

		Method 1 Cleanup	Upper					Sample	IRCUILLER .	OP and oa	undari aldu	(Teet)				
Parameter	Units	Standsrds (GW-2/GW-3)	Concentration Level (UCL)	WS-1	WS-2	WS-3	₩\$-4	WS-5	WS-8	WS-7	WS-8	WS-9	WS-10	WS-11	WS-12	WS-12 (DUP)
FIELD PARAMETERS										K.						
Temperature	ပ	SN	SN	11.0	13.0	10.5	9.6	13.5	13.5	12.2	12.3	11.5	12.2	13.2	10.8	AN
Н	unitless	SN	SN	6.7	6.9	7.0	6.6	6.6	6.8	6.5	6.6	6.6	7.3	6.1	6.7	AA
Specific Conductivity	μS/cm	SN	SN	940	1,200	670	624	1,050	220	929	1,520	1,240	478	970	1,670	AN
Dissolved Oxygen	l/Bu	SN	NS	3.6	4.2	2.7	2.2	2.4	4.4	4.4	2.0	1.4	3.6	1.7	2.7	NA
VOLATILE ORGANIC COMP(	-SONDO															
Chloroform	h9/ا	400	100,000	<2.0	<2.0	<2.0	<2.0	<2.0	9.1	<2.0	<2.0	<2.0	5.8	<2.0	<2.0	<2.0
Trichloroethene	√бл	300	100,000	<2.0	<2.0	<2.0	<2.0	2.2	<2.0	<2.0	<b>42</b> .0	<2.0	<2.0	<2.0	<2.0	<2.0
4-fsopropyltoluene	μ <b>β/</b> Ι	SN	SN	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.8	2.6
PAHs	√6л	1,000	100,000	AN	Q	AN	AN	g	٩N	AN	Q	Q	NA	Q	Q	NA N
PETROLEUM HYDROCARBONS**	l/Bm	1.000	100,000	Q	QN	Q	Q	Q	g	g	ę	Q	Q	a z	Q	Q
METALS																
Arsenic, Total	l/ĝm	0.400	4.0	AN	<0.01	AN	AN	<0.01	NA	AN	<0.02	<0.01	AN	<0.01	<0.01	AN
Barium, Total	µ6₩	30	100	AN	<0.05	NA	AN	0.11	NA	AN	0.15	0.11	AN	<0.05	0.12	AN
Cadmium, Total	mg/l	0.010	0.100	AN	<0.005	NA	AN .	<0.005	NA	AN	<0.005	<0.005	NA	<0.005	<0.005	NA
Chromium, Total	µβm	2.0	20	AN	<0.03	NA	AN	<0.03	NA	AN	<0.03	€0.03	NA	<0.03	<0.03	AN
Lead, Total	l µβw	0.030	0.300	٩N	<0.005	NA	AN	<0.005	NA	AN	<0.010	<0.010	NA	<0.010	<0.005	AN
Mercury, Total	u <sup>g</sup> m	0.001	0.020	AN	<0.0002	NA	AN	<0.0002	AN	AN	<0.0002	<0.0002	AN	<0.0002	<0.0002	AN
Selenium, Total	t/gm	0.080	0.800	AN	<0.025	AN	AN	<0.025	AN	AN	<0.025	<0.025	۸	<0.005	<0.025	AN
Silver, Total	l/gm	0.007	0.400	AN	<0.007	AA	AN	<0.007	NA	AN	<0.007	<0.007	AA	<0.007	<0.007	AN
												G:\Hazwi	raste/BRA\200;	317/Results-Ta	oles VGW Sam	VIng.x!s]GW

Notes: ND = Not Detected; reporting limits ranged from 0.5 ug/t to 5.0 ug/t (for PAHs) and 0.60 mg/t to 2.0 mg/t (for Petroleum Hydrocarbons). NA - Not Analyzed. NS = No Standard.

mg/l = milligrams per liter (parts per million). ug/l = micrograms per liter (parts per billion). • Volatile Organic Compounds by EPA Method 8260. Methylena chloride was detected in the VOC trip blank at a concentration of 2.8 ug/l. • PAHs (Polynuclear Aromatic Hydrocarbons) by EPA Method 8100. Petroleum Hydrocarbons by Gas Chromatography, EPA Method 8100 (Modified). The Method 1 standard is for total petroleum hydrocarbons. • 0.007 = not detacted, i.e., betwo detection limit of 0.007.

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### TABLE 4

## **GROUNDWATER ELEVATION SURVEY DATA BRA PARCEL P-3**

	/01 9/10/01		•	13	1	1		36		80	34		1
tion (feet)	2/6			85		82	desti	83	destr	64	83		
Idwater Eleva	12/12/96	84.99	84.73	85.68	85.53	64.57	84.98	85.05	88.30	88.01	85.06	85.22	
Groui	12/6/96	84.86	84.57	85.45	85.18	84.10	84.48	84.54	68.27	85.95	84.81	84.70	
	12/5/98	84.69	83.75	85.39	85.22	84.08	84.47	84.52	88.25	85.27	85.19	84.68	
	9/10/01		1	ţ	ł	1	I	1	ı	1	ı	:	
	2/6/01	:	ŧ	8.75	ı	15.34	destroyed	14.78	destroyed	17.90	18.85	ı	
ater (feet)	12/12/96	7.50	7.59	8.20	8.53	13.70	12.05	13.07	16.85	16.89	18.93	18.86	
Depth to W	12/6/96	7.63	7.75	8.43	8.88	14.17	12.55	13.58	18.86	16.75	17.38	19.18	
	12/5/96	7.80	8.57	8.49	8.84	14.19	12.56	13.80	18.70	17.43	18.80	19.20	
Ground	Elevation (feet)	93.42	92.48	92.61	92.00	98.39	95.1B	96.34	100.70	100.52	100.98	101.90	
Top of PVC	Elevation (feet)	92.49	92.32	93.86	94.06	98.27	97.03	98.12	102.95	102.70	101.99	103.88	
Monitoring Well	Number	WS-1	WS-2	WS-3	WS-4	WS-5	WS-6	WS-7	WS-8	6-SM	WS-10	WS-11	

Notes:

Elevations were measured relative to an on-site arbitrary 100.00-foot benchmark which was the fire hydrant on Vermon Street.
 Depth to water was measured from the top of PVC riser.
 All locations are soil borings or surface soil samples and were only measured for ground elevations on March 29, 2001.

G: Wazwasie/BRA/200317/Results-Tables/GW Elevation.xis)GW Elev

-- = Not measured

Indicates no water depth was measured.
 During site reconnaissance on Feb. 8, 2001, and March 29, 2001, Weston & Sampson observed that monitoring wells WS-8 and WS-8 were destroyed.

#### TABLE 5

#### PHASE II PID FIELD SCREENING RESULTS BRA PARCEL P-3

Boring	Sample	Sample Depth	PID Reading
		(feet)	(ppm)
B-201(D)	S-1	0 - 2	ND
	S-2	5 - 7	ND
	S-3	10 - 12	ND
	S-4	12 - 14	ND
	S-5	14 - 16	ND
	S-6	16 - 18	0.6
	S-7	18 - 20	ND
	S-8	20 - 22	0.2
	S-9	22 - 24	ND
B-202(S)	S-1	0 - 2	ND
	S-2	5 - 7	ND
	<u>S-3</u>	10 - 12	ND
B-203(S)	S-1	0 - 2	ND
	S-2	5 - 7	ND
	<u>S-3</u>	10 - 12	ND
B-204(S)	S-1	0 - 2	ND
	S-2	5 - 7	ND
	S-3	10 - 12	ND
B-205(S)	S-1	0 - 2	ND
	S-2	2 - 3	ND
	<u>S-3</u>	3 - 5	ND
B-206(S)	S-1	0 - 2	ND
	S-2	2 - 3	ND
	<u>S-3</u>	3 - 5	ND
B-207(S)	S-1	0 - 3	ND
<b>D 1 1 1</b>	S-2	3 - 5	ND
B-208	S-1	0 - 2	21
	S-2	5 - 7	0.6
	S-3	10 - 12	ND
B-209	S-1	0 - 2	ND
	S-2	4 - 6	ND
	S-3	6 - 8	2.4
	S-4	8 - 10	-
	S-5	10 - 12	ND
	<u>S-6</u>	14 - 16	ND
B-210	S-1	0 - 2	ND
	S-2	5 - 7	ND
	5-3	10 - 12	ND
8-211	S-1	0-2	ND
0.040	<u>S-2</u>	5 - 7	ND
B-212	5-1	0-2	ND
	S-2	5-7	ND
	5-3	10 - 12	ND

#### Notes:

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PID = Photoionization Detector Photovac Microtip Model HL-2000.

ppm = parts per million.

ND = Not Detected or less than Background (<0.2 ppm).

NS = Not Screened.

Background PID concentrations were ND, or less than 0.2 ppm.

(--) indicates no sample recovered.

PID readings at B-201(D) - B-207(S) were measured on January 10 and 11, 2001. All other PID readings were measured on September 5, 2001.

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TABLE 6

# PHASE II SOIL SAMPLING RESULTS - SOIL BORING SAMPLES BRA PARCEL P-3 January 10, 2001

		Mothod 4 Clear	* Standarde	Itenar			Sar	nple ident	ification a	nd Sample	Depth (fer	et)	
Parameter	Units		וחל קומווחמותם	Concentration		3-201(D		B-202(S)	B-203(S)	B-204(S)	B-205(S)	B-206(S)	B-207(S)
		S-2 (GW-2/GW-3)	S-3 (GW-2/GW-3)	Level (UCL)*	10-12	10-12 DUP	22-24	5-7	5-7	5-7	3-5	3-5	3-5
EXTRACTABLE PETROLEUM HYDROCA!	RBONS												
C <sub>9</sub> - C <sub>18</sub> Aliphatic Hydrocarbons	mg/kg	2,500	5,000	20,000	<53	<58	<130	<53	<57	<61	<50	<110	<56
C <sub>19</sub> - C <sub>36</sub> Aliphatic Hydrocarbons	mg/kg	5,000	5,000	20,000	<53	<58	<130	<53	<57	<61	<50	<110	<56
C <sub>11</sub> - C <sub>22</sub> Aromatic Hydrocarbons	mg/kg	2,000	5,000	10,000	290	300	<130	520	110	<61	<50	<110	<56
TARGET POLYNUCLEAR AROMATIC HYL	DROCAR	BONS											
2-Methylnaphthatene	mg/kg	1,000	1,000	10,000	0.89	1.3	<0.65	2.6	0.57	<0.31	<0.25	<0.56	<0.28
Acenaphthene	mg/kg	2,500	4,000	10,000	6.3	5.1	<0.65	5.0	1.2	<0.31	<0.25	<0.56	<0.28
Acenaphthylene	mg/kg	1,000	1,000	10,000	0.27	0.76	<0.65	1.3	<0.29	<0.31	<0.25	<0.56	<0.28
Anthracene	mg/kg	2,500	5,000	10,000	8.9	8.6	<0.65	11	2.1	0.50	<0.25	<0.56	0.46
Benzo(a)anthracene	mg/kg	-	4	100	17	16	<0.65	19	4.0	1.0	<0.25	1.4	1.1
Benzo(a)pyrene	mg/kg	0.7	0.7	100	14	14	<0.65	15	3.7	06.0	<0.25	1.3	0.94
Benzo(b)fluoranthene	mg/kg	-	4	100	19	18	<0.65	17	4.3	1.1	<0.25	1.7	1.3
Benzo(g,h,i)perylene	mg/kg	2,500	2,500	10,000	7.8	8.4	<0.65	8.4	2.3	0.55	<0.25	0.83	0.58
Benzo(k)fluoranthene	mg/kg	10	40	400	5.5	5.1	<0.65	5.9	1.5	0.34	<0.25	<0.56	0.33
Chrysene	mg/kg	10	40	400	16	15	<0.65	18	3.8	0.99	<0.25	1.4	1.0
Dibenzo(a,h)anthracene	mg/kg	0.7	0.8	100	2.6	2.6	<0.65	2.6	0.62	<0.31	<0.25	<0.56	<0.28
Fluoranthene	mg/kg	1,000	1,000	10,000	41	41	<0.65	41	9.6	2.3	<0.25	2.7	2.3
Fluorene	mg/kg	2,000	4,000	10,000	4.9	4.8	<0.65	5.0	1.0	<0.31	<0.25	<0.56	<0.28
Indeno(1,2,3-cd)pyrene	mg/kg	-	4	100	9.5	9.7	<0.65	9.2	2.6	0.59	<0.25	0.97	0.62
Naphthalene	mg/kg	1,000	1,000	10,000	2.8	3.4	<0.65	4.0	0.74	<0.31	<0.25	<0.56	<0.28
Phenanthrene	mg/kg	100	100	10,000	37	37	<0.65	48	9.7	2.1	<0.25	1.6	1.9
Pyrene	mg/kg	2,000	5,000	10,000	31	32	<0.65	40	8.2	2.0	<0.25	2.6	2.1
METALS													
Lead, Total	mg/kg	600	600	6,000	550	620	74	7,000	460	230	10	86	220

Notes

mg/kg = milligrams per kilogram, or parts per million (ppm)

PAH = Polynuclear Aromatic Hydrocarbons PCBs = Polychlorinated Biphenyls • = Method 1 cleanup standards and Upper Concentration Limits (UCLs) taken from MCP dated 10/29/99

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- exceeds applicable Method 1 Cleanup Standard published in 310 CMR 40.0000 (10/29/99).

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 - exceeds applicable Method 1 Cleanup Standard published in 310 CMR 40.0000

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 - exceeds Upper Concentration Limit published in 310 CMR 40.0000 (10/29/99).

 <0.65 = not detected, i.e., below detection limit of 0.65.</td>

#### TABLE 7a

#### PHASE II SOIL SAMPLING RESULTS - SURFACE SOIL AND STOCKPILE SOIL SAMPLES **BRA PARCEL P-3** March 29, 2001

Parameter				Upper Concentration	Sample ID and Depth								
		Method 1 Cleanup Standards *			Surficial Soli								
					SS-1	SS-2	SS-3	SS-4	SS-4				
		S.2 (CML2(CML2)	S 2 (CW 2)(CW 2)	Limit (UCL)	0-6"	0-6"	0-6"	0-6"	0-6*				
		3-2 (GW-2/GW-3)	3-3 (011-2011-3)						(DUP)				
VOLATILE PETROLEUM HYDROCARBONS (VPH)													
C <sub>5</sub> - C <sub>8</sub> Aliphalic Hydrocarbons	mg/kg	500	500	5,000	NA	NA	NA	NA	NA				
C <sub>9</sub> - C <sub>12</sub> Aliphatic Hydrocarbons	mg/kg	2,500	5,000	20,000	NA	NA	NA	NA	NA				
C <sub>9</sub> - C <sub>10</sub> Aromatic Hydrocarbons	mg/kg	500	500	5,000	NA	NA	NA	NA	NA				
TARGET VOLATILE ORGANIC COMPOUNDS (VOCs)													
Methyl tert-butyl ether	mg/kg	200	200	5,000	NĂ	NA	NA	NA	NA				
Benzene	mg/kg	60	200	2,000	NA	NA	NA	NA	NA				
Toluene	mg/kg	500	2,500	10,000	NA	NA	NA	NA	NA				
Elhylbenzene	mg/kg	500	500	10,000	NA	NA	NA	NA	NA				
Xylenes	mg/kg	500	2,500	10,000	NA	NA	NA	NA	NA				
Naphthalene	mg/kg	1,000	1,000	10,000	NA	NA	NA	NA	NA				
EXTRACTABLE PETROLEUM HYD	ROCARBO	NS (EPH)	•										
C <sub>9</sub> - C <sub>18</sub> Aliphatic Hydrocarbons	mg/kg	2,500	5,000	20,000	<63	<61	<59	<59	NA				
C <sub>19</sub> - C <sub>36</sub> Aliphatic Hydrocarbons	mg/kg	5,000	5,000	20,000	<63	<61	<59	<59	NA				
C11 - C22 Aromatic Hydrocarbons	mg/kg	2,000	5,000	10,000	100	190	170	<59	NA				
TARGET POLYNUCLEAR AROMAT	IC HYDRO	CARBONS (PAHs)											
2-Methylnaphthalene	ma/ka	1.000	1.000	10.000	< 0.32	< 0.30	0.35	< 0.30	NA				
Acenaphthene	ma/ka	2,500	4.000	10.000	0.87	1.6	1.3	0.35	NA				
Acenaphthylene	mg/kg	1.000	1.000	10.000	0.62	< 0.30	0.67	< 0.30	NA				
Anthracene	mg/kg	2,500	5.000	10,000	2.2	3.7	3.4	1.1	NA				
Benzo(a)anthracene	mg/kg	1	4	100	5.2	9.4	7.1	2.8	NA				
Benzo(a)pyrene	ma/ka	0.7	0.7	100	5.0	8.7	6.8	2.5	NA				
Benzo(b)fluoranthene	ma/ka	1	4	100	6.4	12	8.3	3.3	NA				
Benzo(a.h.i)perviene	ma/ka	2.500	2.500	10,000	3.1	6.1	4.0	1.5	NA				
Benzo(k)fluoranthene	ma/ka	10	40	400	22	44	32	11	NA				
Chrysene	ma/ka	10	40	400	4.8	91	6.3	2.6	NA				
Dibenzo(a h)anthracene	mo/ko	0.7	0.8	100	0.83	16	11	0.42	NA				
Eluoranthene	ma/ka	1 000	1,000	10,000	11	20	14	53	NA				
Eluorene	ma/ka	2,000	4 000	10,000	10	14	14	0.41	NA				
Indeno(1.2.3-cd)nvrene	ma/ka	1	4	100	1.0	70	4.6	1.8	NA				
Nanhthalene	mo/ko	1 000	1 000	10,000	<0.32	0.31	0.69	<0.30	NΔ				
Phenanthrene	ma/ka	100	100	10,000	9.02	18	12	44	NA				
Pyrene	ma/ka	2 000	5,000	10,000	9.0	16	11	4.1	NA				
POLYCHLORINATED BIPHENYLS (	PCBs)		<u></u> ,	.0,000		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,							
Aroclor 1254	ma/ka	2	2	100	NA	NA	NA	NA	NA				
METALS													
Arsenic, Total	ma/ka	30	30	300	NA	NA	NA	NA	NA				
Banum, Total	ma/ka	2 500	5 000	10,000	NA	NA	NA	NA	NA				
Cadmium, Total	mo/ko	80	80	800	NA	ΝΔ	NA	NA	NA I				
Chromium Total	mo/ke	2 500	5,000	10,000	NA		NA	NA	NA				
Lead Total	mo/ko	600	600	6,000	200	300	220	310	340				
Mercury Total	mo/ko	60	000	600	NA NA	NA	NA NA	NA	NA				
Selenium Total	ma/ko	2 500	2 500	10,000	NA	NA	NA	NA	NA				
Silver, Total	mo/ko	200	200	2,000	NA	NA	NA	NA	NA				
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mg/kg = milligrams per kilogram

ug/kg = micrograms per kilogram

NA = Not Analyzed

– = No Standard
 \* = Method 1 cleanup standards and Upper Concentration Limits (UCLs) taken from MCP dated 10/29/99

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<0.30 = not detected, i.e., below detection limit of 0.30.

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= Exceeds applicable Method 1 cleanup standard

= Exceeds UCL

#### TABLE 7b

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#### PHASE II SOIL SAMPLING RESULTS - SURFACE SOIL AND STOCKPILE SOIL SAMPLES **BRA PARCEL P-3** March 29, 2001

Parameter				Unner	Sample ID and Depth								
		Method 1 Clear	Concentration	Stockpile Soil									
Parameter			Limit (UCL)	SP-1	SP-1 2'	SP-2	SP-3						
		S-2 (GW-2/GW-3)	2 (GW-2/GW-3) S-3 (GW-2/GW-3)		2'	(DUP2)	2'	2'					
VOLATILE PETROLEUM HYDROCARBONS (VPH)													
C <sub>5</sub> - C <sub>8</sub> Aliphatic Hydrocarbons	mg/kg	500	500	5,000	<2.8	<2.8	<2.9	<2.7					
C <sub>9</sub> - C <sub>12</sub> Aliphatic Hydrocarbons	mg/kg	2,500	5,000	20,000	<0.69	<0.69	<0.73	<0.67					
C <sub>9</sub> - C <sub>10</sub> Aromatic Hydrocarbons	mg/kg	500	500	5,000	<0.69	<0.69	<0.73	<0.67					
TARGET VOLATILE ORGANIC CON	IPOUNDS	(VOCs)											
Methyl tert-butyl ether	mg/kg	200	200	5,000	< 0.056	<0.055	<0.058	< 0.053					
Benzene	mg/kg	60	200	2.000	<0.056	<0.055	<0.058	< 0.053					
Toluene	ma/ka	500	2.500	10.000	<0.056	<0.055	<0.058	<0.053					
Ethylbenzene	ma/ka	500	500	10.000	<0.056	<0.055	<0.058	<0.053					
Xvienes	ma/ka	500	2 500	10 000	<0.056	<0.055	<0.058	<0.053					
Naphihalene	ma/ka	1 000	1 000	10,000	<0.14	<0.14	<0.15	<0.13					
			1,000	10,000									
EXTRACTABLE PETROLEUM HYDROCARBONS (EPH)													
$C_9 - C_{10}$ Aliphatic Hydrocarbons	mg/kg	2,500	5,000	20,000	<55	<57	<60	<54					
C <sub>19</sub> - C <sub>36</sub> Aliphauc Hydrocarbons	mg/kg	5,000	5,000	20,000	<55	65	<60	55					
C <sub>11</sub> - C <sub>22</sub> Aromatic Hydrocarbons	mg/kg	2,000	5,000	10,000	73	<57	66	92					
TARGET POLYNUCLEAR AROMAT	IC HYDRO	CARBONS (PAHs)	)										
2-Methylnaphthalene	mg/kg	1,000	1,000	10,000	<0.28	<0.29	<0.30	0.31					
Acenaphthene	mg/kg	2,500	4,000	10,000	0.89	0.36	0.47	1.2					
Acenaphlhylene	mg/kg	1,000	1,000	10,000	<0.28	<0.29	< 0.30	0.30					
Anthracene	mg/kg	2,500	5,000	10,000	1.7	0.99	0.95	2.3					
Benzo(a)anthracene	mg/kg	1	4	100	3.9	2.3	2.2	4.3					
Benzo(a)pyrene	mg/kg	0.7	0.7	100	3.7	2.0	1.9	4.2					
Benzo(b)fluoranthene	mg/kg	1	4	100	4.9	2.6	2.4	5.1					
Benzo(g,h,i)perylene	mg/kg	2,500	2,500	10,000	2.2	1.2	1.2	2.5					
Benzo(k)fluoranthene	mg/kg	10	40	400	1.5	0.81	0.64	2.0					
Chrysene	mg/kg	10	40	400	3.6	2.2	2.3	4.1					
Dibenzo(a,h)anthracene	mg/kg	0.7	0.8	100	0.55	0.34	0.32	0.60					
Fluoranthene	mg/kg	1,000	1,000	10,000	7.9	4.4	3.9	8.6					
Fluorene	mg/kg	2,000	4,000	10,000	0.73	0.32	0.37	1.3					
indeno(1,2,3-cd)pyrene	mg/kg	1	4	100	2.4	1.3	1.2	2.8					
Naphthalene	mg/kg	1,000	1,000	10,000	<0.28	<0.29	<0.30	0.29					
Phenanthrene	mg/kg	100	100	10,000	7.1	3.8	4.2	8.0					
Pyrene	mg/kg	2,000	5,000	10,000	6.8	4.1	4.1	7.3					
POLYCHLORINATED BIPHENYLS	PCBs)		-	<u>,</u>									
Aroclor 1254	mg/kg	2	2	100	0.048	<0.028	0.068	<0.027					
METALS													
Arsenic, Total	mg/kg	30	30	300	15	11	20	9.1					
Barium, Total	mg/kg	2,500	5,000	10,000	61	69	54	47					
Cadmium, Total	mg/kg	80	80	800	<0.63	<0.68	<0.74	<0.68					
Chromium, Total	mg/kg	2,500	5,000	10,000	28	23	16	12					
Lead, Total	mg/kg	600	600	6,000	85	120	170	160					
Mercury, Total	mg/kg	60	60	600	0.34	0.41	0.45	0.16					
Selenium, Total	mg/kg	2,500	2,500	10,000	<10	<11	<12	<11					
Silver, Total	mg/kg	200	200	2,000	<1.8	<1.9	<2.1	<1.9					
G:\Hazwasie\BRA\200317\Results-Tables\{Surface Soil Table7.xts}stockpile													

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= Exceeds applicable Method 1 cleanup standard

= Exceeds UCL

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mg/kg = milligrams per kilogram

ug/kg = micrograms per kilogram

NA = Not Analyzed

-- = No Standard \* = Method 1 cleanup standards and Upper Concentration Limits (UCLs) taken from MCP dated 10/29/99

<0.30 = not detected, i.e., below detection limit of 0.30.
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## TABLE 8

# PHASE II SOIL SAMPLING RESULTS - SOIL BORING SAMPLES BRA PARCEL P-3 September 5, 2001

			+ checkers -	Upper	Maximum	20	imple (dent	iffication al	nd sample	Deptn (Tee	1	
Parameter	Unlts	Mernog 1 Crean	up standards	Concentration	Concentration**	B-208	B-209	B-209	B-210	B-211	B-212	
		S-2 (GW-2/GW-3)	S-3 (GW-2/GW-3)	Level (UCL)*	(l/gm)	5-7	6-8	10-12	5-7	5-7	5-7	
Total Lead	mg/kg	600	600	6,000	•	230	33	55	250	13,000	33	
TCLP Lead	l/gm	4	•	1	5.0	•	•	•	<1.0	8.3	•	
					-		G:\Hazwas	te\BRA\200317	Results-Table	s/[Soll Results ]	able8.xis]soil	

## <u>Notes</u>

mg/kg = milligrams per kilogram, or parts per million (ppm) TCLP = Toxicity Characteristic Leaching Procedure

= Method 1 dearup standards and Upper Concentration Limits (UCLs) taken from MCP dated 10/29/99
 = Maximum Concentration of Contaminants for Characteristics of EP Toxicity and EPA Hazardous Waste (310 CMR 30.125A).
 • = Maximum Concentration Limit and Method 1 cleanup standard published in 310 CMR 40.0000 (10/29/99), or the Maximum Concentration published in 310 CMR 30.125A.

<1.0 = not detected, i.e., below detection limit of 1.0.

## TABLE 9

## PHASE II - GROUNDWATER SAMPLING RESULTS BRA PARCEL P-3 February 6, 2001

		Method 1 Stand	Cleanup lards	Upper Concentrat-		Monitorin	ng Well an	nd Sample	Number	
Parameter	Units	GW-2	GW-3		WS-3	WS-5	WS-7	WS-9	WS-10	WS-12
Dissolved Oxygen	mg/l	NA	NA	NA	0.44	1.93	0.85	0.43	1.04	0.62
Oxygen Reduction Potential	mV	NA	NA	NA	121	<b>14</b> 1	143	106	130	96
рН	unitless	NA	NA	NA	6.48	6.40	6.37	6.40	6.24	6.51
Specific Conductivity	µS/cm	NA	NA	NA	1,050	2,350	2,380	1,490	1,380	2,550
Temperature	°C	NA	NA	NA	8.02	11.68	11.39	11.03	12.84	10.4
lunbidity	NTU	NA	NA	NA	4.3	3.0	1.62	3.4	28.5	2.8
OLATILE PETROLEUM HYDROC	ARBONS	(VPH)					·			
C <sub>5</sub> -C <sub>8</sub> Aliphatic Hydrocarbons	ug/l	1,000	4,000	100,000	<100	<100	<100	<100	<100	<100
C9-C12 Aliphatic Hydrocarbons	ug/l	1,000	20,000	100,000	<25	<25	<25	<25	<25	<25
C9-C10 Aromatic Hydrocarbons	ug/l	5,000	4,000	100,000	<25	<25	<25	<25	<25	<25
FARGET VOLATILE ORGANIC CO	MPOUND	S (VOCs)								
Benzene	ug/l	2,000	7,000	70,000	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Ethylbenzene	ug/l	30,000	4,000	100,000	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Methyl tert-butyl ether	ug/l	50,000	50,000	100,000	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Naphthalene	ug/l	6,000	6,000	60,000	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Toluene	ug/l	6,000	50,000	100,000	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total Xylenes	ug/l	6,000	50,000	100,000	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
EXTRACTABLE PETROLEUM HYD	ROCARE	ONS (EPH	)	· · · · · ·						
C9-C18 Aliphatic Hydrocarbons	ug/l	1,000	20,000	100,000	<100	<100	<100	<100	<100	<100
C <sub>19</sub> -C <sub>36</sub> Aliphatic Hydrocarbons	ug/l	NA	20,000	100,000	<100	<100	<100	<100	<100	<100
C11-C22 Aromatic Hydrocarbons	ug/l	50,000	30,000	100,000	<100	<100	<100	<100	<100	160
FARGET POLYNUCLEAR AROMA	TIC HYDR	OCARBON	(S (PAHs)							
2-Methylnaphthalene	ug/l	10,000	3,000	100,000	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthene	ug/l	NA	5,000	50,000	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthylene	ug/l	NA	3,000	30,000	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Anthracene	ug/l	NA	3,000	30,000	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo (a) anthracene	ug/l	NA	3,000	30,000	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo (a) pyrene	ug/l	NA	3,000	30,000	<0.10	<0.10	<0.10	<0.10	<0.10	< 0.10
Benzo (b) fluoranthene	ug/l	NA	3,000	30,000	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo (g,h,l) perylene	ug/l	NA	3,000	30,000	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo (k) fluoranthene	ug/l	NA	3,000	30,000	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chrysene	ug/l	NA	3,000	30,000	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Dibenzo (a,h) anthracene	ug/l	NA	3,000	30,000	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Fluoranthene	ug/l	NA	200	3,000	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Fluorene	ug/l	NA	3,000	30,000	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Indeno (1,2,3-cd) pyrene	ug/l	NA	3,000	30,000	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Naphthalene	ug/l	6,000	6,000	60,000	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Prenanthrene	ug/l		50	3,000	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
ryrene	l ug/l	<u>I</u> NA	3,000	30,000	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
METALS	100/		20	300	<e 0<="" td=""><td>&lt;<u>E</u> 0</td><td>&lt;<u> - E 0</u></td><td>&lt;<u>E</u> 0</td><td><e 0<="" td=""><td><f 0<="" td=""></f></td></e></td></e>	< <u>E</u> 0	< <u> - E 0</u>	< <u>E</u> 0	<e 0<="" td=""><td><f 0<="" td=""></f></td></e>	<f 0<="" td=""></f>
	l ugn	I NA	<u> </u>		<u>∥ ∿0.0</u> G:	L NO.U Hazwaste\BRA	200317\Result	∿O.U Is-Tables\(Grou	I NO.U Indwater Results	LOLU s Table.xis]GW

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MCP Method 1 Cleanup Standards were taken from 310 CMR 40.0974(2) and UCLs were taken from 310 CMR 40.0996(7).

uS/cm = microseimens per centimeter

ug/l = micrograms per liter, or parts per billion (ppb)

<0.10 = not detected, i.e., below detection limit of 0.10.

## TABLE 10

## PHASE II GROUNDWATER SAMPLING RESULTS BRA PARCEL P-3 September 10, 2001

		Method 1 Clea	nup Standards	Upper Concentrat-	Monitoring We Nun	ell and Sample uber
Parameter	Units	GW-2	GW-3		WS-2	WS-13
FIELD PARAMETERS		·,	· · ·			
Dissolved Oxygen	mg/l	NA	NA	NA	0.27	0.22
Oxygen Reduction Potential	mV	NA	NA	NA	-	-
pН	unitless	NA	NA	NA	6.79	6.85
Specific Conductivity	µS/cm	NA	NA	NA	2,110	821
Temperature	°C	NA	NA	NA	18	15.9
Turbidity	NTU	NA	NA	NA	25	10
VOLATILE PETROLEUM HYDROC.	ARBONS (VI	PH)				
$C_5$ - $C_8$ Aliphatic Hydrocarbons	ug/ł	1,000	4,000	100,000	<100	-
C9-C12 Aliphatic Hydrocarbons	ug/l	1,000	20,000	100,000	<25	-
C <sub>9</sub> -C <sub>10</sub> Aromatic Hydrocarbons	ug/l	5,000	4,000	100,000	<25	-
TARGET VOLATILE ORGANIC CO	MPOUNDS (	VOCs)				
Benzene	ug/l	2,000	7,000	70,000	<2.0	-
Ethylbenzene	ug/l	30,000	4,000	100,000	<2.0	-
Methyl tert-butyl ether	ug/l	50,000	50,000	100,000	<2.0	-
Naphthalene	ug/l	6,000	6,000	60,000	<5.0	-
Toluene	ug/l	6,000	50,000	100,000	<2.0	-
Total Xylenes	ug/i	6,000	50,000	100,000	<2.0	-
EXTRACTABLE PETROLEUM HYD	ROCARBO	(S (EPH)			-	
C9-C18 Aliphatic Hydrocarbons	ug/l	1,000	20,000	100,000	<100	-
C <sub>19</sub> -C <sub>36</sub> Aliphatic Hydrocarbons	ug/l	NA	20,000	100,000	140	-
C11-C22 Aromatic Hydrocarbons	ug/l	50,000	30,000	100,000	<100	-
TARGET POLYNUCLEAR AROMA	TIC HYDROC	ARBONS (PAH	s)			
2-Methylnaphthalene	ug/l	10,000	3,000	100,000	<1.0	-
Acenaphthene	ug/l	NA	5,000	50,000	<1.0	-
Acenaphthylene	ug/l	NA	3,000	30,000	<1.0	-
Anthracene	ug/l	NA NA	3,000	30,000	<1.0	-
Benzo (a) anthracene	ug/l	NA	3,000	30,000	<1.0	-
Benzo (a) pyrene	ug/l	NA	3,000	30,000	<1.0	-
Benzo (b) fluoranthene	ug/i	NA	3,000	30,000	< <b>1</b> .0	-
Benzo (g,h,l) perylene	ug/l	NA	3,000	30,000	<1.0	-
Benzo (k) fluoranthene	ug/l	NA	3,000	30,000	<1.0	-
Chrysene .	ug/l	NA	3,000	30,000	<1.0	-
Dibenzo (a,h) anthracene	ug/l	NA	3,000	30,000	<1.0	-
Fluoranthene	ug/l	NA	200	3,000	<1.0	-
Fluorene	ug/l	NA	3,000	30,000	<1.0	-
Indeno (1,2,3-cd) pyrene	ug/l	NA	3,000	30,000	<1.0	-
Naphthalene	ug/I	6,000	6,000	60,000	<1.0	-
Phenanthrene	ug/I	NA	50	3,000	<1.0	-
Pyrene	l ug/i		3,000	30,000	<1.0	-
METALS	110/		20	300	Π	<12
Leau, Dissolved	l ugn		G:\HazwasteV	BRA\200317\Results-Ta	ll - bles\(Groundwater Resu	Its Table Sept01.xls]GW

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. 1: MCP Method 1 Cleanup Standards were taken from 310 CMR 40.0974(2) and UCLs were taken from 310 CMR 40.0996(7).

uS/cm = microseimens per centimeter

ug/l = micrograms per liter, or parts per billion (ppb)

<2.0 = not detected, i.e., below detection limit of 2.0.

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TABLE 11	Comparison of PAH and Metal Concentrations to Urban Background	Parcel P-3
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			Concent	trations		Upper 95th Percentile
		Ar	ea 1	Area 2	Area 3	Urban Background
Parameter	Units	0 to 3 feet	4 to 15 feet	0 to 15	0 to 15	Concentrations
CC Aliphatics	mo/ka	323	1.968	307	55	
	202		-		;	
2-Methylnaphthalene	mg/kg	0.3	2.6	1.7	0.3	2.2
Acenaphthene	mg/kg	6.0	3.2	3.3	0.3	4.1
Acenaphthylene	mg/kg	0.3	0.3	0.8	0.3	1.9
Anthracene	mg/kg	2.0	3.2	7.3	0.5	10
Benzo[a]anthracene	mg/kg	4.8	8.3	12.8	1.4	19
Benzo[a]pyrene	mg/kg	4.5	7.6	10.3	1.3	17
Benzo[b]fluoranthene	mg/kg	4.6	6.5	11.3	1.7	18
Benzo[g,h,i]perylene	mg/kg	2.6	3.3	5.5	0.8	7.7
Benzo[k]fluoranthene	mg/kg	3.0	6.0	4.7	0.3	9.7
Chrysene	mg/kg	4.8	8.4	12.2	1.4	18
Dibenzo[a,h]anthracene	mg/kg	0.8	1.2	1.7	0.3	2.1
Fluoranthene	mg/kg	10.2	20.2	27.7	2.7	33
Fluorene	mg/kg	0.9	2.9	3.3	0.3	5.5
Indeno[1,2,3-cd]pyrene	mg/kg	2.5	3.3	6.0	1.0	7
Naphthalene	mg/kg	0.5	1.9	2.6	0.28	e
Phenanthrene	mg/kg	9.0	19,9	31.8	1.9	38
Pyrene	mg/kg	8.9	16.6	26.7	2.6	35
Arsenic, Total	mg/kg	თ	9	1	ı	21
Cadmium, Total	mg/kg	n	e	•	ſ	5 2
Chromium, Total	mg/kg	46	30	ı	I	50
Lead, Total	mg/kg	361	821	300	220	1100
Mercury, Total	mg/kg	0.4	0.6		ſ	2.6

G:\Hazwaste\Risk Assessments\BRA\P-3 Parce\Risk Assessment\Comparison to Background summarys.xis)Sheet

Notes:

Concentrations shown for Areas 1 and 2 are upper 95th percentile mean of each contaminant in that Area. Concentrations shown for Area 3 are the maximum for each contaminant in that Area. Bold indicates concentration exceeds urban background. Urban Background Concentrations source: "Background Soil Contaminant Assessment", CDM, April 1996.

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## PHASE III - REMEDIAL ACTION ALTERNATIVE SCREENING BRA PARCEL P-3 October 2001 TABLE 12

				Evalua	tion Criteria	1	•			_
	Alternative	Effectiveness	Reliability	Difficulty	Costs <sup>2</sup>	Risks	Benefits	Timeliness	TOTAL	_
0	"Hot Spot" Soil Excavation, Off-Site Disposal, and Activity and Use Limitation (AUL)	~	N	-	<b></b>	~	N	~	12	
<u></u>	Area 1 (0 to 15 feet) and "Hot Spot" Soit Excavation, and Off-Site Disposal	-	-	ĸ	m	2	-	m	14	
4	Area 1 (0 to 8 feet) and "Hot Spot" Soil Excavation, Off-Site Disposal, Capping, and AUL	2	<del>.</del>	2	e	5	-	e	14	
					G:\Hazw	aste\BRA\200	317/Results-Ta	ibles\[Phase 3 ev	al.xls]Sheet1	

## Notes:

Criteria rating: 1 = Best, 3 = Worst
 Estimated costs are summarized in the Phase III section of the report.

## APPENDIX A

Site Plans

Weston & Sampson

RUCELES PLAZA



## **APPENDIX B**

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Correspondence



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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 1 1 CONGRESS STREET, SUITE 1100 BOSTON, MASSACHUSETTS 02114-2023

December 1, 2000

VIA FAX

George Naslas Weston & Sampson Engineers, Inc. Five Centennial Drive Peabody, MA 01960-7985

Dear Mr. Naslas:

EPA has reviewed your response to our comments on the Quality Assurance Project Plan (QAPP) for the Boston Redevelopment Authority's Parcel P-3 site in Roxbury, Massachusetts and has no further comments. This letter represents EPA's approval of the revised QAPP for this site. The work outlined in your revised QAPP may begin at your earliest convenience.

Enclosed is the EPA QA Unit approval memorandum for the QAPP. If you have any questions, feel free to call me at (617) 918-1394.

Sincerely,

James S. Chow Brownfields Program

cc: Noah Luskin (BRA) Alan Peterson (EPA w/o enclosure)

enclosure

## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION I Office of Environmental Measurement and Evaluation 60 Westview Street, Lexington, MA 02421-3185

## MEMORANDUM

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Date: November 30, 2000

Subject: QA approval of the Brownfields Quality Assurance Project Plan for Boston Redovelopment Authority's Parcel P-3 in Roxbury, Massachusetts (November 2000).

From: Alan Peterson, QA Chemist

To: James Chow, EPA Project Manager

The Quality Assurance Unit has reviewed Weston and Sampson's responses to EPA comments for the Roxbury QAPP (dated 11/27/00). Based on the responses provided, the EPA QA Unit approves the plan for site work.

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Should you have any questions, please feel free to contact me at 781-860-4322.



WILLIAM F. WELD Governor

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ARGEO PAUL CELLUCCI Lt. Governor

File 96230.6 - BRA/4 Restring

COMMONWEALTH OF MASSACHUSETTS EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS DEPARTMENT OF ENVIRONMENTAL PROTECTION METROPOLITAN BOSTON - NORTHEAST REGIONAL OFFICE

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TRUDY C Secri

DAVID B. STR Commissi

PROMPT ACTION NECESSARY URGENT LEGAL MATTER: MAY 28 1997 CERTIFIED MAIL: RETURN RECEIPT REQUESTED

Boston Redevelopment Authority 1 City Hall Plaza Boston, MA 02201-1007

RE: Boston/Roxbury Parcel P-3 Tremont & Whittier St. RTN #3-15009

NOTICE OF RESPONSIBILITY; M.G.L. C. 21E & 310 CMR 40.0000

Attention: Mr. Richard Mertens

Dear Mr. Mertens:

Information contained in a Release Notification Form (RNF) submitted to the Department of Environmental Protection (the Department or DEP) on April 14, 1997 and submitted by Boston Redevelopment Authority indicates that there is or has been a release of oil and/or hazardous material at the above-referenced property which exceeds a "120 day" reporting threshold (310 CMR 40.0315) and which requires one or more response actions.

Based on this information, the Department has reason to believe that the subject property or portion(s) thereof is a disposal site as defined in the Massachusetts Oil and Hazardous Material Release Prevention and Response Act, M.G.L. c. 21E, and the Massachusetts Contingency Plan, 310 CMR 40.0000 (the MCP). The assessment and cleanup of disposal sites is governed by M.G.L. c. 2IE and the MCP.

The purpose of this notice is to inform you of your legal responsibilities under state law for assessing and/or remediating the subject release. For purposes of this notice, the terms and phrases used herein shall have the meaning ascribed to them by the MCP unless the text clearly indicates otherwise.

## STATUTORY LIABILITIES

The Department has reason to believe that you (as used in this letter, "you" refers to Boston Redevelopment Authority) are

10 Commerce Way • Woburn, Massachusetts 01801 • FAX (617) 932-7615 • Telephone (617) 932-7600 • TDD Ø (617) 932-767

a Potentially Responsible Party (a PRP) with liability under M.G.L. c. 21E, § 5, for response action costs. Section 5 makes the following parties liable to the Commonwealth of Massachusetts: current owners or operators of a site from or at which there is or has been a release/threat of release of oil or hazardous material; any person who owned or operated a site at the time hazardous material was stored or disposed of; any person who arranged for the transport, disposal, storage or treatment of hazardous material to or at a site; any person who transported hazardous material to a transport, disposal, storage or treatment of site from which there is or has been a release/threat of release of such material; and any person who otherwise caused or is legally responsible for a release/threat of release of oil or hazardous material at a site.

This liability is "strict", meaning it is not based on fault, but solely on your status as an owner, operator, generator, transporter or disposer. It is also joint and several, meaning that you may be liable for all response action costs incurred at the site, regardless of the existence of any other liable parties.

The MCP requires responsible parties to take necessary response actions at properties where there is or has been a release or threat of release of oil and/or hazardous material. If you do not take the necessary response actions, or fail to perform them in an appropriate and timely manner, the Department is authorized by M.G.L. c. 21E to have the work performed by its contractors. By taking such actions, you can avoid liability for response action costs incurred by the Department and its contractors in performing these actions, and any sanctions which may be imposed for failure to perform response actions under the MCP.

You may be liable for up to three (3) times all response action costs incurred by the Department. Response action costs include, without limitation, the cost of direct hours spent by Department employees arranging for response actions or overseeing work performed by persons other than the Department or their contractors, expenses incurred by the Department in support of those direct hours, and payments to the Department's contractors. (For more detail on cost liability, see 310 CMR 40.1200.)

The Department may also assess interest on costs incurred at the rate of twelve percent (12%), compounded annually. To secure payment of this debt, the Commonwealth may place liens on all of your property in the Commonwealth. To recover the debt, the Commonwealth may foreclose on these liens or the Attorney General may bring legal action against you.

In addition to your liability for up to three (3) times all

Boston Redevelopment Authority Page 3

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response action costs incurred by the Department, you may also be liable to the Commonwealth for damages to natural resources caused by the release. Civil and criminal liability may also be imposed under M.G.L. c. 21E, § 11, and civil administrative penalties may be imposed under M.G.L. c. 21A, § 16 for each violation of M.G.L. c. 21E, the MCP, or any order, permit or approval issued thereunder.

### NECESSARY RESPONSE ACTIONS

The subject site shall not be deemed to have had all the necessary and required response actions taken unless and until all substantial hazards presented by the site have been eliminated and a level of No Significant Risk exists or has been achieved in compliance with M.G.L. c. 21E and the MCP. In addition, the MCP requires persons undertaking response actions at disposal sites to perform Immediate Response Actions (IRAs) in response to "sudden releases", Imminent Hazards and Substantial Release Migration. Such persons must continue to evaluate the need for IRAs and notify the Department immediately if such a need exists.

You must employ or engage a Licensed Site Professional (LSP) to manage, supervise or actually perform the necessary response actions at the subject site. In addition, the MCP requires persons undertaking response action at a disposal site to submit to the Department a Response Action Outcome Statement (RAO) prepared by an LSP in accordance with 310 CMR 40.1000 upon determining that a level of No Significant Risk already exists or has been achieved at a disposal site or portion thereof. [You may obtain a list of the names and addresses of these licensed professionals from the Board of Registration of Hazardous Waste Site Cleanup Professionals at (617) 556-1091].

The Department has determined that the following response actions are necessary at the subject site:

Initial site investigation activities in accordance with 310 CMR 40.0405 are necessary. In addition, unless an RAO is submitted earlier, a completed Tier Classification Submittal pursuant to 310 CMR 40.0510, and, if appropriate, a completed Tier I Permit Application pursuant to 310 CMR 40.0700, must be submitted to DEP within one year of the initial date notice of a release is provided to the Department pursuant to 310 CMR 40.0300 or from the date the Department issues a Notice of Responsibility (NOR), whichever occurs earlier.

It is important to note that you must dispose of any Remediation Waste generated at the subject location in accordance with 310 CMR 40.0030 including, without limitation, contaminated

	Mas Bur REL	 sachusetts 「 au of Waste」   EASE NOTIFI	partmen de Cleant	t of Enviro Jp & NOTIFICJ	nmental ATION RI	Prot <sup>ere</sup> ior	N Releas	BWSC-1G2
	DEP FOR	M Pursuant to 31	10 CMR 40.00	335 and 310 CM	AR 40.0371	(Subpart		
	A. RELEASE OR THREA	TOF RELEASE LO	DCATION:					
	Street: Parcel P-3,	Tremont and W	hittier S	Streets	Location Aid:	UTMs: 468	8700 mN, 3	27800 == 2
	City/Town: Boston (Ro	xbury)			ZIP 02 Code:	2120-0000		р
	B. THIS FORM IS BEING TO:	USED (ched	k one)					
	J Submit a Release Not	ffication (complete :	all sections of t	his form).				
	Submit a Retraction of this form). You MUST a	  f a Previously Rep  ttach the supporting ( 	oorted Notifi	cation of a Rele required by 310 (	ase or Threat CMR 40.0335	of Release (cor	nplete Sections A	B, E, F and G of
	C. INFORMATION DESC	RIBING THE RELE	EASE OR TH	REAT OF REL	EASE (TOR	):		1
	Date and time you obtained (	 ທຸດwiedge of the Rele 	ase or TOR.	12/18/96	Time:		Specify:	
	The date you obtained	knowledge is alway	s required. T	he time you obt Conditions.	ained knowle	dge is not requ	ired if reporting	only 120 Day
	IF KNOWN, record date and Date:	time release or TOR	occurred.		ີ ເມື່ອຍ: -		Specify:	
	Check here if you previe	busly provided an Ora	I Notification to	DEP (2 Hour and	d 72 Hour Re;	orting Condition	is only).	1
	Provide date and time o Date:	Oral Notification.			Time:		Specify:	
	Check all Notification Thresh	  olds that apply to the 	Release or Th	reat of Release:	(for more	information see	310 CMR 40.031	0 - 40.0315)
	2 HOUR REPORTING C	ONDITIONS 72 H	IOUR REPORT	ING CONDITION	NS 120 D	NGTREPORT	G CONDITIONS	1
	Threat of Sudden R	elease .	Subsurface No Liquid (NAPL) than 1/2 Inch	on-Aqueous Phas Equal to or Grea	ier 🗹 g	Release of Haza Groundwater Ex Concentration(s)	irdous Material(s) œeding Reportab	to Sail or le
	Oil Sheen on Surfac	⊨ ≫ Water	Underground 3 (UST) Release	Storage Tank e		Release of Gil to	Soil Exceeding F	Reportable
	Poses Imminent Ha		Threat of UST	Release		Yards	210 Anecting me	
	Could Pose Immine	nt Hazard —				Release of OI to Reportable Cond	Groundwater Ex	ceeding
	Release Detected i	n Private Well	Release to Gr Water Supply	oundwater near	_			
	Release to Storm D		Release to Gr School or Res	oundwater near sidence	:	Subsurface Non Equal to or Grea Inch	-Aqueous Phase ater than 1/8 Inch	and Less than to
	Sanitary Sewer Rel (Imminent Hazard (	èase Daty)				1		
	List below the Oils or Hazar If necessary, attach a list of	 çous Materials that ex accitional Oit and Ha: 	ceed their Rep zardous Materi	ortable Concentr al substances su	ation or Report bject to report	rtable Quantity b ing.	by the greatest am	ount.
	Name and Quantities of Oil: Released:	(O) and Hazardous 1	Materials (HM)				Reportable	Concentrations
	O or HM Rel	eased	O HM (check one)	CAS # (if known)	Amount or Concentrațio	Units n	Exceeded (RCS-1, RCS-2,	RCGW-1, RCGW
	PAHs (see Table )	1)	$\Box \mathcal{I} =$				RCS-1	
	TPH (see Table 1	 >	$\mathcal{I} \subseteq -$				RCS-1	<u> </u>
	Lead (see Table	1)	$\Box \mathcal{I} =$				RCS-1	
	D. ADDITIONAL INVOL	VED PARTIES:						
	Check here if attachin who is submitting this	 g names and address Release Notification ( 	es al owners at required).	f properties affect	ted by the Rel	ease or Threat c	if Release, other t	han an owner
	🕄 Check here if attachin	 g Licensed Site Profe: I	ssional (LSP) n	ame and address	s (optional).			i e i
Ú.		You may write in n	ames and add	resses on the b	ottom of the :	secand page of	this form.	" ( a
	Revised 3/1/95	· · · · · · · · · · · · · · · · · · ·	Supe D	rsedes Form B o Not Alter This	WSC-003 Form		<u> </u>	Page

R	Massachusett epartment of Envir Bureau of Waste Site Cleanup	onmenta	al Prc	tion	BWSC-10
	RELEASE NOTIFICATION & NOTIFIC		RETRAG	CTION	Release Tracking Number
	FORM Pursuant to 310 CMR 40,0335 and 310	CMR 40.037	1 (Subpart		
	E. PERSON REQUIRED TO NOTIFY:				
	Name of Boston Redevelopment Authority Organization:				
	Name of Mr. Richard Mertens	Title: Env	ironmen	tal Revi	lew Officer
n	Street: 1 City Hall Plaza				
	City/lown: Boston	State: MA	Z		2201-1007
<b>n</b> ,	E RELATIONSULD OF DEPROV DECUMPED TO NOTIEY TO RELEAS	FAX; <u>footionall</u>	_617-	742-446	4
	T BP of PRP Specify C Owner O Operator O Generator O T	ransporter O	ther RP or F	ELEASE:	(check one)
-	Fiduciary, Secured Lender or Municipality with Exempt Status (as defined t	by M.G.L. c. 2	1E, s. 2)	•	
	Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s.	5(j))			
	Any Person Otherwise Required to Notify Specify				
1 and	G. CERTIFICATION OF PERSON REQUIRED TO NOTIFY:				
	1. Thomas N. O'Brien , attest under the pa familiar with the information contained in this submittal, including any and all door	ins and penal cuments acco	ties of perjui mpanying th	ry (i) that I ha	ve personally examined and form, (ii) that, based on my
	my knowledge and belief, true, accurate and complete, and (iii) that I am fully at responsible for this submittal. If the person or entity on whose behalf this submit	uthorized to m ttal is made ar	ake this atte wis aware t	estation on be	this submittal is, to the best c shalf of the entity legally significant penalties,
	including, but not limited to, possible fines and imprisonment, for willfully submit	ting false, inac	ccurate, or in	ncomplete inf	omation.
state in the second sec	Tri Vann Visan	Tale: Di:	rector		
	(signature)	(	Ula.	65	·····
	For: Boston Redevelopment Authority (print name of person or entity recorded in Section E)	Date:	1/7/	(/	
	Enter address of the person providing certification, if different from address rec	orded in Section	on E:		
÷)	Street:	-			
C	City/Town:	State:	<b>.</b>	ZIP Code: _	
and the second s	Telephone: Ext	FAX: (optional)			
	YOU MUST COMPLETE ALL RELEVANT SECTIONS OF THIS INCOMPLETE. IF YOU SUBMIT AN INCOMPLETE FO	S FORM OR DRM, YOU M	DEP MAY AY BE PE	RETURN T	HE DOCUMENT AS
֠-		EADLINE.			
-					
	Licensed Site Professional:				
	Weston & Sampson Engineers, Inc.		,		
	5 Centennial Drive Peabody Massachusetts 0'960				•
، لــا:	L.S.P. Number 2999				
<u>r</u>	(508) 532-1900				
Ľ		-			
[;] (					
U	Revised 3/1/95 Supercedes Form	BWSC-003	<u> </u>	<u> </u>	Page 2 of 2
	Do Not Alter T	his Form			
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## TABLE 1

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## SOIL HEADSPACE SCREENING AND SAMPLING RESULTS BRAVEDIC PARCEL P-3 Test PH and Soll Boring Samples

		1				Ş	imple Idei	rtification	and sample	e depth fie	-et)		2	
Parameter	Untra	Recordable	WS-1	WS-2	WS-J	WS-4	WS-5	WS-6	WS-7	WS-8	WS-9	WS-10	WS-11	WS-12_
	1	Conce								712-5	TP	TP.7		
		DCC I		40.45	47.47	10.12	10.17	10.40	10.17	47 47 5	48.5.40	475 48	20.7-	19-1
	·····	RLS-1	6.2-10.5	10-12	15-1/	1 10-12	10-12	1 30-12	1 16-17		10.3-19	1.11.9-12	: 20-22	1.5-1
VOLATILE ORGANIC COMPO	NUKOS-													
Benzene	vorg	1 10,000	ND !	ND	ND	ND	ND	I ND	ND	ON C	87	I ND	ND	
Isopropyibenzene	4	11,000,000	CM I	ND	ND	0N	ND	ND	ND		CN	<u>G</u> M		330
n-Propylbenzene	<u>u</u> grug	100,000	ND	NO	DN D	04	ND		ND	ND	ND	<u>כא</u>	ND	760
Xylene (total)	<u>uc/c</u>	1 500,000	ND.	<u>QN</u>	DND	<u>ND</u>		I ND	DN	I ND	UND		I ND	32
len-Butylbenzene	22.20	<u>! NS </u>	DN D	DN	I ND		DN	I ND	<u>; ND ;</u>	I ND	ON .		I ND	36
sec-Bullbenzene	uc/to	i NS I			ND	ND		ND I	NU			I ND	ND	270
n-Butylbenzene	uarca	NS I	CH I	ND.	I ND	1 ND		<u>• NO</u>			NO NO	CN I		470
Napihalene	0542	4.000	<u></u>	NO		1 ND	1 NU	1 NU	· NU	1 150	I ND	150	I NO	160
1,2,4-Inmethylbenzene	<u> </u>	1,000,000	I ND	ND	I NU	1 NO		1 NU	ND		1 ND	CM I	I ND	70
Total BTEX	<u>uighte</u>		CM_			<u> ND</u>			<u>N0</u>	! ND	87	I ND	1 ND	32
Total VOCs {		-		ON	I ND	<u>CM</u>	DN D	סאי	<u>, NO</u>	150	87	: 150	I ND	1 2,125
TUTAL PETROLEUM HYDRO	CARBON	<u>s</u>			1 10			1 10	NO	-	·	1 10	L NO	
	mone	;	<u>. NU</u>								NO			
	mana	<u> </u>	<u>UNU</u>						00		· NO			
	mon:		<u>. ND</u>						N0		- ND	1 160*	L' NO	8400
	monto	· -									· NO			
	000/02				1 10	- NO			· ND					
Poer Og #6	move-					1 110			80			1 920		
Modor Old Hydraulic Ol	monto monto		- NO	<u> (</u> ( ()		I NO		1 NO	011	1 5000		1 920		
TotalTPR	1 100200-5					110				1 000		1	1	
POLYNLICI EAR AROMATIC	hand the second													<u>ب</u>
Narthalene	110000	4 000	L NA	i ND		NA	I NA	I NA		1 8 200	130	N.A.	L' ND	1 000
	1 10010	· 700	1 NA			I NA	i NA		NA	F 4 100	60	NA NA	S ND	73.00
Acenaphthyleos		: 100,000	1 114			1 14	: NA	1 NA	NA	2 000	ND	I NA		800
Acmaphibece	inte-	20,000	I NA	1 10	: NO	NA NA	1 NA	: NA	N.4	1 12 000	180	NA NA	i ND	3400
Eborge	: <u>00.75</u>	400,000	. NA	I ND	i ND	I NA	: NA	NA NA	NA	11 000	200	! NA	L ND	3 900
2beogotorene		100,000	i NA	NO	I ND	1 NA	I NA	NA	NA	93,000	1,500	I NA	ND	1 11 000
Antracene	l un ar	1 000 000	i NA	1 ND	I ND	I NA	- NA	I NA	NA	1 21,000	. 440	I NA	T ND	1 2.700
Elucianthene	ucuto	600 000	I NA	I ND	1 ND	I NA	I NA	1 NA	- NA	1 92.000	1,600	i NA	1 ND	4.100
Рутеле	uo ke	· 500.000	I NA	I ND	I ND	NA.	NA	I NA	T NA	82,000	- 1,400	I NA	I ND	1 4,100
Benzofalanthracene	i vate	700	I NA	CN I	1 ND	I NA	I NA	1 NA	- 14	1.38,000	630	I NA	I ND	1,500
Chrysene	US/KC	7,000	NA	СN	I ND	I NA	1 NA	I NA	NA.	44,000	690	1 NA	I ND	1 1,700
Benzolbilluoranthene	i uore	700	I NA	I ND	I ND	1 NA	Î NA	NA	NA	34,000	560	1 N.	I ND	1,200
Senzo(k)fluoranthene	i ùake	7,000	I NA	CA 1	ND	I NA	! NA	I NA	NA.	1 35,000	i 550	: NA	1 ND	1,300
Benzo(a)pryene	1 light	700	i NA	1 ND	I ND	NA	i NA	! NA	NA	1 39,000	510	3 NA	i ND	1,400
Dibenzo(a,h)anthracene	1 jug/kg	700	I NA	I NO	ND	I NA	NA	NA	NA	4,700	ND	I NA	1 ND	I NO
Senzo(g,h,i)perviene	1 wat:	100,000	I NA	I ND	I ND	NA	I NA	NA	NA	13,000	- 190	1 NA	i ND	ND
Indeno[1,2,3-cd]pyrene	l uç/cc	700	I NA	I ND	ND	i na	: NA	I NA	NA.	14,000	: 200	NA NA	I NO	ND
METALS														<u> </u>
Arsenic, Total	1 marks	30	i NA	1 7.1	7.5	I NA	: NA	NA	· NA	1 7.3	. 7.5	- NA	: 8.1	4.4
Barium, Total	i mene	1,000	NA.	: <del>6</del> 2	1 57	1 N.4	NA NA	NA	. 34	240	160	NA	1 53	72
Cadmium, Total	; marky	30	1 NA	i <5.5	1 42	I NA	I NA	t NA	i na	4.5	- <2.7	1 NA	1 <2.4	<3.:
Chromium, Total	i ma/ka	1,000	1 NA	1 54	1 84	I NA	! NA	I NA	- NA	23	<sup>٤</sup> 14	NA	1 11	Z7
Lead, Total	1 marka	300	NA	1 13	1 5.3	I NA	I NA	NA	! NA	520	960	NA	! 51	120
Mercury, Total	mo/ko	10	NÅ	i <0.023	1 0.059	I NA	I NA	I NA	1 NA	1 3.07	0_204	NA	1 <0.015	<0.022
Selenium, Total	1 marko	300	NA.	<\$.5	1 <4.2	I NA	I MA	I NA	i NA	<2.6	: <27	I NA	<2.4	1 4.
Salver, Total	i mo/ko	100	NA NA	: <5.2	<4.1	- NA	NA	. NA	1 84	<2.8	<2.6	NA	<2.4	⊲.
NOTES:	· · ·		•											
ND = Not detected													Elauraon/Era	edictacierc2
• NA # Not snalyzed														Ë
- a Nor anni-shia													а 1	
morke = millionams per kiloon	e zneq) me	ermājon)	-											
uç/kg = microstams per kilog	ram (pars )	per billion)												
T = weathered TPH													1	

- PAMs present Bold/Shaded = Exceeds applicable reportable concentration

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## **APPENDIX C**

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Field Documentation

- C-1 Soil Boring, Test Pit Logs and Field Notes
- C-2 Groundwater Monitoring Well Construction Logs
- C-3 Groundwater Sampling Field Notes

Appendix C-1

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Soil Boring, Test Pit Logs and Field Notes

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Geotechnical Drilling and Groundwater Monitor Wells

F	Clie	atic	on	Weston & S Corner Tre	ampso	n Engi and Wh	neers ittie	s. In er St	c. reet. Ro	( xbury, MA	Date 3/27/97 Job No. 97-0332
	BO NO	41F	IG	B-101 Ground Elev.		Da St	ate 37	/24/9	7 Date Comp	<sub>lete</sub> 3/24/97	Drilling Foreman MC Eng./Hydrol. Geologist
	P			Sam	ple Data					Soil and	d/or bedrock strata descriptions
	р Т Н		No.	Sample Depth (ft.)	6" P	Blows enetration	Rec. Inches	Casing Blows Per ft.	Strata Change Depth	· v	/isual Identification of Soil and/or Rock Strata
			1	1'0"-2'6"	8-9-3	35				Dry, den	use to medium dense, fine to
		ŀ								coarse s silt, tr	and, trace to some inorganic ace fine to coarse gravel,
	5	4		4 0 -0 0	3-0-1	_9				brick, g Fill	lass, coal, etc.
	ļ		3	7'0"-9'0"	7-4-9	9-9					
	10			· · · · ·					9'0"		
2										End of b No water	ooring at 9'0" encountered upon completion.
,	 15 										
]							_				
,	20										
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	30										
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IJ	35				1						
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ิล	40	)							•		
	Ty	þe	of Bo	oring Casing Size:	T	Ho	blow Stee	m Auger	Size:	4-1/4"	
			Pn	Trace 0 to 10% Some 10 to 40% And 40 to 50%		0 to 4 Ve 4 to 10 L 10 to 30	Granu ry Loose oose Medium	lar Soil Dense	s (blows per ft 30 to 50 D Over 50 Ve	.) ense ny Dense	Cohesive Soils (blows per ft.)           0 to 2 Very Soft         & to 15 Stiff           2 to 4 Soft         15 to 30 Very Stiff           4 to 8 Medium Stiff         Over 30 Hard
						Standard p Blows are	per 6" ta	on test (S aken with	SPT) = 140# ha	ammer falling 30" < 2" O.D. × 1 3/	8" I.D. split spoon sampler unless otherwise noted.
1		i ne : y t : ori	term ime o ng wa	s and percentages used f year and water added as taken. D The stratifi	to descrit during the cation line	be soil and or e drilling pro	rock are cess. D	based o Water le	n visual identifi vels indicated n boundaries bol	cation of the retrie hay vary with seas	ved samples. Moisture content indicated may be affected sonal fluctuation and the degree of soil saturation when the
		<u> </u>	-								

the second value of the se	

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Geotechnical Drilling and Groundwater Monitor Wells

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),		B-102 Elev.	Sta	art 3/	24/9	7 Com	plete 3/24/97	Foreman MC	Geologist
₽		Sar	nple Data	· 			Soil an	d/or bedrock strata descri	ptions
P T H	No.	Sample Depth (ft.)	Blows 6" Penetration	Rec. Inches	Casing Blows Per ft.	Strata Change Depth		Visual Identification of Soil a	and/or Rock Strata
5 _	1	1'0"-3'0" 4'0"-6'0"	8-9-9-15 4-3-6-6				Dry, med trace to fine to boulders Fill.	lium dense, find some inorganic coarse gravel, s, brick, glass	e to coarse sand, c silt, trace cobbles and , coal.
	3	7'0"-9'0"	6-6-6-7						
0						9'0"	End of t No water	ooring at 9'0" encountered u	pon completion.
15 _									
20								r	4 
25 _									
15 _									· · ·
40							-		1 - -
	of Bo	ring Casing Size-			Auger	Size	4 1 / 4 11		·
	Pro	portion Percentages Trace 0 to 10% Some 10 to 40% And 40 to 50%	0 to 4 Ven 4 to 10 Lo 10 to 30 M	Granul y Loose ose ledium [	ar Soils )ense	30 to 50 D Over 50 V	4-1/4 1.) Pense ery Dense	Cohesive S 0 to 2 Very Soft 2 to 4 Soft 4 to 8 Medium Stiff	Soils (blows per ft.) 8 to 15 Stiff 15 to 30 Very Stiff Over 30 Hard
			Standard pe Blows are p	er 6° tal	n test (S ken with	PT) = 140# h an 18" long	ammer falling 30" x 2" O.D. x 1 3/	8° I.D. split spoon sampler i	unless otherwise noted.

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Geotechnical Drilling and Groundwater Monitor Wells

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ċ	- 		Sam	ple Data	ita				Soil and/or bedrock strata descriptions			
1 1		No.	Sample Depth (ft.)	Blow 6" Penet	s ration	Rec. Inches	Casing Blows Per ft.	Strata Change Depth	V	isual Identification of So	il and/or Rock Strata	
		1	1'0"-3'0"	4-5-5-	-10							
			<u>.</u>						Dry, međ	ium dense to	dense, fine to	
									coarse s	and, trace to	some inorganic	
-11 -5	_	2	4'0"-6'0"	6-6-9-	-7				silt, tr	ace fine to c	oarse gravel,	
				<u> </u>			+	-	cobbles	and boulders,	, brick, glass,	
		3	7'0"-9'0"	24-20-3	19-27			-	Fill.			
ļ												
1	p_			 		<b> </b>		9'0"				
			····		•			1	End of b	oring at 9'0'	٢	
						1			No water	encountered	upon completion	
				<b> </b>				-				
	5_						+	4				
				-		<b> </b>	+	-				
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	40.		· · · · · · · · · · · · · · · · · · ·					-4				
	Тур	e of B	oring Casing Size:		Но	llow Ste	em Auge	er Size:	4-1/4"	·· <u> </u>		
Π		P	roportion Percentages			Gran	ular So	ils (blows per	ft.)	Cohesi	ve Sails (blows per ft.)	
			Trace 0 to 10% Some 10 to 40% And 40 to 50%		0 to 4 Ve 4 to 10 L 10 to 30	ry Loos oose Medium	e 1 Dense	30 to 50 l Over 50 V	Dense /ery Dense	0 to 2 Very Soft 2 to 4 Soft 4 to 8 Medium Sti	8 to 15 Stiff 15 to 30 Very Stiff ff Over 30 Hard	
				S	itandard p llows are	enetrat per 6*	ion test taken w	(SPT) = 140#   ith an 18" long	hammer falling 30' x 2" O.D. x 1 3/	(8° 1.D. split spoon samp	pler unless otherwise noted.	
	Ti by	ne tern r time	is and percentages used of year and water added	d to describe : I during the d	soil and or rilling pro	rock ar cess. 🗆	e based Water I	on visual identi levels indicated	fication of the retrie may vary with sea	eved samples.  Moistur sonal fluctuation and the	e content indicated may be all degree of soil saturation wh	



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RO	NG	B-104 Ground	Date	a 3/	24/9	7 Date	Lete 3/24/97 Drilling MC Eng./Hydrol.		
D		Sam	iple Data				Soil and/or bedrock strata descriptions		
E P T	No.	Sample Depth (fl.)	Blows 6" Penetration	Rec. Inches	Casing Blows Per ft	Strata Change Depth	Visual Identification of Soil and/or Rock Strata		
<u>n_</u>	1	1'0"-3'0" 4'0"-6'0"	17-15-7-7 7-7-8-7			Doprin	Dry. medium dense to dense, fine to coarse sand, some inorganic silt, trace fine to coarse gravel, cobbles and boulders, brick, glass, coal, etc. Fill		
10	3	7'0"-9'0"	35-21-24-19			9'0"	End of boring at 9'0"		
15							No water encountered upon completion.		
20									
25 _ 30 _									
35 _		•							
40						0	3		
Туре ——	of Bo	pring Casing Size: pportion Percentages Trace 0 to 10% Some 10 to 40% And 40 to 50%	0 to 4 Very 4 to 10 Loc 10 to 30 M Standard pe	Granut Loose se edium D	ar Soils Dense	Size: ; (blows per ft; 30 to 50 De Over 50 Ve ; (PT) = 140# hz	4-1/4"       Cohesive Solls (blows per ft.)         inse       0 to 2 Very Solt       8 to 15 Stiff         ry Dense       2 to 4 Soft       15 to 30 Very Stiff         4 to 8 Medium Stiff       Over 30 Hard		

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NO.		ذ 	B-105 Ground Elev.	Sta	a 3/	24/9	7 Comp	lete 3/24/97	Foreman MC	Geologist
Proph		No	Sample Depth (ft.)	ple Data Blows 6" Penetration	Rec. Inches	Casing Blows	Strata Change	Soli and Vi	sual Identification of Soil and/o	r Rock Strata
<u></u>	╋	1	1'0"-3'0"	12-13-7-10		Per π.	Depth			
			· · · · · · · · · · · · · · · · · · ·					Dry, med: sand, som	ium dense, fine t me inorganic silt coarse gravel co	o coarse , some
   5 		2	4'0"-6'0"	4-3-4-6				boulders Fill.	, brick, glass, c	coal, wood.
		3	7'0"-9'0"	15-15-10-13						
10 .	+						9'0"			
	F							End of b	oring at 9'0"	completion
   5  	-		· · · · · · · · · · · · · · · · · · ·						encouncered apor	. compression
	F			 	+		-			
  20					1		-			
							-			
25							-			
					-					
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			••			+	-			
<sup> </sup> 35	; _[						-			
	ľ			-			-1			
40	>									
<b> y</b> 	pe	or B Pr	oportion Percentages	Ho	Gran	ular Soi	ils (blows per	<u>4-1/4"</u> ft.)	Cohesive Soil	s (blows per tt.)
			Some 10 to 10% And 40 to 50%	0 to 4 Ve 4 to 10 L 10 to 30	ry Loosi oose Medium	e Dense	30 to 50 t Over 50 \	Vense Very Dense	2 to 4 Soft 4 to 8 Medium Stiff	o to 15 Stiff 15 to 30 Very Stiff Over 30 Hard
 		10/7	s and nercentation upon	Standard p Blows are	per 6" (	ion lest i laken wi	(SPT) = 140# 1 th an 18" long	hammer falling 30' $\times$ 2" O.D. $\times$ 1 3'	18" I.D. split spoon sampler uni	ess otherwise noted.
	by t	ime (	) year and water added	I during the drilling pro	cess.	Water I	evels indicated	may vary with sea	sonal fluctuation and the degree	e of soil saturation wh

er	nt ti	Weston & S	Sampson Engi	neers	s, Ir	nc.	oxbury, MA	Date 3/27/97	Job No. 97-0332
R	ING	B-106 Ground Elev.	Da Sta	te 3/	24/9	7 Date Comp	blete 3/24/97	Drilling Foreman MC	Eng./Hydrol. Geologist
		Sam	ple Data	,			Soil and	l/or bedrock strata descrip	tions
	No.	Sample Depth (ft.)	Blows 6" Penetration	Rec. Inches	Casing Blows Per ft.	Strata Change Depth		isual Identification of Soil an	nd/or Rock Strata
	1	4 <sup>†</sup> 0 <sup>11</sup> -6 <sup>†</sup> 0 <sup>11</sup>	3-5-9-9				Dry, med some inc coarse g brick, w Fill	ium dense, fine organic silt, so ravel, cobbles bood, glass, coa	to coarse sand. ome fine to and boulders, al.
	3	7'0"-9'0"	7-8-8-7						
0_						9'0"			
							End of t No water	oring at 9'0" encountered up	oon completion.
5_						-			\$
						-			
20 _						-			
									7 . 7
25 _						-			, , ,
'n			4			-		2	5 11
· -		•							• • •
15 _						-			у)
-						-			; , , *
10.					-				3 -
УP	e of B	oring Casing Size:	Ho	llow Ster	n Auger	r Size;	4-1/4"		,
	Pı	Trace 0 to 10% Some 10 to 40% And 40 to 50%	0 to 4 Ve 4 to 10 Lo 10 to 30	Granu ry Loose oose Medium	ll <mark>ar Soi</mark> l Dense	Is (blows per f 30 to 50 E Over 50 V	t.) Dense ery Dense	Cohesive S 0 to 2 Very Soft 2 to 4 Soft 4 to 8 Medium Stiff	ioils (blows per ft.) 8 to 15 Stiff 15 to 30 Very Stiff Over 30 Hard
			Standard p	enetratio	in test (	SPT) = 140# h	ammer falling 30		

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<b>d h</b>		Weston & Sa	ampson Engi	neers	. Ir	IC .	Da	te 3/27/97	Job No. 97-0332
Locatio	on j	Corner Trei	nont and What Da	<u>ittie</u>	er <u>St</u>	reet, Ro	xbury, MA	Drilling NO	Eng /Hydrol
<b>N</b>		B-107 Elev.	Sta	n 3/	25/9	Comp	lete 3/25/97	Foreman MC	Geologist
Ĕ	i	Sample Samp	Blows	Ber	Casino	Strata		or Deorock strata des	scriptions
	No.	Depth (ft.)	6" Penetration	Inches	Blows Per ft.	Change Depth	Vis	ual Identification of Se	oil and/or Rock Strata
	1	1'0"-3'0"	5-9-12-12						
្រា		l					Dry, medi some inor	um dense, f ganic silt.	ine to coarse sand, some fine to
	2						coarse gi	avel, cobbl	es and boulders,
5 _ 	<u> </u>	4.00.0	4-4-4-3			-	brick, wo	ood, glass,	coal.
			0_12_15_15	•			1111		
	2		9-12-15-15	-		]			
			-			9'0"			
ا لنہا							End of be	oring at 9'0 encountered	upon completion.
		1				-	NO water	encouncerca	apon compressions
[] 15 _				-		-			
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	e of P	Uning Casing Size:	Цн	ollow St	em Auro	er Size:	4-1/4"		
	P:	In Percentages	<u> </u>	Gran	nular Sc	oils (blows per	t.)	Cohe	sive Soils (blows per ft.)
		Trace 0 to 10% Some 10 to 40% And 40 to 50%	0 to 4 V 4 to 10 10 to 30	ery Loos Loose Medium	se n Dense	30 to 50 1 Over 50 1	Dense Very Dense	0 to 2 Very Soft 2 to 4 Soft 4 to 8 Medium S	8 to 15 Stiff 15 to 30 Very Stiff Over 30 Hard
			Standard Blows are	penetrai per 6*	tion test taken w	(SPT) = 140# ith an 18" long	hammer falling 30" × 2" O.D. × 1 3/	8" I.D. split spoon san	npler unless otherwise noted.
by D	ne terri / time pring v	his and percentages used of year and water added was taken.   The stratifi	to describe soil and o during the drilling pri cation lines represen	or rock a ocess. E t the ap	re based I Water proximal	l on visual identi levels indicated te boundaries b	fication of the retrie may vary with seas etween soil types,	ved samples.  Moist sonal fluctuation and the the actual transitions i	ure content indicated may be affected he degree of soil saturation when the may be gradual.
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Sheet # \_\_\_\_ of \_\_\_\_

Clien	t	Weston & S	Sampson Engi	neers	5. II	10.	Date 3/27/97 Job No. 97-0332
Locat	ion	Corner Tre	emont and Wh	ittie	er St	reet, Ro	oxbury, MA
BORI NO.	NG	B-112 Ground Elev.	Da Sta	int 3,	/25/9	7 Date Comp	plete 3/25/97 Drilling MC Eng./Hydrol. Foreman MC Geologist
₽ I		Sam	ple Data	· · · · ·			Soil and/or bedrock strata descriptions
Р Т Н	No.	Sample Depth (ft.)	Blows 6" Penetration	Rec. Inches	Casing Blows Per ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
-	1	1'0"-3'0"	3-4-7-11		· · ·		Dry, medium dense, fine to coarse sand, some fine to coarse gravel, some inorganic silt, cobbles and
5	2	4'0"-6'0" 7'0"-9'0"	9-7-7-20 1 6-4'-3-7				Fill.
			i 			01011	
10							End of boring at 9'0" No water encountered upon completion.
15							9 
20 _							
25				· · · · · · · · · · · · · · · · · · ·			
' 30							
25		•	 				
-							t •
40				- <b>!</b>			
Туре	of Bo	pring Casing Size:	Hol	low Sten	n Auger	Size:	4-1/4"
Proportion Percentages         Granular Soil:           Trace 0 to 10%         0 to 4 Very Loose           Some 10 to 40%         4 to 10 Loose           And 40 to 50%         10 to 30 Medium Dense				Granus y Loose ose ledium (	lar Soit	s (blows per ft 30 to 50 De Over 50 Ve	Cohesive Solls (blows per ft.)           Dense         0 to 2 Very Soft         8 to 15 Stilf           ery Dense         2 to 4 Soft         15 to 30 Very Stilf           4 to 8 Medium Stiff         Over 30 Hard
,			Standard pe Blows are p	enetratio er 6" ta	n lest (S ken with	SPT) = 140# ha 1 an 18" long >	ammer falling 30" x 2" O.D. x 1 3/6" I.D. split spoon sampler unless otherwise noted.
The by t bori	terms ime of ing wa	s and percentages used it year and water added of as taken.  The stratific	to describe soil and or during the drilling proc ation lines represent t	rock are ess. III V he appro	based o Vater le oximate	n visual identific vels indicated m boundaries bet	ication of the retrieved samples. II Moisture content indicated may be affected may vary with seasonal fluctuation and the degree of soil saturation when the even soil types, the actual transitions may be gradual. II

148 Pioneer	Dr.	
Leominster,	MA	01453
(508) 840-03	91	

## SOIL EXPLORATION CORPORATION

Geotechnical Drilling and Groundwater Monitor Wells

5 Mon	son	Place
Milford.	NH	03055
(603)	672	2-2135

	Clie	nt	Weston & S	Sampson Engi	neer	<u>s, I</u>	nc.	Dat	ie <u>3/27/</u>	97	Job No. 97-0332
	Log BC	ation RING	Corner Tre Ground B-113 Sta	emont and Wh Date	$\frac{1tt1}{3}$	<u>er S</u> 25/9	Date	oxbury, MA	Drilling	MC	Eng./Hydrol.
e e e e e e e e e e e e e e e e e e e	NQ. Dİ	- <u>_</u>	D=113 Elev. Sami	ole Data	,			Soil and/o	r bedrock str	ata descrip	ptions
A	E C	No	Sample Depth (ft.)	Blows 6" Penetration	Rec. Inches	Casing Blows Per ft.	Strata Change Depth	Visi	ual Identification	on of Soil a	and/or Rock Strata
Ţ,		1	1'0"-3'0"	2-3-4-4							
								Dry, loos coarse sa	e to med nd, some	lium de e fine ilt. ce	ense, fine to to coarse gravel, obbles and
	5	- 2	4'0"-6'0"	9-10-10-12				boulders, Fill.	brick,	glass	, coal, etc.
]		3	7'0"-9'0"	10-11-15-15			-				
Ì	K	F					9'0"	End of bo	ring at	9'0"	
							-	No water	encount	ered u	pon completion.
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	4	-  0 -									
<u> </u>	Ţ	pe o	Boring Casing Size:	Ho	llow Ste	em Auge	er Size:	4-1/4"			, <u>.</u> .
			Proportion Percentages Trace 0 to 10% Some 10 to 40% And 40 to 50%	0 to 4 Ve 4 to 10 L 10 to 30	Gran ry Loos oose Medium	iular So e i Dense	ils (blows per 30 to 50 f Over 50 V	ft.) Dense /ery Dense	0 to 2 Ve 2 to 4 So 4 to 8 Me	Cohesive ry Soft it edium Stiff	e Soils (blows per ft.) 8 to 15 Stiff 15 to 30 Very Stiff Over 30 Hard
Į.				Standard p Blows are	penetrat per 6"	ion test taken w	(SPT) = 140# ith an 18" long	hammer falling 30" x 2" O.D. x 1 3/8	" I.D. split sp	oon sample	er unless otherwise noted.
		The to by tin boring	erms and percentages used te of year and water addec y was taken.   The stratig	t to describe soil and o during the drilling pro lication lines represent	r rock ar cess. 🛙 the app	e based I Water I proximal	l on visual identi levels indicated le boundaries b	fication of the retriev may vary with sease etween soil types, th	red samples, E onal fluctuation he actual trans	] Moisture on and the disitions may	content indicated may be affected legree of soil saturation when the r be gradual.
Ľ											

lient		Weston &	Sampson Engi	neers, I	nc.		Date 3/27/97	Job No. 97-0332
cat	ion	Corner Tr	emont and Wh	ittier S	treet, R	oxbury, MA	Drillion	E Histori
).		B-114 Elev.	Sta	ant 3/25/	97 Comp	<sub>plete</sub> 3/25/97	Foreman MC	Geologist
		San	nple Data			Soil and	l/or bedrock strata descri	ptions
	No.	Sample : Depth (ft.)	Blows 6" Penetration	Rec. Casing Inches Blows Per ft.	g Strata Change Depth	v	isual Identification of Soil	and/or Rock Strata
	1 2 3	4'0"-6'0" 7'0"-9'0"	5-5-5-5 7-12-14-18 		- · - - - - - -	Dry, med sand, so some ino boulders etc. Fill.	ium dense, fin me fine to coa rganic silt, c , brick, wood,	te to coarse arse gravel, obbles and glass, coal,
					9'0"			
					-	End of b No water	oring at 9'0" encountered u	pon completion.
					-			3 4
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pe	of Bo Pro	portion Percentages Trace 0 to 10% Some 10 to 40% And 40 to 50%	Hol 0 to 4 Ver 4 to 10 Lo 10 to 30 M	low Stem Auge Granular Soi y Loose ose Aedium Dense	r Size: Is (blows per ft 30 to 50 D Over 50 Ve	4-1/4"	Cohesive 0 to 2 Very Soft 2 to 4 Soft 4 to 8 Medium Stift	Soils (blows per ft.) 8 to 15 Stiff 15 to 30 Very Stiff Over 30 Hard
			Standard pe Blows are p	enetration test ( per 6" taken wit	SPT) = 140# ha	ammer falling 30" × 2" O.D. × 1 3/8	" I.D. split spoon sampler	unless otherwise noted.

Sheet # \_\_\_

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148 Pioneer Dr.
Leominster, MA 01453
(508) 840-0391

## SOIL EXPLORATION CORPORATION

Geotechnical Drilling and Groundwater Monitor Wells

Sneet # \_\_\_\_ of \_\_\_\_ 5 Monson Place

	lace
Milford, NH 0	3055
10001 070	
(603) 672-3	2135

Ê	<u> </u>	Sam	ple Data	Dee	<b>C</b> asing	Strata	Soil and/or bedrock strata descriptions	
P  T H	No.	Depth (ft.)	Blows 6" Penetration	nec. Inches	Blows Per ft.	Change Depth	Visual Identification of Soit and/or Rock Strata	
Ī	1	1'0"-3'0"	1-3-3-5					
i							Dry, loose to medium dense to loose fine to coarse sand, some fine to	,
	2	410"-610"	6 7 2 2		<u> </u>		coarse gravel, some inorganic silt,	
1-		40-00					cobbles and boulders, brick, wood,	
	3	7'0"-9'0"	1-1-7-10		<u> </u>		F111.	
	É							
前_   「				-		9'0''		
				1			End of boring at 9'0" No water encountered upon completio	п.
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<u></u> ,ур	e of E	Casing Size:		Contraction Ste	m Auge	r Size:		
	P	Trace 0 to 10% Some 10 to 40% And 40 to 50%	0 to 4 Ve 4 to 10 L 10 to 30	orani ery Loosi .oose Medium	e Dense	30 to 50 ( Over 50 V	Corresive Solis (blows per ft.)           Dense         0 to 2 Very Soft         8 to 15 Stiff           lery Dense         2 to 4 Soft         15 to 30 Very Stiff           4 to 8 Medium Stiff         Over 30 Hard	
			Standard Blows are	penetrati per 6° t	on test ( aken wi	(SPT) = 140# 1 th an 18" long	nammer falling 30" × 2" O.D. × 1 3/8" I.D. split spoon sampler unless otherwise noted	
   Τ	ne tern	ns and percentages used	d to describe soil and o	r rock an	e based	on visual identi	lication of the retrieved samples. I Moisture content indicated may be a	affect

Location         Corner Tremont and Whittier Street           BORING         B-116         Ground         Date Start 3/26/97           P         Sample         6" Penetration         Inches Blows Charles of Penetration           No         Depth (ft.)         6" Penetration         Inches Blows Charles of Penetration           1         1'0''-3''0''         9-9-13-20	Clien	t	Weston & S	ampson Engi	neers	s, Ir	nc.
BORING NO.         B-116         Ground Elex.         Date Start         3/26/97           P         Sample         Blows 6" Penetration         Rec. Rec. Per ft.         Casing Blows Per ft.         Str. Dept           1         1*0**-3*0**         9-9-13-20         -         -           -         -         -         -         -           5         -         -         -         -           10         -         -         -         -         -           10         -         -         -         -         -         -           10         -         -         -         -         -         -         -           10         -	Loca	ion	Corner Tre	mont and Wh:	ittie	er St	reet
P         Sample         Blows         Rec.         Casing         Sin           1         1 '0''-3''0''         9-9-13-20         -	BOR NO.	NG	B-116 Ground Elev.	Da Sta	ie 3/2	26/97	,
Sample         Blows         Rec. Casing Blows         Str. Chample Blows           1         1 '0''-3'0''         9-9-13-20	D		Sam	ple Data			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		No.	Sample Depth (ft.)	Blows 6" Penetration	Rec. Inches	Casing Blows Per ft	Stra Char Dep
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Trace 0 to 10%

Some 10 to 40%

And 40 to 50%

## XPLORATION CORPORATION

I Drilling and Groundwater Monitor Wells

Roxbury,

Complete 3/26/97

5 Monson Place Milford, NH 03055 (603) 672-2135

Sneet # \_\_\_\_ of \_

Job No. 97-0332

Eng./Hydrol.

Geologist

MA

coal. Fill.

End of boring at 3'0"

Date 3/27/97

Orilling

Foreman

Soil and/or bedrock strata descriptions

MC

Visual Identification of Soil and/or Rock Strata

Dry, medium dense, fine to medium sand, trace fine to coarse gravel, trace in-organic silt, cobbles, brick, wood, glass

No water encountered upon completion.

Cohesive Soils (blows per ft.)

8 to 15 Stiff

Over 30 Hard

15 to 30 Very Slift

0 to 2 Very Soft

4 to 8 Medium Stiff

2 to 4 Soft

Standard penetration test (SPT) = 140# hammer falling 30" Blows are per 6" taken with an 18" long x 2" O.D. x 1 3/8" I.D. split spoon sampler unless otherwise noted. The terms and percentages used to describe soil and or rock are based on visual identification of the retrieved samples. by time of year and water added during the drilling process. Water levels indicated may vary with seasonal fluctuation and the degree of soil saturation when the boring was taken. II The stratification lines represent the approximate boundaries between soil types, the actual transitions may be gradual.

30 to 50 Dense

Over 50 Very Dense

0 to 4 Very Loose

10 to 30 Medium Dense

4 to 10 Loose

4-1/4"

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	Leominster, MA 01453
	(508) 840-0391

## SOIL EXPLORATION CORPORATION

Geotechnical Drilling and Groundwater Monitor Wells

Sneet # \_\_\_\_ 01 \_\_\_\_

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5	MOR	son	Place	ł
Milf	ord,	NH.	03055	5
	(603)	672	2-2135	

BO NO	ation	n Corner Tr	emont and Whi	ittie	er St	reet, Ro	oxbury, MA
BO NO						Data	Drilling Eee Hudel
		G B-117 Ground Elev.	Da	ie 3/2	7/97	Comp	olete 3/27/97 Foreman MC Geologist
<b>p</b> <sup>l</sup>		Sar	nple Data				Soil and/or bedrock strata descriptions
Pi Ti H	$\left  \right $	No. Depth (ft.)	Blows 6" Penetration	Rec. Inches	Casing Blows Per ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
1		1 1'0"-3'0"	3-4-79				Dry, medium dense, fine to medium sand
I I	L			<b> </b>	ļ		silt, cobbles, brick, wood, glass.
- [	-		-	+	<u> </u>	3'0"	F111.
5	F						End of boring at 3'0"
	Т				ļ		No water encountered upon completion.
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i	pe	of Boring Casing Size	: H	ollow Ste	em Auge	er Size:	4-1/4"
Ti	Proportion Percentages Granular Soil				ular So	ils (blows per	ft.) Cohesive Soils (blaws per ft.)
Trace 0 to 10% Some 10 to 40% And 40 to 50%			0 to 4 V 4 to 10 10 to 30	ery Loos Loose ) Medium	e Dense	30 to 50 l Over 50 \	Dense     0 to 2 Very Soft     8 to 15 Stiff       Very Dense     2 to 4 Soft     15 to 30 Very Stiff       4 to 8 Medium Stiff     Over 30 Hard
	Standard penet Biows are per f				ration lest (SPT) = 140# hammer falling 30" 5" taken with an 18" long x 2" O.D. x 1 3/8" I.D. split spoon sampler unless otherwise noted.		
	The by t	e terms and percentages us time of year and water add	ed to describe soil and i ed during the drilling pr	or rock ar ocess. D	e based Water I	on visual identi evels indicated	ification of the retrieved samples. D Moisture content indicated may be affecti may vary with seasonal fluctuation and the degree of soil saturation when the

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N-J 3 Paul R. Oshar to shed water and to enhance it a written image. Makes it possible to write sharp, legible field lata in any kind of weather. "Rite in the Rain" - a unique all-we ather writing surface created 019610 UHAU IS マクノケク Paucel 532-1900 Sampson # 33320 J. L. DARLING C IRPORATION TACOMA, WA 96 121-3696 USA PAPER BRA / CUSE No.S. JAAU ι 96230 255 ALL-WEATHER WRITING 2870 a produ Bostoc ( ł Ч # See 2005 617 Andrey Nestor 000 ACA JHAY Beek Als Name \_ Address Project Phone MEASUREMENT CONVERSIONS liters fluid ounces quarts galtons (U.S.) TO FIND centimeters centimeters maters kilometers kilometers inches inches faet faet miles Milli-meters 1.5875 3.1750 4.7625 8.3500 7.9350 9.5250 12.700 15.875 19.050 22.225 25.400 50.800 78.200 101.60 grams kilograms ounces pounds 152.40 177.80 203.20 226.60 2254.00 279.40 304.80 millillers Iters liters MULTIPLY BY 29.573 0.473 0.948 3.785 0.033 1.056 0.264 Decimela of foot .0052 .0104 .0156 .0268 .5000 .5833 .6867 .7500 .17500 .9167 .9167 2.540 30.480 0.914 1.609 0.333 0.333 0.333 0.333 0.333 0.333 28.350 0.453 0.035 2.204 .0313 .0417 .0521 .0625 .0729 .0833 .1667 .2500 .3333 •C = (\*F - 32) x .555 •F = (•C x 1.8) + 32 querts galions (U.S.) milliliters fluid ounces inches feet yards milimaters cantimaters meters meters kilometers TEMPERATURE ounces pounds gràms kilograms IF YOU KNOW liters liters 8° 11° 11° pints Dches 1/18 1/8 2/18 1/4 52555 LENGTH WEIGHT VOLUME ę ð NCH NCH ł

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New March 1997

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1:10% 64 Q N Co 8.7.2 , C ò 0 d 0 0 lo 95.61.CI 2513 E HO 7-50 ξ 7.69.20 9 16.86 1.83 9:27 S S 0.17 40.8 45.0V and the second shart to the standard of the second standard and the second standard standard standard standard 100 IA Ϋ́ 3 F 2 5 615 901 Barled dry a TEMO 11.0 C DH 6.2 C SL 940 WS DO 3.6 mJ/0 TIME · S · 2 13.0 6.9 4.2 Dry-10 2.12.19 505 teme 2~2 0 Fd 









ذيلون. (22) 9 <del>1</del> 2 2 96250.A 0 J 07 j 1 マフロ 2 ) 0 -N 45 5 /a./97 1 0  $\frac{1}{2}$ Ų Ś 「「 93.88 98.27 9.36 92.00 6.97 94,39 94.15 70.86 34.06 8.75 92.61 7,30 3.09 7.48 t E 7,01 101,36 H I σ 0 ι Ń 57 M \$  $|\mathbf{c}|$ ALL PROPERTY AND A SUCCESSION OF AS SUCCESSION OF A SUCCESSION OF A SUCCESSION OF A SUCCESSION OF A SUCCESSION OF A SUCCESSION OF A SUCCESSION OF A SUCCESSION OF A SUCCESSION OF A SUCCESSION OF A SUCCESSION OF A SUCCESSION OF A SUCCESSION OF A SUCCESSION OF A SUCCESSION A. 1. 13 2

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1.001d and Kent IP/9 HOWEN + 10" QUMINUM PENGAP BIT 28/16-6-16-11-11 Xor Goo WEN COSMUSION oraaric 1 CONTROOM 1 200 *3 3* ⊕ ר ה 0.1 101 (ato) F lon nel 900 TLUSH NS-Z N 5 12 C Q Paul Scharger, Paul Rosinha 22 5-7 5-7-11-12 15 ac. P.D. 0.0 P10.00 1-3-2-4 20 Rec. PID 0.0 5 5-1 - 1 - 3' 10 - 7 - 5 - 3 13 Rec P10 0. Dev DK Br. E-M SAND and Sill, asphalt 31 (+ Sult - Antract OVERSE ON 111M 12,3.0/2 HERVES ON SITE 2 ADTO F Selica Pickup 200 Deillers Setting up an and Concrete DK-36 F-M Snnd and trace OK Br F Sand Organic PEAT Begins 1000 Slight Retroleven alor Branular Oct-Q-VERANA .1 1-3 F Gravel C. Hylenes. Frace F-C Gravel operations Ray han plander leisl 3030 10-15/ trace ų k <u></u> でつ Ś 言葉の

900 Ð THE H T HOUSE WHINTIER HEALAN CENTER ord hithe Const addien BRICK BATH Btell 5 U U X 1 to bit VEN U Â IN OFE OF THINGS BONDI PARING 101. 60012 7-5-3 & 4"Rec, PLD 0.0 90.00 trace Silt Organic Sult 14" Red 5' AUGENING HAVAUAR SLI+ Race Egravel Traile Briek -2'7 -7 - 10 - 19 9'Rec. 13-58 5'Rec 21 3-1) Organic S-4 15-17' 3-44 12-14. 0.0 Below PVC: Sample Retrieved -3 Net IL MED GR-GY OF Socinal Wet DEBC. 6 Located entrance an Struction DK BN repised 2 trace pear HIH Wat e1-01 5.6 Formally B-11-W5-3 0:01 MEN のくの SEC Ś 



0 TO 2.5 5 Pro-570 Rec G Cover SAND Trate :- Balila 22-60-05-20 MATAN マピー 5-0-0-25 2 PAAC Constructor C1-16 20100 BUND 12-2 STR. io F オナシ 5 5400 ントウ 14 117 -NS-101 228 800 Cobicket 34030140 ß **\$** SA 3 10-12 5 Sauleen SAAD 306 t blue NUG II 350 NATER Frade END 2 S 2 Ner Á JON- HOLA-10-010, 5, Saug E-0-0-3 10 éec A TIME de brid t acrives on FLL Resume Drilling モニー Juleva + 1 シーレ 4 2 PSOL Con la SL C.Care 1440 GRANULAR 6.2.3.8 3.507 COLESIVE S-51 Bornally BIS 2,0 A C. Hushed Such to Some |× |-1002 000 3 - o Amy activities Ro Home U 0 0 54 4 37029 へい 220 Souch WYSH: 45 Ŷ 0,400 00:6 Servic 1 \$1.S 4 D ar Ę d

















							PRO.	JECT	REPO	RT OF BORIN	IG No.		B-201 (D)
	W	esto	n & Sal	mpson			BRA	P-3		SHEET	1		OF 2
		ENG	SINEERS.	INC.		R	loxbu	ry, MA		Project No.		20	00317.A
		_// _								CHKD BY			CRM
BORI	NG Co.	Eath E	xoloration (	Geologic)			BOR		ΓΙΟΝ	**	See atta	ached	plan
ORE	MAN	Mike N	lartinelli	<u>-</u>			GRO	UND SURF	ACE	ELEV.			DATUM
VSE	GEOLO	SIST:	Robert F. B	utler			DATI	E START	1	/10/2001	DATE	END	1/10/2001
SAMF	LER:	SAMPLE	R CONSISTS	OF 2" SPLIT S	SPOON					GROUNDWA	TER RE	ADIN	GS
24.01			USING A 140	Ib. HAMMER F	ALLING 30 in			DATE	TIME	WATER AT	CASIN	GAT	STABILIZATION TIM
SASI	NG: -	NA						1/10/2001	NA	NA	N/	4	NA
CASIN	IG SIZE:	NA			OTHER:	3.25"	HSA						
EPTH	CASING		S	MPLE		PID		SAMPLE	DESCRI	PTION	NOTES	STE	
(feet)	(lb/ft)	No.	PEN/REC (in)	DEPTH (ft)	BLOWS/6"	(ppm)		Burmister	r Classi	fication	NOTES		
		S-1	NA	0-2	NA	<0.2	Dry,	dark yellow	ish bro	wn, (+)fine to	(1)		
							Grav	el and orga	inics.	Pieces of red			
2 _							brick	present.					
-													
4 –													
		6.2	24/6	E 7	10.9	-0.2	D-1	dork vollow	ioh hra	we (L)fine to			<b>5</b> 11 1
_		0-2	24/0	5-7	9-42	<b>~0.2</b>	icoar	se SAND, s	ome S	ilt. trace fine			FILL
6 -							Grav	el. Pieces	of red	brick, and a			
							few	pieces of co	oal tar/a	asphalt			
							pres	ent.					
8 -													
							l					1	
					l								
10 -		S-3	24/10	10-12	24-20	<0.2	Dry.	light gray to	o black	, (+)fine to	1		
					10-9		coar	se SAND, t	race Si	ilt and fine		ļ	
						<u> </u>	Grav	el. Lots of	red bri	ck present.			
12 -		S-4	24/19	12-14	5-7	<0.2	Drv	black to lig	ht arav	(+)fine to			
		<u> </u>			8-9		(-)cc	arse SAND	, little	Silt, trace		]	
						ļ	fine	Gravel. So	me pie	ces of red			
	GRANI			COHEST		REM		c and coal to	ar/aspr	nalt present.			
BL	DWS/FT		DENSITY	BLOWS/FT	DENSITY			φ.					
	0-4	V.	LOOSE	0-2	V. SOFT	1	(1)	S-1 samp	le was	taken off the	auger fli	ghts f	or classification.
	4-10			2-4	SOFT								
3	30-30 30-50	1	DENSE	8-15	STIFF								
	> 50	V.	DENSE	15-30	V. STIFF								
				> 30	HARD								
NOTE	S:	1) THE	STRATIFICATIO	N LINES REPRE	SENT THE APP			UNDARY BETW	EEN SO	L TYPES. TRANSI	TIONS MAY	Y BE GR	ADUAL.
		2) WAT	ER LEVEL READ	HE LEVEL OF G	ROUNDWATER		CCUR	DUE TO OTHER	FACTOR	RS THAN THOSE P	RESENTA	T THE T	IME
		MEA	SUREMENTS A	RE MADE.									
											BORI	NG NO.	B-201 (D)

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							PRO.	JECT	REPO		Ĝ No.	_	B-201 (D)
	W	esto	n & Sal	mpson			BRA	P-3		SHEET	2		OF 2
		ENG	INEERS.	INC.		F	Roxbu	ry, MA		Project No.		20	0317 A
										CHKD BY			CRM
ORIN	NG Co.	Eath E	xploration (	Geologic)			BOR	ING LOCAT	TION		See attac	hed p	olan
ORE	MAN	Mike N	lartinelli				GRO	UND SURF	ACE E	LEV.			DATUM
ISE (	GEOLO	GIST:	Robert F. B	utier				- START		1/10/2001		END	1/10/2001
AMP	LER:	SAMPLE	RCONSISTS	DF 2" SPLIT S	POON					GROUNDWA	TER REA	DING	S
	IG:	NA	USING A 140 I	D. HAMMER F	ALLING 30 in.			DATE 1/10/2001	NA NA	NA		GAL	NA
ASIN	G SIZE:	NA	, <u></u>		OTHER:	3.25	' HSA						
EPTH	CASING	N	S/	MPLE	DI OLUGION	PID		SAMPLE	EDESCR		NOTES	STR	ATUM DESCRIPTION
feet)	(ID/ft)	NO	PEN/REC (in)	DEPTH (ft)	BLOWS/6"	(ppm)	├──	Burmiste	er Class	ification	┦──┤		
							1						
													FILL
14		S-5	24/22	14-16	9-8	<0.2	14'-1: 15-15	5' Same as S 5' Wet, dark ve	i-4. Mawish h	rown (.) fine			
					14-6	0.2	to (-)c	oarse SAND, t	race fine	Gravel and Silt.	1 1		SAND
							15.5-	16' Wet, bluis	sh gray	CLAYEY SILT,	[		CLAYEY SILT
16 -		S-6	24/10	16-18	12-14	0.6	trace Wet	fine to medit bluish grav	um Sani I. CLAN	i. 7. trace Silt.			
					10-10		Sma	il pieces of	peat fil	pers at 16'.			
							]						CLAY
18 –		S-7	24/0	18-20	5-6	<02	Nore	ecoVerv					
					6-4								
20 –		S-8	24/20	20-22	1-1	0.2	Mois	t. brownish	PEAT	little Silt.			
					5-5		]	.,					
							]						PEAT
22 –		S-9	24/15	22-24	4-5	<0.2	Mois	t. brownish	PFAT	little Silt.			
					6-6		1	., 2.0					
							]						
24 —							-						FOB at 24.0 ft
							1						
							1						
	GRAN	JLAR S	SOILS	COHESI	L VE SOILS	REN	IARKS	S:					
BLC	WS/FT	0	ENSITY	BLOWS/FT	DENSITY	1							
	0-4	V.	LOOSE	0-2	V. SOFT								
1	0-30	м.	DENSE	4-8	M. STIFF								
3	0-50	[	DENSE	8-15	STIFF								
>	• 50	V.	DENSE	15-30	V. STIFF								
OTES	6:	1) THE	STRATIFICATIO	LINES REPRI	SENT THE AP		ATE BO	UNDARY BETV	VEEN SO	L TYPES. TRANSIT	ONS MAY R	E GRAF	DUAL.
		2) WAT	ER LEVEL READ	INGS HAVE BE	EN MADE IN T	HE DRIL	LHOLE	S AT TIMES AN	DUNDER	CONDITIONS STAT	ED ON THIS	BORIN	G LOG.
		FLUG	CTUATIONS IN T	HE LEVEL OF	GROUNDWATE	RMAY	OCCUR	DUE TO OTHEF	R FACTO	RS THAN THOSE PR	ESENT AT T	'HE TIM	E
		MEA	SUREMENTS AF	RE MADE.									

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							PROJECT	REPO	RT OF BORIN	G No.		B-202 (S)
	Weston & Sampson ENGINEERS, INC. RING Co. Eath Exploration (Geologic) REMAN Mike Martinelli E GEOLOGIST: Robert F. Butler MPLER: SAMPLER CONSISTS OF 2" SPLIT SPOO						BRA P-3		SHEET	1		OF 1
		ENG	GINEERS,	INC.		R	oxbury, MA		Project No. CHKD BY		20	00317.A
BORIN	NG Co	Eath F	xoloration (	Geologic)			BORING LOCA			See atta	ached	plan
FORE	MAN	Mike M	lartinelli				GROUND SURI	FACE	ELEV.		10,100	DATUM
WSE	GEOLO	GIST:	Robert F. B	utler			DATE START	1	1/11/2001	DATE	END	1/11/2001
SAMP	LER:	SAMPLE	R CONSISTS	OF 2" SPLIT S	POON				GROUNDWAT	FER RE	ADIN	GS
		DRIVEN	USING A 140	Ib. HAMMER F	FALLING 30 in.		DATE	TIME	WATER AT	CASIN	IG AT	STABILIZATION T
CASIN	NG:	NA					1/11/2001		NA	N/	Α	NA
CASIN	IG SIZE:	NA			OTHER:	3.25"	HSA					
DEPTH	CASING		S/	AMPLE		PID	SAMPLE	DESCR		NOTES	ете	
(feet)	(ib/ft)	No.	PEN/REC (in)	DEPTH (ft)	BLOWS/6"	(ppm)	Burmiste	er Class	ification	NUTES	516	CATUM DESCRIPTIC
		S-1	24/8	0-2	7-8	<0.2	Dry, moderate y	ellowis	h brown,			
					6-10		trace fine Grave	SAND	, intie Sin,			
5 -					00.10		<b>D</b>					
		5-2	24/5	5-7	32-10	<0.2	to (-)coarse SAM	ry dark ND littl	prown, (+)fine			FILL
					,0-02		fine Gravel. Pie	ces of	red brick and			
							coal tar/asphalt	presen	it.			
10 -		6.2	24/2	10,12	21-22	<0.2	Mojet moderat		wish brown			SAND
			2412	10-12	45-46	~0.2	fine SAND, som	e yenov ie Silt.	Trace bluish		<u> </u>	SILT
							green CLAY at	tip of sp	000 <b>n</b> .			EOB at 12.0 ft
15 –												
20 –												
25												
25 -				[								
		<u> </u>										
			<u> </u>									
30 -												
			┥───									
			<u> </u>			<del> </del>						
						DEM	ADKO					
BLC	GRAN		DENSITY	BLOWS/FT	DENSITY	IKEW	ARNO:					
	0-4	V.	LOOSE	0-2	V. SOFT	1						
	4-10 0.20			2-4	SOFT							
3	0-30	M.   [	DENSE	8-15	STIFF							
	> 50	V.	DENSE	15-30	V. STIFF							
				> 30	HARD							
NOTES	S:	1) THE S		LINES REPRE	SENT THE APPE		E BOUNDARY BETWE	EN SOIL	TYPES. TRANSITION	NS MAY BE		JAL.
		ZJ WAD	CTUATIONS IN T	HE LEVEL OF G		MAY OC	CUR DUE TO OTHER	FACTORS	STHAN THOSE PRES	SENT AT T	HE TIME	100.
L		MEA	SUREMENTS AR	E MADE.			-					

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							PROJ	IECT	REPO	RT OF BORIN	G No.		B-203 (S)
	<b>W</b>	estol	n & Sai	mpson	1		BRA	P-3		SHEET	1		OF 1
		ENG	INEERS,	INC.		F	Roxbu	ry, MA		Project No.		20	00317.A
										CHKD BY			CRM
BORIN	G Co.	Eath Ex	oploration (	Geologic)			BORI	NG LOCA			See atta	iched	plan
HUREN WSE G	IAN	MIKE M	artinelli Robert F. Bi	utler			GRO	UND SURI	ACE E	LEV. 1/11/2001	DATE	END	_DATUM 1/11/2001
SAMPL	.C.R.	DRIVEN	USING A 140 I	DF 2" SPLIT : b. HAMMER I	SPOON FALLING 30 in			DATE	TIME	WATER AT			STABILIZATION TI
CASIN	G:	NA						1/11/2001	NA.	NA	N/	4	NA
CASING	2 0175-	ΝΔ				3 25"	ЦСЛ					_	· · · · · ·
	ASING				OTRER.	3.23	H3A	CAMPLE	DESCR				
(feet)	(Ib/ft)	No.	PEN/REC (in)	DEPTH (ft)	BLOWS/6"	(ppm)		Burmiste	er Class	ification	NOTES	STR	RATUM DESCRIPTIO
		S-1	24/12	0-2	7-9	<0.2	Moist	, dark yello	wish b	rown, fine to			
					11-14	<u> </u>	Coars	e SAND, li ⊳∣	ttle Silt	, trace fine			
													FILL
5 🕂			0.1/0		0.40					-1. K			
		5-2	24/6	5-7	8-10	<0.2	Moist (+)fin	t, black to v e to (-)coa	rse SAI	rk brown, ND. some Silt			
							trace	fine Grave	I. Piec	es of red			
							brick	and coal ta	ar/asph	alt present.			
10 +		S-3	24/16	10-12	14-29	<0.2	Moist	t, dark vello	wish b	rown, fine to			SAND
					49-64		coars	e SAND, li	ittle Silt	, trace fine			
							Grav	el.					EOB at 12.0 ft
15							1						
15 +	_						1						
						<u> </u>	-						
							1						
20													
							-						
							1						
			<u></u>				4						
25 -					<u> </u>	+	1						
							1						
							4						
20						+	1						
							1						
							1						
							1						
	COAN			COLLER		DEM		2.			_		
BLOV	VS/FT		ENSITY	BLOWS/FT	DENSITY								
0	-4	V.	LOOSE	0-2	V. SOFT	1							
4- 10	-10 -30	м	DENSE	2-4	SOFT M. STIFF								
30	-50		ENSE	8-15	STIFF								
>	50	<b>  ∨</b> .	DENSE	15-30	V. STIFF					x			
NOTES		1) THE S	TRATIFICATION	LINES REPRE	SENT THE APP	ROXIMA	TE BOU	NDARY BETWE	EN SOIL	TYPES, TRANSITION	NS MAY BF	GRADI	JAL.
		2) WATE		NGS HAVE BE	EN MADE IN TH	EDRILL	HOLES	AT TIMES AND	UNDER	CONDITIONS STATED	ON THIS	BORING	LOG.
		FLUC			ROUNDWATER	MAY O	CCUR DI	JE TO OTHER	FACTORS	S THAN THOSE PRES	SENT AT TH	ie time	
		MEAS	OREMENTS AR	E MADE.							BORI	NG No.	B-203 (S)
										CALLER		11700	

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							PROJ	ECT	REPO	RT OF BORI	NG No.		B-204 (S)
	W	esto	n & Sa	mpson	ł		BRA	P-3		SHEET	1		OF 1
		ENC	GINEERS,	INC.		F	Roxbur	y, MA		Project No.		20	0317.A
										CHKD BY			CRM
BORIN	IG Co.	Eath E	xploration (	Geologic)			BORI	NG LOCA	TION		See atta	ached	plan
FORE		Mike N	Robert F B	utler			GROU	JND SURF		ELEV.			DATUM
								SIANI		0001			1/11/2001
SAMP	LER:	SAMPLE	ER CONSISTS	of 2" split s ID. Hammer f	POON Alling 30 in	L.	ŀ	DATE	TIME	GROUNDWA WATER AT			GS STABILIZATION TI
CASIN	IG:	NA				-	t	1/11/2001	NA	NA	N/	4	NA
CASIN	C SIZE	ΝΔ			OTHER	2 25"	Печ						
DEPTH	CASING				OTHER.	3.25		SAMOLE	DESCRI				
(feet)	(lb/ft)	No.	PEN/REC (in)	DEPTH (ft)	BLOWS/6"	(ppm)		Burmister	r Classi	fication	NOTES	STR	ATUM DESCRIPTIO
		S-1	24/12	0-2	6-9	<0.2	Dry, n	noderate y	ellowis	h brown,			
					11-11		(+)fine Silt_tr	e to (-)coar ace fine G	'se SAI ravel	ND, little			EU I
									lavel.				
5 -		<u> </u>	0.415				1	14 1 1	-				
		5-2	24/8	5-7	5-7 18-11	<0.2	Moist, (+)fine	black to v	ery dai	rk brown, ND. little Silt			
							trace	fine Grave	I. Piec	es of red			
1							brick a	and coal ta	ar/asph	alt present.			
10 -		S-3	24/24	10-12	1-1	<0.2	Moist.	olive blac	k, CLA	YEY SILT.			AL AVEN AN -
					1-1		with tr	aces of pe	at fibe	rş.			CLAYEY SIL1
						<u> </u>							EOB at 12.0 ft
15							1						
19 –							1						
							-						
											1		
20 _													
							-						
							1						
							-						
25 -							1						
							1						
							-						
30							1						
50 -							-						
		<b> </b>				-	1						
							1						
	GRANI		SOILS	COHESI		REM	IARKS	:					
BLO	WS/FT		DENSITY	BLOWS/FT	DENSITY								
	0-4	V	LOOSE	0-2	V. SOFT								
4		м	DENSE	2-4 4-8	M. STIFF	;							
3	0-50		DENSE	8-15	STIFF								
>	> 50	<b>∨</b> .	DENSE	15-30	V. STIFF								
NOTES	S:	1) THE	STRATIFICATION	LINES REPRE	SENT THE APP	ROXIMA	TE BOUN	OARY BETWE	EN SOIL	TYPES. TRANSITIC	NS MAY B	E GRAD	UAL.
		2) WAT		INGS HAVE BEE	N MADE IN TH	E DRILL	HOLES A	T TIMES AND	UNDER C	CONDITIONS STATE	D ON THIS	BORING	G LOG.
		FLU	CTUATIONS IN T	HE LEVEL OF G	ROUNDWATER	R MAY OC	CCUR DU	E TO OTHER I	FACTORS	S THAN THOSE PRE	ESENT AT 1	THE TIMI	E
		MEA	oonement o An								BORIN	IG No.	B-204 (S)

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Weston & Sampson ENGINEERS, INC.     BRA P-3 Robury, MA     SHEET     1     OF     1       ORING Co.     Eath Exploration (Geologic)     BORING LOCATION     See attached plan     OATUM       OREMAN     Mile Mantinelli     GROUND SURFACE ELEX.     DATUM     DATUM       VSE GEOLOGIST:     Robert F. Butler     DATE START     L111/2001     DATE END     DATUM       AMMLER:     SAMPLE CONSISTS OF 2' SPLT SPCON     DATE START     CASING TO A 140 b. HAMMER FALLING 50 in.     In11/2001     NA     NA     NA     NA       EPTH CASING     SAMPLE     SAMPLE CONSISTS OF 2' SPLT SPCON     GROUND/WATCER READINGS     In11/2001     NA     NA     NA     NA       PH     SAMPLE CONSISTS OF 2' SPLT SPCON     GRADUATION (START CONSISTS OF 2' SPLT SPCON)     In11/2001     NA     NA     NA       AMMLER Consists of a system spectra of the splat s		-					PRO.	JECT	REPO	RT OF BORING	No.		B-205 (S)
ENGINEERS, INC.     Roxbury, MA     Project No. CHKD BY     200317.A CRM       JORING Co.     Eath Exploration (Geologic) OREMAN     BORING LOCATION     See attached plan       JORING TOREARD, Mike Matinelii     GROUND SURFACE ELEV.     DATUM       VBE GEOLOGIST:     Robert F. Butler     DATE     DATUM       JAMPLER:     SAMPLE CONSISTS OF 2" SPUT SPOON DRIVEN USING A 140 b. HAMMER FALLING 36 in.     A     NA     NA       ASING SIZE:     NA     OTHER:     3.25" HSA     Intel WATER AT CASING A 140 b. HAMMER FALLING 36 in.       ASING SIZE:     NA     OTHER:     3.25" HSA     Intel WATER AT CASING A 140 b. HAMMER FALLING 36 in.       ASING SIZE:     NA     OTHER:     3.25" HSA     Intel WATER AT CASING A 140 b. HAMMER FALLING 36 in.       ASING SIZE:     NA     OTHER:     3.25" HSA     Intel Consoler       BEDWEN USING A 140 b. HAMMER FALLING 36 in.     SAMPLE DESCRIPTION     Notes     STRATUM DESCRIPT       Web (into 10)     FEMAL     CASING A 140 b. HAMMER FALLING 36 in.     FILL     SAMPLE DESCRIPTION       10     SAMPLE CONSOLVER (Intel A 16 COZ DV)     DOZ DV, RUSS (Intel A 16 COZ DV)     DOZ DV, RUSS (Intel A 16 COZ DV)     F	И	'esto	n & Sa	mpson	1		BRA	P-3		SHEET	1		OF 1
DRING Co. Eath Exploration (Geologic) BORING LOCATION See attached plan   OREMAN Mike Matinelli GROUND SURFACE ELEV. DATUM   VBE GEOLOGIST: Robert F: Butter DATE START 1/11/2001   DATUM DATE START 1/11/2001   SAMPLER: SAMPLE CONSISTS OF 2' SPLIT SPOON GROUND SURFACE ELEV. DATE START   DRIVEN USING A 140 b. HAMMER FALLING 39 in. AASING: NA NA   ASING: NA NA NA NA   ASING: NA OTHER: 3.25' HSA Intel Watter AT CASING A 140 b. HAMMER FALLING 39 in.   ASING: NA SAMPLE DESCRIPTION BORWS USING 10 CPTH (II) BORWS USING 10 CPTH (II) BORWS USING 10 CPTH (II) SAMPLE DESCRIPTION   Berged (edit) No PENREC (III) DEPTH (III) BORWS USING 10 CPTH (III) BORWS USING 10 CPTH (IIII) SAMPLE DESCRIPTION   2 S-2 12/8 2.3 14-16 402 (Dr), dight yellowish brown (-)fine to (-)coarse SAND, title Sit, trace fine Gravel. FilL   4 S-2 14-16 402 (Dr), dight yellowish brown, (-)fine to (-)coarse SAND trace Sit & fine Gravel. FilL   10 S-2 12/8 2.0 Dr), dight yellowish brown, (-)fine to (-)coarse SAND trace Sit & fine Gravel. EOB at 5.		ENG	GINEERS,	INC.		F	Roxbu	ry, MA		Project No. CHKD BY		20	0317.A CRM
OREMAN     Mike Marinelit     ORALL     GROUND SURFACE ELEV.     DATE END     I/1/12001       VSE GEOLOGIST:     Robert F. Butler     DATE START     1/1/12001     DATE END     1/1/12001       MMPLER:     SamPLer Consists of 2: SPUT SPOON DRIVEN USING A 140 Ib HAMMER FALLING 30 Ib.     GROUNDWATER READINGS     GROUNDWATER READINGS       ASING SIZE:     NA     OTHER:     3.25" HSA     I/1/12001     NA     NA     NA       ASING SIZE:     NA     OTHER:     3.25" HSA     I/1/12001     NA     NA     NA       ASING SIZE:     NA     OTHER:     3.25" HSA     I/1/12001     NA     NA     NA       ASING SIZE:     NA     OTHER:     3.25" HSA     I/1/12001     NOTES     STRATUM DESCRIPTION       Burnister Classification     NOTES     SAMPLE DESCRIPTION     Burnister Classification     NOTES     STRATUM DESCRIPTION       2     S-2     1/2/6     2.3     1/4-16     0.2     Dry, light yellowish brown (+)fine to (-)coarse       3     SAMPLE     SAMPLE DESCRIPTION     Burnister Classification     FILL     EOB at 5.0 ft <	ORING Co.	Eath E	xploration (	Geologic)			BOR	ING LOCA	<b>FION</b>	S	ee attac	hed p	lan
SEE GEOLOGIST:   Robert F. Butler   DATE START   1/11/2001   DATE END   1/11/2001     AMPLER:   SAMPLER CONSISTS OF 2' SPLIT SPOON BRUKEN USING A 140 b. HAMMER FALLING 30 in.   Image: Construct of 2' SPLIT SPOON ASING:   Image: Construct of 2' SPLIT SPOON BRUKEN USING A 140 b. HAMMER FALLING 30 in.     ASING SIZE:   NA   OTHER:   3.25" HSA   Image: Construct of 2' SPLIT SPOON BRUKEN USING A 140 b. HAMMER FALLING 30 in.     ASING SIZE:   NA   OTHER:   3.25" HSA   Image: Construct of 2' SPLIT SPOON BRUKEN Classification   Notes   STRATUM DESCRIPTION BRUKEN Classification   Notes   STRATUM DESCRIPTION Plot SAMPLE Classification     2   S-1   24/18   O-2   14-18   40.2   Dry, dark brown, (+)fine to (-)coarse SAND, titte Stit, trace fine Gravel, Ploces of red brick present.   FILL     2   S-2   12/8   2-3   14-18   40.2   Dry, light yellowish brown (+)fine to (-)coarse SAND, titte Stit, trace Sit & fine Gravel, trace SAND, titte Stit, trace Sit & fine Gravel, trace Sit and red brick.   FILL     4   S-3   24/12   3-5   10.7   Sit and red brick.   EOB at 5.0 ft     12   Sit STIFF   SOUST   DENSY   DENSY   DENSY   DENSY   DENSY     4   Sit S	OREMAN	Mike N	lartinelli				GRO	UND SURF	ACE E	ELEV.			DATUM
AMPLER:     SAMPLER CONSISTS OF 2: SPLIT SPOON DRIVEN USING A 140 b. HAMMER FALLING 30 in. ASING:     GROUNDWATER READINGS       ASING:     NA     NA     NA     NA     NA     NA       ASING:     NA     OTHER:     3.25" HSA     Image: State 100 to the state 100 tothe state 100 to the state 100 tothe state 100 to the state 100 t	SE GEOLO	GIST:	Robert F. B	lutler			DATE	E START		1/11/2001	DATE	ENĎ	1/11/2001
DRIVEN USING A 140 b. HAMMER FALLING 30 in.     DATE     TWE     WATER AT     CASING A 140 b. HAMMER FALLING 30 in.       ASING SIZE: NA	AMPLER:	SAMPLI	ER CONSISTS	OF 2" SPLIT S	SPOON					GROUNDWAT	ER REA	DING	s
ASING:     NA     NA     NA     NA     NA       ASING SIZE:     NA     OTHER:     3.25" HSA     Integration     Notes     STRATUM DESCRIP       PENT CASING     SAMPLE     SAMPLE     DIVIDING     SAMPLE     DIVIDING     Notes     STRATUM DESCRIP       PENT CASING     S-1     24/18     0-2     14-16     402     Dividing the brown (+) fine to (-) coarse     SAMPLE     SAMPLE DESCRIPTION     Notes     STRATUM DESCRIP       Pieces of red brick present.     -		DRIVEN	USING A 140	Ib. HAMMER F	ALLING 30 in			DATE	TIME	WATER AT	CASIN	GAT	STABILIZATION
ASING SIZE: NA OTHER: 3.25" HSA OTHER: 3	ASING:	NA						1/11/2001	NA	NA	NA	4	NA
NSING SIZE: NA     OTHER:     3.25 TISA       WAINTO SIZE: NA     OTHER:     0.0     NOTES     STRATUM DESCRIPTION       eeti (bth)     No.     PENREC (n)     DEPTH (n)     BLOWSIFF (perm)     Burnister Classification     NOTES     STRATUM DESCRIPTION       eeti (bth)     S-1     24/18     0-2     14-16     <0.2						0.05							
EPTH CASING     SAMPLE     PD     SAMPLE     PD     SAMPLE     PD     SAMPLE DESCRIPTION     NOTES     STRATUM DESCRIP       0     0.017     No.     PENERCION     DEPTH (N. 100WSR)     Open Burnister Classification     NOTES     STRATUM DESCRIP       2     -     1.24/18     O-2     14.16     <0.2	ASING SIZE				OTHER:	3.25	HSA						
Bern (ind)     No.     PENREC (iff)     DEPTRING     BUTWEST (iff)     DEVENTION       1     1     24/18     0-2     14-16     <02		-	S.		D1 014/0 /01	PID		SAMPL	E DESC		NOTES	STR	ATUM DESCRIPTI
Image: Section of the section of th		S-1	24/18	0-2	14-16	(ppm) <0.2	Dry	dark brown	(+)fine	sincation			
Pieces of red brick present. Pieces		⊢ <u> </u>			12-10		SAN	D, little Silt.	trace f	ine Gravel.			
2   S-2   12/8   2-3   14-18   <0.2			<u> </u>				Piece	es of red bri	ck pres	sent.			
S-2   12/8   2-3   14-18   <0.2 [Dry, light yellowish brown (s) fine to (-)coarsel SAND, trace Silt & fine Gravel with red brick	2												
SAND, trace Sill & time Gravel with red brick SAND, trace Sill & time Gravel, trace Sill and red brick. Sill and red brick. EOB at 5.0 ft EOB at 5.0 ft EOB at 5.0 ft		<u>S-2</u>	12/8	2-3	14-18	<0.2	Dry, li	ight yellowis	h brown	(+)fine to (-)coarse			FILL
CONSTRUCTION OF A CONSTRU		9.3	24/12	3.5	40-43	<0.2	ISANE	), trace Silt 8 light vellowing	k fine G	ravel with red brick			
CONTROL AND AND AND AND AND AND AND AND AND AND	.		24/12	3-5	30-31	<u> ~0.2</u>	(-)co:	arse SAND	little fi	ne Gravel trace			
GRANULAR SOILS COHESIVE SOILS GRANULAR SOILS COHESIVE COHESIVE SOILS COHESIVE SOILS COHESIVE SOILS COHESIVE SOILS COHESIVE SOILS COHESIVE SOILS COHESIVE SOILS COHESIVE SOILS COHESIVE SOILS COHESIVE SOILS COHESIVE SOILS COHESIVE SOILS COHESIVE SOILS COHESIVE SOILS COHESIVE COHESIVE COHESIVE COHESIVE COHESIVE COHESIVE COHESIVE COHESIVE COHESIVE COHESIVE COHESIVE COHESIVE COHESIVE COHESIVE COHESIVE COHESIVE COHESIVE COHESIVE COHESIVE	4 +						Silt a	nd red brick	(.				
GRANULAR SOILS COHESIVE SOILS GRANULAR SOILS COHESIVE SOILS GRANULAR SOILS COHESIVE COHESIVE COHESIVE SOILS COHESIVE COHESIV							1						
6   Image: Construction of the structure of the													EOB at 5.0 ft
A A	6 🕂												
B GRANULAR SOILS COHESIVE SOILS REMARKS: BLOWS/FT DENSITY BLOWS/FT							4						
B GRANULAR SOILS COHESIVE SOILS GRANULAR SOILS COHESIVE COHESIVE SOILS COHESIVE COHE		<u> </u>					1						
O   GRANULAR SOILS   COHESIVE SOILS     I2   III   IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	e						1						
Image: Image:	° <del> </del>						]						
0   Image: Content of the second se		<u> </u>				<u> </u>	-						
0   Image: Content of the second se							{						
Image: Second State State   Image: Second State   Image: Second State   Image: Second State     Image: Second State   Image: Second State   Image: Second State   Image: Second State   Image: Second State     Image: Second State   Image: Second State   Image: Second State   Image: Second State   Image: Second State   Image: Second State     Image: Second State	10 -			<u></u>	· · · · · ·		1						
12   Image: Comparison of the service					· · ·		1						
I2   GRANULAR SOILS   COHESIVE SOILS   REMARKS:     BLOWS/FT   DENSITY   BLOWS/FT   DENSITY     0-4   V. LOOSE   0-2   V. SOFT     4-10   LOOSE   2-4   SOFT     10-30   M. DENSE   4-8   M. STIFF     30-50   DENSE   8-15   STIFF     > 50   V. DENSE   15-30   V. STIFF     > 30   HARD   ARD     OTES:   1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.     2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG.     FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.     BORING LOG   FLOCTUATIONS ARE MADE.							]						
GRANULAR SOILS   COHESIVE SOILS     BLOWS/FT   DENSITY     0-4   V. LOOSE     0-4   V. LOOSE     0-4   V. LOOSE     0-4   V. LOOSE     0-50   DENSE     8-15   STIFF     30-50   DENSE     10-30   M. DENSE     8-15   STIFF     30-50   DENSE     15-30   V. STIFF     20   V. DENSE     10-30   M. DENSE     8-15   STIFF     30-50   DENSE     8-15   STIFF     20   V. DENSE     10-30   K. DENSE     8-15   STIFF     30-50   DENSE     20   HARD     OTES:   1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.     2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG.     FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE THE MEADE.     PODINC No   P.205 (I	12	<u> </u>				ļ							
GRANULAR SOILS   COHESIVE SOILS   REMARKS:     BLOWS/FT   DENSITY   BLOWS/FT   DENSITY     0-4   V. LOOSE   0-2   V. SOFT     4-10   LOOSE   2-4   SOFT     10-30   M. DENSE   4-8   M. STIFF     30-50   DENSE   8-15   STIFF     >50   V. DENSE   15-30   V. STIFF     > 50   V. DENSE   15-30   V. STIFF     > 50   V. DENSE   15-30   V. STIFF     > 50   V. DENSE   15-30   V. STIFF     > 00TES:   1) THE STRATE/CATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.     2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG.     FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.     DODING No   THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME     MEASUREMENTS ARE MADE.   DODING NO		⊢			┨		-						
GRANULAR SOILS   COHESIVE SOILS   REMARKS:     BLOWS/FT   DENSITY   BLOWS/FT   DENSITY     0-4   V. LOOSE   0-2   V. SOFT     4-10   LOOSE   2-4   SOFT     10-30   M. DENSE   4-8   M. STIFF     30-50   DENSE   8-15   STIFF     > 50   V. DENSE   15-30   V. STIFF     > 30   HARD   HARD     OTES:   1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.     2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG.     FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.		$\vdash$	l	-			1						
GRANULAR SOILS   COHESIVE SOILS   REMARKS:     BLOWS/FT   DENSITY   BLOWS/FT   DENSITY     0-4   V. LOOSE   0-2   V. SOFT     4-10   LOOSE   2-4   SOFT     10-30   M. DENSE   4-8   M. STIFF     30-50   DENSE   8-15   STIFF     > 50   V. DENSE   15-30   V. STIFF     > 50   V. DENSE   15-30   V. STIFF     > 50   V. DENSE   15-30   V. STIFF     > 50   V. DENSE   15-30   V. STIFF     > 50   V. DENSE   15-30   V. STIFF     > 30   HARD   HARD   DOTES:   1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.     2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG.   FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.     REORING NO.		<b></b>				1	1						
BLOWS/FT   DENSITY   BLOWS/FT   DENSITY     0-4   V. LOOSE   0-2   V. SOFT     4-10   LOOSE   2-4   SOFT     10-30   M. DENSE   4-8   M. STIFF     30-50   DENSE   8-15   STIFF     > 50   V. DENSE   15-30   V. STIFF     > 50   V. DENSE   15-30   V. STIFF     > 30   HARD   HARD     OTES:   1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.     2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG.     FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.	GRAN	ULAR S	SOILS	COHESI	VE SOILS	REM	ARKS	S:					
U-4   V. LOOSE   U-2   V. SOFT     4-10   LOOSE   2-4   SOFT     10-30   M. DENSE   4-8   M. STIFF     30-50   DENSE   8-15   STIFF     > 50   V. DENSE   15-30   V. STIFF     > 50   V. DENSE   15-30   V. STIFF     > 30   HARD   30   HARD     OTES:   1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.   2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG.     FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.	BLOWS/FT	(		BLOWS/FT	DENSITY	4							
10-30   M. DENSE   2-4   SOFT     10-30   M. DENSE   4-8   M. STIFF     30-50   DENSE   8-15   STIFF     > 50   V. DENSE   15-30   V. STIFF     > 30   HARD     OTES:   1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.     2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG.     FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.	0-4		LOOSE	0-2	V. SOFT								
30-50   DENSE   8-15   STIFF     > 50   V. DENSE   15-30   V. STIFF     > 30   HARD     OTES:   1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.     2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG.     FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.	10-30	M	DENSE	4-8	M. STIFF								
> 50   V. DENSE   15-30   V. STIFF     > 30   HARD     OTES:   1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.     2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.	30-50		DENSE	8-15	STIFF								
OTES:   1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.     (OTES:   1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.     (2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG.     FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.	> 50	V.	DENSE	15-30	V. STIFF								
OTES: 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL. 2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.				> 30	HARD								
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE. RODING No. R. 2005 (1)	IOTES:	1) THE		N LINES REPRES	SENT THE APPR				EN SOIL 1	TYPES. TRANSITIONS N	AAY BE GR	ADUAL.	<u>_</u>
MEASUREMENTS ARE MADE.		2) WAT	ER LEVEL READ	HE LEVEL OF G	ROUNDWATER	MAY OF			ACTORS	THAN THOSE PRESEN		ang LQ IME	<b>b</b> .
ROPING No. R-205 (		MEA	SUREMENTS AR	RE MADE.									
BORING NO. B-203 (											BORIN	IG No.	B-205 (S

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							PRO.	JECT	REPO	RT OF BORI	NG No.		B-206 (S)
	Ŵ	'esto	n & Sa	mpson			BRA	P-3		SHEET	1		OF 1
	-	ENC	SINEERS.	INC.		F	Roxbu	ry, MA		Project No.		20	0317.A
			· · · · · · · · · · · · · · · · · · ·							CHKD BY			CRM
BORII	NG Co.	Eath E	xploration (	Geologic)			BOR	ING LOCA	TION		See atta	ached	plan
ORE	MAN	Mike N	fartinelli				GRO	UND SURF	ACE E	LEV.			DATUM
NSE	GEOLO	GIST:	Robert F. B	utler		_	DATI	ESTART	1/	/11/2001	DATE	END	1/11/2001
SAMP	PLER:	SAMPL	ER CONSISTS	OF 2" SPLIT S	SPOON		-			GROUNDWA	TER RE	ADIN	GS
0400		DRIVEN	USING A 140	Ib. HAMMER I	FALLING 30 ir	<b>n</b> .		DATE	TIME	WATER AT	CASIN	GAT	STABILIZATION TI
JASH	NG;							1/11/2001	NA	NA	N/	4	NA
CASIN	IG SIZE:	NA			OTHER:	3.25"	HSA						
EPTH	CASING	Г	S			PID	<u> </u>	SAMPLE	DESCRI	PTION		0.70	
(feet)	(lb/ft)	No.	PEN/REC (in)	DEPTH (ft)	BLOWS/6"	(ppm)		Burmiste	r Classif	ication	NOTES	STR	ATUM DESCRIPTION
		S-1	24/18	0-2	6-10	<0.2	Dry,	dark brown	, (+)fine	to (-)coarse			
					11-11		SAN	D, little Silt,	trace fi	ine Gravel.			
							Fiece	es of red br	ick pres	SEII(,			FILL
2		S-2	12/6	2-3	11-9	<0.2	Sam	e as S-1.					
		<u>S-3</u>	24/4	3-5	12-13	<0.2	Sam	e as S-1.					
4 —					33-40		1						
		<u> </u>	·				1						
							1				1 1		EOB at 5.0 ft
6 —				<u>.</u>	<u> </u>								
			<u></u>			<del> </del>	ł						
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10			r				1						
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		<b> </b>					4						
						+	1						
12 –		+				1	1						
							1						
							1						
4	I GRAN	ULAR S	J SOILS	COHEST	L VE SOILS	REM	ARK	S:					
BLC	DWS/FT	(	DENSITY	BLOWS/FT	DENSITY								
	0-4	V.	LOOSE	0-2	V. SOFT	1							
4	4-10 0-30			2-4	SOFT								
3	0-50		DENSE	8-15	STIFF								
;	> 50	v.	DENSE	15-30	V. STIFF								
				> 30	HARD								
NOTE	S:	1) THE	STRATIFICATION	N LINES REPRE	SENT THE APP	ROXIM	ATE BO	UNOARY BETW	EEN SOIL	TYPES, TRANSI	TIONS MAY	BEGR	ADUAL.
		2) WAT	ER LEVEL READ	INGS HAVE BEI			HOLES			CONDITIONS STA	RESENT A	IS BOR	ING LOG.
		MEA	SUREMENTS AF	REMADE.			JUURI		- AUTUR				
											BORIN	IG No.	B-206 (S)

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		-					PRO	JECT	REPO	RT OF BORIN	IG No.		B-207 (S)
	Ŵ	esto	n & Sal	mpson	1		BRA	P-3		SHEET	1		OF 1
		ENG	SINEERS.	INC.		F	loxbu	ry, MA		Project No.		20	00317 A
										CHKD BY			CRM
ORIN	IG Co.	Eath E	xploration (	Geologic)			BOR	ING LOCAT			See atta	ached	l plan
ORE	MAN	Mike N	lartinelli				GRO	UND SURF	ACE E	LEV.			DATUM
VSEC	SEOLO	GIST:	Robert F. B	utler			DATE	E START	1	/10/2001	DATE	END	1/10/2001
AMPI	LER:	SAMPLE	ER CONSISTS	OF 2" SPLIT :	SPOON					GROUNDWA	TER RE		IGS
		DRIVEN	USING A 140	Ib. HAMMER	FALLING 30 ir	1.		DATE	TIME	WATER AT	CASIN	G AT	STABILIZATION TIM
AOIN	IG.							1/10/2001	IN/A		N/	4	<u>NA</u>
ASIN	G SIZE:	NA			OTHER:	3.25"	HSA						
EPTH	CASING		S/	MPLE		PID		SAMPLE	DESCRI	PTION	NOTES	STE	
feet)	(lb/ft)	No.	PEN/REC (in)	DEPTH (ft)	BLOWS/6"	(ppm)	L	Burmister	Classi	fication		0.1	
		<u> </u>	24/18	0-2	12-16	<0.2	Dry,	dark brown.	, (+)fin	e to (-)coarse			
					14-18	-	SAN	D, little Silt,	trace t	ine Gravel.			
							Fiece	es or red bri	ck pre	sent.			EII I
2 +		S-2	12/8	2-3	14-18	<0.2	Sam	e as S-1					▮╵┃┡┡
		<u> </u>				0.2							
		S-3	24/10	3-5	47-53	<0.2	Sam	e as S-1.			1 1		
₄ ⊥					33-35						1 1		
·													
		L		<u>-</u>		<u> </u>						_	500 -4 5 0 A
													EOB at 5.0 ft
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10 -+					·····	<u> </u>	1						
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		<u> </u>					1						
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	GRAN	JLAR S	SOILS	COHESI	VE SOILS	REM	ARKS	S:					
BLO	VVS/FT	<u> </u> , <sup>-</sup>		BLOWS/FT		-							
4	-10		_00SE	2-4	SOFT								
10	)-30	м.	DENSE	4-8	M. STIFF	[							
30	)-50	(	DENSE	8-15	STIFF								
>	50	V.	DENSE	15-30	V. STIFF								
				> 30	HARD								
OTES	61	1) THE	STRATIFICATION	LINES REPRE	SENT THE APP	ROXIM	TE BOL	JNDARY BETW	EEN SOI	TYPES. TRANSIT	IONS MAY	BEGR	
		2) WAT	ER LEVEL READ				COURT			CONDITIONS STAT	ED ON TH	115 BOF T T⊔⊏ T	ang LOG. IME
		MEA	SUREMENTS AF	RE MADE.				JUE TO OTHER		o man muae Pi	COENT A		
											BORIN	IG No.	B-207 (S)
	_												

						<u> </u>	PROJ	ECT	REPO	ORT OF BORI	ING No.		B-208
	W	estol	n & Sai	mpson			BRA	P-3		SHEET	1		OF 1
		ENG	INEERS,	INC.		R	oxbur	y, MA		Project No. CHKD BY		20	0317.A AMW
BORI	NG Co. MAN	Earth E Derek M	xploration S Makudera	Services			BOR	ING LOC	ATION	ELEV.	See att	ached	plan DATUM
WSE	GEOLO	GIST:	Len Rappol	i			DATE	E START	9	9/5/2001	DATE	END	9/5/2001
SAMF	PLER:	SAMPLER C	CONSISTS OF 2" S	PLIT SPOON						GROUNDW	ATER R	EADI	NGS
~ . ~ .		DRIVEN US	ING A 300 Ib. HAM	MER FALLING 30	in,			DATE	TIME	WATER AT	CASIN	G AT	STABILIZATION T
ÇASII	NG:	N/A											
CASIN	G SIZE:	N/A			OTHER:	4.25"	HSA				<u> </u>		
DEPTH	CASING		SA	AMPLE		PID		SAMPLE	DESCR	IPTION	NOTES	et o	
(feet)	(lb/ft)	No.	PEN/REC (in)	DEPTH (ft)	BLOWS/6"	(ppm)		Burmiste	r Classi	fication	NOTES	518	
		S-1	24/15	0-2	1-2	21	Dark I	brown SILT	F, little fi	ine to coarse			
					4-3		and/o	r Wood Ch	r, Glass lips	s, olay, Asir			
5-			0.1115										
		<u>- S-2</u>	24/12	5-7	3-5	0.6	Dark	orown SILT Jittle Brick	i , little fi . Glass	Ine to coarse Slag, Ash			URBAN FILL
							and/o	r Wood Ch	nips				
							1						
10		6.2	24/14	10.12	<u>R 11</u>	<0.2	Brown		fine to				
		-0-0	24/14	10-12	13-13	NU.2	trace	fine Grave	I, trace	Brick, Glass,			
							Slag,	Ash and/o	r Wood	Chips			EOB at 12.0 ft
	1												
15-							-						
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	0.5.1.1		0".0	001170									
BLC	GRAN					REM	IARKS	5:					
	0-4	1 V.	LOOSE	0-2	V. SOFT	1							
	4-10		OOSE	2-4	SOFT								
1	0-30 10-50	M.   D	DENSE	4-8	M. STIFF								
3	> 50	v.	DENSE	15-30	V. STIFF								
				> 30	HARD								
NOTE	S:	1) THE S			SENT THE APP			NOARY BET		DIL TYPES. TRAN	SITIONS M	AY BE C	SRAOUAL.
		FLUC	TUATIONS IN T	HE LEVEL OF G	ROUNDWATER			UE TO OTHE	ER FACTO	ORS THAN THOSE	PRESEN		E TIME
1		MEAS	UREMENTS AR	E MADE.									
1											BORIN	IG No.	B-208

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						F	ROJECT	REPO	RT OF BORI	NG No.	B-209
	W	estol	n & Sar	npson		-	BRA P-3		SHEET	1	OF 1
		ENG	INEERS,	INC.		R	oxbury, MA		Project No. CHKD BY		200317.A AMW
BORIN	NG Co. MAN	Earth E Derek M	xploration S Makudera	ervices			BORING LOC	ATION	ELEV.	See att	ached plan DATUM
NSE (	GEOLO	GIST:	Len Rappoli				DATE START	9	/5/2001	DATE	END 9/5/2001
SAMP	LER:	SAMPLER C	CONSISTS OF 2 SI	PLIT SPOON					GROUNDWA	TER R	EADINGS
	IG:	DRIVEN US	ING A 300 Ib. HAMI	MER FALLING 30	in.		9/5/2001	12:40	11.5 ft	N/	A
CASIN	G SIZE:	N/A			OTHER:	4.25"	HSA SAMPLE	05600			
(feet)	(lb/ft)	No.	SA PEN/REC (in)	DEPTH (ft)	BLOWS/6"	(ppm)	Burmiste	er Classi	fication	NOTES	STRATUM DESCRIPTIO
	(12)11/	S-1	24/12	0-2	3-3	<0.2	1-2': Dark brown	n SILT a	nd fine to		
l		<b> </b>			3-5		coarse GRAVEI	L; 2-3': L SAND. ti	ight brown race Brick.		
		- +					Glass, Slag, As	h and/or	Wood Chips.		UNDAN FILL
5-		S-2	24/8	4-6	2-3	<0.2	4-8': Light brow	n to gray	SILT, some		
1			04/10		4-4		fine to coarse S	and, trac ss. Slag	ce fine Gravel, Ash and/or		
		8-3	24/12	0-0	10-13	2.4	Wood Chips	50, Olag,	,		
		<u>S-4</u>	24/0	8-10	10-12		No recovery				9.0 ft
10-			0.1112		6-6	-0.5	<b>D</b> . 4		-		
		<u>S-5</u>	24/18	10-12	4-8	<0.2	Dark gray CLA	r and Sli	LT	(1)	CLAY and SILT
											13.0 ft
15-		S-6	24/18	14-16	8-12	<0.2	Dark brown fine	to coars	se SAND and		SAND and GRAVE
				<u> </u>			Tine to coarse G	RAVEL	, trace Sill, wet		EOB at 16.0 ft
				_ <b>.</b>	<u> </u>						
20-		<b>I</b> d			<u> </u>					1	
05				<b>_</b>							1
25-							[			1	l
					<u> </u>						1
30							1			l	
30-											1
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							1			1	l
	0041			0011501		DEL	A DI/O			<u> </u>	L
BIC	WS/FT		ENSITY	BLOWS/ET			ARKS: (1) Faint orga	nics od	or		
	0-4	<u>v.</u>	LOOSE	0-2	V. SOFT	1	Boring B-209	was co	mpleted as m	onitorin	ng well WS-13.
4	4-10 0.20		OOSE	2-4	SOFT						
3	0-30		DENSE	4-8 8-15	STIFF						
>	> 50	V.	DENSE	15-30	V. STIFF	!					
1077		<u> </u>		> 30	HARD						
NOTES	S:	1) THE S		I LINES REPRE	SENT THE APP		TE BOUNDARY BET HOLES AT TIMES A	TWEEN SO	DIL TYPES. TRAN	SITIONS N TATED ON	IAY BE GRADUAL. THIS BORING LOG
l		FLUC	TUATIONS IN T	HE LEVEL OF G	ROUNDWATE	R MAY O	CCUR DUE TO OTH	ER FACTO	DRS THAN THOSE	PRESEN	T AT THE TIME
		MEAS	SUREMENTS AF	E MADE.							10 NI-
1										BORIN	NG ND. <u>B-209</u>

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				_			PROJ	ECT	REPO	RT OF BOR	ING No.	_	B-210	
	Ŵ	esto	n & Sal	moson			BRA	P-3		SHEET	1		OF 1	
		ENG	SINEERS,	INC.		R	oxbur	y, MA		Project No. CHKD BY		20	00317.A AMW	
	IG Co	Farth 8	Exploration S	Services			BOR				See att	acheo	t olan	
ORE	MAN	Derek	Makudera				GRO	UND SUF	RFACE	ELEV.	000 41		DATUM	
VSE G	GEOLO	GIST:	Len Rappol	1			DATE	E START	9/	5/2001	DATEI	END	9/5/200	1
AMP	LER:	SAMPLER	CONSISTS OF 2" S	PLIT SPOON					(	GROUNDW	ATER R	EADI	NGS	
		DRIVEN U	SING A 300 lb. HAM	MER FALLING 30 i	ia.			DATE	TIME	WATER AT	CASIN	<u>G AT</u>	STABILIZATIO	N TI
CASIN	IG:	N/A						9/5/2001	12:40	11.5	N//	4	·	
ASIN	G SIZE:	N/A			OTHER:	4.25"	HSA							
EPTH	CASING		S/			PID		SAMPLE	DESCRI	PTION				
(feet)	(lb/ft)	No.	PEN/REC (in)	DEPTH (ft)	BLOWS/6*	(ppm)		Burmister	r Classif	ication	NOTES	STF	RATUM DESCRI	PTIO
-		S-1	24/12	0-2	2-5	<0.2	Light	to dark bro	wn SILT	, little fine to				
ļ					6-8	<u> </u>	coars	e Sand, littl	le Brick	and Ash				
							4						URBAN FIL	L
_							1							-
٦Ļ		S-2	24/10	5-7	5-6	<0.2	Brown	n SILT, son	ne fine te	o coarse				
					2-2		Sand	, little Brick	and Asł	1				
		<u> </u>				<u> </u>	{				1			
10					·	<u> </u>	1							
10-		S-3	24/14	10-12	5-8	<0.2	10-11	': Brown Si	LT, BRI	CK and			11.0 ft	
ļ					6-6		SLAG	6, some fine	e to coar	se Sand		SI	LT and fine S	AN
							11-12 SAND	l': Light bro	wn SILT	and very fine	1		EOB at 12.0	ft
								, wei			1 1			
<sup>15</sup>							1				1			
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							1.							
	ĞRAN	ULAR S	SOILS	COHESI	VE SOILS	REM	ARKS	S:						
BLO	WS/FT			BLOWS/FT		-								
4	-10		LOOSE	2-4	SOFT	ļ								
10	0-30	м	DENSE	4-8	M. STIFF									
30	0-50		DENSE	8-15	STIFF	1								
>	50	V.	DENSE	15-30										
NOTES	}:	1) THE	STRATIFICATION			ROXIMA			VEEN SO	LTYPES TRAN	SITIONS M	AYRE	GRAQUAL	
		2) WAT	ER LEVEL READ	INGS HAVE BE	EN MAGE IN TH	E DRILL	HOLES	AT TIMES AN	ND UNDER	CONDITIONS S	TATED ON	THIS B	ORING LOG.	
		FLU	CTUATIONS IN T	HE LEVEL OF G	ROUNDWATER	R MAY O		UE TO OTHE	R FACTO	RS THAN THOSE	E PRESENT	т ат тн	ETIME	
		FLU	CIUATIONS IN 1	HE LEVEL OF G	ROUNDWATER	T MAT Q	CORE	JUE TO OTHE	IN FACIO	NO I HAN THUSE	- PRESENT	ALTH		

:\Hazwaste\BRA\200317\Logs\[Soil borings 05Sept01.XLS]B21

							PROJ	ECT	REPO	RT OF BOR	NG No.		B-211
	W	esto.	n & Sai	noson			BRA	P-3		SHEET	1		OF 1
		FNG	INFERS	INC			oxhur	v MA		Project No		20	0317 A
			···· <b>·</b> ·· <b>·</b> ·· <b>·</b> ,				en bai	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		CHKD BY			AMW
BORI	NG Co.	Earth E	Exploration S	ervices			BOR	ING LOC	ATION		See att	acheo	d olan
ORE	MAN	Derek	Makudera				GRO	UND SUF	RFACE	ELEV.			DATUM
NSE	GEOLO	GIST:	Len Rappoli	Ì			DATE	E START	9	/5/2001	DATE	END	9/5/2001
SAMF	PLER:	SAMPLER	CONSISTS OF 2" SI	PLIT SPOON						GROUNDW	ATER R	EADI	NGS
		DRIVEN US	SING A 300 Ib. HAMI	MER FALLING 30	in.			DATE	TIME	WATER AT	CASIN	G AT	STABILIZATION T
CASII	NG:	N/A											
CASIN	IG SIZE	N/A				4 25"	HSA						
EPTH						PID		SAMPLE	DESCRI		<u> </u>		
(feet)	(lb/ft)	No.	PEN/REC (in)	DEPTH (ft)	BLOWS/6"	(ppm)		Burmiste	r Classif	ication	NOTES	STF	ATUM DESCRIPTIC
• • • •		S-1	24/12	0-2	1-4	<0.2	0-1.5	: Dark brov	vn SILT,	little fine to	11		•
		<b></b>			4-3		coars	e Gravel, li 1 5 2'i Lio	Ittle Brick	k, Slag and			
		<u> </u>					mediu	um SAND		i very line to			
_							1						
5-		<u>S-2</u>	24/12	5-7	2-6	<0.2	Brow	n to gray S	ILT, sorr	ne Brick and			
					3-4		Ash, 1	race fine to	o coarse	Sand			
		<b></b>											
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	GRAN	ULAR S	SOILS	COHESI	L VE SOILS	REM	ARK	3:					
BLC	DWS/FT		ENSITY	BLOWS/FT	DENSITY	]	Auge	er refusal	at 7.5 fi	t.			
	0-4	V.	LOOSE	0-2	V. SOFT	1	-						
4	4-10 0-20		OOSE	2-4	SOFT								
3	0-30 80-50		DENSE	8-15	STIFF								
:	> 50	v.	DENSE	15-30	V. STIFF								
				> 30	HARD								
NOTE	S:	1) THE \$	STRATIFICATION	LINES REPRE	SENT THE APP	ROXIMA	TE BOU	INDARY BET	WEEN SC	IL TYPES. TRAN	SITIONS M	AY BE (	GRADUAL.
		2) WATE	ER LEVEL REAO	INGS HAVE BEI			HOLES	AT TIMES A		R CONDITIONS S		THIS B	ORING LOG.
		MEA	SUREMENTS AR	E MADE.		K MAY C			ERFACIO	INS THAN THUS	PRESEN	IAITH	E IME
													<b>6</b> 044

					!	PROJ	ECT	REPC	RT OF BOR	NG No.		B·	·212	
Weston & Sampson ENGINEERS, INC.					BRA P-3 Roxbury, MA			SHEET		1		OF	1	
									Project No.		200317.A		,	
		,			.,		,		CHKD BY			AMW		
BORING Co. Earth Exploration Services FOREMAN Derek Makudera				BORING LOCATION GROUND SURFACE ELEV.					See attached plan DATUM					
								ELEV.						
GEOLO	GIST:	Len Rappol	i			DATE	E START	9	9/5/2001	DATE	END		/2001	
SAMPLER: SAMPLER CONSISTS OF 2" SPLIT SPOON								GROUNDW	ATER R	EADI	NGS			
IG:	DRIVEN U	SING A 300 lb. HAM	MER FALLING 30	in.			DATE	TIME	WATER AT	CASIN	GAT	STABILI	ZATION T	
G SIZE:	N/A			OTHER:	4.25"	HSA								
DEPTH CASING		SAMPLE				PID SAMPLE			DESCRIPTION		STF	ATUM DE	SCRIPTIC	
(lb/ft)	<u>No.</u>	PEN/REC (in) 24/10	DEPTH (ft) BLOWS/6"		(ppm)	Brown	Burmiste	er Classi	fication coarse Sand					
	0-1	24/10	<u> </u>	4-3	little Brick and Ash				coarse cana,					
												URBAN	I FILL	
5		24/16	5-7	4-3	<0.2	Brown	n fine to co	ND, little Silt,						
				6-7		little E	Brick and A	sh						
					<u> </u>							9 F	ft	
												CLAY ar	d SILT	
	S-3	24/17	10-12 3-	3-13	<0.2	10-11': Light brown CLAY and SILT					11.0	) ft		
				13-10		11-12 SANE	וי: Brown S א	fine to coarse			SAN FOR at	10 0 ft		
							•					EOB at	12.0 11	
					1									
						1								
						1								
						1								
						1								
						1								
GRANI	JLAR S	SOILS	COHESI	VE SOILS	REM	ARKS	6:			·				
WS/FT			BLOWS/FT	DENSITY	4									
-10	<sup>V.</sup>	LOOSE	2-4	SOFT										
10-30		DENSE	4-8 M. STIFF											
)-50 50		DENSE	8-15	STIFF										
50	<sup>v</sup> .	DENSE	> 30	V. STIFF										
:	1) THE	STRATIFICATION	LINES REPRE	SENT THE APP	ROXIMA	TE BOU	NDARY BET	WEEN \$0	UL TYPES. TRAN	SITIONS M	AY BE G	RADUAL.		
	2) WAT	ER LEVEL READ	NGS HAVE BEE	EN MADE IN TH	E DRILL	HOLES	AT TIMES A	ND UNDE	R CONDITIONS S	TATED ON	THIS BO	ORING LOG	i.	
	FLUC	CTUATIONS IN TH	HE LEVEL OF G	ROUNDWATER	NAY O		UE TO OTHE	ER FACTO	ORS THAN THOSE	PRESENT	AT TH	TIME		
	MEA	SUREMENTS AD	E MADE											
	GRANU GRANU GRANU (Ib/ft) GRANU WS/FT -4 -10 -30 -50 50	VVesto ENC IG Co. Earth MAN Derek FEOLOGIST: LER: SAMPLER DRIVENU IG: N/A G SIZE: N/A CASING (Ib/ft) No. S-1 GSIZE: N/A CASING (Ib/ft) No. S-1 S-2 S-2 S-3 S-3 S-3 S-3 S-3 S-3 S-3 S-3 S-3 S-3	Vestor & Sal ENGINEERS,     IG Co.   Earth Exploration S MAN     Derek Makudera     JEOLOGIST:   Len Rappol     LER:   SAMPLER CONSISTS OF 2''S DRIVEN USING A 300 Ib. HAM     IG:   N/A     G SIZE:   N/A     CASING   S/ (Ib/ft)     No.   PEN/REC (in)     S-1   24/10     S-2   24/16     S-3   24/17     S-3   24/17     S-3   24/17     S-3   24/17     S-3   24/17     S-3   CASING     S-3   CASING     S-3   CASING     S-3   CASING     S-3   CASING     S-3   CASING     S-3   CASING     S-3   CASING     S-3   CASING     S-3   CASING     S-4   V. LOOSE     LOOSE   DENSE     S-50   V. DENSE     S-10   V. DENSE     S-10   V. DENSE     S-10   V. DENSE	Weston & Sampson     ENGINEERS, INC.     IG Co.     Earth Exploration Services     MAN   Derek Makudera     SEOLOGIST: Len Rappoli     LER:   SAMPLE CONSISTS OF 2" SPLIT SPOON DRIVEN USING A 300 Ib. HAMMER FALLING 30     IG:   N/A     GSIZE: N/A     CASING     SAMPLE     (Ib/ft)   No.     PEN/REC (in)     DEPTH (ft)     S-2     S-2     S-2     S-3     S-3     S-3     S-3     S-3     S-3     DENSITY     DENSITY     BLOWS/FT     DENSITY     BLOWS/FT     DENSITY     BLOWS/FT     SAME     Advite Level Readings Have Bee     SO     DENSITY <td col<="" td=""><td>Weston &amp; Sampson ENGINEERS, INC.       IG Co.     Earth Exploration Services MAN     Derek Makudera       SEOLOGIST:     Len Rappoli       LER:     SAMPLER CONSISTS OF 2 SPLIT SPOON DRIVEN USING A 300 Ib. HAMMER FALLING 30 In.       IG:     N/A       G SIZE:     N/A       G SAMPLE     OTHER:       S-1     24/10       0-2     3-5       S-3     24/17       10-12     3-13       S-3     24/17       S-3</td><td>Weston &amp; Sampson ENGINEERS, INC.   R     IG Co.   Earth Exploration Services     MAN   Derek Makudera     SEOLOGIST:   Len Rappoli     LER:   SAMPLE CONSISTS OF 2 SPLIT SPOON DRIVEN USING A 300 B. HAMMER FALLING 30 in.     IG:   N/A     G SIZE:   N/A     G SIZE:   N/A     CASING   SAMPLE     VIDITY   DEPTH (ft)     BLOWSIG:   (ppm)     S-1   24/10   0-2     S-2   24/16   5-7   4-3     S-2   24/17   10-12   3-13   &lt;0.2</td>     S-3   24/17   10-12   3-13   &lt;0.2</td> S-3   24/17   10-12   3-13   <0.2	<td>Weston &amp; Sampson ENGINEERS, INC.       IG Co.     Earth Exploration Services MAN     Derek Makudera       SEOLOGIST:     Len Rappoli       LER:     SAMPLER CONSISTS OF 2 SPLIT SPOON DRIVEN USING A 300 Ib. HAMMER FALLING 30 In.       IG:     N/A       G SIZE:     N/A       G SAMPLE     OTHER:       S-1     24/10       0-2     3-5       S-3     24/17       10-12     3-13       S-3     24/17       S-3</td> <td>Weston &amp; Sampson ENGINEERS, INC.   R     IG Co.   Earth Exploration Services     MAN   Derek Makudera     SEOLOGIST:   Len Rappoli     LER:   SAMPLE CONSISTS OF 2 SPLIT SPOON DRIVEN USING A 300 B. HAMMER FALLING 30 in.     IG:   N/A     G SIZE:   N/A     G SIZE:   N/A     CASING   SAMPLE     VIDITY   DEPTH (ft)     BLOWSIG:   (ppm)     S-1   24/10   0-2     S-2   24/16   5-7   4-3     S-2   24/17   10-12   3-13   &lt;0.2</td> S-3   24/17   10-12   3-13   <0.2	Weston & Sampson ENGINEERS, INC.       IG Co.     Earth Exploration Services MAN     Derek Makudera       SEOLOGIST:     Len Rappoli       LER:     SAMPLER CONSISTS OF 2 SPLIT SPOON DRIVEN USING A 300 Ib. HAMMER FALLING 30 In.       IG:     N/A       G SIZE:     N/A       G SAMPLE     OTHER:       S-1     24/10       0-2     3-5       S-3     24/17       10-12     3-13       S-3     24/17       S-3	Weston & Sampson ENGINEERS, INC.   R     IG Co.   Earth Exploration Services     MAN   Derek Makudera     SEOLOGIST:   Len Rappoli     LER:   SAMPLE CONSISTS OF 2 SPLIT SPOON DRIVEN USING A 300 B. HAMMER FALLING 30 in.     IG:   N/A     G SIZE:   N/A     G SIZE:   N/A     CASING   SAMPLE     VIDITY   DEPTH (ft)     BLOWSIG:   (ppm)     S-1   24/10   0-2     S-2   24/16   5-7   4-3     S-2   24/17   10-12   3-13   <0.2	Weston & Sampson ENGINEERS, INC.   BRA Roxbur     IG Co.   Earth Exploration Services   BOR     IG Co.   Earth Exploration Services   BOR     IG Co.   Earth Exploration Services   BOR     SEOLOGIST:   Len Rappoli   DATE     LER:   SAMPLER CONSISTS OF 2' SPLIT SPOON DRIVEN USING A 300 b. HAMMER FALLING 30 b.   DATE     G SIZE:   N/A   OTHER:   4.25" HSA     CASING   SAMPLEC (in) DEPTH (ft)   BLOWS/6" (pm)   Brown     (Ibft)   No.   PEN/REC (in) DEPTH (ft)   BLOWS/6" (pm)   Ittle E     S-1   24/10   0-2   4-3   Ittle E     S-2   24/16   5-7   4-3   <0.2	Weston & Sampson ENGINEERS, INC. BRA P-3 Roxbury, MA   IG Co. Earth Exploration Services Derek Makudera BORING LOC. GROUND SUB SEOLOGIST: Len Rappoli DATE START   LER: SAMPLE CONSISTS OF 2 SPLT SPOON DERVENUSING A JOB. HAMMER FALLING 30%. DATE START   G SIZE: N/A OTHER: 4.25" HSA   CASING SAMPLE SAMPLE Consists of 2 SPLT SPOON DERVENUSING A JOB. HAMMER FALLING 30%. DATE START   G SIZE: N/A OTHER: 4.25" HSA   CASING SAMPLE SAMPLE PID Burniste Construction ST. JILL Intel Brick and A   S-1 24/10 0-2 3-5   S-2 24/16 5-7 4-3   S-2 24/17 10-12 3-13   S-3 24/17 10-12 3-13   S-3 24/17 10-12 3-13   S-3 24/17 10-12 3-13   SAND SAND SAND   GRANULAR SOILS COHESIVE SOILS REMARKS: REMARKS:   WSFT DENSITY BLOWSFT DENSITY   V. LOOSE 0-2 V. SOFT   10 LOSE 2-2 V. SOFT   10 LOSE 2-2 V. SOFT   10 N. DENSE 8-15 STIFF   20 V. DENSE 15-30	Weston & Sampson ENGINEERS, INC.   BRA P-3 Roxbury, MA   RCPC     BRA P-3 Roxbury, MA   BRA P-3 Roxbury, MA   RCPC     IG Co.   Earth Exploration Services   BORING LOCATION QROUND SURFACE GROUND SURFACE     BEOLOGIST:   Len Rappoli   DATE START   S     LER:   Swelfer Consists of 2 set 1 spoon DRIVE USING A 300 b. HAMMER FALING 30 h.   DATE TIME   S     G SIZE:   N/A   OTHER:   4.25* HSA   DATE   TIME     (b/t)   No   PEN/REC (in DEPTH (ft) BLOWS/et (ppm)   Burnister Classifier Clas	Weston & Sampson ENGINEERS, INC. PROJECT BRA P-3 Roxbury, MA Project No. CHKD BY   IG Co. Earth Exploration Services BORING LOCATION CHKD BY   MAD. Derek Makudera GROUND SURFACE ELEV.   2E0LOGIST: Len Rappoli DATE START 9/5/2001   LER: SAMPLE CONSTST OF 2 PUT SPOON DOWEN USED A 300 b. HAMMER FALUNG 200. GROUND SURFACE ELEV.   GSIZE: N/A OTHER: 4.25" HSA   G SIZE: N/A OTHER: 4.25" HSA   GID: N/A Environmentation Burnister Classification   SAMPLE CONSTST OF 2 PUT (ff) BLOWSRF Derek Classification   GSIZE: N/A OTHER: 4.25" HSA   GSIZE: N/A OTHER: 4.25" HSA   Sample Construction SAMPLE DESCRIPTION Burnister Classification   Sold SAMPLE Environmentation   Sold SAMPLE Description   Sold SAMPLE Time of the coarse SAND, little Sit, little Brick and Ash   SAND SAND SAND   SAND SAND   GRANULAR SOLS COHESIVE SOLLS   GRANULAR SOLS COHESIVE SOLES   GRANULAR SOLS COHESIVE SOLES   GRANULAR SOLS COHESIVE SOLES   GRANULAR SOLS<	Weston & Sampson ENGINEERS, INC. PROBLEM RePORT OF BORNERS.   IS Co. Earth Exploration Services BORING LOCATION SheET 1   YAN Derek Makudera GROUND SURFACE ELEV. GROUND SURFACE ELEV.   SEDLOGIST: Len Rappoli DATE START 9///2001 DATE T   BORING LOCATION See att 9///2001 DATE T   BORNERA 208 - MAMER FALMO 30 n. GROUND SURFACE ELEV. GROUNDWATER R   GS ZE: N/A DATE START 9///2001 DATE T   GROWING A308 - MAMER FALMO 30 n. GROUNDWATER R CASING DATE TIME WATERAT CASIN   GS ZE: N/A OTHER: 4.25 HSA DATE TIME WATERAT CASIN   GS JUNC OTHER: 4.25 HSA DATE TIME WATERAT CASIN NOTES   GS JUNC SAMPLE OTHER: 4.27 HSA DATE TIME WATERAT CASIN NOTES   GS JUNC SAMPLE OTHER: 4.27 HSA DATE TIME WATERAT CASIN NOTES   GROWN SILT SAMPLE DESCRIPTION SAMPLE DESCRIPTION NOTES SAMPLE DESCRIPTION NOTES   GROWN SILT SAMPLE GROWN SILT, WILL BROWN CLAY and SILT SILT WATERAT CASIN SAMPLE SAMPLE   S-3 24/17 10-12 3-13 GOZ SAMPLE	Weston & Sampson ENGINEERS, INC.     PROJECT     PROVING NO.       IG Co.     Earth Exploration Services     BORING LOCATION OCKO BY     SHEET     1 Project No.	Weston & Sampson ENGINEERS, INC.     BRA P.3 Roxbury, MA     CHEVE TO PORTION OF SUMMON.     BRA P.3 Project No.     DOTING NO.     BRA P.3 Roxbury, MA       IG Co.     Earth Exploration Services BORING LOCATION     BORING LOCATION     See attached plan AMM     DATUM       Derek Makudera     GROUND SURFACE ELEV.     DATUM     DATUM       Derek Makudera     GROUND SURFACE ELEV.     DATUM       Derek Makudera     GROUND WATER READINGS     GROUNDWATER READINGS       Derek Makudera     GROUNDWATER READINGS     DATUM       G SIZE: N/A     OTHER:     4.25 HSA       G SIZE: N/A     OTHER:     4.25 HSA       G SIZE: N/A     OTHER:     4.25 HSA       S-1     24/10     0-2     3-5       G SIZE: N/A     OTHER:     4.25 HSA       S-1     24/10     0-2     3-5       G SIZE: N/A     OTHER:     4.25 HSA       S-1     24/10     0-2     3-5       G SIZE: N/A     OTHER:     4.3       URBA     6-7     Hille Brick and Ash       GRANULAR SOILS     COHESIVE SOILS       GRANU



Appendix C-2

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Groundwater Monitoring Well Construction Logs

GROU	JNDWATER MON	ITORING	WELL INSTALL	ATION REPOR	T	
PROJECT NAME/NO.	BRA/EDIC Parcel P-3	/ Job No: 96	MONITORING WELL NO.			
LOCATION	Roxbury, MA		WS - 1			
CLIENT	BRA/EDIC			ELEVATION		
CONTRACTOR	Zoino - Hebert, Inc.	DRILLER	Dave Andersen	TOP OF PVC	· 92.49 *	
OBSERVED BY	Andrew Wise	DATE	Dec. 3, 1996	DEPTH TO GRO	JUNDWATER FROM	
CHECKED BY	Andrew Wise	DATE	Dec. 11, 1996	TOP OF PVC	7.80 '	
CROUND						
		ET LIGH M				
CENERAL SOIL CONDITIONS		FLO3H-IW	DONTED ROADBOX		(GROUND SURFACE	
(NOT TO SCALE)				(5)	10.	
(NOT TO SCALE)			SURFACE SEAL(S)	-(3)	Concrete	
			SURFACE SEAL(S)		Concele	
00.1204 /						
Eine to coome SAND					Adminidan Roadbox	
FILL			TTOM OF CASING		19 *	
10.0 21.0.4 .	4	DEFINE	OTTOM OF CASING		10	
					<b>3</b> •	
Organic SILT and PEAT					Enhadula (A DVC	
04.0 00.0 4		TIPEOF	RISER PIPE		Schedule 40 PVC	
21.0 - 60.0 π, :						
Coarse to Fine SAND/		TYPE OF	BACKFILL AROUND R	ISER PIPE	Native Ful	
GRAVEL						
GLACIAL OUTWASH			OP OF SEAL		3.0*	
	<	TYPE OF	SEAL		Bentonite	
			DITOM OF SEAL/TOP	OF SAND COLUMN	5.0	
	· · · · · ·	DEPTHIC	OP OF SCREEN		7.0	
			000551			
		TYPE OF	SCREEN		Machine-slotted PVC	
	····	SIZE OPE	NINGS		0.010 -	
		ID OF SCI	REEN		2*	
		TYPE OF	BACKFILL AROUND S	CREEN	#1 Silica Sand	
		0.507(1.0)			17.01	
	E. ←	DEPTH B	OTTOM OF SCREEN		17.0	
	a de la construcción de La definicación de la construcción de La definicación de la construcción de la construcción de	DEDTUS		1 15 46 1	<b>*C *</b>	
	<u></u>	DEPTH B	UTTOM OF SAND CO	LOMN	18.0 ·	
			BAOKER L DELOWICE		Notivo Cilli 21 - 21	
	<sup>&lt;</sup> ~−	I TPE OF	BACKFILL BELOW SC	RCEN	Native Pill; 21 - 60	
		DIALETE			<b>/-</b>	
		DEDTUC		F		
	· <	DEPTHB	UTIOM OF BOKEHOL	-C	00.0	
NOTES				MONITOR	NG WELL NO	
	d ou December 5, 1006				NS 1	
Elevation minimum to an article	ru un December 5, 1995.			WESTON	& SAMPSON	
Lievation relative to an aronral	y 100,00 i00i datum.			ENGIN	FFRS INC	
				ENGIN		



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Appendix C-3

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Groundwater Sampling Field Notes

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### **APPENDIX D**

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Hydraulic Gradient and Groundwater Velocity Calculations

 $\left[ \right]$ PROJECT: DATE: PAGE: Weston & Sampson ENGINEERS, INC. 2/20/98 BRAEDIL BY: G.D. Nichtig 9030 A CHKD. BY: BEE 2/27/78 HORIZONTAL HYDRAULL GRADIENTS Lange ( PARCEL P-3 - ( /////// {|| Hydrauin Grudent in SND Portun of P-3, Madison Purk High School Farting hot: AH = 85' contair to 845' contair = 0.5 feet 01 = 220 Peet -Ì Gradient  $(J) = \frac{0.5}{220} = 0.002873 = 0.0023$ ļ Į. Hyproutic Grudient rour Cornolly's Tavern: į AH = 86' contax to 85' contour = 1 foot AL = 50' Gradient (I) = 1/50 = 0.02 A antice · .... . . 

PAGE: DATE: PROJECT: Weston & Sampson 2/20/48 BRG/EDIC ENGINEERS, INC. G.D. NASLAS BY: 90230.A CHKD. BY: / BF 2/27/98 Ŋ GROUNDWOTER CALCULATIONS VELDENTY  $V = \frac{Ki}{n}$ K= Hydraulic Conductivity -assimed value of 2883 ft/day \* Freez + Cherry 1479 U= 0.0023 to 0.02 (Qnocoll, 1989) n= 0.2  $( \$ a for I value of 0.0023 = 0.03255 ft/day 283 × 0.0023 V = = 11.9 H / year 6) for I value of 0.02 9:43 × 0.02 N 2 P D 0 283 ft/day = 103\_4 ft/year. 1

### **APPENDIX E**

Phase II Laboratory Analytical Data Reports

É-1	Soil
E-2	Ground

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1 1 Groundwater

E-3 Surface Soil Appendix E-1

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Soil

Weston & Sampson



111 Herrick Street, Merrimack, NH 03054 TEL: (603) 424-2022 · FAX: (603) 429-8496

Vec'd 9/28/01.

September 24, 2001

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And a second

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Annika Willis Weston & Sampson Engineers 5 Centennial Drive Peabody, MA 019607985 TEL: (978) 532-1900 FAX: (978) 977-0100

RE: 200317.B BRA - PARCEL P3

Order No.: 0109098

Dear Annika Willis:

AMRO Environmental Laboratories Corp. received 2 samples on 9/17/01 for the analyses presented in the following report.

The enclosed results are additional analyses requested after the original report was issued. AMRO operates a Quality Assurance Program which meets or exceeds National Environmental Laboratory Accreditation Conference (NELAC), state, and EPA requirements. A copy of the appropriate state and/or NELAC Certificate is attached.

The enclosed Sample Receipt Checklist details the condition of your sample(s) upon receipt. Please be advised that any unused sample volume and sample extracts will be stored for a period of thirty (30) days from this report date. After this time, AMRO will properly dispose of the remaining sample(s). If you require further analysis, or need the samples held for a longer period, please contact us immediately.

This report consists of a total of  $\square$  pages. This letter is an integral part of your data report. If you have any questions regarding this project in the future, please refer to the Order Number above.

Sincerely,

Van St

Nancy Stewart Vice President / Lab Director

1 LINE A

Date: 24-Sep-01

	CLIENT: Project: Lab Order: Date Received:	Weston & Sampson Engineers 200317.B BRA - PARCEL P3 0109098 9/17/01	Work Order Sample Summary
1	Lab Sample ID	Client Sample ID B-210 5-7	Collection Date
1	0109098-02A	B-211 5-7'	9/5/01

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Date: 24-Sep-01

CLIENT:	Weston & Sampsor	Engineers	(	Client Sample ID:	B-210	5-7'
Lab Order:	0109098					
Project:	200317.B BRA - PA	ARCEL P3		<b>Collection Date:</b>	9/5/01	
Lab ID:	0109098-01A			Matrix:	SOIL	
Analyses		Result	RL Qua	l Units	DF	Date Analyzed
ICP METALS, 1	TCLP LEACHED	SV	V1311/6010B			Analyst: RK
Lead		ND	1.0	mg/L	1	9/20/01 1:49:14 PM

Qualifiers:

ND - Not Detected at the Reporting Limit

- J Analyte detected below quantitation limits
- B Analyte detected in the associated Method Blank
- H Method prescribed holding time exceeded
- S Spike Recovery outside accepted recovery limits
- R RPD outside accepted recovery limits
- E Value above quantitation range
- # See Case Narrative

RL - Reporting Limit; defined as the lowest eoncentration the laboratory can accurately quantitate.

#### Date: 24-Sep-01 AMRO Environmental Laboratories Corp. **CLIENT:** Weston & Sampson Engineers Client Sample ID: B-211 5-7' Lab Order: 0109098 Collection Date: 9/5/01 Project: 200317.B BRA - PARCEL P3 Matrix: SOIL Lab ID: 0109098-02A **RL** Qual Units DF Analyses Result **Date Analyzed** ICP METALS, TCLP LEACHED SW1311/6010B Analyst: RK Lead 8.3 1.0 mg/L 1 9/20/01 1:52:46 PM

Qualifiers:

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ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

H - Method prescribed holding time exceeded

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

# - See Case Narrative

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

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			Matrix	Soil	
	n Engineers	ARCEL P3	Collection Date	9/5/01	
8606010	Weston & Sampsol	200317.B BRA - P	Client Sample ID	B-210 5-7	B-211 5-7
Lab Order:	<b>Client:</b>	Project:	Sample ID	0109098-01A	0109098-02A

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(978) 977-0100

			Amro #0109098
]@₽		From:	
o. Name:	AMRO	Name:	Annika Willis
ddress:	Merrimack, NH	No. of Pages:	(including cover sheet)
		Date/Time:	9-17-01 1:34 pm
ax No.:	603.429.8496	Chargeable No.:	200317.A
ttention:	Denise, Marianne Sheen	Verifying No.:	(978) 532-1900 ext. 2215

BRA P-3 Soil samples 109025

Note: If you did not receive all of the pages or if you have a question, please call the verifying number (above). Remarks:

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Weston & Sampson

ENGINEERS, INC.

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Re:

Please run TCLP-Lead tests for the following soil

| Fax No.:

Samples :

	Sample 1D	-Lab Sample ID
1.	B-210 5-7'	109025-04A
<b>д</b> .	B-211 5-7'	109025-05A

Report the data to me within the stand round time (10 business days). Thank you, Annika

 Water 

 Water 
 Wastewater 
 Transportation 

 Solid Waste 

 Geotechnical 

 Environmen

 Information Technology
 Construction Services
 Landscape Archite

This telecopy transmission and accompanying documents contain information which is confidential and legally privileged, intend dual or entity named on this transmission sheet. If you are not the intended recipient, you are hereby notified that any disclosure, copying, dist n reliance on the contents of this telecopied information is strictly prohibited, and that the documents should be returned to this firm immediate received this telexopy in error, please notify us by telephone immediately at (978) 532-1900 so we can arrange for the return of the original doo 6

Five Centennial Drive

Weston & Sampson Engineers, Inc.

Tel: (978) 532-1900 Fax: (978) 977-0100

FAX TRANSMISSIO

Peabody, Massachusetts 01960-7985 www.westonandsampson.com

Innovative Solutions since 1899

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AMRO Environmental Laboratories Corporation

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## SAMPLE RECEIPT CHECKLIST

111 Herrick Street Merrimack, NH 03054

Hand Del., Other Courier, Other:         Items to be Checked Upon Receipt         1. Army Samples received in individual plastic bags?         2. Custody Seals present?         3. Custody Seals Intact?         4. Air Bill included in folder if received?         5. Is COC included with samples?         6. Is COC signed and dated by client?         7. Laboratory receipt temperature.         Samples rec. with ice ice packs neither         8. Were samples received the same day they were sampled?         Is client temperature 4*C ± 2*C?         If no obtain authorization from the client for the analyses.         Client authorization from:         Date:         Obtained by:         9. Is the COC filled out correctly and completely?         10. Does the info on the COC match the samples?         11. Were samples properly labeled?         12. Were all samples properly preserved?         13. Were all samples properly preserved?         14. Were proper sample containers used?         15. Were the sample volumes sufficient for requested analysis?         16. Were all samples received?         17. Were the sample volumes sufficient for requested analysis?         18. Were all samples received?	Yes			Comments
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# Department of Environmental Protection Division of Environmental Analysis Senator William X. Wall Experiment Station

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### AMRO ENVIRONMENTAL LAB 111 HERRICK ST MERRIMACK, NH 03054-0000

Laboratory Director: Nancy Stewart

for the analysis of NON POTABLE WATER (CHEMISTRY) POTABLE WATER (CHEMISTRY)

pursuant to 310 CMR 42.00

This certificate supersedes all previous Massachusetts certificates issued to this laboratory. The laboratory is regulated by and shall be responsible for being in compliance with Massachusetts regulations at 310 CMR 42.00.

This certificate is valid only when accompanied by the latest dated Certified Parameter List as issued by the Massachusetts D.E.P. Contact the Division of Environmental Analysis to verify the current certification status of the laboratory.

Certification is no guarantee of the validity of the data. This certification is subject to unannounced laboratory inspections.

acar Q. Garcala

Director, Division of Environmental Analysis

Issued: 01 JUL 2001 Expires: 30 JUN 2002

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#### COMMONWEALTH OF MASS ACHUS ETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

#### Certified Parameter List as of: 09 JUL 2001

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July 3, 2001

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AMRO ENVIRONMENTAL LAB MERRIMACK NH

NON POTABLE WATER (CHEMISTRY) Effective 01 JUL 2001 Emiration 30 JUN 2002 Date Date . Analytes and Methods EPA 200.7 NITRATE-N EA 353.2 EPA 200.7 KJELDAHL-N EA 351.1 EFA 204.Z KJELOAHL-N EA 351.2 EA 200.7 ORTHOPHOSPHATE EA 365.2 EPA 206.2 ORTHOPHOSPHATE EA 300.0 ASTM 02972-93(C) TOTAL PHOSPHORUS EPA 365.2 EA 200.7 CHENICAL OXY GEN DEMAND EPA 410.4 EPA 200.7 CHEMICAL OXY GEN DEMAND HACH METHOD S. EPA 200.7 BIOCHEVICAL OXY GEN DEVANO EA 405.1 EA 200.7 TOTAL CYANDE EPA-115.2 NON-FILTERABLE RESIDUE EPA 200.7 EPA 160.2 EA 200.7 TOTAL RESIDUAL CHLORINE SM 4500-CL-G EA 200.7 OL AND GREASE EPA 413.1 8PA 219.2 TOTAL PHENOLICS EPA 420.1 VOLATLE HALOCARBONS EA 200.7 EA 624 EA 245.1 VOLATLE AROMATICS EPA 624 EPA 200.7 CHLORDANE EA 608 ALDRIN EA 200.7 EPA 608 EA 200.7 OUELORIN ERA 608 200 EA 270.2 803 A-3 EPA 200.7 DOT EPA 608 EPA 200.7 HETACHOR . EA 608 EPA 200.7 HETTACHLOR EPOXDE EPA 608 POLY CHLORINATED BIPHENYLS (WATER) EPA 279\_2 EPA 608 EA 200.7 POLY CHLORINA TED BIPHENYLS (OL) EPA 600/4-81-045 EPA 150.1 EA 120.1 TOTAL OSSOLVED SOLLOS EA 160.1

EPA 200.7

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EA 140.2

EA 100.0

EPA 375.4

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EA 310.1 '

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### COMMONWEALTH OF MASS ACHUS ETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

Certified Parameter List as of: 09 JUL 2001

Effective

09 JUL 2001

Excitation 30 JUN 2002

#### M-NH012 AMRO ENVIRONMENTAL LAB

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MERRIMACK NH

### POTABLE WATER (CHEMISTRY)

		Date	Dute	
An	alytes and Methods			
ANTWONY	EPA 200.9			
ARSONC	EA 200.7			
ARSENC	EA 200.9			
ea rum	EPA 200.7	. ·		
BERYLLUM	EPA 200.7	•		
CADMIUM	EPA 200,7			
CHROMILIM	EPA 200.7			
COFPER	EA 200.7	•		
LEAD	EA 200.9			
MERCURY	EPA 245.1			•
NICKE	EA 200.7	1. 1.		
SELENIUM	EA 200.9			
THALLUM	EA 200.9			
NITRATE-N	EPA 353.2			
NITRITEIN	EA 353.2			
FLUORIDE	EPA 300.0			•
FLUCROE	SM 4500-F-E			
SULFATE	EPA 300.0	•		
CYANDE	SM 4500-CN-CE		• • •	
TURBIOITY	- EPA 180.1		· .	
RESIDUAL FREE CHLORINE	SM 4500-CL-G			
CALCUM	EPA 200.7		· . ·	
TOTAL ALKALINITY	SM 23208			
TOTAL DISSOLVED SOLIDS	SM 2540C		· •	
FH .	EPA 150.1	•		
1.2-OBROMOETHANE	E <sup>3</sup> A 504.1			
1.2-DEROMO-3-CHLOROPPOPAN	E EPA 504.1			



111 Herrick Street, Merrimack, NH 03054 TEL: (603) 424-2022 · FAX: (603) 429-8496

September 14, 2001

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rec'd 9/20/01 200317.B

Annika Willis Weston & Sampson Engineers 5 Centennial Drive Peabody, MA 019607985 TEL: (978) 532-1900 FAX: (978) 977-0100

RE: 200317.B BRA - PARCEL P3

Order No.: 0109025

Dear Annika Willis:

AMRO Environmental Laboratories Corp. received 6 samples on 9/6/01 for the analyses presented in the following report.

AMRO operates a Quality Assurance Program which meets or exceeds National Environmental Laboratory Accreditation Conference (NELAC), state, and EPA requirements. A copy of the appropriate state and/or NELAC Certificate is attached.

The enclosed Sample Receipt Checklist details the condition of your sample(s) upon receipt. Please be advised that any unused sample volume and sample extracts will be stored for a period of thirty (30) days from this report date. After this time, AMRO will properly dispose of the remaining sample(s). If you require further analysis, or need the samples held for a longer period, please contact us immediately.

This report consists of a total of  $\underline{14}$  pages. This letter is an integral part of your data report. If you have any questions regarding this project in the future, please refer to the Order Number above.

Sincerely,

Nancy Stewart Vice President / Lab Director

#### AMRO Environmental Laboratories Corp. Date: 14-Sep-01 CLIENT: Weston & Sampson Engineers 200317.B BRA - PARCEL P3 Project: Lab Order: 0109025 Date Received: 9/6/01

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# Work Order Sample Summary

	Lab Sample ID	Client Sample ID	Collection Date
	0109025-01A	B-208 5-7'	9/5/01
	0109025-02A	B-209 6-8'	9/5/01
I	0109025-03A	B-209 10-12'	9/5/01
	0109025-04A	B-210 5-7'	9/5/01
	0109025-05A	B-211 5-7'	9/5/01
	0109025-06A	B-212 5-7'	9/5/01

Date: 14-Sep-01

CLIENT:	Weston & Sampson Eng	ineers		C	Client Sample ID:	B-208	5-7'	
Lab Order: Project: Lab ID:	0109025 200317.B BRA - PARC 0109025-01A	EL P3			Collection Date: Matrix:	9/5/01 Soil		
analyses		Result	RL	Qual	Units	DF	Date	Analyzed
CP METALS T	OTAL SW-846 - 3051/6010		SW6010B					Analyst: RK
Lead		230	3.3		mg/Kg-dry	1	<del>9</del> /11/01	1:44:15 PM
ERCENT MOI	ISTURE		D2216					Analyst: CLM
Percent Moistu	re	9.0	c	i	wt%	1	9/7/01	

Qualifiers:

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ND - Not Detected at the Reporting Limit

- J Analyte detected below quantitation limits
- B Analyte detected in the associated Method Blank
- H Method prescribed holding time exceeded
- S Spike Recovery outside accepted recovery limits
- R RPD outside accepted recovery limits
- E Value above quantitation range
  - # See Case Narrative

RL - Reporting Limit; defined as the lowest concentration the laboratory ean accurately quantitate.

Date: 14-Sep-01

CLIENT: Lab Order:	Weston & Sampson Eng 0109025	ineers			Client Sample ID:	B-209	6-8'
Project: Lab ID:	200317.B BRA - PARC 0109025-02A	EL P3			Collection Date: Matrix:	9/5/01 SOIL	
Analyses		Result	R	L Qu	al Units	DF	Date Analyzed
CP METALS T	OTAL SW-846 - 3051/6010		SW6010	3			Analyst: RK
Lead		33	3	.3	mg/Kg-dry	1	9/11/01 1:49:24 PM
	ISTURE		D2216				Analyst: CLM
Percent Moistu	re	3.9		0	wt%	1	9/7/01

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Qualifiers: ND - Not Detected at the Reporting Limit

- J Analyte detected below quantitation limits B - Analyte detected in the associated Method Blank
- H Method prescribed holding time exceeded
- S Spike Recovery outside accepted recovery limits
- R RPD outside accepted recovery limits
- E Value above quantitation range
- # See Case Narrative

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

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Date: 14-Sep-01

CLIENT: Weston & Sampson Engineers Lab Order: 0109025 Project: 200317.B BRA - PARCEL P3 Lab ID: 0109025-03A

Client Sample ID: B-209 10-12'

Collection Date: 9/5/01 Matrix: SOIL

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ĺ	Analyses	Result	RL	Qual	Units	DF	Date	Analyzed
1	CP METALS TOTAL SW-846 - 3051/6010		SW6010B					Analyst: <b>RK</b>
:	Lead	55	3.7		mg/Kg-dry	1	9/11/01	1:54:22 PM
•	PERCENT MOISTURE		D2216					Analyst: CLM
,	Fercent Moisture	18.5	0		wt%	1	9/7/01	

- ND Not Detected at the Reporting Limit
- J Analyte detected below quantitation limits
- B Analyte detected in the associated Method Blank
- H Method prescribed holding time exceeded
- S Spike Recovery outside accepted recovery limits
- R RPD outside accepted recovery limits
- E Value above quantitation range
- # See Case Narrative

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

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AMRO Env	ironmental Labor	ratorio	es Corp.		Date:	14-Sep	-01	
CLIENT:	Weston & Sampson Engi	ineers		C	lient Sample ID:	B-210	5-7'	
Projeet:	200317.B BRA - PARC	EL P3			Collection Date:	9/5/01		
Lab ID:	0109025-04A				Matrix:	SOIL		
Analyses		Result	RL	Qual	Units	DF	Date	Analyzed
CP METALS TO	TAL SW-846 - 3051/6010		SW6010B					Analyst: RK
L.ead		250	3.4		mg/Kg-dry	1	9/11/0 <b>1</b>	1:59:18 PM
	ľURE		D2216					Analyst: CLM
Percent Moisture		9.5	0		wt%	1	9/7/01	
Qualifiers:	ND - Not Detected at the Report	rting Limit			S - Spike Recovery ou	tside acce	pted recove	ery limits
	J - Analyte detected below qua	ntitation lir	nits		R - RPD outside acecp	ted recove	ery limits	
	B - Analyte detected in the asso	eiated Me	hod Blank		E - Value above quant	itation ran	ige	
	11 Marked associated helding	time average	dad		# . See Cace Narrativ	a.		

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Date: 14-Sep-01

CLIENT: Lab Order:	Weston & Sampson Engi 0109025	neers		C	lient Sample ID:	B-211	5-7'
Project:	200317.B BRA - PARC	EL P3			Collection Date:	9/5/01	
Lab ID:	0109025-05A				Matrix:	SOIL	
Analyses		Result	RL	Quai	Units	DF	Date Analyzed
ICP METALS T	OTAL SW-846 - 3051/6010		SW6010B				Analyst: RK
Lead		13,000	3.3		mg/Kg-dry	1	9/11/01 2:04:26 PM
PERCENT MO	ISTURE		D2216				Analyst: CLM
Percent Moistu	re	9.6	0		wt%	1	9/7/01

Qualifiers:

ND - Not Dctected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

H - Method preseribed holding time exceeded

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

# - See Case Narrative

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

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Date: 14-Sep-01

Date Analyzed

Analyst: RK

**CLIENT:** Weston & Sampson Engineers Client Sample ID: B-212 5-7' Lab Order: 0109025 Collection Date: 9/5/01 **Project:** 200317.B BRA - PARCEL P3 Matrix: SOIL Lab ID: 0109025-06A Result **RL** Qual Units DF Analyses ICP METALS TOTAL SW-846 - 3051/6010 SW6010B Lead 33 3.4 mg/Kg-dry 1 9/11/01 2:10:24 PM

PERCENT MOISTURE	D2216				Analyst: CLM
Percent Moisture	13.7	0	wt%	1	9/7/01

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Oua	lifiers:	N

D - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

- H Method prescribed holding time exceeded
- R RPD outside accepted recovery limits E - Value above quantitation range

S - Spike Recovery outside accepted recovery limits

# - See Case Narrative

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

Client: Weston & Sampson Engineers         DO3 17.B BRA - PARCEL P3         Project:       2003 17.B BRA - PARCEL P3         Sample ID       Client Sample ID       Collection Date       Matrix       Test Name       Matrix         Nomple ID       Client Sample ID       Collection Date       Matrix       Test Name       Propert       91001       911/01         Sample ID       Element Sample ID       Collection Date       Matrix       Test Name       Propert       91001       911/01         0100025-01A       B-206 6.8*       D-200 5.301/6010       91001       911/01       971/01         0100025-01A       B-200 10-12*       Sol 16.010       91001       911/01       971/01         0100025-01A       B-210 5.7*       D-210 5.7*       D-210 5.7*       01001       911/01         0100025-05A       B-211 5.7*       D-211 5.7*       01001       911/01       971/01         0100025-05A       B-211 5.7*       D-212 5.7*       D-212 5.7*       91001       911/01         0100025-05A       B-211 5.7*       D-212 5.7*       D-212 5.7*       01001       911/01         0100025-05A       B-212 5.7*       D-212 5.7*       D-212 5.7*       D-210 5.7*       91001       911/01	Lab Order:	0109025						
Project:         200317.13         BRA- PARCEL P3           Sample ID         Client Sample ID         Collection Date         Matrix         Text. 3051/6010         Fep Date         Analysis Date           Sample ID         Client Sample ID         Collection Date         Matrix         Text. 3051/6010         Picent Point         91/001           0109025-01A         B-208 5-7         9/5/01         Soil         CP METALS, 3051/6010         9/10/01         9/10/01           0109025-02A         B-209 6-8*         Picent Moisture         Picent Moisture         9/10/01         9/10/01         9/10/01           0109025-03A         B-209 10-12'         Soil         CP METALS, 3051/6010         9/10/01         9/10/01         9/10/01           0109025-03A         B-210 5-7'         CP METALS, 3051/6010         9/10/01         9/10/01         9/10/01           0109025-05A         B-210 5-7'         CP METALS, 3051/6010         9/10/01         9/10/01         9/10/01         9/10/01           0109025-05A         B-211 5-7'         CP METALS, 3051/6010         9/10/01         9/10/01         9/10/01           0109025-05A         B-211 5-7'         CP METALS, 3051/6010         9/10/01         9/10/01         9/10/01           0109025-05A         B-211 5-7'	Client:	Weston & Sampson Eng	gineers			DATI	ES REPORT	
Sample ID         Client Sample ID         Collection Date         Matrix         Text Name         Text Date         Prep Date         Analysis Date           0109025-01A         B-208 5.7*         9/5/01         Soil         CP         CP         P10/01         9/10/01         9/10/01           0109025-01A         B-208 5.7*         9/5/01         Soil         CP         RETALS, 3051/6010         P10/01         9/11/01           0109025-02A         B-209 6.8*         CP         CP         RETALS, 3051/6010         P10/01         9/11/01           0109025-03A         B-209 10-12*         CP         RETALS, 3051/6010         P10/01         9/11/01           0109025-03A         B-210 5.7*         CP         RETALS, 3051/6010         P10/01         9/11/01           0109025-03A         B-210 5.7*         CP         RETALS, 3051/6010         9/10/01         9/11/01           0109025-05A         B-211 5.7*         CP         CP         RETALS, 3051/6010         9/10/01         9/11/01           0109025-05A         B-211 5.7*         CP         CP         PECent Moisture         9/10/01         9/11/01           0109025-05A         B-211 5.7*         PC         PECENT MOISTURE         9/10/01         9/11/01         9/11/01 </th <th>Project:</th> <th>200317.B BRA - PARC</th> <th>CEL P3</th> <th></th> <th></th> <th></th> <th></th> <th></th>	Project:	200317.B BRA - PARC	CEL P3					
0109025-01A         B-208         5-7         9/5/01         Soil         ICP METALS, 3051/6010         9/1/01	Sample ID	Client Sample ID	Collection Date	Matrix	Test Name T(	CLP Date	Prep Date	Analysis Date
Percent Moisture         97/01           0109025-02A         B-209 6-8'         Percent Moisture         9/10/01         9/11/01           0109025-03A         B-209 10-12'         CP METALS, 3051/6010         9/10/01         9/11/01           0100025-03A         B-209 10-12'         Dercent Moisture         9/10/01         9/10/01           0100025-03A         B-210 5-7'         CP METALS, 3051/6010         9/10/01         9/11/01           0100025-04A         B-210 5-7'         CP METALS, 3051/6010         9/10/01         9/11/01           0100025-04A         B-211 5-7'         CP METALS, 3051/6010         9/10/01         9/11/01           0100025-05A         B-211 5-7'         CP METALS, 3051/6010         9/10/01         9/11/01           0109025-05A         B-211 5-7'         CP METALS, 3051/6010         9/10/01         9/11/01           0109025-05A         B-211 5-7'         CP METALS, 3051/6010         9/10/01         9/11/01           0109025-05A         B-211 5-7'         CP METALS, 3051/6010         9/10/01         9/10/01           0109025-05A         B-212 5-7'         CP METALS, 3051/6010         9/10/01         9/10/01	0109025-01A	B-208 5-7'	9/5/01	Soil	ICP METALS, 3051/6010		9/10/01	10/11/6
010025-02A       B-209 6.8'       ICP METALS, 3051/6010       9/10/01       9/11/01         100025-03A       B-209 10-12'       Percent Moisture       9/10/01       9/11/01         0100025-03A       B-209 10-12'       CP METALS, 3051/6010       9/10/01       9/11/01         0100025-04A       B-210 5-7'       Percent Moisture       9/10/01       9/11/01         0100025-05A       B-211 5-7'       Percent Moisture       9/10/01       9/11/01         0100025-05A       B-211 5-7'       Percent Moisture       9/10/01       9/10/01         0100025-05A       B-212 5-7'       Percent Moisture       9/10/01       9/10/01         0100025-05A       B-212 5-7'       Percent Moisture       9/10/01       9/10/01					Percent Moisture			10/L/6
Percent Moisture       9/10/1         0109025-03A       B-209 10-12'       Percent Moisture       9/10/1         0109025-03A       B-210 5-7'       Percent Moisture       9/10/1         0109025-04A       B-210 5-7'       Percent Moisture       9/10/10         0109025-05A       B-211 5-7'       9/10/10       9/10/10         0109025-05A       B-212 5-7'       9/10/10       9/10/10         0109025-06A       B-212 5-7'       Percent Moisture       9/10/10         0109025-06A       B-212 5-7'       Percent Moisture       9/10/10         0109025-06A       B-212 5-7'       Percent Moisture       9/10/10	0109025-02A	B-209 6-8'			ICP METALS, 3051/6010		10/01/6	10/11/6
0100025-03A       B-209 10-12'       ICP METALS, 3051/6010       9/10/01       9/11/01         Percent Moisture       Percent Moisture       9/10/01       9/11/01         0109025-04A       B-210 5-7'       Percent Moisture       9/10/01       9/11/01         0109025-04A       B-211 5-7'       Percent Moisture       9/10/01       9/11/01         0109025-05A       B-211 5-7'       Percent Moisture       9/10/01       9/11/01         0109025-05A       B-211 5-7'       Percent Moisture       9/10/01       9/11/01         0109025-05A       B-212 5-7'       Percent Moisture       9/10/01       9/11/01         0109025-05A       B-212 5-7'       Percent Moisture       9/11/01       9/11/01         0109025-05A       B-212 5-7'       Percent Moisture       9/11/01       9/11/01					Percent Moisture			10/L/6
Percent Moisture       977/01         0109025-04A       B-210 5-7       9/10/01       9/11/01         0109025-05A       B-211 5-7       Percent Moisture       9/10/01       9/10/01         0109025-05A       B-211 5-7       Percent Moisture       9/10/01       9/11/01         0109025-05A       B-211 5-7       Percent Moisture       9/10/01       9/11/01         0109025-05A       B-212 5-7       Percent Moisture       9/10/01       9/11/01         0109025-06A       B-212 5-7       Percent Moisture       9/10/01       9/10/01         0109025-06A       B-212 5-7       Percent Moisture       9/10/01       9/10/01	0109025-03A	B-209 10-12'			ICP METALS, 3051/6010		6/10/01	10/11/6
0109025-04A       B-210 5-7       9/10/01       9/11/01         0109025-05A       B-211 5-7       9/10/01       9/11/01         0109025-05A       B-211 5-7       9/10/01       9/11/01         0109025-05A       B-211 5-7       9/10/01       9/11/01         0109025-05A       B-212 5-7       0/10/01       9/11/01         0109025-06A       B-212 5-7       0/10/01       9/10/01         0109025-06A       B-212 5-7       9/10/01       9/10/01         0109025-06A       B-212 5-7       9/10/01       9/10/01         0109025-06A       B-212 5-7       9/10/01       9/10/01					Percent Moisture			10/L/6
Percent Moisture       97701         0109025-05A       B-211 5-7'       9/10/01       9/11/01         0109025-05A       B-212 5-7'       9/10/01       9/11/01         0109025-06A       B-212 5-7'       Percent Moisture       9/11/01         0109025-06A       B-212 5-7'       Percent Moisture       9/11/01	0109025-04A	B-210 5-7			ICP METALS, 3051/6010		10/01/6	10/11/6
0109025-05A B-211 5-7' [CP METALS, 3051/6010 9/10/0] 9/10/0] 9/11/01 Percent Moisture 9/7/01 0109025-06A B-212 5-7 [CP METALS, 3051/6010 9/10/0] 9/10/0] Percent Moisture 9/10/0]					Percent Moisture			10/L/6
Percent Moisture         9/7/01           0109025-06A         B-212 5-7         CP METALS, 3051/6010         9/10/01         9/11/01           Percent Moisture         Percent Moisture         9/7/01         9/7/01         9/7/01	0109025-05A	B-211 5-7'			ICP METALS, 3051/6010		9/10/01	10/11/6
0109025-06A B-212 5-7 9/10/01 ICP METALS, 3051/6010 9/10/01 9/11/01 Percent Moisture 9/7/01					Percent Moisture			10/L/6
Percent Moisture 9/7/01	0109025-06A	B-212 5-7			ICP METALS, 3051/6010		10/01/6	10/11/6
					Percent Moisture			10/L/6

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AMRO Environmental Laboratories Corp.

14-Sep-01

			· 	Merrimack, N (603)	H 0305
Client: WESTON & SAMPSON ENG	AMRO I	D:	01	09025	
Project Name: 2003/17. B BRA-PARCEL P3	Date Re	c.:		7-6-01	
Ship via: (circle one) Fed Ex., UPS, AMRO Courier,	Date Du	ie:		3-18-01	÷ .
Hand Del., Other Couner, Other:			<u> </u>	,,	
tems to be Checked Upon Receipt	Yes	No	NA	Соптер	
Army Samples received in individual plastic baos?					<u> </u>
2. Custody Seals present?				<u> </u>	
Custody Seals Intact?					<u> </u>
Air Bill included in folder if received?					
5. Is COC included with samples?					
. Is COC signed and dated by client?					
7. Laboratory receipt temperature. TEMP = $5^{\circ}$	-				
Samples rec, with ice ice packs neither					
3. Were samples received the same day they were sampled?		V			
Is client temperature 4°C ± 2°C?					
If no obtain authorization from the client for the analyses.					
Client authorization from: Date: Obtained by:		-			
B. Is the COC filled out correctly and completely?					
10. Does the info on the COC match the samples?					
1. Were samples rec, within holding time?	V				
2. Were all samples properly labeled?					
3. Were all samples properly preserved?	1				
4. Were proper sample containers used?	1				
5. Were all samples received intact? (none broken or leaking)	1				
16. Were VOA vials rec, with no air bubbles?			1.7		
17. Were the sample volumes sufficient for requested analysis?					
18. Were all samples received?	V				v.
19. VPH and VOA Soils only:			12		
Sampling Method VPH (circle one): M=Methanol, E=EnCore (air-tight	container	г)			
Sampling Method VOA (circle one): M=Methanol, SB=Sodium Bisulfat	e, E=EnC	ore, B=B	Sulk		
If M or SB:					
Does preservative cover the soil?					
If NO then client must be faxed.					
Does preservation level come close to the fill line on the vial?					
If NO then client must be faxed.					
Were vials provided by AMRO?					
If NO then weights MUST be obtain	ned from	client			
Was dry weight aliquot provided?					
If NO then fax client and inform the	e VOA lat	ASAP.			
0. Subcontracted Samples:			V		
What samples sent:			(		
Where sent:					
Date:					
Analysis:					
TAT:					
1. Information entered into:					
Internal Tracking Log?					
Dry Weight Log?	/				
Client Log?	· ·		~		
Composite Log?					
Filtration Log?			-		

NA= Not Applicable

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qc/qcmemos/forms/samplerec Rev.18 06/00
t Name: BRA - PAF t State: MA e/Time Matrix
e: BRA - PAI
me Matrix
d A= Air S= Soil GW= Ground W. WW= Waste W. DW= Drinking W. O= Oil
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# Department of Environmental Protection Division of Environmental Analysis Senator William X. Wall Experiment Station

certifies

M-NH012

AMRO ENVIRONMENTAL LAB 111 HERRICK ST MERRIMACK, NH 03054-0000

Laboratory Director: Nancy Stewart

for the analysis of NON POTABLE WATER (CHEMISTRY) POTABLE WATER (CHEMISTRY)

pursuant to 310 CMR 42.00

This certificate supersedes all previous Massachusetts certificates issued to this laboratory. The laboratory is regulated by and shall be responsible for being in compliance with Massachusetts regulations at 310 CMR 42.00.

This certificate is valid only when accompanied by the latest dated Certified Parameter List as issued by the Massachusetts D.E.P. Contact the Division of Environmental Analysis to verify the current certification status of the laboratory.

Certification is no guarantee of the validity of the data. This certification is subject to unannounced laboratory inspections.

acar C. Gascarbo

Issued: 01 JUL 2001 Expires: 30 JUN 2002

Director, Division of Environmental Analysis

# COMMONWEALTH OF MASS ACHUS ETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

Effective

01 JUL 2001

Expiration 30 JUN 2002

## Certified Parameter List as of: 09 JUL 2001

# M-NH012 AMRO ENVIRONMENTAL LAB MERRIMACK NH

NON POTABLE WATER (CHEVISTRY)

	Date	Date	
	Analytes and Methods		· .
ALUMINUM	EA 200.7	NITRA TE-N	EPA 353.2
ANTINONY	EA 200.7	KJELOAHL-N	EPA 351.1
ANTINONY	EPA 204.2	KJELOAHL-N	EPA 351.2
ARSENIC	EA 200.7	ORTHOPHOSPHATE	EPA 365.2
ARSENIC	EA 206.2	ORTHOPHOSPHATE	EA 300.0
ARSENIC	A STM 02972-93(C)	TOTAL PHOSPHORUS	EPA 365,2
8 STYLLUM	EA 200.7	CHEMICAL OXY GEN DEVIAND	EA 410.4
CADNIUM	EPA 200.7	CHEMICAL OXY GEN DEMAND	HACH METHOD 200
CHROMIUM	EA 200.7	BIOCHEVICAL OXY GEN DEVANO	EPA 405.1
COBALT	EA 200.7	TOTAL CYANDE	EPA 335.2
COPPER	EA 200.7	NON-FILTERABLE RESIDUE	EPA 160,2
FON	EPA 200.7	TOTAL RESIDUAL CHLORINE	SM 4500-CL-G
LEND	EA 200.7	OL AND GREASE	EA 413.1
LEAD	EPA 239.2	TOTAL PHENOLICS	EPA 420.1
MANGANESE	EA 200.7	VOLATLE HALOCARBONS	EPA 524
MERCURY	E <sup>3</sup> A 245.1	VOLATLEAROMATICS	EPA 624
MOLYBORNUM	EA 200.7	CHLORDANE	EA 608
NICKE_	EA 200.7	ALORIN	EPA 608
SELENIUM	EPA 200.7	DHELORIN .	EA 608
SELENIUM	EPA 270.2	000	EA 608
SLVER	, EPA 200.7	COT 2	EPA 608
STRONTLIM	EPA 200.7	HEPTACHLOR .	EPA 608
TALLIM	EA 200.7	HEPTACHLOR BROXIDE	EA 508
THALLOW	EA 279_1	POLY CHLORINA TED BIPHENY LS (WATER)	EPA 608
ZNC	EA 200.7	POLY CHLORINA TED BIPHENY LS (OL)	EA 600/4-81-045
PH	EA 150.1		
SPECIFIC CONDUCTIVITY	EPA 120.1		•
TOTAL DISSOLVED SOLLOS	EPA 160_1		
TOTAL HARDNESS (CACO3)	EPA 200.7		
CALCIM	EPA 200.7		
MAGNEELIM	EPA 200.7		
	EA 200.7		
FURASSUM	EA 200.7		
IOTAL ALKALINITY	EPA 310.1		

July 3, 2001

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\* Provisional Certification

EA 325.3

EPA 300.0

EPA 340.2

EPA 300.0

EPA 375.4

EPA 300.0

EPA 350.2

EPA 300,0

## COMMONWEALTH OF MASS ACHUS ETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

Certified Parameter List as of: 09 JUL 2001

M-NH012

AMRO ENVIRONMENTAL LAB

MERRIMACK NH

POTABLE WATER (CHEVIISTRY)

Effective 09 JUL 2001 Date

Expiration 30 JUN 2002 Date

•	Analytes and Methods
ANTMONY	EPA 200.9
APSENIC	EA 200.7
ARSENIC	EPA 200.9
<b>BARILIM</b>	EA 200.7
BERYLLUM	EPA 200.7
CADMELM	EA 200.7
CHROMUM	ERA 200.7
COPPER	EPA 200.7
LEAD	EPA 200.9
MERCURY	EPA 245.1
NICKE	EA 200.7
SELENIUM	EPA 200.9
THALLUM	EA 200.9
NITRA TE-N	EPA 353.2
NITRITE-N	EA 353.2
FLUORDE	E3A 300.0
FLUORIDE	SM 4500-F-E
SULFATE	57A 300.0
CYANDE	SM 4500-CN-C,E
TURBIOITY	EPA 180,1
RESIDUAL FREE CHLORINE	SM 4500-CL-G
CALCUM	EPA 200.7
TOTAL ALKALINITY	SM 23208
TOTAL DISSOLVED SOLIDS	SM 2540C
84	EPA 150.1
1.2-DEROMOETHANE	EPA 504.1
1.2-DIBROMO-3-CHLOROPROP	ANE EPA 504,1
•	•

July 3, 2001

# Environmental Laboratories Corporation



111 Herrick Street, Merrimack, NH 03054 TEL: (603) 424-2022 · FAX: (603) 429-8496

January 26, 2001

Chris McDermott Weston & Sampson Engineers 5 Centennial Drive Peabody, MA 019607985 TEL: (978) 532-1900 FAX (978) 977-0100

RE: 200317.A BRA P-3 Roxbury

Order No.: 0101094

Dear Chris McDermott:

AMRO Environmental Laboratories Corp. received 9 samples on 1/12/01 for the analyses presented in the following report.

AMRO operates a Quality Assurance Program which meets or exceeds National Environmental Laboratory Accreditation Conference (NELAC), state, and EPA requirements. A copy of the appropriate state and/or NELAC Certificate is attached. Please see the enclosed Case Narrative for quality control deviations that were encountered during the analyses associated with this project.

The enclosed Sample Receipt Checklist details the condition of your sample(s) upon receipt. Please be advised that any unused sample volume and sample extracts will be stored for a period of thirty (30) days from this report date. After this time, AMRO will properly dispose of the remaining sample(s). If you require further analysis, or need the samples held for a longer period, please contact us immediately.

This report consists of a total of 56 pages. This letter is an integral part of your data report. If you have any questions regarding this project in the future, please refer to the Order Number above.

Sincerely,

Nancy Stewart Vice President / Lab Director



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AMRO Env	vironmental Laboratories Corp.	Date: 26-Jan-01
CLIENT: Project: Lab Order: Date Received:	Weston & Sampson Engineers 200317.A BRA P-3 Roxbury 0101094 1/12/01	Work Order Sample Summary
Lab Sample ID	Client Sample ID	Collection Date
0101094-01A	B-201(D) 10-12'	1/10/01
0101094-02A	B-201(D) 22-24'	1/10/01
0101094-03A	B-207(S)- 3-5'	1/10/01
0101094-04A	DUP	1/10/01
0101094-05A	B-202(S) 5-7'	1/11/01
0101094-06A	B-203(S) 5-7'	1/11/01
0101094-07A	B-204(S) 5-7'	1/11/01
0101094-08A	B-205(S) 3-5'	1/11/01
0101094-09A	B-206(S) 3-5'	1/11/01

AMRO EI	<u>ıyironmental Labor</u>	ratories Corp.	t t t		26-Jan-01	
						l
Lab Order:	0101094				DATES REPORT	r
Client: Project:	Weston & Sampson Eng 200317.A BRA P-3 Rox	thury the second s				
Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCLP Date Prep Date	Analysis Date
0101094-01A	B-201(D) 10-12'	10/01/1	Soil	EPH, Soil, Full List	1/15/01	1/11/01
				EPH, Soil. Full List	1/15/01	1/19/01
				JCP METALS, 3051/6010	1/15/01	1/15/01
				Percent Moisture		1/15/01
0101094-02A	B-201(D) 22-24'			EPH, Soil, Full List	1/15/01	1/17/01
	ч г			ICP METALS, 3051/6010	1/15/01	1/15/01
				Percent Moisture		1/15/01
0101094-03A	B-207(S)- 3-5'			EPH, Soil. Full List	1/15/01	1/17/01
				ICP METALS, 3051/6010	1/15/01	1/15/01
				Percent Moisture		1/15/01
0101094-04A	DUP			EPH, Soil, Fuil List	1/15/01	1/16/01
				EPH, Soil, Fult List	1/15/01	1/17/01
				ICP METALS, 3051/6010	1/15/01	1/15/01
				Percent Moisture		1/15/01
0101094-05A	B-202(S) 5-7'	1/11/01		EPH, Soil, Full List	1/15/01	10/11/1
				EPH, Soil, Full List	1/15/01	10/61/1
				ICP METALS, 3051/6010	1/15/01	1/15/01
				Percent Moisture		1/15/01
0101094-06A	B-203(S) 5-7'			EPH, Soil, Full List	1/15/01	1/11/01
				ICP METALS, 3051/6010	1/15/01	1/15/01
				Percent Moisture		1/15/01
0101094-07A	B-204(S) 5-7'			EPH, Soil, Full List	1/15/01	1/11/01
				ICP METALS, 3051/6010	1/15/01	1/15/01
				Percent Moisture		1/15/01
0101094-08A	B-205(S) 3-5'			EPH, Soil, Full List	1/15/01	1/11/01
				ICP METALS, 3051/6010	1/15/01	1/15/01
				Percent Moisture		1/15/01
0101094-09A	<b>B-2</b> 06(S) 3-5'			EPH, Soil. Full List	1/15/0F	10/11/1

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						Πυ	1-	ľ
						Analysis Dat	1/15/0	1/15/0
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	-Jan-01			ATES		Date Pre	1/15	
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		1					1/6010	
						ame	ETALS, 305	t Moisture
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Ì						Matrix	Soil	
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	Labora			son Engin	P-3 Roxbı			
	nental J		94	n & Samp	7.A BRA	mple ID	3-5'	
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ient: WESTON J AMPSON	AMRO	D:	01	01094603) 424-2
oject Name: ROXBURY	Date Re	c.:		1-12-01
in via: (circle one) Fed Ex., UPS, AMRO Courier.)	Date Du	e:		1-7-4-01
and Del., Other Courier, Other:		0.000		
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ms to be Checked Upon Receipt	Yes	NO		
Army Samples received in individual plastic bags?			1	
Custody Seals present?				
Custody Seals Intact?				
Air Bill included in folder if received?				<u> </u>
Is COC included with samples?		l	1	
is COC signed and dated by client?	~		1	
Laboratory receipt temperature.				
Samples rec. with ice $\underline{\checkmark}$ ice packs neither			<u> </u>	[
Were samples received the same day they were sampled?				
is client temperature 4°C ± 2°C?		1		
If no obtain authorization from the client for the analyses.				
Client authorization from: Date: Obtained by:		· · · -	 	
Is the COC filled out correctly and completely?				
). Does the into on the COC match the samples?	. V		<u> </u>	
Were samples rec. within holding time?				
2. Were all samples property labeled?				
1. Were an samples propeny preserved?		<u> </u>		
<ol> <li>Were proper sample containers used:</li> <li>Mere all samples received intact? (none broken or leaking)</li> </ol>	~~~			
3. Were all samples received induct: (none broken or leaking)	V			
7. Were the sample volumes sufficient for requested analysis?	,			Pinnite Pray
3. Were all sample received?	$\overline{\mathbf{v}}$	<u></u>	1	convince - mipe
2. VPH and VOA Soils only:				
Sampling Method VPH (circle one): M=Methanol, E=EnCore (air-tigh	t container	)	Ų	I
Sampling Method VOA (circle one): M=Methanol, SB=Sodium Bisulfa	ate, E=EnC	ore, B=E	Bulk	
If M or SB:				
Does preservative cover the soil?				
If NO then client must be faxed.			1	
Does preservation level come close to the fill line on the vial?				
If NO then client must be faxed.			1	
Were vials provided by AMRO?				
If NO then weights MUST be obta	ined from	client		
Was dry weight aliquot provided?				
If NO then fax client and inform the	he VOA lai	DASAP.		/
). Subcontracted Samples: *				
What samples sent:				
Where sent:				
Date:			<u> </u>	
Analysis:				
TAT:				
1. Information entered into:	/			
Internal Tracking Log?	_ V			
	V	<u> </u>	•	
Dry Weight Log?				1
Dry Weight Log? Client Log?				
Dry Weight Log? Client Log? Composite Log?			7	

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# STATE CERTIFICATE

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# State of New Hampshire Environmental Laboratory Accreditation Program

Awards Primary Accreditation to

# AMRO Environmental Laboratories or Merrimack, NH

For the analyses listed on the attached page(s) in accordance with the provisions of the NELAC Standards and Env-C 300.

Certificate Number: 100100-C

h

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Date of Issue: January 24, 2001

Expiration Date: July 19, 2001



Program Manage

Continuing accreditation status is dependent on successful ongoing participation in the program. Customers may verify the laboratory's current status by calling (603) 271-2991 or (603) 271-2998

# NEW HAMPSHIRE ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

Laboratory: AMRO Environmental Laboratories Address: Merrimack, NH Certificate Number: 100100-C Date of Issue: January 24, 2001

Page 1 of 3 Expiration Date: July 19, 2001

ACCREDITS THE ABOVED MENTIONED LABORATORY FOR THE FOLLOWING ANALYSES:

## (ANALYSES IN UNDERLINED BOLD ARE NOT EPA APPROVED FOR COMPLIANCE TESTING)

#### DRINKING WATER METALS

NASTEWATER	METALS	Cont.)
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Aluminum:	EPA 200.7
Antimony:	EPA 200.7, EPA 200.9
Arsenic:	EPA 200.7, EPA 200.9
Barium:	EPA 200.7
Beryllium:	EPA 200.7, EPA 200.9
Cadmium:	EPA 200.7, EPA 200.9
Calcium:	EPA 200.7
Chromium:	EPA 200.7, EPA 200.9
Copper:	EPA 200.7, EPA 200.9
lion:	EPA 200.7, EPA 200.9
Lead:	EPA 200.7, EPA 200.9
Mercury:	EPA 245.1
Nickel:	EPA 200.7, EPA 200.9
Selenium:	EPA 200.9
Silver:	EPA 200.7, EPA 200.9
Sodium:	EPA 200.7
Thallium:	EPA 200.9
Zinc:	EPA 200.7

#### DRINKING WATER INORGANIC CONTAMINANTS

EPA 310.1
EPA 300.0, EPA 325.3
SM 4500Cl G mod.
SM 4500Cl G mod.
EPA 120.1
SM 4500-CN E
EPA 300.0, EPA 340.2
SM 4500-F E
EPA 200.7
EPA 353.2
EPA 353.2
EPA 300.0
EPA 150.1
EPA 375.4, EPA 300.0
SM 2540C
EPA 180.1

#### INDIVIDUAL DRINKING WATER ORGANIC CONTAMINANTS

DBCP:		
ED8:		

EPA 504.1 EPA 504.1

#### WASTEWATER METALS

Aluminum:

EPA 200.7

This certificate supercedes all previously issued certificates.

Antimony:	EPA 200.7, EPA 204.2
Arsenic:	EPA 200.7, D297293C
Arsenic:	EPA 206.2
Barium:	EPA 200.7
Beryllium:	EPA 200.7
Cadmium:	EPA 200.7
Calcium:	EPA 200.7
Chromium:	EPA 200.7
Cobalt:	EPA 200.7
Copper:	EPA 200.7
iron:	EPA 200.7
Lead:	EPA 200.7, EPA 239.2
Manganese:	EPA 200.7
Mercury:	EPA 245.1
Molybdenum:	EPA 200.7
Nickel:	EPA 200.7
Selenium:	EPA 200.7, EPA 270.2
Silver:	EPA 200.7
Thallium:	EPA 200.7, EPA 279.2
Vanadium:	EPA 200.7
Zinc:	EPA 200.7

#### WASTEWATER INORGANIC CONTAMINANTS

Alkalinity:	EPA 310.1
Ammonia-N:	EPA 350.2
BOD:	EPA 405.1
Chloride:	EPA 325.3, <u>EPA 300.0</u>
COD:	HACH 8000, EPA 410.4
Conductivity (Spec. Cand.):	EPA 120.1
Cyanide, Total:	EPA 335.2
Fluoride:	EPA 340.2, <u>EPA 300.0</u>
Hardness by Calculation:	EPA 200.7
Magnesium:	EPA 200.7
Nitrate by calculation:	EPA 353.2
Nitrate-Nitrite, Total:	EPA 353.2
Nitrate-N:	EPA 300.0
Oil & Grease:	EPA 413.1
Orthophosphate:	EPA 365.2, EPA 300.0
pH:	EPA 150.1
Potassium:	EPA 200.7
Residue, Filterable (TDS):	EPA 160.1
Residue, Non-Filt.	EPA 160.2
Residue, Total:	EPA 160.3
Sodium:	EPA 200.7
Sulfate:	EPA 375.4, EPA 300.0
	~ <b>7</b>

Chailes H. Maije -

Program Manager

## NEW HAMPSHIRE ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

Laboratory: AMRO Environmental Laboratories Certificate Number: 100100-C Date of Issue: January 24, 2001

Address: Merrimack, NH

Page 2 of 3 Expiration Date: July 19, 2001

# ACCREDITS THE ABOVED MENTIONED LABORATORY FOR THE FOLLOWING ANALYSES:

( WASTEWATER INORGANIC CONTAMINANTS (cont.)		VOLATILE ORGANICS IN WASTEWATER (Cont.)			
i	TKN:	EPA 351.1	1,2 Dichloroethane:	EPA 624	
i	Total Phosphorus:	EPA 365.2	1,1-Dichloroethene:	EPA 624	
+	Total Phenolics:	EPA 420.1	t-1,2-Dichloroethene:	EPA 624	
1			1,2-Dichloropropane:	EPA 624	
1	PCBs IN WASTEWATER		t-1,3-Dichloropropene:	EPA 624	
1			Ethylbenzene:	EPA 624	
i	PCB-Aroclor 1016:	EPA 608	Methylene Chloride:	EPA 624	
ļ	PCB-Aroclor 1221:	EPA 608	Tetrachloroethene:	EPA 624	
į	PCB-Aroclor 1232:	EPA 608	1,1,2,2-Tetrachloroethane:	EPA 624	
ļ	PCB-Aroclor 1242:	EPA 608	Toluene:	EPA 624	
1	PCB-Aroclor 1248:	EPA 608	1,1,1 Trichloroethane:	EPA 624	
ļ	PCB-Aroclor 1254:	EPA 608	1,1,2-Trichloroethane:	EPA 624	
!	PCB-Aroclor 1260:	EPA 608	Trichloroethene:	EPA 624	
ł			Trichlorofluoromethane:	EPA 624	
1	PESTICIDES IN WASTEW	ATER	Vinyl Chloride:	EPA 624	
1					
1	Aldrin:	EPA 608	WASTEWATER SEMIVOLA	TILE ORGANICS	
1	a-BHC:	EPA 608	·		
ł	t-BHC:	EPA 608	Acenaphthene:	EPA 625	
1	c-BHC	EPA 608	Anthracene:	EPA 625	
i	g-BHC (Lindane):	EPA 608	Benzidine:	EPA 625	
ļ	Chlordane:	EPA 608	Benzo(a)anthracene:	EPA 625	
1	4,4'-DDD:	EPA 60B	Benzo(b)fuoranthene:	EPA 625	
i	4,4*-DDE:	EPA 608	8enzo(a)pyrene:	EPA 625	
1	4,4'-DDT:	EPA 608	Benzyl butyl phthalate:	EPA 625	
ì	Dieldrin:	EPA 60B	Bis(2-chloroethyl) ether:	EPA 625	
(	Endosulfan I:	EPA 608	Bis(2-chloroethoxy) methan	e: EPA 625	
1	Endosulfan II:	EPA 608	Bis(2-chloroisopropyl) ether:	: EPA 625	
i	Endosulfan Sulfate:	EPA 608	Bis(2-ethylhexyl) phthalate:	EPA 625	
	Endrin:	EPA 608	4-Bromophenyl phenyl ether	r: EPA 625	
i	Endrin Aldehyde:	EPA 608	4-Chloro-3-methylphenol:	EPA 625	
1	Heptachlor:	EPA 608	2-Chloronaphthalene:	EPA 625	
1	Heptachlor Epoxide:	EPA 608	2-Chlorophenol:	EPA 625	
ł			4-Chlorophenyl phenyl ethe	r: EPA 625	
	VOLATILE ORGANICS IN	WASTEWATER	Chrysene:	EPA 625	
i			Di-n-butyl phthalate:	EPA 625	
l	Benzene:	EPA 624	Di-n-octyl phthalate:	EPA 625	
	Bromodichloromethane:	EPA 624	3,3-Dichlorobenzidine:	EPA 625	
	Bromoform:	EPA 624	2,4-Dichlorophenol:	EPA 625	
	Bromomethane:	EPA 624	Diethyl phthalate:	EPA 625	
	Carbon Tetrachloride:	EPA 624	Dimethyl phthalate:	EPA 625	
	Chloroethane:	EPA 624	2,4-Dimethylphenol:	EPA 625	
	Chloroform:	EPA 624	2,4-Dinitrophenol:	EPA 625	
	Chloromethane:	EPA 624	2,4-Dinitrotoluene:	EPA 625	
	1,2-Dichlorobenzene:	EPA 624	2,6-Dinitrotoluene:	EPA 625	
	1,3-Dichlorobenzene:	EPA 624	Fluoranthene:	EPA 625	
	1,4-Dichlorobenzene	EPA 624	Hexachlorobenzene:	EPA 625	
	1,1-Dichloroethane:	EPA 624	Hexachlorobutadiene:	EPA 625	
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This certificate supercedes all previously issued certificates.

Charles II. Mager Program Manager

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## NEW HAMPSHIRE ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

Laboratory: AMRO Environmental LaboratoriesAddress: Merrimack, NHPage 3 of 3Certificate Number: 100100-CDate of Issue: January 24, 2001Expiration Date: July 19, 2001

ACCREDITS THE ABOVED MENTIONED LABORATORY FOR THE FOLLOWING ANALYSES:

#### WASTEWATER SEMIVOLATILE ORGANICS

Hexachlorocyclopentadiene:	EPA 625	
Hexachloroetnane:	EPA 625	
ndeno(1,2,3-c,d)pyrene:	EPA 625	
sophorone:	EPA 625	
2-Methyl-4,6-dinitrophenol:	EPA 625	
Nitrobenzene:	EPA 625	
2-Nitrophenol:	EPA 625	
4-Nitrophenol:	EPA 625	
n-Nitrosodi-n-propylamine:	EPA 625	
n-Nitrosodiphenylamine:	EPA 625	
Pentachlorophenol:	EPA 625	
Phenol:	EPA 625	
Pyrene:	EPA 625	
1,2,4-Trichiorobenzene:	EPA 625	
2,4,6-Trichlorophenol:	EPA 625	

This certificate supercedes all previously issued certificates.

<u>Charles YI. Mage</u> Program Manager

The Commonwealth of Massachusetts



# Department of Environmental Protection

Division of Environmental Analysis Senator William X. Wall Experiment Station

*certifies* 

M-NH012

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AMRO ENVIRONMENTAL LAB 111 HERRICK ST MERRIMACK, NH 03054-0000

Laboratory Director: Nancy Stewart

for the analysis of NON POTABLE WATER (CHEMISTRY) POTABLE WATER (CHEMISTRY)

pursuant to 310 CMR 42.00

This certificate supersedes all previous Massachusetts certificates issued to this laboratory. The laboratory is regulated by and shall be responsible for being in compliance with Massachusetts regulations at 310 CMR 42.00.

This certificate is valid only when accompanied by the latest dated Certified Parameter List as issued by the Massachusetts D.E.P. Contact the Division of Environmental Analysis to verify the current certification status of the laboratory.

Certification is no guarantee of the validity of the data. This certification is subject to unannounced laboratory inspections.

ecar Q. Gascala

Director, Division of Environmental Analysis

Issued: 01 JUL 2000 Expires: 30 JUN 2001

### COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

Certified Parameter List as of: 28 DEC 2000

# M-NH012 AMRO ENVIRONMENTAL LAB MERRIMACK NH

NON POTABLE WATER (CHEMISTRY)

Effective 20 DEC 2000 Date

Method

Expiration 30 JUN 2001 Date

# <u>Analvte</u>

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ALDRIN ALUMINUM AMMONIA-N ANTIMONY ARSENIC BERYLLIUM BIOCHEMICAL OXYGEN DEMAND CADMIUM CALCIUM CHEMICAL OXYGEN DEMAND CHLORDANE CHLORIDE CHROMIUM COBALT COPPER DDD DDT DIELDRIN FLUORIDE HEPTACHLOR HEPTACHLOR EPOXIDE IRON KJELDAHL-N LEAD MAGNESIUM MANGANESE MERCURY MOLYBDENUM NICKEL NITRATE-N NON-FILTERABLE RESIDUE OIL AND GREASE ORTHOPHOSPHATE PH POLYCHLORINATED BIPHENYLS (OIL) POLYCHLORINATED BIPHENYLS (WATER) POTASSIUM SELENIUM SILVER SODIUM SPECIFIC CONDUCTIVITY STRONTIUM

## **COMMONWEALTH OF MASSACHUSETTS** DEPARTMENT OF ENVIRONMENTAL PROTECTION

Certified Parameter List as of: 28 DEC 2000

	Certifieu I aramete	EI LIST 45 01.	13 DEC 2000		
M-NH012	AMRO ENVIRONMENTAL MERRIMACK NH	LAB			
NON POTABLE V	VATER (CHEMISTRY)	Effective Date	20 DEC 2000	Expiration Date	30 JUN 2001
Analyte			Method		
SULFATE THALLIUM TOTAL ALKALI TOTAL CYANIE TOTAL DISSOL TOTAL HARDNI TOTAL PHENOI TOTAL PHOSPH TOTAL RESIDU VOLATILE ARO VOLATILE HAL ZINC	NITY DE VED SOLIDS ESS (CACO3) LICS IORUS AL CHLORINE MATICS OCARBONS				
POTABLE WATE	R (CHEMISTRY)	Effective Date	28 DEC 2000	Expiration Date	30 JUN 2001
Analyte			Method		
I.2-DIBROMO-3- I.2-DIBROMOET ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CALCIUM CHROMIUM COPPER CYANIDE FLUORIDE LEAD MERCURY NICKEL NITRATE-N NITRITE-N PH RESIDUAL FREE SELENIUM SODIUM SULFATE THALLIUM TOTAL ALKALIN TOTAL DISSOLV TURBIDITY	-CHLOROPROPANE THANE E CHLORINE NITY /ED SOLIDS				

December 28, 2000

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# CASE NARRATIVE

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# CASE NARRATIVE

# GENERAL

1. No QC deviations were observed.

# MADEP-EPH SOIL

- 1. The matrix spike (MS) was performed on sample B-203 (S) 5-7' (0101094-06A). The recoveries for Anthracene, Pyrene, and Chrysene were outside the laboratory control limits (40-140%) possibly due to non-homogeneity between the native sample and the MS.
- 2. The batch duplicate (0101098-07A) had a %RPD for the C9-C18 Aliphatic Hydrocarbons at 50.7% outside the laboratory control limit (50%).
- 3. No other QC deviations were observed.

# METALS SOIL

1. No QC deviations were observed.

AMRO Environmental Laboratories Corporation 111 Herrick Street Merrimack, NH 03054

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## Volatile Petroleum Hydrocarbons (VPH) Massachusetts Department of Environmental Protection (MADEP) Method 1.0 - January 1998 AMRO Modifications

This modification is based on the use of a purge and trap gas chromatography mass spectrometer (GC/MS) system to analyze samples for VPH. The hydrocarbon ranges are quantified using predominant mass fragmentation ions which are characteristic for the range being measured. This approach eliminates potential false positives for the target analytes while providing accurate hydrocarbon range data.

The chromatographic column is an HP-624 capillary column which has been validated by GC/MS analysis of a gasoline standard to correctly identify the marker compounds and elution order of specific gasoline components. Batch quality control includes, at a minimum, method blank, laboratory control sample, and duplicate analysis. A matrix spike and/or matrix spike duplicate is analyzed if sufficient sample is submitted to the laboratory.

The Reporting Limit (RL) of this method for each of the collective aliphatic and aromatic ranges is approximately 0.6-2.8 mg/kg in soil and 25-110  $\mu$ g/L in water. The RL of this method for the target analytes ranges from approximately 0.05-0.13 mg/kg in soil and 2.0-5.0  $\mu$ g/L for water samples.

## Extractable Petroleum Hydrocarbons (EPH) Massachusetts Department of Environmental Protection (MADEP) Method 1.0 - January 1998 AMRO Modifications

This modification is based on a solvent extraction and gas chromatography mass spectrometer (GC/MS) analysis. The hydrocarbon ranges are quantified using predominant mass fragmentation ions which are characteristic for the range being measured. This approach eliminates the silica gel solid-phase fractionation step. False positives for targeted PAH analytes are eliminated by using GC/MS as the primary analysis technique.

The chromatographic column is a J&W Scientific DB-5ms capillary column.

Internal standard calibration is performed using  $5\alpha$ -Androstane at a concentration of 40 ng/µL. o-Terphenyl and 1-Chlorooctadecane are added as surrogate compounds at 20 ng/µL in the sample extract. These two surrogates monitor the effects of the sample matrix and extraction efficiency. Two additional surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, are added to the finished extract prior to analysis to monitor instrument performance. Batch quality control includes, at a minimum, a procedure blank, laboratory control sample and duplicate sample analysis. A matrix spike is analyzed if sufficient sample is submitted to the laboratory.

The Reporting Limit (RL) of this method for each of the collective aliphatic and aromatic ranges is approximately 2-15 mg/kg in soil and 10-50  $\mu$ g/L in water. The RL of this method for the Target PAH analytes ranges from approximately 0.25 to 0.5mg/kg in soil. 1.0 $\mu$ g/L for water when operating the GC/MS in full scan mode, and 0.1 to 1.0 $\mu$ g/L when operating the GC/MS in SIM mode. For sites requiring the lowest levels cited in the Massachusetts Contingency Plan for water, GC/MS in the Selected Ion Monitoring (SIM) mode is used.

# EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SOIL

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# SAMPLE RESULTS

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CLIENT: Weston & Sampson Engineers Client Sample ID: B-201(D) 10-12' \* Lab Order: 0101094 Tag Number: Collection Date: 1/10/01 **Project:** 200317.A BRA P-3 Roxbury Matrix: SOIL Lab ID: 0101094-01A

	Result	RL	Qual Units	DF	Date Analyzed
EXTRACTABLE PETROLEUM HYDR	OCARBONS	MAEPH			Analyst: KEM
C9-C18 Aliphatic Hydrocarbons	ND	53	mg/Kg-dry	1	1/17/01 1:12:00 PM
C19-C36 Aliphatic Hydrocarbons	ND	53	mg/Kg-dry	1	1/17/01 1:12:00 PM
C11-C22 Aromatic Hydrocarbons	290	53	mg/Kg-dry	1	1/17/01 1:12:00 PM
Naphthalene	2.8	0.26	mg/Kg-dry	1	1/17/01 1:12:00 PM
2-Methylnaphthalene	0.89	0.26	mg/Kg-dry	1	1/17/01 1:12:00 PM
Acenaphthylene	0.27	0.26	mg/Kg-dry	1	1/17/01 1:12:00 PM
Acenaphthene	6.3	0.26	mg/Kg-dry	1	1/17/01 1:12:00 PM
Fluorene	4.9	0.26	mg/Kg-dry	1	1/17/01 1:12:00 PM
Phenanthrene	37	2.6	mg/Kg-dry	10	1/19/01 3:44:00 AM
Anthracene	8.9	0.26	mg/Kg-dry	1	1/17/01 1:12:00 PM
Fluoranthene	41	2.6	mg/Kg-dry	10	1/19/01 3:44:00 AM
Pyrene	31	2.6	mg/Kg-dry	10	1/19/01 3:44:00 AM
Benz(a)anthracene	17	0.26	mg/Kg-dry	1	1/17/01 1:12:00 PM
Chrysene	16	0.26	mg/Kg-dry	1	1/17/01 1:12:00 PM
Benzo(b)fluoranthene	19	0.26	mg/Kg-dry	1	1/17/01 1:12:00 PM
Benzo(k)fluoranthene	5.5	0.26	mg/Kg-dry	1	1/17/01 1:12:00 PM
Benzo(a)pyrene	14	0.26	mg/Kg-dry	1	1/17/01 1:12:00 PM
Dibenz(a,h)anthracene	2.6	0.26	mg/Kg-dry	1	1/17/01 1:12:00 PM
Indeno(1,2,3-cd)pyrene	9.5	0.26	mg/Kg-dry	1	1/17/01 1:12:00 PM
Benzo(g,h,i)perylene	7.8	0.26	mg/Kg-dry	1	1/17/01 1:12:00 PM
Surr: 1-Chlorooctadecane	82.2	40-140	%REC	1	1/17/01 1:12:00 PM
Surr: 2-Bromonaphthalene	123	40-140	%REC	1	1/17/01 1:12:00 PM
Surr: 2-Fluorobiphenyl	119	40-140	%REC	1	1/17/01 1:12:00 PM
Surr: o-Terphenyl	80.8	40-140	%REC	1	1/17/01 1:12:00 PM

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

Were all QA/QC procedures required by the VPH or EPH method followed:

Were all performance/acceptance standards for required QA/QC procedures achieved: Were any significant modifications made to the method as specified in section 11.3:

Yes No - If No, See Case Narrative Yes No - If No, See Case Narrative Yes - Details enclosed \_\_\_No

I attest under the pains and penalties of perjury 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.

SIGNATURE:

PRINTED NAME: Nancy Stewart

1-26-01 DATE:

POSITION: Laboratory Director (or designee)

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate. Qualifiers: ND - Not Detected at the Reporting Limit J - Analyte detected below quantitation limits B - Analyte detected in the associated Method Blank

- S Spike Recovery outside accepted recovery limits
- R RPD outside accepted recovery limits
- E Value above quantitation range
- # See Case Narrative

Date: 26-Jan-01

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Analyses

Date: 26-Jan-01

Analyses	Result	RL Qual Units	DF Date Analyzed
Lab ID:	0101094-02A	Matrix:	SOIL
Project:	200317.A BRA P-3 Roxbury	Collection Date:	1/10/01
Lab Order:	0101094	Tag Number:	
CLIENT:	Weston & Sampson Engineers	Client Sample ID:	B-201(D) 22-24'
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EXTRACTABLE PETROLEUM HYDROCA	RBONS	MAEPH			Analyst: KEM
C9-C18 Aliphatic Hydrocarbons	ND	130	mg/Kg-dry	1	1/17/01 1:48:00 PM
C19-C36 Aliphatic Hydrocarbons	ND	130	mg/Kg-dry	1	1/17/01 1:48:00 PM
C11-C22 Aromatic Hydrocarbons	ND	130	mg/Kg-dry	1	1/17/01 1:48:00 PM
Naphthalene	ND	0.65	mg/Kg-dry	1	1/17/01 1:48:00 PM
2-Methylnaphthalene	ND	0.65	mg/Kg-dry	1	1/17/01 1:48:00 PM
Acenaphthylene	ND	0.65	mg/Kg-dry	1	1/17/01 1:48:00 PM
Acenaphthene	ND	0.65	mg/Kg-dry	1	1/17/01 1:48:00 PM
Fluorene	ND	0.65	mg/Kg-dry	1	1/17/01 1:48:00 PM
Phenanthrene	ND	0.65	mg/Kg-dry	1	1/17/01 1:48:00 PM
Anthracene	ND	0.65	mg/Kg-dry	1	1/17/01 1:48:00 PM
Fluoranthene	ND	0.65	mg/Kg-dry	1	1/17/01 1:48:00 PM
Pyrene	ND	0.65	mg/Kg-dry	1	1/17/01 1:48:00 PM
Benz(a)anthracene	ND	0.65	mg/Kg-dry	1	1/17/01 1:48:00 PM
Chrysene	ND	0.65	mg/Kg-dry	1	1/17/01 1:48:00 PM
Benzo(b)fluoranthene	ND	0.65	mg/Kg-dry	1	1/17/01 1:48:00 PM
Benzo(k)fluoranthene	ND	0.65	mg/Kg-dry	1	1/17/01 1:48:00 PM
Benzo(a)pyrene	ND	0.65	mg/Kg-dry	1	1/17/01 1:48:00 PM
Dibenz(a,h)anthracene	ND	0.65	mg/Kg-dry	1	1/17/01 1:48:00 PM
Indeno(1,2,3-cd)pyrene	ND	0.65	mg/Kg-dry	1	1/17/01 1:48:00 PM
Benzo(g,h,i)perylene	ND	0.65	mg/Kg <b>-d</b> ry	1	1/17/01 1:48:00 PM
Surr: 1-Chlorooctadecane	100	40-140	%REC	1	1/17/01 1:48:00 PM
Surr: 2-Bromonaphthalene	130	40-140	%REC	1	1/17/01 1:48:00 PM
Surr: 2-Fluorobiphenyl	122	40-140	%REC	1	1/17/01 1:48:00 PM
Surr: o-Terphenyl	92.8	40-140	%REC	1	1/17/01 1:48:00 PM

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

Were all QA/QC procedures required by the VPH or EPH method followed: Were all performance/acceptance standards for required QA/QC procedures achieved: Were any significant modifications made to the method as specified in section 11.3:

No - If No, See Case Narrative Yes \_\_\_\_\_No - If No, See Case Narrative Yes Yes - Details enclosed No

I attest under the pains and penalties of perjury 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.

SIGNATURE:

PRINTED NAME: Nancy Stewart

DATE:

POSITION: Laboratory Director (or designee)

**Oualifiers:** RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate. ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits B - Analyte detected in the associated Method Blank

E - Value above quantitation range # - See Case Narrative

CLIENT:Weston & Sampson EngineersClient Sample ID: B-207(S)- 3-5'Lab Order:0101094Tag Number:Project:200317.A BRA P-3 RoxburyCollection Date: 1/10/01Lab ID:0101094-03AMatrix: SOIL

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	Result	KL	Qual Units	DF	Date Analyzed
EXTRACTABLE PETROLEUM HYDR	OCARBONS	MAEPH			Analyst: KEM
C9-C18 Aliphatic Hydrocarbons	NÐ	56	mg/Kg-dry	1	1/17/01 2:23:00 PM
C19-C36 Aliphatic Hydrocarbons	ND	56	mg/Kg-dry	1	1/17/01 2:23:00 PM
C11-C22 Aromatic Hydrocarbons	ND	56	mg/Kg~dry	1	1/17/01 2:23:00 PM
Naphthalene	ND	0.28	mg/Kg-dry	1	1/17/01 2:23:00 PM
2-Methylnaphthalene	ND	0.28	mg/Kg-dry	1	1/17/01 2:23:00 PM
Acenaphthylene	ND	0.28	mg/Kg-dry	1	1/17/01 2:23:00 PM
Acenaphthene	ND	0.28	mg/Kg-dry	1	1/17/01 2:23:00 PM
Fluorene	NÐ	0.28	mg/Kg-dry	1	1/17/01 2:23:00 PM
Phenanthrene	1.9	0.28	mg/Kg-dry	1	1/17/01 2:23:00 PM
Anthracene	0.46	0.28	mg/Kg-dry	1	1/17/01 2:23:00 PM
Fluoranthene	2.3	0.28	mg/Kg-dry	1	1/17/01 2:23:00 PM
Pyrene	2.1	0.28	mg/Kg-dry	1	1/17/01 2:23:00 PM
Benz(a)anthracene	1,1	0.28	mg/Kg-dry	1	1/17/01 2:23:00 PM
Chrysene	1.0	0.28	mg/Kg-dry	1	1/17/01 2:23:00 PM
Benzo(b)fluoranthene	1.3	0.28	mg/Kg-dry	1	1/17/01 2:23:00 PM
Benzo(k)fluoranthene	0.33	0.28	mg/Kg-dry	1	1/17/01 2:23:00 PM
Benzo(a)pyrene	0.94	0.28	mg/Kg-dry	1	1/17/01 2:23:00 PM
Dibenz(a,h)anthracene	ND	0.28	mg/Kg-dry	1	1/17/01 2:23:00 PM
Indeno(1,2,3-cd)pyrene	0.62	0.28	mg/Kg-dry	1	1/17/01 2:23:00 PM
Benzo(g,h,i)perylene	0.58	0.28	mg/Kg-dry	1	1/17/01 2:23:00 PM
Surr: 1-Chlorooctadecane	104	40-140	%REC	1	1/17/01 2:23:00 PM
Surr: 2-Bromonaphthalene	123	40-140	%REC	1	1/17/01 2:23:00 PM
Surr: 2-Fluorobiphenyl	119	40-140	%REC	1	1/17/01 2:23:00 PM
Surr: o-Terphenyl	96.2	40-140	%REC	1	1/17/01 2:23:00 PM
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Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

Were all QA/QC procedures required by the VPH or EPH method followed:

Were all performance/acceptance standards for required QA/QC procedures achieved: Were any significant modifications made to the method as specified in section 11.3:

Yes \_\_\_\_\_No - If No, See Case Narrative Yes \_\_\_\_\_No - If No, See Case Narrative No \_\_\_\_\_Yes - Details enclosed

I attest under the pains and penalties of perjury 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.

DATE:

SIGNATURE:

PRINTED NAME: Nancy Stewart

26-01

POSITION: Laboratory Director (or designee)

 Qualifiers:
 RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

 ND - Not Detected at the Reporting Limit
 S - Spike Recovery outside accepted recovery limits
 E - Val

 J - Analyte detected below quantitation limits
 R - RPD outside accepted recovery limits
 # - See

 B - Analyte detected in the associated Method Blank
 # - See

- E Value above quantitation range
- # See Case Narrative

Date: 26-Jan-01

DE

CLIENT:Weston & Sampson EngineersClient Sample ID:DUPLab Order:0101094Tag Number:Project:200317.A BRA P-3 RoxburyCollection Date:1/10/01Lab ID:0101094-04AMatrix:SOIL

1		Kesun	RL	Qual Units	DF	Date Analyzed
1	EXTRACTABLE PETROLEUM HYDI	ROCARBONS	MAEPH			Analyst: KEM
ł	C9-C18 Aliphatic Hydrocarbons	ND	58	mg/Kg-dry	1	1/17/01 2:59:00 PM
I	C19-C36 Aliphatic Hydrocarbons	ND	58	mg/Kg-dry	1	1/17/01 2:59:00 PM
1	C11-C22 Aromatic Hydrocarbons	300	58	mg/Kg-dry	1	1/17/01 2:59:00 PM
1	Naphthalene	3.4	0.29	mg/Kg-dry	1	1/17/01 2:59:00 PM
(	2-Methylnaphthalene	1.3	0.29	mg/Kg-dry	1	1/17/01 2:59:00 PM
l í	Acenaphthylene	0.76	0.29	mg/Kg-dry	1	1/17/01 2:59:00 PM
í	Acenaphthene	5.1	0.29	mg/Kg-dry	1	1/17/01 2:59:00 PM
1	Fluorene	4.8	0.29	mg/Kg-dry	1	1/17/01 2:59:00 PM
	Phenanthrene	37	2.9	mg/Kg-dry	10	1/19/01 4:20:00 AM
1	Anthracene	8.6	0.29	mg/Kg-dry	1	1/17/01 2:59:00 PM
	Fluoranthene	41	2.9	mg/Kg-dry	10	1/19/01 4:20:00 AM
i	Pyrene	32	2.9	mg/Kg-dry	10	1/19/01 4:20:00 AM
	Benz(a)anthracene	16	0.29	mg/Kg-dry	1	1/17/01 2:59:00 PM
	Chrysene	15	0.29	mg/Kg-dry	1	1/17/01 2:59:00 PM
	Benzo(b)fluoranthene	18	0.29	mg/Kg-dry	1	1/17/01 2:59:00 PM
	Benzo(k)fluoranthene	5.1	0.29	mg/Kg-dry	1	1/17/01 2:59:00 PM
	Benzo(a)pyrene	14	0.29	mg/Kg-dry	1	1/17/01 2:59:00 PM
	Dibenz(a,h)anthracene	2.6	0.29	mg/Kg-dry	1	1/17/01 2:59:00 PM
	Indeno(1,2,3-cd)pyrene	9.7	0.29	mg/Kg-dry	1	1/17/01 2:59:00 PM
I	Benzo(g,h,i)perylene	8.4	0.29	mg/Kg-dry	1	1/17/01 2:59:00 PM
	Surr: 1-Chlorooctadecane	89.1	40-140	%REC	1	1/17/01 2:59:00 PM
	Surr: 2-Bromonaphthalene	114	40-140	%REC	1	1/17/01 2:59:00 PM
	Surr: 2-Fluorobiphenyl	114	40-140	%REC	1	1/17/01 2:59:00 PM
	Surr: o-Terphenyl	80.6	40-140	%REC	1	1/17/01 2:59:00 PM
Т						

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

Were all QA/QC procedures required by the VPH or EPH method followed:

Were all performance/acceptance standards for required QA/QC procedures achieved: Were any significant modifications made to the method as specified in section 11.3: Yes \_\_\_\_\_ No - If No, See Case Narrative \_\_\_\_\_ Yes \_\_\_\_ No - If No, See Case Narrative \_\_\_\_ No \_\_\_\_ Yes - Details enclosed

I attest under the pains and penalties of perjury 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.

DATE:

SIGNATURE: PRINTED NAME: Nancy Stewart

-26-01

POSITION: Laboratory Director (or designee)

 Qualifiers:
 RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

 ND - Not Detected at the Reporting Limit
 S - Spike Recovery outside accepted recovery limits
 E - Val

 J - Analyte detected below quantitation limits
 R - RPD outside accepted recovery limits
 # - See

 B - Analyte detected in the associated Method Blank
 # - See

- E Value above quantitation range
- # See Case Narrative

Date: 26-Jan-01

Date:	26-Jan-01

CLIENT:Weston & Sampson EngineersLab Order:0101094Project:200317.A BRA P-3 RoxburyLab ID:0101094-05A

Client Sample ID: B-202(8) 5-7' Tag Number: Collection Date: 1/11/01 Matrix: SOIL

Analyses	Result	RĹ	Qual Units	DF	Date Analyzed
EXTRACTABLE PETROLEUM HYDRO	CARBONS	MAEPH			Analyst: KEM
C9-C18 Aliphatic Hydrocarbons	ND	53	mg/Kg-dry	1	1/17/01 3:35:00 PM
C19-C36 Aliphatic Hydrocarbons	ND	53	mg/Kg-dry	1	1/17/01 3:35:00 PM
C11-C22 Aromatic Hydrocarbons	520	53	mg/Kg-dry	1	1/17/01 3:35:00 PM
Naphthalene	4.0	0.26	mg/Kg-dry	1	1/17/01 3:35:00 PM
2-Methylnaphthalene	2.6	0.26	mg/Kg-dry	1	1/17/01 3:35:00 PM
Acenaphthylene	1.3	0.26	mg/Kg-dry	1	1/17/01 3:35:00 PM
Acenaphthene	5.0	0.26	mg/Kg-dry	1	1/17/01 3:35:00 PM
l <sup>-</sup> luorene	5.0	0.26	mg/Kg-dry	1	1/17/01 3:35:00 PM
Phenanthrene	48	2.6	mg/Kg-dry	10	1/19/01 4:55:00 AM
Anthracene	11	0.26	mg/Kg-dry	1	1/17/01 3:35:00 PM
Fluoranthene	41	2.6	mg/Kg-dry	10	1/19/01 4:55:00 AM
Pyrene	40	2.6	mg/Kg-dry	10	1/19/01 4:55:00 AM
Benz(a)anthracene	19	0.26	mg/Kg-dry	1	1/17/01 3:35:00 PM
Chrysene	18	0.26	mg/Kg-dry	1	1/17/01 3:35:00 PM
Benzo(b)fluoranthene	17	0.26	mg/Kg-dry	1	1/17/01 3:35:00 PM
Benzo(k)fluoranthene	5.9	0.26	mg/Kg-dry	1	1/17/01 3:35:00 PM
Benzo(a)pyrene	15	0.26	mg/Kg-dry	1	1/17/01 3:35:00 PM
Dibenz(a,h)anthracene	2.6	0.26	mg/Kg-dry	1	1/17/01 3:35:00 PM
Indeno(1,2,3-cd)pyrene	9.2	0.26	mg/Kg-dry	1	1/17/01 3:35:00 PM
Benzo(g,h,i)perylene	8.4	0.26	mg/Kg-dry	1	1/17/01 3:35:00 PM
Surr: 1-Chlorooctadecane	93.8	40- <b>1</b> 40	%REC	1	1/17/01 3:35:00 PM
Surr: 2-Bromonaphthalene	124	40-140	%REC	1	1/17/01 3:35:00 PM
Surr: 2-Fluorobiphenyl	119	40-140	%RÉC	1	1/17/01 3:35:00 PM
Surr: o-Terphenyl	84.0	40-140	%REC	1	1/17/01 3:35:00 PM

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

Were all QA/QC procedures required by the VPH or EPH method followed: Were all performance/acceptance standards for required QA/QC procedures achieved:

Were any significant modifications made to the method as specified in section 11.3:

Yes \_\_\_\_\_ No - If No, See Case Narrative Yes \_\_\_\_\_ No - If No, See Case Narrative \_\_\_\_\_ No \_\_\_\_ Yes - Details enclosed

I atlest under the pains and penalties of perjury 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.

SIGNATURE:

PRINTED NAME: Nancy Stewart

DATE:

POSITION: Laboratory Director (or designee)

 Qualifiers:
 RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

 ND - Not Detected at the Reporting Limit
 S - Spike Recovery outside accepted recovery limits
 E - Val

 J - Analyte detected below quantitation limits
 R - RPD outside accepted recovery limits
 # - See

 B - Analyte detected in the associated Method Blank
 # - See
 # - See

- E Value above quantitation range
- # Scc Case Narrative

Date: 26-Jan-01

DE

CLIENT:Weston & Sampson EngineersClient Sample ID:B-203(S) 5-7'Lab Order:0101094Tag Number:Project:200317.A BRA P-3 RoxburyCollection Date:1/11/01Lab ID:0101094-06AMatrix:SOIL

bт

Owel II.

Ľ						Date Analyzed
	EXTRACTABLE PETROLEUM HYDR	OCARBONS	MAEPH			Analyst: KEM
	C9-C18 Aliphatic Hydrocarbons	ND	57	mg/Kg-dry	1	1/17/01 4:11:00 PM
l	C19-C36 Aliphatic Hydrocarbons	ND	57	mg/Kg-dry	1	1/17/01 4:11:00 PM
l	C11-C22 Aromatic Hydrocarbons	110	57	mg/Kg-dry	1	1/17/01 4:11:00 PM
	Naphthalene	0.74	0.29	mg/Kg-dry	1	1/17/01 4:11:00 PM
	2-Methylnaphthalene	0.57	0.29	mg/Kg-dry	1	1/17/01 4:11:00 PM
	Acenaphthylene	ND	0.29	mg/Kg-dry	1	1/17/01 4:11:00 PM
	Acenaphthene	1.2	0.29	mg/Kg-dry	1	1/17/01 4:11:00 PM
	Fluorene	1.0	0.29	mg/Kg-dry	1	1/17/01 4:11:00 PM
	Phenanthrene	9.7	0.29	mg/Kg-dry	1	1/17/01 4:11:00 PM
	Anthracene	2.1	0.29	mg/Kg-dry	1	1/17/01 4:11:00 PM
I	Fluoranthene	9.6	0.29	mg/Kg-dry	1	1/17/01 4:11:00 PM
	Pyrene	8.2	0.29	mg/Kg-dry	1	1/17/01 4:11:00 PM
i	Benz(a)anthracene	4.0	0.29	mg/Kg-dry	1	1/17/01 4:11:00 PM
ţ	Chrysene	3.8	0.29	mg/Kg-dry	1	1/17/01 4:11:00 PM
1	Benzo(b)fluoranthene	4.3	0.29	mg/Kg-dry	1	1/17/01 4:11:00 PM
i	Benzo(k)fluoranthene	1.5	0.29	mg/Kg-dry	1	1/17/01 4:11:00 PM
ł	Benzo(a)pyrene	3.7	0.29	mg/Kg-dry	1	1/17/01 4:11:00 PM
1	Dibenz(a,h)anthracene	0.62	0.29	mg/Kg-dry	1	1/17/01 4:11:00 PM
i	Indeno(1,2,3-cd)pyrene	2.6	0.29	mg/Kg-dry	1	1/17/01 4:11:00 PM
ļ	Elenzo(g,h,i)perylene	2.3	0.29	mg/Kg-dry	1	1/17/01 4:11:00 PM
i	Surr: 1-Chlorooctadecane	89.2	40-140	%REC	1	1/17/01 4:11:00 PM
ł	Surr: 2-Bromonaphthalene	118	40-140	%REC	1	1/17/01 4:11:00 PM
	Surr: 2-Fluorobiphenyl	118	40-140	%REC	1	1/17/01 4:11:00 PM
i	Surr: o-Terphenyl	102	40-140	%REC	1	1/17/01 4:11:00 PM
ł						

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

SIGNATURE:

Were all QA/QC procedures required by the VPH or EPH method followed: Were all performance/acceptance standards for required QA/QC procedures achieved:

Were any significant modifications made to the method as specified in section 11.3:

Yes \_\_\_\_\_No - If No, See Case Narrative Yes \_\_\_\_\_No - If No, See Case Narrative \_ No \_ Yes - Details enclosed

I attest under the pains and penalties of perjury 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.

1-26-01 DATE:

POSITION: Laboratory Director (or designee)

PRINTED NAME: Nancy Stewart

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate. **Oualifiers**: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits B - Analyte detected in the associated Method Blank

- E Value above quantitation range
- # See Case Narrative

. .

Date: 26-Jan-01

CLIENT:Weston & Sampson EngineersLab Order:0101094Project:200317.A BRA P-3 RoxburyLab ID:0101094-07A

Client Sample ID: B-204(S) 5-7' Tag Number: Collection Date: 1/11/01 Matrix: SOIL

ļ	Analyses	Result		Qual Units	DF	Date Analyzed
1	EXTRACTABLE PETROLEUM HYDRO	CARBONS	MAEPH			Analyst: KEM
1	C9-C18 Aliphatic Hydrocarbons	ND	61	mg/Kg-dry	1	1/17/01 5:22:00 PM
ļ	C19-C36 Aliphatic Hydrocarbons	ND	61	mg/Kg-dry	1	1/17/01 5:22:00 PM
ļ	C11-C22 Aromatic Hydrocarbons	ND	61	mg/Kg-dry	1	1/17/01 5:22:00 PM
1	Naphthalene	ND	0.31	mg/Kg-dry	1	1/17/01 5:22:00 PM
	2-Methylnaphthalene	ND	0.31	mg/Kg-dry	1	1/17/01 5:22:00 PM
1	Acenaphthylene	ND	0.31	mg/Kg-dry	1	1/17/01 5:22:00 PM
ļ	Acenaphthene	ND	0.31	mg/Kg-dry	1	1/17/01 5:22:00 PM
ł	Fluorene	ND	0.31	mg/Kg-dry	1	1/17/01 5:22:00 PM
ļ	Phenanthrene	2.1	0.31	mg/Kg-dry	1	1/17/01 5:22:00 PM
1	Anthracene	0.50	0.31	mg/Kg-dry	1	1/17/01 5:22:00 PM
,	Fluoranthene	2.3	0.31	mg/Kg-dry	1	1/17/01 5:22:00 PM
ł	Pyrene	2.0	0.31	mg/Kg-dry	1	1/17/01 5:22:00 PM
1	Benz(a)anthracene	1.0	0.31	mg/Kg-dry	1	1/17/01 5:22:00 PM
i	Chrysene	0.99	0.31	mg/Kg-dry	1	1/17/01 5:22:00 PM
ļ	Benzo(b)fluoranthene	1.1	0.31	mg/Kg-dry	1	1/17/01 5:22:00 PM
r t	Benzo(k)fluoranthene	0.34	0.31	mg/Kg-dry	1	1/17/01 5:22:00 PM
1	Benzo(a)pyrene	0.90	0.31	mg/Kg-dry	1	1/17/01 5:22:00 PM
) 	Dibenz(a,h)anthracene	ND	0.31	mg/Kg-dry	1	1/17/01 5:22:00 PM
1	Indeno(1,2,3-cd)pyrene	0.59	0.31	mg/Kg-dry	1	1/17/01 5:22:00 PM
i	Benzo(g,h,i)perylene	0.55	0.31	mg/Kg-dry	1	1/17/01 5:22:00 PM
1	Surr: 1-Chlorooctadecane	113	40-140	%REC	1	1/17/01 5:22:00 PM
ļ	Surr: 2-Bromonaphthalene	111	40-140	%REC	1	1/17/01 5:22:00 PM
1	Surr: 2-Fluorobiphenyl	<b>11</b> 1	40-140	%REC	1	1/17/01 5:22:00 PM
ł	Surr: o-Terphenyl	96.6	40-140	%REC	1	1/17/01 5:22:00 PM
	1					

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

ł

Were all QA/QC procedures required by the VPH or EPH method followed:

Were all performance/acceptance standards for required QA/QC procedures achieved: Were any significant modifications made to the method as specified in section 11.3:

Yes \_\_\_\_ No - If No, See Case Narrative \_\_ Yes \_\_\_ No - If No, See Case Narrative \_\_ No \_\_\_ Yes - Details enclosed

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

SIGNATURE:

PRINTED NAME: Nancy Stewart

DATE:

POSITION: Laboratory Director (or designee)

 Qualifiers:
 RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

 ND - Not Detected at the Reporting Limit
 S - Spike Recovery outside accepted recovery limits
 E - Val

 J - Analyte detected below quantitation limits
 R - RPD outside accepted recovery limits
 # - Sec

 B - Analyte detected in the associated Method Blank
 # - Sec

E - Value above quantitation range

Date: 26-Jan-01

CLIENT:Weston & Sampson EngineersLab Order:0101094Project:200317.A BRA P-3 RoxburyLab ID:0101094-08A

# Client Sample ID: B-205(S) 3-5' Tag Number: Collection Date: 1/11/01 Matrix: SOIL

EXTRACTABLE PETROLEUM HYDROCARBONS MAEPH Analyst:	KEM
C9-C18 Aliphatic Hydrocarbons ND 50 mg/Kg-dry 1 1/17/01 5:58:00 F	м
C19-C36 Aliphatic Hydrocarbons ND 50 mg/Kg-dry 1 1/17/01 5:58:00 F	М
C11-C22 Aromatic Hydrocarbons ND 50 mg/Kg-dry 1 1/17/01 5:58:00 F	М
Naphthalene ND 0.25 mg/Kg-dry 1 1/17/01 5:58:00 F	м
2-Methylnaphthalene ND 0.25 mg/Kg-dry 1 1/17/01 5:58:00 F	М
Acenaphthylene ND 0.25 mg/Kg-dry 1 1/17/01 5:58:00 F	м
Acenaphthene ND 0.25 mg/Kg-dry 1 1/17/01 5:58:00 F	М
Fluorene ND 0.25 mg/Kg-dry 1 1/17/01 5:58:00 F	м
Phenanthrene ND 0.25 mg/Kg-dry 1 1/17/01 5:58:00 F	м
Anthracene ND 0.25 mg/Kg-dry 1 1/17/01 5:58:00 F	М
Fluoranthene ND 0.25 mg/Kg-dry 1 1/17/01 5:58:00 F	М
Pyrene ND 0.25 mg/Kg-dry 1 1/17/01 5:58:00 F	м
Benz(a)anthracene         ND         0.25         mg/Kg-dry         1         1/17/01 5:58:00 F	м
Chrysene ND 0.25 mg/Kg-dry 1 1/17/01 5:58:00 F	М
Benzo(b)fluoranthene         ND         0.25         mg/Kg-dry         1         1/17/01 5:58:00 F	M
Benzo(k)fluoranthene         ND         0.25         mg/Kg-dry         1         1/17/01 5:58:00 F	м
Benzo(a)pyrene ND 0.25 mg/Kg-dry 1 1/17/01 5:58:00 F	м
Dibenz(a,h)anthracene         ND         0.25         mg/Kg-dry         1         1/17/01 5:58:00 F	M
Indeno(1,2,3-cd)pyrene ND 0.25 mg/Kg-dry 1 1/17/01 5:58:00 F	м
Benzo(g,h,i)perylene ND 0.25 mg/Kg-dry 1 1/17/01 5:58:00 F	М
Surr: 1-Chlorooctadecane 92.6 40-140 %REC 1 1/17/01 5:58:00 F	M
Surr: 2-Bromonaphthalene 111 40-140 %REC 1 1/17/01 5:58:00 F	м
Surr: 2-Fluorobiphenyl 109 40-140 %REC 1 1/17/01 5:58:00 F	м
Surr: o-Terphenyl 93.5 40-140 %REC 1 1/17/01 5:58:00 F	М

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

Were all QA/QC procedures required by the VPH or EPH method followed: Were all performance/acceptance standards for required QA/QC procedures achieved:

\_\_\_ No - If No, See Case Narrative Yes \_ Yes \_\_\_\_No - If No, See Case Narrative No Yes - Details enclosed

Were any significant modifications made to the method as specified in section 11.3: \_\_\_\_\_ No \_\_\_\_Yes - Details enclosed I attest under the pains and penalties of perjury 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.

SIGNATURE:

PRINTED NAME: Nancy Stewart

DATE:

POSITION: Laboratory Director (or designee)

 Qualifiers:
 RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

 ND - Not Detected at the Reporting Limit
 S - Spike Recovery outside accepted recovery limits
 E - Val

 J - Analyte detected below quantitation limits
 R - RPD outside accepted recovery limits
 # - See

 B - Analyte detected in the associated Method Blank
 # - See

- E Value above quantitation range
- # See Case Narrative

CLIENT:

Project:

Lab ID:

Lab Order:

\_\_\_\_\_ Weston & Sampson Engineers Client Sample ID: B-206(S) 3-5' 0101094 **Tag Number:** Collection Date: 1/11/01 200317.A BRA P-3 Roxbury Matrix: SOIL 0101094-09A

Date: 26-Jan-01

# AMRO Environmental Laboratories Corp.

Analyses	Result	RL	Qual Units	DF	Date Analyzed
EXTRACTABLE PETROLEUM HYDROCARBONS		MAEPH			Analyst: KEM
C9-C18 Aliphatic Hydrocarbons	ND	110	mg/Kg-dry	1	1/17/01 6:33:00 PM
C19-C36 Aliphatic Hydrocarbons	ND	110	mg/Kg-dry	1	1/17/01 6:33:00 PM
C11-C22 Aromatic Hydrocarbons	ND	110	mg/Kg-dry	1	1/17/01 6:33:00 PM
Naphthalene	ND	0.56	mg/Kg-dry	1	1/17/01 6:33:00 PM
2-Methylnaphthalene	ND	0.56	mg/Kg-dry	1	1/17/01 6:33:00 PM
Acenaphthylene	ND	0.56	mg/Kg-dry	1	1/17/01 6:33:00 PM
Acenaphthene	ND	0.56	mg/Kg-dry	1	1/17/01 6:33:00 PM
Fluorene	ND	0.56	mg/Kg-dry	1	1/17/01 6:33:00 PM
Phenanthrene	1.6	0.56	mg/Kg-dry	1	1/17/01 6:33:00 PM
Anthracene	ND	0.56	mg/Kg-dry	1	1/17/01 6:33:00 PM
Fluoranthene	2.7	0.56	mg/Kg-dry	1	1/17/01 6:33:00 PM
Pyrene	2.6	0.56	mg/Kg-dry	1	1/17/01 6:33:00 PM
Benz(a)anthracene	1.4	0.56	mg/Kg-dry	1	1/17/01 6:33:00 PM
Chrysene	1.4	0.56	mg/Kg-dry	1	1/17/01 6:33:00 PM
Benzo(b)fluoranthene	1.7	0.56	mg/Kg-dry	1	1/17/01 6:33:00 PM
Benzo(k)fluoranthene	ND	0.56	mg/Kg-dry	1	1/17/01 6:33:00 PM
Benzo(a)pyrene	1.3	0.56	mg/Kg-dry	1	1/17/01 6:33:00 PM
Dibenz(a,h)anthracene	ND	0.56	mg/Kg-dry	1	1/17/01 6:33:00 PM
Indeno(1,2,3-cd)pyrene	0.97	0.56	mg/Kg-dry	1	1/17/01 6:33:00 PM
Benzo(g,h,i)perylene	0.83	0.56	mg/Kg-dry	1	1/17/01 6:33:00 PM
Surr: 1-Chlorooctadecane	103	40-140	%REC	1	1/17/01 6:33:00 PM
Surr: 2-Bromonaphthalene	111	40-140	%REC	1	1/17/01 6:33:00 PM
Surr: 2-Fluorobiphenyl	110	40-140	%REC	1	1/17/01 6:33:00 PM
Surr: o-Terphenyl	96.8	40-140	%REC	1	1/17/01 6:33:00 PM

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

Were all QA/QC procedures required by the VPH or EPH method followed:

Were all performance/acceptance standards for required QA/QC procedures achieved: Were any significant modifications made to the method as specified in section 11.3:

Yes \_\_\_\_\_ No - If No, See Case Narrative Yes Vo - If No, See Case Narrative Yes - Details enclosed No

E - Value above quantitation range

# - See Case Narrative

I attest under the pains and penalties of perjury 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.

SIGNATURE: PRINTED NAME: Nancy Stewart

Qualifiers: RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate. ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits B - Analyte detected in the associated Method Blank

DATE: 1-26-01

POSITION: Laboratory Director (or designee)



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LIENT:     Weston & Sampson Engineers       ork Order:     0101094       ork Order:     2003117.A BRA P-3 Roxbury       opec::     2003117.A BRA P-3 Roxbury       opec::     2003117.A BRA P-3 Roxbury       opec::     2003117.A BRA P-3 Roxbury       opec::     2003117.A BRA P-3 Roxbury       opec::     2003117.A BRA P-3 Roxbury       mem ID:     WB-3591     Fant ID::       ent ID:     Server     Run ID::       ent ID:     Server     2003117.A BRA P-3 Roxbury       ent ID:     Server     Run ID::       ent ID:     Server     20380       ent ID:     Server     20380       ent ID:     Server     20380       ent ID:     Server     20380       ent ID:     Server     20380       ent ID:     Server     20380       ent ID:     Server     20380       ent ID:     Server     20380       ent ID:     Server     20380       extender     ND     252       extender     ND     025       ent ID:     025     mg/40       extender     ND     025       ent ID:     025     mg/40       ent ID:     025     mg/40       ent ID:	MRO Environmer	ital Laboratories	s Corp.							Date: 26	Jan-01	
Method:         J01004         Method Blat           oject:         200317 A RR A P.3 Rovhury         Test Cole:         MAEPH         Units:         majvis Date         171501         Test Dots         Method Blat           mple ID         Bach ID         391         Test Cole:         MAEPH         Units:         majvis Date         171501         Test Dots         Method Blat           ent ID:         Name         Result         Ru         Units         Score:         Manysis Date         171501         Test Dots         Te	LIENT: Weston &	¿ Sampson Engineers	-						QC SUN	IMARY I	REPOR	
Topel ME-3591         Test Code:         MAEPH         Units:         mg/kg         Amilysis Date         1/17/01         Prop Date         1/15/01           ent (D:         OC Sample         Run (D:         SV-2_01017A         SeqNo:         103960         Prop Date         1/15/01           Amount         Amount         CS Shife Onginal Sample         OC Shife Onginal Sample         Organal Sample         Organal Sample           Amount         Result         RL         Units         Amount         Result         SRPD         PPDLmit           C153 Aliphatic Hydrocarbons         ND         50         mg/kg         OC Shife Onginal Sample         Organal Sample           C153 Aliphatic Hydrocarbons         ND         50         mg/kg         Ondition Sample         Organal Sample           C152 Anonatic Hydrocarbons         ND         0.25         mg/kg         Ondition Sample         Organal Sample           C152 Anonatic Hydrocarbons         ND         0.25         mg/kg         Amount         Result         %RPD         RPDLmit           C152 Anonatic Hydrocarbons         ND         0.25         mg/kg         Organal Sample         Organal Sample           Amount         Result Sample         ND         0.25         mg/kg         Orga	ork Order: 0101094 oject: 200317./	A BRA P-3 Roxbury								Mé	ethod Bla	농 I
ent (L)         Kun (L)         SV2_0117A         Seevice         Seevice         T000         SV2_0111A         Seevice         T000         S000         T000	mple ID MB-3591	Batch ID: 3591	Test Cod	e: MAEPH	Units: mg/Kg		Analysis	Date 1/17/01	12:00:00 PM	Prep Date	1/15/01	
After able         CC Sample         CC Sample         Original Sample         Original Sample           a)ter         Result         RL         Units         Amount         Result         %FPC         Covint         PRPDLimit         Original Sample           C12 Altranterie         ND         50         mg/Kg         Amount         Result         %FPC         Lowint         PRPDLimit         ""><td>ent ID:</td><td></td><td>Run ID:</td><td>SV-2_010</td><td>117A</td><td></td><td>SeqNo:</td><td>103950</td><td></td><td></td><td></td><td></td></td<>	ent ID:		Run ID:	SV-2_010	117A		SeqNo:	103950				
ayte         Result         R.L.         Units         Amount         Result         %FEC         LowLimit         HighLimit         or/MS Result         %FPD         RPDLimit           C.13 Aliphater (Hydrocarbons         ND         50         mg/Mg		QC Sample			QC Spike Original Sam	ple		-	Original Sample			
C18 Aliphatic Hydrocarbons         ND         50         mg/kg           C18 Aliphatic Hydrocarbons         ND         50         mg/kg           9-056 Aliphatic Hydrocarbons         ND         50         mg/kg           9-056 Aliphatic Hydrocarbons         ND         50         mg/kg           9-056 Aliphatic Hydrocarbons         ND         25         mg/kg           Aliphatic Hydrocarbons         ND         0.25         mg/kg           Aliphatic Hydrocarbon </td <td>alyte</td> <td>Result</td> <td>RL</td> <td>Units</td> <td>Amount Resu</td> <td>ult %REC</td> <td>LowLimit</td> <td>HighLimit</td> <td>or MS Result</td> <td>%RPD F</td> <td><b>RDLimit</b></td> <td>Qua</td>	alyte	Result	RL	Units	Amount Resu	ult %REC	LowLimit	HighLimit	or MS Result	%RPD F	<b>RDLimit</b>	Qua
9-C56 Aliphatic Hydrocathons         ND         50         mg/kg           9-L122 Adomatic Hydrocathons         ND         50         mg/kg           Ph114alere         ND         25         mg/kg           Ph114alere         ND         0.25         mg/kg           Aethymaphhalere         ND         0.25         mg/kg           Aethymaphhalere         ND         0.25         mg/kg           Aethymaphice         ND         0.25         mg/kg           Aethymaphhalere         ND         0.25         mg/kg           Aethymaphhalere         ND         0.25         mg/kg           Analore         ND         0.25         mg/kg	-C18 Aliphatic Hydrocarbons	QN	50	mg/Kg								
1-C22 Aromatic Hydrocarbons         ND         50         mg/kg           1-C22 Aromatic Hydrocarbons         ND         0.25         mg/kg           Rehtynjamente         ND         0.25         mg/kg           Rehtynjamente         ND         0.25         mg/kg           enaphthere         ND         0.25         mg/kg           criterie         ND         0.25         mg/kg <t< td=""><td>9-C36 Aliphatic Hydrocarbon</td><td>s ND</td><td>50</td><td>mg/Kg</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	9-C36 Aliphatic Hydrocarbon	s ND	50	mg/Kg								
phthalene         ND         0.25         mg/kg           (ebh/mathhalene         ND         0.25         mg/kg           (ebh/mathhalene         ND         0.25         mg/kg           (ebh/mathhalene         ND         0.25         mg/kg           enaphhtene         ND         0.25         mg/kg           enaphhtene         ND         0.25         mg/kg           enanhmene         ND         0.25         mg/kg           enan(1,2,3-cd)prene         ND         0.25         mg/kg           enan(1,2,3-cd)prene         ND         0.25         mg/kg           enan(1,2,3-cd)prene         ND         0.25         mg/kg </td <td>1-C22 Aromatic Hydrocarbor</td> <td>IS ND</td> <td>50</td> <td>mg/Kg</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	1-C22 Aromatic Hydrocarbor	IS ND	50	mg/Kg								
Activinationational (activinational (activity)))))         0.25         mg/Kg         0.25         mg/Kg         0.25         mg/Kg         0.25         mg/Kg         0.25         mg/Kg         0.26         0.26         0.26         0.26         0.26         0.26         0.26         0.26         0.26         0.26         0.26         0.26         0.26         0.26         0.26         0.26         0.26         0.26         0.26	phthalene	QN	0.25	mg/Kg								
enaphthylene         ND         0.25         mg/kg           enaphthylene         ND         0.25         mg/kg           enaphthylene         ND         0.25         mg/kg           enaphthylene         ND         0.25         mg/kg           enaphthere         ND         0.25         mg/kg           enanthere         ND         0.25         mg/kg           criticitatione         ND         0.25         mg/kg           criticitatione         ND         0.25         mg/kg           criticitatione         ND         0.25         mg/kg           criticitatione         ND         0.25         mg/kg           cricitatione         ND         0.25         mg/kg	<b>Aethylnaphthalene</b>	ND	0.25	mg/Kg								
enablithere         ND         0.25         mg/kg           enanthrene         ND         0.25         mg/kg           enanthrene         ND         0.25         mg/kg           enanthrene         ND         0.25         mg/kg           enanthrene         ND         0.25         mg/kg           orathere         ND         0.25         mg/kg           critication         ND         0.25         mg/kg           critication         ND         0.25         mg/kg           critication         ND         0.25         mg/kg           crici()/luoranthere         ND         0.25         mg/kg         1           crici()/luoranthere         ND         0.25         mg/kg         1         0         2           crici()/luoranthere         ND         0.25         mg/kg         1         0         2         1         1         0	enaphthylene	QN	0.25	mg/Kg								
orene         ND         0.25         mg/kg           enarthrene         ND         0.25         mg/kg           intracene         ND         0.25         mg/kg           oranthrene         ND         0.25         mg/kg           oranthrene         ND         0.25         mg/kg           oranthrene         ND         0.25         mg/kg           oranthrene         ND         0.25         mg/kg           rz(s/)funcanthrene         ND	enaphthene	ÛN	0.25	mg/Kg								
enanthreate         ND         0.25         mg/kg           thracene         ND         0.25         mg/kg           thracene         ND         0.25         mg/kg           oranthracene         ND         0.25         mg/kg           oranthracene         ND         0.25         mg/kg           oranthracene         ND         0.25         mg/kg           psee         ND         0.25         mg/kg           rac(s)f/luoranthrace         ND         0.25         mg/kg           rac(s)f/luoranthrace         ND         0.25         mg/kg           rac(s)f/luoranthrace         ND         0.25         mg/kg            rac(s)f/luoranthrace         ND         0.25         mg/kg             rac(s)f/luoranthrace         ND         0.25         mg/kg              rac(s)f/luoranthrace         ND         0.25         mg/kg               rac(s)f/luoranthrace         ND         0.25         mg/kg               rac(s)f/luoranthrace         ND         0.25         mg/kg           <	orene	QN	0.25	mg/Kg								
Intracente         ND         0.25         mg/kg           ciranthene         ND         0.25         mg/kg         1           ciranthene         ND         0.25         mg/kg         1         1         1           ciranthinacene         ND         0.25         mg/kg         1         1         1         1         1           cirantificacene         ND         0.25         mg/kg         1 <th1< th=""> <th1< th=""></th1<></th1<>	enanthrene	QN	0.25	mg/Kg								
oranthene         ND         0.25         mgKg           rene         ND         0.25         mgKg           radio anthracene         ND         0.25         mgKg           radio (h)toranthene         ND         0.25         mgKg           radio (h)toranthene         ND         0.25         mgKg         1         0         94         40         140         0           radio (h)toranthene         ND         0.25         mgKg         5         0         124         40         140         0           radio (h)toranthene         ND         0.25         mgKg         5         0         124         40         140         0           sur: 0-Terphenyl         5.948         0.255         mgKg         5         0         124         40         140         0           sur: 0-Terphenyl         5.948         0         74         0         140         0	thracene	QN	0.25	mg/Kg								
ene         ND         0.25         mg/kg           nz(a)anthracene         ND         0.25         mg/kg           rysene         ND         0.25         mg/kg           rysene         ND         0.25         mg/kg           rz(a)huntanthene         ND         0.25         mg/kg           rz(a)huntanthene         ND         0.25         mg/kg           rz(a,h)anthracene         ND         0.25         mg/kg           rz(a,h)anthracene         ND         0.25         mg/kg           enc(1,2,3-cd)pyrene         ND         0.25         mg/kg           stor(1,3,5-cd)pyrene         ND         0.25         mg/kg           stor(1,3,5-cd)pyrene         ND         0.25         mg/kg           stor(1,3,5-cd)pyrene         ND         0.25         mg/kg           stor(1,3,5-cd)pyrene         ND         0.25         mg/kg           stor	oranthene	QN	0.25	mg/Kg								
nz(a)anthracene         ND         0.25         mg/kg           rysene         ND         0.25         mg/kg           rysene         ND         0.25         mg/kg           nzo(b)fluoranthene         ND         0.25         mg/kg           nzo(s)pyrene         ND         0.25         mg/kg         r           nzo(s)pyrene         ND         0.25         mg/kg         r         r           nzo(s)pyrene         ND         0.25         mg/kg         r         r         r           nzo(s)pyrene         ND         0.25         mg/kg         r         r         r         r           nzo(s)pyrene         ND         0.25         mg/kg         r         r         r         r           nzo(s)pyrene         ND         0.25         mg/kg         r         r         r         r           nzo(s)hory/ene         ND         0.25         mg/kg         r         r         r         r         r           nzo(s)hory/ene         ND         0.25         mg/kg         r         0         140         140         0           Sur: 2-Fluorobiphenyl         5.948         0         124         40	rene	QN	0.25	mg/Kg								
ysene         ND         0.25         mg/kg           nzg(b/fluoranthene         ND         0.25         mg/kg           nzg(k/fluoranthene         ND         0.25         mg/kg           nzg(k/fluoranthene         ND         0.25         mg/kg           nzg(k)fluoranthene         ND         0.25         mg/kg           nzg(a,h)anthracene         ND         0.25         mg/kg           enc(1,2,3-cd)pyrene         ND         0.25         mg/kg           nzg(g,h,i)pen/ene         ND         0.25         mg/kg           nzg(g,h,i)pen/ene         ND         0.25         mg/kg           sur: 1-Chlorooctadecane         0.94         0.25         mg/kg           sur: 2-Fluorobiphenyl         5.948         0.25         mg/kg           sur: 2-Fluorobiphenyl         5.948         0.25         mg/kg           sur: 0-Terphenyl         0.9838         0.25         mg/kg         140         0           sur: 0-Terphenyl         0.9838         0.25         mg/kg         1         0         98.9         40         140         0	nz(a)anthracene	QN	0.25	mg/Kg								
nzo(b)fluoranthene         ND         0.25         mg/kg           nzo(x)fluoranthene         ND         0.25         mg/kg           nzo(a)pyrene         ND         0.25         mg/kg           nzo(a)pyrene         ND         0.25         mg/kg           enzo(a)pyrene         ND         0.25         mg/kg           enzo(a)pyrene         ND         0.25         mg/kg           enzo(a)pirane         ND         0.25         mg/kg           nzo(g,h,i)perylene         ND         0.25         mg/kg           nzo(g,h,i)perylene         ND         0.25         mg/kg           Surr: 1-Chlorooctadecane         0.94         0.25         mg/kg           Surr: 2-Bromonaphthalene         6.199         0.25         mg/kg         1         0         94.0         140         0           Surr: 2-Fluorobiphenyl         5.948         0.25         mg/kg         1         0         98.9         40         140         0           Surr: 0-Terphenyl         0.9888         0.25         mg/kg         1         0         98.9         40         140         0	rysene	QN	0.25	mg/Kg								
nzo(k)fluoranthene         ND         0.25         mg/kg           nzo(a)pyrene         ND         0.25         mg/kg           nzo(a)pyrene         ND         0.25         mg/kg           enz(a,h)anthracene         ND         0.25         mg/kg           eno(1,2,3-cd)pyrene         ND         0.25         mg/kg           nzo(g,h,i)perylene         ND         0.25         mg/kg           nzo(g,h,i)perylene         ND         0.25         mg/kg           nzr: 2-Bromonaphthalene         0.94         40         140         0           Surr: 2-Fluorobiphenyl         5.948         0.25         mg/kg         1         0         94.0         140         0           Surr: 0-Terphenyl         0.9888         0.25         mg/kg         1         0         98.9         40         140         0	nzo(b)fluoranthene	QN	0.25	mg/Kg								
nzo(a)pyrene         ND         0.25         mg/Kg           lenz(a,h)anthracene         ND         0.25         mg/Kg           eno(1,2,3-cd)pyrene         ND         0.25         mg/Kg           nzo(g,h,i)perylene         ND         0.25         mg/Kg           Zurr. 1-Chlorooctadecane         ND         0.25         mg/Kg           Surr. 1-Chlorooctadecane         0.94         0.25         mg/Kg           Surr. 2-Fluorobiphenyl         5.948         0.25         mg/Kg         5         0         140         0           Surr. 2-Fluorobiphenyl         5.948         0.25         mg/Kg         5         0         140         0           Surr. 2-Fluorobiphenyl         5.948         0.25         mg/Kg         5         0         140         0           Surr. 2-Fluorobiphenyl         0.9888         0.25         mg/Kg         5         0         140         0	nzo(k)fluoranthene	QN	0.25	mg/Kg								
Intercente         ND         0.25         mg/Kg           eno(1,2,3-cd)pyrene         ND         0.25         mg/Kg           nzo(g,h,i)perylene         ND         0.25         mg/Kg           nzo(g,h,i)perylene         ND         0.25         mg/Kg           nzr(1-Chlorooctadecane         0.94         0.25         mg/Kg           Surr: 1-Chlorooctadecane         0.94         0.25         mg/Kg         5           Surr: 2-Fluorobiphenyl         5.948         0.25         mg/Kg         5         0         119         40         140         0           Surr: 2-Fluorobiphenyl         5.948         0.25         mg/Kg         5         0         119         40         140         0           Surr: 0-Terphenyl         0.9888         0.25         mg/Kg         1         0         98.9         40         140         0	nzo(a)pyrene	QN	0.25	mg/Kg								
leno(1,2,3-cd)pyrene         ND         0.25         mg/Kg         1         0         2         1	penz(a,h)anthracene	QN	0.25	mg/Kg								
nzo(g,h,i)perylene         ND         0.25         mg/Kg         1         0         94         40         140         0         0         0         0         140         0         0         0         0         140         0         0         0         0         0         140         140         0         0         0         124         40         140         0 <td>leno(1,2,3-cd)pyrene</td> <td>QN</td> <td>0.25</td> <td>mg/Kg</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	leno(1,2,3-cd)pyrene	QN	0.25	mg/Kg								
Surr. 1-Chlorooctadecane         0.94         0.25         mg/Kg         1         0         94         40         140         0           Surr. 2-Bromonaphthalene         6.199         0.25         mg/Kg         5         0         124         40         140         0           Surr. 2-Bromonaphthalene         6.199         0.25         mg/Kg         5         0         124         40         140         0           Surr. 2-Fluorobiphenyl         5.948         0.25         mg/Kg         5         0         119         40         140         0           Surr: o-Terphenyl         0.9838         0.25         mg/Kg         1         0         98.9         40         140         0	nzo(g,h,i)perylene	QN	0.25	mg/Kg								
Surr: 2-Fluorobiphenyl         6.199         0.25         mg/Kg         5         0         124         40         140         0           Surr: 2-Fluorobiphenyl         5.948         0.25         mg/Kg         5         0         119         40         140         0           Surr: 0-Terphenyl         0.9888         0.25         mg/Kg         1         0         98.9         40         140         0           Surr: o-Terphenyl         0.9888         0.25         mg/Kg         1         0         98.9         40         140         0	Surr: 1-Chlorooctadecane	0.94	0.25	mg/Kg	~	0 94	40	140	0			
Surr: 2-Fluorobiphenyl 5.948 0.25 mg/Kg 5 0 119 40 140 0 Surr: o-Terphenyl 0.9888 0.25 mg/Kg 1 0 98.9 40 140 0 	Surr: 2-Bromonaphthalene	6.199	0.25	mg/Kg	5	0 124	40	140	0			
Surr: o-Terphenyl 0.9888 0.25 mg/Kg 1 0 98.9 40 140 0 	Surr: 2-Fluorobiphenyl	5.948	0.25	mg/Kg	5	0 119	40	140	0			
inolfiane. ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank	Surr: o-Terphenyl	0.9888	0.25	mg/Kg	۲	0 98.9	40	140	0			
	notificare. ND Not Detector	at the Recording Limit		- Snike Recov	verv outside accented recov	erv limits	R - Analy	te deteeted in	the accordated Met	hod Rlant		
		mine Ginnoday and the	,	where where a	· · · · · · · · · · · · · · · · · · ·				1011 DA111/0000 A11	ULU LUIGIIN		
I America Anterior halow manufaction limite R - RPD Anteida accented recovery limite			C									

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## MATRIX SPIKE

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			Sample Matrix Spike
nits: mg/Kg-dry	Analysis D	)ate 1/17/01 4:46:00 PM	Prep Date 1/15/01
	SeqNo:	103958	
e Original Sample		Original Sample	
t Result %RE	EC LowLimit	HighLimit or MS Result	%RPD RPDLimit Qu
3 0 1	06 40	140 0	
3 0 1	09 40	140 0	
3 0 81	1.9 40	140 0	
3 0 1	06 40	140 0	
3 0 98	9.2 40	140 0	
3 0.7419 65	5.8 40	140 0	
3 1.179 52	2.6 40	140 0	c
3 2.113 35	5.1 40	140	ω U
3 3.841 -12	1 40 40	140 0	n v
8 0 84	4.9 40	140 0	•
1 0 1	27 40	140 0	
1 0 1	20 40	140 0	
0 0	4.6 40	140 0	
0 7 7 0	ò ŏ	0 127 40 0 120 40 0 94.6 40	0 0 127 40 140 0 0 127 40 140 0 0 120 40 140 0 0 94.6 40 140 0

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## EPH SOIL SAMPLE / SAMPLE DUPLICATE AND RPD

Amro Project ID: 0101098-07A Amro Duplicate ID: 0101098-07ADUP Analysis Date: 19-Jan-10

Instrument # : SV-2 Analyst : KEM [011801]

COMPOUND	SAMPLE CONCENTRATION (mg/Kg)	DUPLICATE CONCENTRATION (mg/Kg)	% RPD	QC LIMITS RPD
	179	106	50.7	* 50
C19-C36 ALIPHATICS	310	206	40.3	50
C11-C22 ABOMATICS	122	77 3	40.0	50
	0	0	0.0	50
2-METHYLNAPHTHALENE	0	0	0.0	50
	0	0	0.0	50
ACENAPHTHENE	0	0	0.0	50
FLUORENE	0	0	0.0	50
PHENANTHRENE	0	0	0.0	50
ANTHRACENE	0	0	0.0	50
FLUORANTHENE	0	0	0.0	50
PYRENE	0.345	0.315	9.1	50
BENZO(A)ANTHRACENE	0	0	0.0	50
CHRYSENE	0	0	0.0	50
BENZO(B)FLUORANTHEN	0	0	0.0	50
BENZO(K)FLUORANTHEN	0	0	0.0	50
BENZO(A)PYRENE	0	0	0.0	50
DIBENZO(A,H)ANTHRACE	0	0	0.0	50
INDENO(1,2,3-CD)PYRENE	0	0	0.0	50
BENZO(G,H,I)PERYLENE	0	0	0.0	50

\* Values outside QC limits RPD: 1 of 20 outside limits. Sample File: 2B15233.D Duplicate File: 2B15235.D Amro Environmental Laboratories Corp.

# LABORATORY CONTROL SAMPLE

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MAEPH     Units: mg/Kg     Analysis Date     1/17/01       s: MAEPH     Units: mg/Kg     Analysis Date     1/17/01       sV-2_010117A     SeqNo:     103951       sV-2_010117A     SeqNo:     103951       sV-2_010117A     SeqNo:     103951       sV-2_010117A     SeqNo:     103951       availysis Date     1/17/01     12::       QC Spike Original Sample     0     98:3       Units     Amount     Result     %REC       LowLimit     HighLimit     or       mg/Kg     1.25     0     99:7       mg/Kg     1.25     0     99:7     40       mg/Kg     1.25     0     99:7     40       mg/Kg     1.25     0     99:7     40       mg/Kg     1.25     0     99:7     40       mg/Kg     1.25     0     96:5     40       mg/Kg     1.25     0     96:2     40       mg/Kg     1.25     0     96:2     40       mg/Kg     1.25     0     96:2     40	st Code: Mu	- Te 0.22 Ru 0.22 0.22
MAEPH     Units: mg/Kg     Analysis Date 1/17/01 12::       SV-2_010117A     SeqNo:: 103951       SV-2_010117A     SeqNo:: 103951       SV-2_010117A     SeqNo:: 103951       SV-2_010117A     SeqNo:: 103951       SV-2_010117A     SeqNo:: 103951       SV-2_010117A     SeqNo:: 103951       SV-2_010117A     SeqNo:: 103951       SV-2_010117A     SeqNo:: 103951       SV-2_010117A     SeqNo:: 103951       Origit     Malysis Date 1/17/01 12::       Units     Amount     Result       Mg/Kg     1.25     0       mg/Kg     1.25     0       mg/Kg     1.25     0       mg/Kg     1.25     0       mg/Kg     1.25     0       mg/Kg     1.25     0       mg/Kg     1.25     0       mg/Kg     1.25     0       mg/Kg     1.25     0       mg/Kg     1.25     0       mg/Kg     1.25     0       mg/Kg     1.25     0       mg/Kg     1.25     0       mg/Kg     1.25     0       mg/Kg     1.25     0       mg/Kg     1.25     0	de:Maria de:Maria	Test Co Run ID: RL 0.25 0.25 0.25
MAEPH       Units: mg/Kg       Analysis Date 1/17/01 12::         SV-2_010117A       SeqNo::       103951         CC Spike Original Sample       Origit       Origit         QC Spike Original Sample       0       98.3       40       140         Units       Amount       Result       %REC       LowLimit       HighLimit       or         mg/Kg       1.25       0       99.1       40       140         mg/Kg       1.25       0       99.7       40       140         mg/Kg       1.25       0       99.7       40       140         mg/Kg       1.25       0       99.5       40       140         mg/Kg       1.25       0       96.2       40       140         mg/Kg       1.25       0       96.2       40       140         mg/Kg       1.25       0       96.2       40       140         mg/Kg       1.25       0       96.2       40       140<	de: ∰ G	Test Co Run ID: RL 0.25 0.25 0.25
MAEPH         Units: mg/Kg         Analysis Date         1/17/01         12::           SV-2_010117A         SeqNo:         103951         Origit           CC Spike Original Sample         QC Spike Original Sample         Origit           QC Spike Original Sample         0         98.3         40         140           Units         Amount         Result         %REC         LowLimit         140           mg/Kg         1.25         0         99.1         40         140           mg/Kg         1.25         0         99.7         40         140           mg/Kg         1.25         0         91.2         40         140           mg/Kg         1.25         0         91.2         40         140           mg/Kg         1.25         0         91.2         40         140           mg/Kg <th>de: ₩</th> <th>Test Co Run ID: RL 0.25 0.25 0.25</th>	de: ₩	Test Co Run ID: RL 0.25 0.25 0.25
SV-2_010117A       SeqNo::       103351         QC Spike Original Sample       QC Spike Original Sample       Origit         Units       Amount       Result       %REC       LowLimit       HighLimit       or         mg/Kg       1.25       0       98.3       40       140         mg/Kg       1.25       0       99.1       40       140         mg/Kg       1.25       0       99.7       40       140         mg/Kg       1.25       0       99.7       40       140         mg/Kg       1.25       0       99.7       40       140         mg/Kg       1.25       0       99.7       40       140         mg/Kg       1.25       0       99.7       40       140         mg/Kg       1.25       0       99.5       40       140         mg/Kg       1.25       0       90.2       40       140         mg/Kg       1.25       0       96.2       40       140         mg/Kg       1.25       0       96.2       40       140         mg/Kg       1.25       0       96.2       40       140         mg/Kg       1.	S J B	Run ID: RL 0.25 0.25 0.25
QC Spike Original Sample         Origin           Units         Amount         Result         %REC         LowLimit         HighLimit         or           mg/Kg         1.25         0         98.3         40         140           mg/Kg         1.25         0         99.1         40         140           mg/Kg         1.25         0         99.1         40         140           mg/Kg         1.25         0         99.7         40         140           mg/Kg         1.25         0         89.5         40         140           mg/Kg         1.25         0         89.5         40         140           mg/Kg         1.25         0         99.7         40         140           mg/Kg         1.25         0         99.7         40         140           mg/Kg         1.25         0         91.2         40         140	วิธี	RL 0.25 0.25 0.25 0.25
Units         Amount         Result         %REC         LowLimit         HighLimit         or           mg/Kg         1.25         0         98.3         40         140           mg/Kg         1.25         0         98.1         40         140           mg/Kg         1.25         0         99.1         40         140           mg/Kg         1.25         0         99.7         40         140           mg/Kg         1.25         0         99.7         40         140           mg/Kg         1.25         0         89.5         40         140           mg/Kg         1.25         0         89.5         40         140           mg/Kg         1.25         0         91.2         40         140           mg/Kg         1.25         0         91.2         40         140           mg/Kg         1.25         0         91.2         40         140           mg/Kg         1.25         0         96.2         40         140           mg/Kg         1.25         0         96.2         40         140	ם מ	RL 0.25 0.25 0.25 0.25
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mg/kg         1.25         0         99.1         40         140           mg/kg         1.25         0         72.3         40         140           mg/kg         1.25         0         72.3         40         140           mg/kg         1.25         0         99.7         40         140           mg/kg         1.25         0         89.5         40         140           mg/kg         1.25         0         89.5         40         140           mg/kg         1.25         0         83.8         40         140           mg/kg         1.25         0         91.2         40         140           mg/kg         1.25         0         90.9         40         140           mg/kg         1.25         0         96.2         40         140		0.25 0.25 0.25
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## TRACE METALS-SOIL

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## SW-846 METHODS: 6010B

# SAMPLE RESULTS

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Date: 26-Jan-01

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CLIENT: Weston & Sampson Engineers Lab Order: 0101094 Project: 200317.A BRA P-3 Roxbury Lab ID: 0101094-01A

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**Date:** 20-547-03

Client Sample ID: B-201(D) 10-12'

Project: Lab ID:	200317.A BRA P-3 Rox 0101094-01A	bury			Collection Date: Matrix:	1/10/01 SOIL	
Analyses		Result	RL	Qual	Units	DF	Date Analyzed
ICP METALS	TOTAL SW-846 - 3051/6010	550	SW6010B 3.3		mg/Kg-dry	1	Analyst: REB 1/15/01 5:23:54 PM
PERCENT M	OISTURE ture	6.0	D2216		wt%	1	Analyst: CH

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

\* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

# - See Case Narrative

Date: 26-Jan-01

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CLIENT:Weston & Sampson EngineersLab Order:0101094Project:200317.A BRA P-3 RoxburyLab ID:0101094-02A

Collection Date: 1/10/01

Client Sample ID: B-201(D) 22-24'

Matrix: SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
CP METALS TOTAL SW-846 - 3051/6010 Lead	74	SW6010B 7.8		mg/Kg-dry	1	Analyst: REB 1/15/01 5:29:00 PM
PERCENT MOISTURE	62.0	D2216 0		wt%	1	Analyst: CH

Oua	lifiers:	

ND - Not Detected at the Reporting Limit

- J Analyte detected below quantitation limits
- B Analyte detected in the associated Method Blank
- \* Value exceeds Maximum Contaminant Level
- S Spike Recovery outside accepted recovery limits
- R RPD outside accepted recovery limits
- E Value above quantitation range
- # See Case Narrative

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## AMRO Environmental Laboratories Corp.

Date: 26-Jan-01

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CLIENT:Weston & Sampson EngineersLab Order:0101094Project:200317.A BRA P-3 RoxburyLab ID:0101094-03A

Collection Date: 1/10/01

Client Sample ID: B-207(S)- 3-5'

Matrix: SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
CP METALS TOTAL SW-846 - 3051/6010		SW6010B				Analyst: REB
Lead	220	3.5		mg/Kg-dry	1	1/15/01 5:41:46 PM
PERCENT MOISTURE		D2216				Analyst: CH
Percent Moisture	11.6	0		wt%	1	1/15/01

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

\* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

# - See Case Narrative

Date: 26-Jan-01

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1/15/01

CLIENT:	Weston & Sampson Engl	ineers		C	lient Sample ID:	DUP	
Lab Order:	0101094						
Project:	200317.A BRA P-3 Rox	вигу			<b>Collection Date:</b>	1/10/01	
Lab ID:	0101094-04A				Matrix:	SOIL	
Analyses		Result	RL	Qual	Units	DF	Date Analyzed
ICP METALS T	OTAL SW-846 - 3051/6010	620	<b>SW6010B</b> 3.6		mg/Kg-dry	1	Analyst: REB 1/15/01 5:46:35 PM
 PERCENT MO	ISTURE		D2216				Analyst: CH

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wt%

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Qualifiers:

ND - Not Detected at the Reporting Limit

- J Analyte detected below quantitation limits
- B Analyte detected in the associated Method Blank
- \* Value exceeds Maximum Contaminant Level
- S Spike Recovery outside accepted recovery limits
- R RPD outside accepted recovery limits
- E Value above quantitation range
- # See Case Narrative

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

Percent Moisture

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Date: 26-Jan-01

CLIENT:	Weston & Sampson Eng	ineers		Client S	ample ID:	B-202(S	) 5-7'
Lab Order:	0101094						
Project:	200317.A BRA P-3 Rox	bury		Collec	tion Date:	1/11/01	
Lab ID:	0101094-05A				Matrix:	SOIL	
Analyses	· · · · · · · · · · · · · · · · · · ·	Result	RL	Qual Units	1	DF	Date Analyzed
CP METALS 1	TOTAL SW-846 - 3051/6010		SW6010B				Analyst: REB
Lead		7,000	3.1	mg/Kg	j-dry	1	1/15/01 5:51:42 PM
DEDOENT NO	INTURE		50040				

 PERCENT MOISTURE
 D2216
 Analyst: CH

 Percent Moisture
 6.8
 0
 wt%
 1
 1/15/01

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

- \* Value exceeds Maximum Contaminant Level
- S Spike Recovery outside accepted recovery limits
- R RPD outside accepted recovery limits
- E Value above quantitation range
- # See Case Narrative

Date: 26-Jan-01

CLIENT:Weston & Sampson EngineersLab Order:0101094Project:200317.A BRA P-3 RoxburyLab ID:0101094-06A

Collection Date: 1/11/01

Client Sample ID: B-203(S) 5-7'

Matrix: SOIL

Analyses	Result	RL	Qual Units	DF	Date Analyzed
ICP METALS TOTAL SW-846 - 3051/6010	460	SW6010B 3.5	mg/Kg-dry	1	Analyst: REB 1/15/01 5:56:24 PM
PERCENT MOISTURE	16.2	D2216	wt%	1	Analyst: CH

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

\* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

# - See Case Narrative

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Date: 26-Jan-01

-----\_\_\_\_\_ Weston & Sampson Engineers **CLIENT:** Client Sample ID: B-204(S) 5-7' Lab Order: 0101094 Collection Date: 1/11/01 Project: 200317.A BRA P-3 Roxbury Matrix: SOIL Lab ID: 0101094-07A Analyses Result **RL** Qual Units DF Date Analyzed CP METALS TOTAL SW-846 - 3051/6010 SW6010B Analyst: REB 230 Lead 3.5 mg/Kg-dry 1 1/15/01 6:01:23 PM PERCENT MOISTURE D2216 Analyst: CH Percent Moisture 0 18.4 wt% 1 1/15/01

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

- \* Value exceeds Maximum Contaminant Level
- S Spike Recovery outside accepted recovery limits
- R RPD outside accepted recovery limits
- E Value above quantitation range
- # See Case Narrative

Date: 26-Jan-01

CLIENT:Weston & Sampson EngineersLab Order:0101094Project:200317.A BRA P-3 RoxburyLab ID:0101094-08A

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Client Sample ID: B-205(S) 3-5' Collection Date: 1/11/01

Matrix: SOIL

Analyses	Result	RL Q	ual Units	DF	Date Analyzed
ICP METALS TOTAL SW-846 - 3051/6010	10	SW6010B	ma/Ka.do/	1	Analyst: REB
	10	D2216	ng/kg-ury	1	Analyst: CH
Percent Moisture	3.3	0	wt%	1	1/15/01

ND - Not Detected at the Reporting Limit

S - Spike Recovery outside accepted recovery limits

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

\* - Value exceeds Maximum Contaminant Level

E - Value above quantitation range

R - RPD outside accepted recovery limits

# - See Case Narrative

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PERCENT MOISTURE

Percent Moisture

Date: 26-Jan-01

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Analyst: CH

1/15/01

ICP METALS T	OTAL SW-846 - 3051/6010		SW6010B				Analyst: REB
Analyses		Result	RL	Qual	Units	DF	Date Analyzed
Lab <b>ID:</b>	0101094-09A				Matrix:	SOIL	
Project:	200317.A BRA P-3 Roxt	bury			Collection Date:	1/11/01	
Lab Order:	0101094						
CLIENT:	Weston & Sampson Engi	ineers		С	lient Sample ID:	B-206(S	) 3-5'

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wt%

D2216

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Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

\* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

# - See Case Narrative

# METHOD BLANK

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LIENT: ork Or oject:	: We der: 01( 20(	eston & Sa 01094 0317.A BR	mpson En A P-3 Ro	gineers xbury	•							0	C SUN	MMAR	<b>LY RE</b> Metho	POF d Bla	~ =
mple ID ent ID:	MB-3585	Ĕ	atch ID: 358	35	Test Cod Run 1D:	e: SW6010E ICP-OPTI	3 Unit MA_01011	s: mg/Kg 15C		Analy: SegNe	sis Date 1. o: 10	/15/01 4:52 )2219	:38 PM	Prep D	Jate 1/15/	10	
alyte			QC Samp Res	uit u	RL	Units	QC Spike Amount	Original Si Ri	ample tesult %REC	C LowLir	mit HighL	Origin Limit or I	al Sample MS Result	%RP	D RPDI	imit I	1
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alifiers:	ND - Not E	Detected at th	c Reporting	Limit	S	- Spike Rccor	vcry outside	accepted ro	scovery limits	B - A	nalyte detec	cted in the as	sociated Me	ethod Blank		1	
launers:	J - Analyte	Detected at un detected bela	ic reputure ow quantitat	tion limits	2 22	- RPD outsid	e accepted r	ccovery lim	ocuvery mine	- VN	Not applica	the where J	values or NI	D results acc	cur		
	RL - Repoi	rting Limit; d	lefined as the	s lowest con	centration th	e laboratory c	an accurate:	ly quantitate	ບໍ່								

# MATRIX SPIKE AND MATRIX SPIKE DUPLICATE

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цій цій			DB PTIMA_0	QC Sp Amo	25	TIMA_01	QC Sp Amo	52	covery out
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RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate. J - Analyte detected below quantitation limits

NA - Not applicable where J values or ND results occur

R - RPD outside accepted recovery limits

# LABORATORY CONTROL SAMPLE

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	AMRO EI	CLAENT: Vork Order: Project:	Sample ID LCS	nalyte	ead
			10 0	∢∣	

Qualifiers:	ND - Not Detected at the Reporting Limit	S - Spike Recovery outside accepted recovery limits	$B \cdot Analyte detected in the associated Method Blank$
	J - Analyte detected below quantitation limits	R - RPD outside accepted recovery limits	NA - Not applicable where J values or ND results occur
	RL - Reporting Limit; defined as the lowest concentrati	ion the laboratory can accurately quantitate.	

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Appendix E-2

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Т

Groundwater

Weston & Sampson



111 Herrick Street, Merrimack, NH 03054 TEL: (603) 424-2022 · FAX: (603) 429-8496

September 25, 2001

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George Naslas Weston & Sampson Engineers 5 Centennial Drive Peabody, MA 019607985 TEL: (978) 532-1900 FAX: (978) 977-0100

RE: 200317B BRA P 3

Order No.: 0109052

Dear George Naslas:

AMRO Environmental Laboratories Corp. received 2 samples on 9/11/01 for the analyses presented in the following report.

AMRO operates a Quality Assurance Program which meets or exceeds National Environmental Laboratory Accreditation Conference (NELAC), state, and EPA requirements. A copy of the appropriate state and/or NELAC Certificate is attached.

The enclosed Sample Receipt Checklist details the condition of your sample(s) upon receipt. Please be advised that any unused sample volume and sample extracts will be stored for a period of thirty (30) days from this report date. After this time, AMRO will properly dispose of the remaining sample(s). If you require further analysis, or need the samples held for a longer period, please contact us immediately.

This report consists of a total of 12 pages. This letter is an integral part of your data report. If you have any questions regarding this project in the future, please refer to the Order Number above.

Sincerely,

Nancy Stewart Vice President / Lab Director

WS-2

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0109052-02B

Date: 25-Sep-01

9/10/01

CLIENT: Project: Lab Order: Date Received:	Weston & Sampson Engineers 200317B BRA P 3 0109052 9/11/01	Work Order Sample Summary
– Lab Sample ID	Client Sample ID	Collection Date
0109052-01A	WS-13	9/10/01
0109052-02A	WS-2	9/10/01

## AMRO Environmental Laboratories Corp. Date: 25-Sep-01

CLIENT:Weston & Sampson EngineersProject:200317B BRA P 3Lab Order:0109052

CASE NARRATIVE

#### MADEP-VPH

1. Sample 0109052-02A had a recovery for the surrogate 2,5-Dibromotoluene outside the QC limits.

AMRO En	wironmental Labo	ratorie	s Corp.			• Date:	25-Sep-(	
CLIENT:	Weston & Sampson En	gineers		C	lient Sa	mple ID:	WS-13	
Lab Order: Project:	0109052 200317B BRA P 3				Collect	ion Date:	9/10/01	
Lab ID:	0109052-01A					Matrix:	GROUN	IDWATER
Analyses		Result	RL	Qual	Units		DF	Date Analyzed
ICP METALS D	DISSOLVED SW-846		SW6010B					Analyst: RK
Lead		ND	12		µg/L		<b>1</b>	9/13/01 3:52:33 PM
Qualifiers:	ND - Not Detected at the Rep	orting Limit			S - Spike	Recovery ou	tside accept	ed recovery limits
	J - Analyte detected below qu B - Analyte detected in the as	antitation lin	nits hod Blank		R - RPD ( E - Value	above quant	ted recover	y limits e
	H - Method prescribed holdin	g time excee	ded		# - See C	ase Narrative		

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CLIENT:	Weston & Sampson Er	igineers		С	lient Sample ID:	WS-2	
Lab Order:	0109052				Tag Number:		
Project:	200317B BRA P 3				<b>Collection Date:</b>	9/10/0	)1
Lab ID:	0109052-02A				Matrix:	GROU	JNDWATER
Analyses		Result	RL	Qual	Units	DF	Date Analyzed
VOLATILE PE	TROLEUM HYDROCARBO	ONS	MAVPH				Analyst: JO
C5-C8 Aliphatic	c Hydrocarbons	ND	100		µg/L	1	9/13/01 3:34:00 PM
C9-C12 Alipha	tic Hydrocarbons	ND	25		µg/L	1	9/13/01 3:34:00 PM
C9-C10 Aroma	tic Hydrocarbons	ND	25		µg/L	1	9/13/01 3:34:00 PM
Methyl tert-but	yl ether	ND	2.0		µg/L	1	9/13/01 3:34:00 PM
Benzene		ND	2.0		µg/L	1	9/13/01 3:34:00 PM
Toluene		ND	2.0		µg/L	1	9/13/01 3:34:00 PM
Ethylbenzene		ND	2.0		µg/L	1	9/13/01 3:34:00 PM
m,p-Xylene		ND	2.0		µg/L	1	9/13/01 3:34:00 PM
o-Xylene		ND	2.0		µg/L	1	9/13/01 3:34:00 PM
Naphthalene		ND	5.0		µg/L	1	9/13/01 3:34:00 PM
Surr: 1,2-Dic	chloroethane-d4	103	70-130		%REC	1	9/13/01 3:34:00 PM
Surr: 2,5-Dit	promotoluene	159	70-130	S	%REC	1	9/13/01 3:34:00 PM
Surr: 4-Bron	nofluorobenzene	85.9	70-130		%REC	1	9/13/01 3:34:00 PM
Surr: Dibron	nofluoromethane	108	70-130		%REC	1	9/13/01 3:34:00 PM
	a d0	105	70-130		%REC	1	9/13/01 3:34:00 PM

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

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Were all QA/QC procedures required by the VPH or EPH method followed:

Were all performance/acceptance standards for required QA/QC procedures achieved: Were any significant modifications made to the method as specified in section 11.3:

Yes \_\_\_\_ No - If No, See Case Narrative \_\_\_\_ Yes \_\_\_\_ No - If No, See Case Narrative \_\_\_\_ No \_\_\_\_ Yes - Details enclosed

I attest under the pains and penalties of perjury 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.

SIGNATURE:

PRINTED NAME: Nancy Stewart

9-25-01 DATE:

POSITION: Laboratory Director (or designee)

 Qualifiers:
 RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

 ND - Not Detected at the Reporting Limit
 S - Spike Recovery outside accepted recovery limits
 E - Val

 J - Analyte detected below quantitation limits
 R - RPD outside accepted recovery limits
 # - See

 B - Analyte detected in the associated Method Blank
 H - Method prescribed holding time exceeded

E - Value above quantitation range

# - See Case Narrative

AMRO Er	nvironmental Lab	oratorie	es Corp.		Date:	25-Se,	p-01
CLIENT:	Weston & Sampson E	ngineers		Client S	ample ID:	WS-2	
Lab Order:	0109052			Tag	Number:	0.110.00	
Project:	200317B BRA P 3			Collec	tion Date:	9/10/(	)]
Lab ID:	0109052-02B				Matrix:	GRO	UNDWATER
Analyses		Result	RL	Qual Units		DF	Date Analyzed
EXTRACTABL	E PETROLEUM HYDROC	ARBONS	МАЕРН				Analyst: RKK
C9-C18 Aliphat	tic Hydrocarbons	ND	100	µg/L		1	9/19/01 9:54:00 PM
C19-C36 Alipha	atic Hydrocarbons	140	100	µg/L		1	9/19/01 9:54:00 PM
C11-C22 Arom	atic Hydrocarbons	ND	100	µg/L		1	9/19/01 9:54:00 PM
Naphthalene		ND	1.0	µg/L		1	9/19/01 9:54:00 PM
2-Methylnaphth	nalene	ND	1.0	µg/L		1	9/19/01 9:54:00 PM
Acenaphthylen	e	ND	1.0	µg/L		1	9/19/01 9:54:00 PM
Acenaphthene		ND	1.0	µg/L		1	9/19/01 9:54:00 PM
Fluorene		ND	1.0	µg/L		1	9/19/01 9:54:00 PM
Phenanthrene		ND	、1.0	µg/L		1	9/19/01 9:54:00 PM
Anthracene		ND	1.0	µg/L		1	9/19/01 9:54:00 PM
Fluoranthene		ND	1.0	hð\r		1	9/19/01 9:54:00 PM
Pyrene		ND	1.0	µg/L		1	9/19/01 9:54:00 PM
Benz(a)anthrac	cene	ND	1.0	µg/L		1	9/19/01 9:54:00 PM
Chrysene		ND	1.0	µg/L		1	9/19/01 9:54:00 PM
Benzo(b)fluora	nthene	ND	1.0	µg/L		1	9/19/01 9:54:00 PM
Benzo(k)fluora	nthene	ND	1.0	µg/L		1	9/19/01 9:54:00 PM
Benzo(a)pyren	e	ND	1.0	µg/L		1	9/19/01 9:54:00 PM
Dibenz(a,h)ant	thracene	ND	1.0	µg/L		1	9/19/01 9:54:00 PM
Indeno(1,2,3-c	d)pyrene	ND	1.0	µg/L		1	9/19/01 9:54:00 PM
Benzo(g,h,i)pe	rylene	ND	1.0	µg/L		1	9/19/01 9:54:00 PM
Surr: 1-Chlo	rooctadecane	51.7	40-140	%REC	;	1	9/19/01 9:54:00 PM
Surr: 2-Bron	nonaphthalene	87.7	40-140	%REC	>	1	9/19/01 9:54:00 PM
Surr: 2-Fluo	robiphenyl	86.5	40-140	%REC	>	1	9/19/01 9:54:00 PM
Surr: o-Terp	henyl	73.7	40-140	%REC	;	1	9/19/01 9:54:00 PM

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

Were all QA/QC procedures required by the VPH or EPH method followed:

Were all performance/acceptance standards for required QA/QC procedures achieved: Ves No - If No, See Case Narrative Were any significant modifications made to the method as specified in section 11.3: No Ves - Details enclosed

Yes \_\_\_\_ No - If No, See Case Narrative

I attest under the pains and penalties of perjury 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.

SIGNATURE:

l

PRINTED NAME: Nancy Stewart

9-25-01 DATE:

POSITION: Laboratory Director (or designee)

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate. Qualifiers: S - Spike Recovery outside accepted recovery limits ND - Not Detected at the Reporting Limit J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits B - Analyte detected in the associated Method Blank H - Method prescribed holding time exceeded

E - Value above quantitation range

# - See Case Narrative

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	- <u>Sep-01</u>	
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	mental	9052
	<u>nviron</u>	010
	M.R.O.F	b Order:
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Client:	Weston & Sampson En	igineers			DATE	S REPORT	
Project:	200317B BRA P 3						
Sample ID	Clicnt Sample ID	Collection Date	Matrix	Test Name	TCLP Date	Prep Date	Analysis Date
0109052-01A	WS-13	9/10/01	Groundwater	ICP METALS, DISSOLVED		9/13/01	9/13/01
0109052-02A	WS-2			Volatile Petroleum Hydrocarbons		9/13/01	9/13/01
0109052-02B				EPH, Water, Full List		9/15/01	10/61/6

Client: <u>Weston &amp; Samb son Eug</u> Project Name: <u>2003/78</u> BEA/P-3 Ship via: (circle one) Fed Ex., UPS, AMRO Courier, Hand Del., Other Courier, Other.	AMRO I Date Re Date Du	D: ec.: ie;		(603) 424 9-12-01 9-24-01
Items to be Checked Linon Receipt	Ves	No		Commonte
1. Army Samples received in individual plastic bags?	163			Conments
2. Custody Seals present?			1.	
3. Custody Seals Intact?			-45	
4. Air Bill included in folder if received?			1/	
5. Is COC included with samples?	1			· · · · · · · · · · · · · · · · · · ·
6. Is COC signed and dated by client?			1	·····
7. Laboratory receipt temperature. TEMP = $2,5^{\circ}$ Samples rec. with ice <u></u> ice packs neither				
8. Were samples received the same day they were sampled?		V		
Is client temperature 4°C ± 2°C?	$\checkmark$			
If no obtain authorization from the client for the analyses.				
Client authorization from: Date: Obtained by:				
9. Is the COC filled out correctly and completely?				
10. Does the info on the COC match the samples?	~			
11. Were samples rec. within holding time?				
12. Were all samples properly labeled?	V	[	<u> </u>	
13. Were all samples properly preserved?	V		ļ	O2B(2) needsa
14. Were proper sample containers used?	V		<u> </u>	
15. Were all samples received intact? (none broken or leaking)	V.		<u> </u>	
15. Were VOA vials rec. with no air bubbles?				
17. Were the sample volumes sufficient for requested analysis?	V	<u> </u>		<u> </u>
10. VPH and VOA Salla antig		1		· · · · · · · · · · · · · · · · · · ·
Sampling Method VPH (circle one): M=Methanol E=EnCore (air-tight	Containe			
Sampling Method VCA (circle one): M=Methanol, SB=Sodium Bisulfat	e E=EnC	ore B⊐f	-	
If M or SB:				<u> </u>
Does preservative cover the soil?				
If NO then client must be faxed.		· · · · ·		
Does preservation level come close to the fill line on the vial?			-	
If NO then client must be faxed.				·
Were vials provided by AMRO?			1	
If NO then weights MUST be obtain	ned from	client		
Was dry weight aliquot provided?				
If NO then fax client and inform the	e VOA lai	b ASAP.		
20. Subcontracted Samples:				
What samples sent:				
Where sent:				
Date:			ļ	
Analysis:				
			<u></u>	
21. Information entered into:	L			
Internal Tracking Log?				
Dry Weight Log?	<u> </u>		$\vdash$	
Client Log?				
Composite Log?				
Filtration Log?				

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AMRO Environmental Laboratories Corporation

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F	lease Circle if:
Ś	ample= Soil
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111 Herrick Street Merrimack, NH 03054 (603) 424-2022

<u> </u>						List			
						Preserv.		Voiume	Final
0	<b>A</b> and the first	Volume	Preserv.	Initial	Acceptable?	Added by	Solution ID #	Preservative	adjuste
	Analysis	Sample	LISTED		V V		ULFIESEW.	Added	pr
<u>017</u>	D PB	1-500P	41003	<u> </u>			1		
Mar (1)	FRU	3-99110	<u>HCI</u>	12	V			· ·	
$\frac{2}{2} \frac{2}{2} \frac{2}{2} \frac{2}{2}$	EOU	I = ILA	NCI	2	n/	1101	R02831	2 ml	122
JAD (A)	<u>LIH</u>	1-1LH	NCL.			NC/	100001		
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Checked By:	CC			1 9-	Date: -/2-0/	pH adjusted	By: CC	Date: 9-12-	01 9
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~ )	mv K	~ 767 1							

ratories Corporation CHAIN-OF-CUSTODY RECORD & CHAIN-CUSTODY R		oject Name: BR2A P-3 Project Manager: (-ROJER NESKS Samplers (Signature): AMRO Project No.:	oject State:	Date/Time Matrix Total # Analysis Required Remarks	Sampled A= Air Server of Cont. S= Soil GW= Ground W. GW= Ground W. WW= Waste W. DW= Drinking W. DW= Drinking W. Of Cont.	1150 60 1 testin X X X X X X X X X X X X X X X X X X X	1350 6W JAM 3V X X A Sheer	C Mater			S-H2SO4, Na-NaOH, O- Other Cr [C1 [N] Vial, T- Teflon, O-Other V 6 T	etely. Samples can not be FAX No.: タアタイフ O/DO NOTES: Preservatives, Special reporting limits, Known Contamination, etc; ck will not start until any	encient DCVC Seal Intact? GW-1 _ GW-3 _ GW-3 _	VAT CITIC TO NOT TO THE Needed:	Date Time Received By Date/Time P.O. No: PRIORITY TURNAROUND TIME AUTHORIZATION	Ale 417 HT. By: Thrulder and received a coded TAT AUTHORIZATION NUMBER By: Thrulder AUTHORIZATION No. BY:	Nong in the TAT SHEET OF I	Ilow: Accompanies Report Pink: Client Copy
aboratories Corporation		Project Name: BC2	Project State:	Date/Time Matrix	Sampled A= Air S= Soif GW= Ground V WW= Waste W DW= Drinking O= Oil Other= Specify	Fall50 62	9101350 6W		-		1 103, S-H2SO4, Na-NaOH, O- O s, V-Vial, T- Teflon, O-Other	ompletely. Samples can not be e clock will not start until any	K-lenner 26	aits tim he	Date/ Time	3/h/02 457 47.	Man	Yellow: Accompanies Report
AMRO Environmental	Merrimack, NH 03054	Froject No.: 20317B		Sample ID		W5-12	K , S(M *				Preservative: Cl-HCl, MeOH, N-HN Container Type: P-Plastic, G-Glass	Please print clearly, legibly and cologged in and the turnaround time ambiguities are resolved.	Send Results To:	reciver à	Nu AD . I Clarked By	Juce - 17	10	White I ab Conv

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# Department of Environmental Protection Division of Environmental Analysis Senator William X. Wall Experiment Station

#### certifies

M-NH012

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AMRO ENVIRONMENTAL LAB 111 HERRICK ST MERRIMACK, NH 03054-0000

Laboratory Director: Nancy Stewart

for the analysis of

NON POTABLE WATER (CHEMISTRY) POTABLE WATER (CHEMISTRY)

#### pursuant to 310 CMR 42.00

This certificate supersedes all previous Massachusetts certificates issued to this laboratory. The laboratory is regulated by and shall be responsible for being in compliance with Massachusetts regulations at 310 CMR 42.00.

This certificate is valid only when accompanied by the latest dated Certified Parameter List as issued by the Massachusetts D.E.P. Contact the Division of Environmental Analysis to verify the current certification status of the laboratory.

Certification is no guarantee of the validity of the data. This certification is subject to unannounced laboratory inspections.

car Q. Jaroche

Director, Division of Environmental Analysis

Issued: 01 JUL 2001 Expires: 30 JUN 2002
### COMMONWEALTH OF MASS ACHUS ETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### Certified Parameter List as of: 09 JUL 2001

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#### M-NE012 AMRO ETVIRONMENTAL LAB MERRIMACK NH

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NON POTABLE WATER	(CHEMISTRY)	Effective Date	01 JUL 2001	Expiration Date	30 JUN 2002
	Analytes and Methods				
ALLIMINUM	EA 200.7		NITRATE-N		ETA 353.2
ANTMONY	EA 200.7		KJELCAHL N		EA 351.1
ANTIMONY	EA 204.2		KIELDAHL-N		EA 151.2
ARSENIC	EA 200.7		ORTHOPHOSPHATE		EA 165.7
ARSENIC	E-A 206.2		ORTHOPHOSPHATE		EFA 100.0
ARSENIC	A STM 02972-93	4(C)	TOTAL PHOSPHORUS		E-A 365.2
857YULUM	ERA 200.7		CHENICAL CITY GEN DEM	4.140	EA 410.4
CADNILIM	EFA 200.7		CHEWICAL OXYGEN DEW	ANO	HACH METHOD
CHROMUM	ERA 200.7		BIOCHEVICAL OXYGEN D	ENANO	E-A 405.1
COBALT	EA 200.7		TOTAL CYANDE		E-A 115.2
COFFER	EA 200.7		NON-FILTERABLE RESIDU	E	ETA 150.2
RON	EPA 200.7		TOTAL RESIDUAL CHLOR	INE	SM 4500-CL-G
LE40	EA 200.7	•	OL AND GREASE		EPA 413.1
LEAD	EA 239.2		TOTAL PHENOLICS		ERA 420.1
MANGANESE	EA 200.7		VOLATLE HALOCARBON	5	EPA 524
MERCURY	EA 245.1		VOLATLEAROMATICS	•	EA 624
MOLYEDENUM	EA 200.7		CHLORDANE		EA 608
NICKE_	EA 200.7		ALDRIN		E-A 608
SE_Salm	EA 200.7		DECRIN		808 A <sup>C</sup> 3
. Selenim	EA 270.2		202 .		ETA 608
SLVER	, EA 200.7		COT		E-A 608
STRONTLIM	.ERA 200.7		HEPTACHLOR		EA 608
THALLEM	EPA 200.7		HETACHLOR FOXDE		EPA 608
THALLAM	EPA 279.2		FOLY CHLORINA TEL BIPH	BALS (WATER)	EA 608
ZNC	EA 200.7		POLYCHLORINATED BIPHE	encs (or)	EA 630/4-81-0
PH	EA 150.1				
SPECIFIC CONDUCTIVITY	EA 120.1				•
TOTAL DISSOLVED SOLIDS	EA 160.1	•			
TOTAL HARDNESS (CACOS)	EA 200.7				
	EA 200.7				
MAGNEALIM	EA 200.7				
	EA 200.7				
POTASSEM	EA 200.7				
	EA 310.1				
	EA 125.1				
	EA 300.0				
	EA 340.2 ,			-	
	EPA 300.0				

July 3, 2001

SULFATE

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NITRATE-N

\* Provisional Certification

EA 375.4

EA 300.0

EFA 150.2

ERA 300.0

### COMMONIVEALTH OF MASS ACEUS ETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

Effective

Certified Parameter List as of: 09 JU

09 JUL 2001

M-NH012

SULFATE

CYANCE

CALCUM

PH

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RESIDUAL FREE CHLORINE

TOTAL DISSOLVED SOLIDS

1.2-DIERONIO-J-CHLOROPPOPANE

TOTAL ALKALINITY

1,2-OBROMOETHANE

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AMIRO ENVIRONMENTAL LAB

MERRIMACK NH

POTABLE WATER (CHEMISTRY)

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09 JUL 2001

Expiration 30 JUN 2002

			Date		Dute
	· · ·	Analytes and Methods			
ANTWONY		EA 200.9			
ARSENC		EA 200.7			
ARSENC		EA 200.9			
BARLIM		EA 200.7			
BERYLLIM		EPA 200.7	·		
CACMILIM		EPA 200.7			•
CHROMIUM		EA 200.7			-
COFFER		EPA 200.7	•		
LEAD		EPA 200.9			
MERCURY		EA 245.1			
NICKE_		EA 200.7	·	-	
SE ENAIN		EA 200.9			
THALLUM		EA 200.9			
NITRATE-N	•	EA 353.2			
ทรณรงห		EA 3512	•		
LUORDE		EA 300.0			
LUCROE		SM 4500-F-E		•	

67A 100.0

EPA 180.1

EPA 200.7

SM 21208

SM 2540C

EPA 150.1

EA 504.1

EA 504.1

SM 4500-CL-G

SM 4500-CN-C.E

July 3, 2001



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111 Herrick Street, Merrimack, NH 03054 TEL: (603) 424-2022 · FAX: (603) 429-8496

rec'd. 2/23/01.

February 20, 2001

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George Naslas Weston & Sampson Engineers 5 Centennial Drive Peabody, MA 019607985 TEL: (978) 532-1900 FAX: (978) 977-0100

RE: 200317.A P-3 Roxbury

Order No.: 0102063

Dear George Naslas:

AMRO Environmental Laboratories Corp. received 7 samples on 2/8/01 for the analyses presented in the following report.

AMRO operates a Quality Assurance Program which meets or exceeds National Environmental Laboratory Accreditation Conference (NELAC), state, and EPA requirements. A copy of the appropriate state and/or NELAC Certificate is attached. Please see the enclosed Case Narrative for quality control deviations that were encountered during the analyses associated with this project.

The enclosed Sample Receipt Checklist details the condition of your sample(s) upon receipt. Please be advised that any unused sample volume and sample extracts will be stored for a period of thirty (30) days from this report date. After this time, AMRO will properly dispose of the remaining sample(s). If you require further analysis, or need the samples held for a longer period, please contact us immediately.

This report consists of a total of  $\frac{67}{2}$  pages. This letter is an integral part of your data report. If you have any questions regarding this project in the future, please refer to the Order Number above.

Sincerely,

Ver Sprant

Nancy Stewart Vice President / Lab Director



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CLIENT: Project: Lab Order: Date Received:	Weston & Sampson Engineers 200317.A P-3 Roxbury 0102063 2/8/01	Work Order Sample Summary
Lab Sample ID	Client Sample ID	Collection Date
0102063-01A	WS-12	2/6/01
0102063-01B	WS-12	2/6/01
0102063-01C	WS-12	2/6/01
0102063-02A	WS-10	2/6/01
0102063-02B	WS-10	2/6/01
0102063-02C	WS-10	2/6/01
0102063-03A	WS-9	2/6/01
0102063-03B	WS-9	2/6/01
0102063-03C	WS-9	2/6/01
0102063-04A	WS-7	2/7/01
0102063-04B	WS-7	2/7/01
0102063-04C	WS-7	2/7/01
0102063-05A	WS-5	2/7/01
0102063-05B	WS-5	2/7/01
0102063-05C	WS-5	2/7/01
0J02063-06A	WS-3	2/7/01
0102063-06B	WS-3	2/7/01
0102063-06C	WS-3	2/7/01
0102063-07A	TRIP BLANK	2/7/01

## AMRO Environmental Laboratories Corp.

Date: 19-Feb-01

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		XY OF A PAGE OF A	the set of the set of	Remarks	X			X						NAROUND TIME AUTHORIZATION samples for expedited T.A.T., you must have requested in advance and	NO. T.A.T. authorized by:	Send Results to:	WESTON & SAMPSON ENGINERRS	Raber MA, 01960	Remarks	- GW-1 Standards			
	CUSTODY RECORD	oject State MATRIX Water - A	pe Vaste-W Xaste-W No of Other-O	Explain A	VA Z-IL A X	X X V	X V	A	XXX					d PRIORITY TUR Before submitting s		Eax to (phone)	Results peeded	PO#	AMRO Project No.	0103063	Seal Intact?	Yes No N/A	
articres Comparticut and an and an and an and an and an and an and an and an and an and an and an and an and an	3496 CHAIN OF	2-3 Roxbury	att-	Comp Grab Station Location	W5-12 3-1	W5-10	Ws-9	W5-7	WS - 5	W5-3	I TRIP BLANK			and completely. Samples cannot be logged clock will not start until any ambiguities are	4	Date Time Received by (Signature)	2/8/01 1028 N/11 Xaur	Date Time Received by (Signature)	Date Time Received by (Signature)		pate Time 2.42 Received for Laboratory by: (Signature	2/8/61 (Instand) (Park	ccompanies report Pink: Client copy
Amed Environmental Les	Office: 603-424-2022 Fax; 603-429-8	Proj. No. 2003 i 7, A	Samplers (Signature) RULF &	Sta. No. Date	2/4/01 1036	2/6/01 1325	2/6/01 1530	21/61 1205	2/7/61 1345	0440 10/2/2	-			Please print clearly, legibly in and the turnaround time	resolved.	Relinquished by (Signature)	KNAT BUTD	Relinquished by (Signature)	Relinouished by (Signature)		gelinguished by (Signature)	all avelar	White: I ab conv Yellow: A

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	AMRO Environmental SAMPLE RECEIPT	CHEC	KLIS	Т	111 Herrick Stru Merrimack, NH 030	eet )54
	ent: /DAS	AMRO	D:	01	02063	522
Pł	Diect Name: 2003174 P-3 Roxburg	Date Re	ec.:		-8-01	
sł	Ip via: (circle one) Fed Ex., UPS, AMRO Courier,	Date Du	ie:	2	-20-01	
ΗĘ	nd Det., Other Courier, Other:					
	ms to be Checked Lines Passist	Vor	Ma	NA		
	Army Samples received in individual electic beer?	165	110	INA		
	Custedy Seals present?				1	
	Custody Seals present?					
	Custody Seals Intact?					
4	Air Bill included in folder if received?					
12	Is COC included with samples?					
6	Is COC signed and dated by client?	~				
7	Laboratory receipt temperature. TEMP = 2°			· ·		
	Samples rec. with ice <u><!--</u--> ice packs <u>neither</u></u>					
8!	Were samples received the same day they were sampled?		$\overline{\nu}$			
1.1	Is client temperature 4°C ± 2°C?					
	If no obtain authorization from the client for the analyses.					
ŀ	Client authorization from: Date: Obtained by:					
9	Is the COC filled out correctly and completely?	~				
10	Does the info on the COC match the samples?	V				
11	Were samples rec, within holding time?	V				
1:2	Were all samples properly labeled?	~			1-500 ml Cale	0.
13	Were all samples properly preserved?			1	Lilledoc	<i>L</i> <sup>n</sup>
	Were proper sample containers used?				- pullada	<b>[</b>
11	Were all samples received interf2 (seea broken or leaking)					
	Were an samples received intact? (none bloken of leaking)					
	Were the complexity with no air bubbles?					
	Were all camples received?					
10.	VOL and VOA Sala actu					
119.	VPH and VOA Solis only:					
	Sampling Method VPH (circle one): M=Methanol, E=EnCore (air-tight	container	)			
	Sampling Method VOA (circle one): M=Methanol, SB=Sodium Bisulfat	e, E=EnC	ore, B=E			
	If M or SB:					
	Does preservative cover the soil?					
	If NO then client must be faxed.					
	Does preservation level come close to the fill line on the vial?					
i i	If NO then client must be faxed.					
	Were vials provided by AMRO?		-			
	If NO then weights MUST be obtain	ned from	client	1		
	Was dry weight aliquot provided?					
20	Subcontracted Samples:		ASAP.			
	What samples sent:					
	Where sent:					
	Pate:					
	MILEUSIS. TAT-				<u> </u>	
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1	Internation entered into:					
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i	Dry Weight Log?					
	Client Log?		~			
	Composite Log?			4		
<u>  </u>	Filtration Log?	l				
- Ifte	ceived By: (1) Date: 2-8-0/ Logged in By: (	<u>'</u> C		Date:	2-8-01	

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AMRO	Enviro	nmental	
Labora	tories	Corporation	

Please Circle if: Sample= Soil Sample= Waste

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							Preserv.		Volume	Final
	Sample ID	Analysis	Volume Sample	Preserv. Listed	Initial pH	Acceptable? Y or N	Added by AMRO	Solution ID # of Preserv.	Preservative Added	adjuste pH
Ì	IA- OBA	VPH	3x44ml	HCI						
Ī	OTA	VPH	8×44mil	Hel						
2	1B-06B	EPH	2×1LA	NCI	1	Ý				1
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## STATE CERTIFICATE

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No. of Street,

Pittan.

# The Commonwealth of Massachusetts



## Department of Environmental Protection

Division of Environmental Analysis Senator William X. Wall Experiment Station

### certifies

M-NH012

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### AMRO ENVIRONMENTAL LAB 111 HERRICK ST MERRIMACK, NH 03054-0000

Laboratory Director: Nancy Stewart

for the analysis of NON POTABLE WATER (CHEMISTRY) POTABLE WATER (CHEMISTRY)

pursuant to 310 CMR 42.00

This certificate supersedes all previous Massachusetts certificates issued to this laboratory. The laboratory is regulated by and shall be responsible for being in compliance with Massachusetts regulations at 310 CMR 42.00.

This certificate is valid only when accompanied by the latest dated Certified Parameter List as issued by the Massachusetts D.E.P. Contact the Division of Environmental Analysis to verify the current certification status of the laboratory.

Certification is no guarantee of the validity of the data. This certification is subject to unannounced laboratory inspections.

Q: Garcarbo

Director, Division of Environmental Analysis

Issued: 01 JUL 2000 Expires: 30 JUN 2001

## CASE NARRATIVE

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## CASE NARRATIVE 0102063

## GENERAL

1. No QC deviations were observed.

## MADEP-VPH WATER

- 1. The surrogate 2,5-Dibromotoluene was outside the laboratory control limits (70-130%) in the following samples: WS-12 (0102063-01A), WS-10 (0102063-02A), WS-5 (0102063-05A), WS-3 (0102063-06A), Batch QC 0102045-08AMS/MSD and 0102009-01ADUP.
- 2. The batch Matrix Spike (MS) and Matrix Spike duplicate (MSD) analyzed on 02/17/01 were performed on sample 0102079-04. All %R's and %RPD's were within control limits with the following exceptions:
  - 2.1 The recovery for Methyl tert-butyl ether and Toluene were outside the laboratory control limits (70-130%) in the MS.
- 3. No other QC deviations were observed.

## MADEP-EPH WATER

1. No QC deviations were observed.

## METALS

1. No QC deviations were observed.

AMRO Environmental Laboratories Corporation 111 Herrick Street Merrimack, NH 03054

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### Volatile Petroleum Hydrocarbons (VPH) Massachusetts Department of Environmental Protection (MADEP) Method 1.0 - January 1998 AMRO Modifications

This modification is based on the use of a purge and trap gas chromatography mass spectrometer (GC/MS) system to analyze samples for VPH. The hydrocarbon ranges are quantified using predominant mass fragmentation ions which are characteristic for the range being measured. This approach eliminates potential false positives for the target analytes while providing accurate hydrocarbon range data.

The chromatographic column is an HP-624 capillary column which has been validated by GC/MS analysis of a gasoline standard to correctly identify the marker compounds and elution order of specific gasoline components. Batch quality control includes, at a minimum, method blank, laboratory control sample, and duplicate analysis. A matrix spike and/or matrix spike duplicate is analyzed if sufficient sample is submitted to the laboratory.

The Reporting Limit (RL) of this method for each of the collective aliphatic and aromatic ranges is approximately 0.6-2.8 mg/kg in soil and 25-110  $\mu$ g/L in water. The RL of this method for the target analytes ranges from approximately 0.05-0.13 mg/kg in soil and 2.0-5.0  $\mu$ g/L for water samples.

### Extractable Petroleum Hydrocarbons (EPH) Massachusetts Department of Environmental Protection (MADEP) Method 1.0 - January 1998 AMRO Modifications

This modification is based on a solvent extraction and gas chromatography mass spectrometer (GC/MS) analysis. The hydrocarbon ranges are quantified using predominant mass fragmentation ions which are characteristic for the range being measured. This approach eliminates the silica gel solid-phase fractionation step. False positives for targeted PAH analytes are eliminated by using GC/MS as the primary analysis technique.

The chromatographic column is a J&W Scientific DB-5ms capillary column.

Internal standard calibration is performed using  $5\alpha$ -Androstane at a concentration of 40 ng/µL. o-Terphenyl and 1-Chlorooctadecane are added as surrogate compounds at 20 ng/µL in the sample extract. These two surrogates monitor the effects of the sample matrix and extraction efficiency. Two additional surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, are added to the finished extract prior to analysis to monitor instrument performance. Batch quality control includes, at a minimum, a procedure blank, laboratory control sample and duplicate sample analysis. A matrix spike is analyzed if sufficient sample is submitted to the laboratory.

The Reporting Limit (RL) of this method for each of the collective aliphatic and aromatic ranges is approximately 2-15 mg/kg in soil and 10-50  $\mu$ g/L in water. The RL of this method for the Target PAH analytes ranges from approximately 0.25 to 0.5mg/kg in soil; 1.0 $\mu$ g/L for water when operating the GC/MS in full scan mode, and 0.1 to 1.0 $\mu$ g/L when operating the GC/MS in SIM mode. For sites requiring the lowest levels cited in the Massachusetts Contingency Plan for water, GC/MS in the Selected Ion Monitoring (SIM) mode is used.

## VOLATILE PETROLEUM HYDROCARBONS (VPH) WATER

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## SAMPLE RESULTS

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Date: 19-Feb-01

CLIENT: Weston & Sampson Engineers Client Sample ID: WS-12 Lab Order: 0102063 Tag Number: **Project:** 200317.A P-3 Roxbury Collection Date: 2/6/01 Matrix: AQUEOUS Lab ID: 0102063-01A

Analyses F	Result	RL	Qual	Units	DF	Date Analyzed
VOLATILE PETROLEUM HYDROCARBONS		MAVPH				Analyst: JSL
C5-C8 Aliphatic Hydrocarbons	ND	100		µg/L	1	2/8/01 11:20:00 PM
C9-C12 Aliphatic Hydrocarbons	ND	25		µg/L	1	2/8/01 11:20:00 PM
C9-C10 Aromatic Hydrocarbons	ND	25		µg/L	1	2/8/01 11:20:00 PM
Methyl tert-butyl ether	ND	2.0		µg/L	1	2/8/01 11:20:00 PM
Benzene	ND	2.0		µg/L	1	2/8/01 11:20:00 PM
Toluene	ND	2.0		µg/L	1	2/8/01 11:20:00 PM
Ethylbenzene	ND	2.0		µg/L	1	2/8/01 11:20:00 PM
m,p-Xylene	ND	2.0		µg/L	1	2/8/01 11:20:00 PM
o-Xylene	ND	2.0		µg/L	1	2/8/01 11:20:00 PM
Naphthalene	ND	5.0		µg/L	1	2/8/01 11:20:00 PM
Surr: 1,2-Dichloroethane-d4	103	70-130		%REC	1	2/8/01 11:20:00 PM
Surr: 2,5-Dibromotoluene	61.0	70-130	S	%REC	1	2/8/01 11:20:00 PM
Surr: 4-Bromofluorobenzene	87.4	70-130		%REC	1	2/8/01 11:20:00 PM
Surr: Dibromofluoromethane	110	70-130		%REC	1	2/8/01 11:20:00 PM
Surr: Toluene-d8	103	70-130		%REC	1	2/8/01 11:20:00 PM

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

Were all QA/QC procedures required by the VPH or EPH method followed: Were all performance/acceptance standards for required QA/QC procedures achieved:

Were any significant modifications made to the method as specified in section 11.3:

Yes \_\_\_\_\_ No - If No, See Case Narrative Yes \_\_\_\_\_ No - If No, See Case Narrative Yes - Details enclosed No

I attest under the pains and penalties of perjury 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.

SIGNATURE:

PRINTED NAME: Nancy Stewart

2-20-01 DATE: POSITION: Laboratory Director (or designee)

Oualifiers: RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

- ND Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
- R RPD outside accepted recovery limits J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

Date: 19-Feb-01

CLIENT:	Weston & Sampson Engineers	Client Sample ID:	WS-10
Lab Order:	0102063	Tag Number:	
Project:	200317.A P-3 Roxbury	<b>Collection Date:</b>	2/6/01
Lab ID:	0102063-02A	Matrix:	AQUEOUS

Analyses	Result	RL	Qual	Units	ÐF	Date Analyzed
VOLATILE PETROLEUM HYDROCARBON	s	MAVPH				Analyst: JSL
C5-C8 Aliphatic Hydrocarbons	ND	100		µg/L	1	2/8/01 11:51:00 PM
C9-C12 Aliphatic Hydrocarbons	ND	25		µg/L	1	2/8/01 11:51:00 PM
C9-C10 Aromatic Hydrocarbons	ND	25		µg/L	1	2/8/01 11:51:00 PM
Methyl tert-butyl ether	ND	2.0		µg/L	1	2/8/01 11:51:00 PM
Benzene	ND	2.0		µg/L	1	2/8/01 11:51:00 PM
Toluene	ND	2.0		µg/L	1	2/8/01 11:51:00 PM
Ethylbenzene	NÐ	2.0		µg/L	1	2/8/01 11:51:00 PM
m,p-Xylene	ND	2.0		µg/L	1	2/8/01 11:51:00 PM
o-Xylene	NÐ	2.0		µg/L	1	2/8/01 11:51:00 PM
Naphthalene	ND	5.0		µg/L	1	2/8/01 11:51:00 PM
Surr: 1,2-Dichloroethane-d4	106	70-130		%REC	1	2/8/01 11:51:00 PM
Surr: 2,5-Dibromotoluene	68.8	70-130	S	%REC	1	2/8/01 11:51:00 PM
Surr: 4-Bromofluorobenzene	87.2	70-130		%REC	1	2/8/01 11:51:00 PM
Surr: Dibromofluoromethane	110	70-130		%REC	1	2/8/01 11:51:00 PM
Surr: Toluene-d8	103	70-130		%REC	1	2/8/01 11:51:00 PM

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

Were all QA/QC procedures required by the VPH or EPH method followed: Were all performance/acceptance standards for required QA/QC procedures achieved:

Were any significant modifications made to the method as specified in section 11.3:

Yes \_\_\_\_\_ No - If No, See Case Narrative \_\_\_\_\_ Yes \_\_\_\_ No - If No, See Case Narrative \_\_\_\_\_ No \_\_\_ Yes - Details enclosed

I attest under the pains and penalties of perjury 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.

SIGNATURE:

PRINTED NAME: Nancy Stewart

DATE: 2-2000/ POSITION: Laboratory Director (or designee)

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate. Qualifiers: S - Spike Recovery outside accepted recovery limits ND - Not Detected at the Reporting Limit J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits B - Analyte detected in the associated Method Blank

CLIENT:	Weston & Sampson Engineers	Client Sample ID:	WS-9
Lab Order:	0102063	Tag Number:	
Project:	200317.A P-3 Roxbury	Collection Date:	2/6/01
Lab ID:	0102063-03A	Matrix:	AQUEOUS

Analyses	Result	RL	Qual Ur	nits	DF	Date Analyzed
OLATILE PETROLEUM HYDROCARBON	s	MAVPH				Analyst: JSL
C5-C8 Aliphatic Hydrocarbons	ND	100	μgi	/L	1	2/9/01 12:21:00 AM
C9-C12 Aliphatic Hydrocarbons	ND	25	μg	/L	1	2/9/01 12:21:00 AM
C9-C10 Aromatic Hydrocarbons	ND	25	hði	/L	1	2/9/01 12:21:00 AM
Methyl tert-butyl ether	ND	2.0	μgi	/L	1	2/9/01 12:21:00 AM
Benzene	ND	2.0	μg	/L	1	2/9/01 12:21:00 AM
Toluene	ND	2.0	μg	/L	1	2/9/01 12:21:00 AM
Ethylbenzene	ND	2.0	μg	/L	1	2/9/01 12:21:00 AM
m,p-Xylene	ND	2.0	μĝ	/L	1	2/9/01 12:21:00 AM
o-Xylene	ND	2.0	hð	/L	1	2/9/01 12:21:00 AM
Naphthalene	ND	5.0	μ <u>θ</u> ι	/L	1	2/9/01 12:21:00 AM
Surr: 1,2-Dichloroethane-d4	106	70-130	%F	REC	1	2/9/01 12:21:00 AM
Surr: 2,5-Dibromotoluene	74.2	70-130	%F	REC	1	2/9/01 12:21:00 AM
Surr: 4-Bromofluorobenzene	86.0	70-130	%F	REC	1	2/9/01 12:21:00 AM
Surr: Dibromofluoromethane	107	70-130	%F	REC	1	2/9/01 12:21:00 AM
Surr: Toluene-d8	102	70-130	%f	REC	1	2/9/01 12:21:00 AM

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

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Analyses

Were all QA/QC procedures required by the VPH or EPH method followed:

Were all performance/acceptance standards for required QA/QC procedures achieved: Were any significant modifications made to the method as specified in section 11.3:

V Yes	No - If No, See Case Narrative
Yes	No - If No, See Case Narrative
No	Ves - Details enclosed

I attest under the pains and penalties of perjury 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.

DATE:

SIGNATURE:

PRINTED NAME: Nancy Stewart

2-20-01

Date: 19-Feb-01

POSITION: Laboratory Director (or designee)

Qualifiers: RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate. ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits B - Analyte detected in the associated Method Blank

**CLIENT:** Weston & Sampson Engineers Client Sample ID: WS-7 Lab Order: 0102063 **Tag Number:** Collection Date: 2/7/01 **Project:** 200317.A P-3 Roxbury Matrix: AQUEOUS Lab ID: 0102063-04A

Analyses	Result	RL	Qual Un	its	DF	Date Analyzed
VOLATILE PETROLEUM HYDROCARBON	s	MAVPH				Analyst: JSL
C5-C8 Aliphatic Hydrocarbons	ND	100	μg/	L	1	2/9/01 12:51:00 AM
C9-C12 Aliphatic Hydrocarbons	ND	25	μg/	L	1	2/9/01 12:51:00 AM
C9-C10 Aromatic Hydrocarbons	ND	25	μg/	L	1	2/9/01 12:51:00 AM
Methyl tert-butyl ether	ND	2.0	μg/	L	1	2/9/01 12:51:00 AM
Benzene	ND	2.0	μg/	L	1	2/9/01 12:51:00 AM
Toluene	ND	2.0	μg/	L	1	2/9/01 12:51:00 AM
Ethylbenzene	ND	2.0	μg/	Ľ	1	2/9/01 12:51:00 AM
m,p-Xylene	ND	2.0	μg/	L	1	2/9/01 12:51:00 AM
o-Xylene	ND	2.0	µg/	Ľ	1	2/9/01 12:51:00 AM
Naphthalene	ND	5.0	μg/	Ľ	1	2/9/01 12:51:00 AM
Surr: 1,2-Dichloroethane-d4	106	70-130	%F	REC	1	2/9/01 12:51:00 AM
Surr: 2,5-Dibromotoluene	72.6	70-130	%F	REC	1	2/9/01 12:51:00 AM
Surr: 4-Bromofluorobenzene	84.6	70-130	%F	REC	1	2/9/01 12:51:00 AM
Surr: Dibromofluoromethane	106	70-130	%F	REC	1	2/9/01 12:51:00 AM
Surr: Toluene-d8	100	70-130	%F	REC	1	2/9/01 12:51:00 AM

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

Were all QA/QC procedures required by the VPH or EPH method followed:

Were all performance/acceptance standards for required QA/QC procedures achieved: \_\_\_\_\_Yes \_\_\_\_ Were any significant modifications made to the method as specified in section 11.3:

\_\_\_\_ No - If No, See Case Narrative No - If No, See Case Narrative Yes - Details enclosed No

attest under the pains and penalties of perjury 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.

SIGNATURE:

). H

PRINTED NAME: Nancy Stewart

2-2001

Date: 19-Feb-01

POSITION: Laboratory Director (or designee)

Qualifiers: RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

DATE:

J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits E - Value above quantitation range # - Sce Case Narrative

B - Analyte detected in the associated Method Blank

Date: 19-Feb-01

CLIENT:	Weston & Sampson Engineers	Client Sample ID: WS-5	
Lab Order:	0102063	Tag Number:	
Project:	200317.A P-3 Roxbury	Collection Date: 2/7/01	
Lab ID:	0102063-05A	Matrix: AQUEOUS	

Analyses R	lesult	RL	Qual	Units	DF	Date Analyzed
VOLATILE PETROLEUM HYDROCARBONS		MAVPH				Analyst: JSL
C5-C8 Aliphatic Hydrocarbons	ND	100		µg/L	1	2/9/01 1:21:00 AM
C9-C12 Aliphatic Hydrocarbons	ND	25		µg/L	1	2/9/01 1:21:00 AM
C9-C10 Aromatic Hydrocarbons	ND	25		µg/L	<sup>1</sup> 1	2/9/01 1:21:00 AM
Methyl tert-butyl ether	ND	2.0		µg/L	1	2/9/01 1:21:00 AM
Benzene	ND	2.0		µg/L	1	2/9/01 1:21:00 AM
Toluene	ND	2.0		µg/L	1	2/9/01 1:21:00 AM
Ethylbenzene	ND	2.0		µg/L	1	2/9/01 1:21:00 AM
m,p-Xylene	ND	2.0		µg/L	1	2/9/01 1:21:00 AM
o-Xylene	ND	2.0		µg/L	1	2/9/01 1:21:00 AM
Naphthalene	ND	5.0		µg/L	1	2/9/01 1:21:00 AM
Surr: 1,2-Dichloroethane-d4	106	70-130		%REC	1	2/9/01 1:21:00 AM
Surr: 2,5-Dibromotoluene	62.8	70-130	S	%REC	1	2/9/01 1:21:00 AM
Surr: 4-Bromofluorobenzene	86.4	70-130		%REC	1	2/9/01 1:21:00 AM
Surr: Dibromofluoromethane	109	70-130		%REC	1	2/9/01 1:21:00 AM
Surr: Toluene-d8	100	70-130		%REC	1	2/9/01 1:21:00 AM

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

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Were all QA/QC procedures required by the VPH or EPH method followed:

Were all performance/acceptance standards for required QA/QC procedures achieved: Were any significant modifications made to the method as specified in section 11.3:

Yes	No - If No, See Case Narrative
_ Yes	V No - If No, See Case Narrative
No	Yes - Details enclosed

I attest under the pains and penalties of perjury 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.

DATE:

SIGNATURE:

PRINTED NAME: Nancy Stewart

-20 0

POSITION: Laboratory Director (or designee)

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate. Qualifiers:

ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits

- J Analyte detected helow quantitation limits R - RPD outside accepted recovery limits B - Analyte detected in the associated Method Blank
- E Value above quantitation range # - See Case Narrative

Date: 19-Feb-01

CLIENT:	Weston & Sampson Engineers	Client Sample ID: WS-3	
Lab Order:	0102063	Tag Number:	
Project:	200317.A P-3 Roxbury	Collection Date: 2/7/01	
Lab ID:	0102063-06A	Matrix: AQUEOUS	

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
VOLATILE PETROLEUM HYDROCARBO	ONS	MAVPH				Analyst: JSL
C5-C8 Aliphatic Hydrocarbons	ND	100		µg/L	1	2/9/01 1:51:00 AM
C9-C12 Aliphatic Hydrocarbons	ND	25		µg/L	1	2/9/01 1:51:00 AM
C9-C10 Aromatic Hydrocarbons	ND	25		μg/L	1	2/9/01 1:51:00 AM
Methyl tert-butyl ether	ND	2.0		µg/L	1	2/9/01 1:51:00 AM
Benzene	ND	2.0		μg/L	1	2/9/01 1:51:00 AM
Toluene	ND	2.0		μg/L	1	2/9/01 1:51:00 AM
Ethylbenzene	ND	2.0		µg/L	1	2/9/01 1:51:00 AM
m,p-Xylene	ND	2.0		µg/L	1	2/9/01 1:51:00 AM
o-Xylene	ND	2.0		µg/L	1	2/9/01 1:51:00 AM
Naphthalene	ND	5.0		µg/L	1	2/9/01 1:51:00 AM
Surr: 1,2-Dichloroethane-d4	105	70-130		%REC	1	2/9/01 1:51:00 AM
Surr: 2,5-Dibromotoluene	63.4	70-130	S	%REC	1	2/9/01 1:51:00 AM
Surr: 4-Bromofluorobenzene	86.6	70-130		%REC	1	2/9/01 1:51:00 AM
Surr: Dibromofluoromethane	110	70-130		%REC	1	2/9/01 1:51:00 AM
Surr: Toluene-d8	104	70-130		%REC	1	2/9/01 1:51:00 AM

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

Were all QA/QC procedures required by the VPH or EPH method followed:

Were all performance/acceptance standards for required QA/QC procedures achieved: Were any significant modifications made to the method as specified in section 11.3: Yes \_\_\_\_\_No - If No, See Case Narrative Yes \_\_\_\_\_No - If No, See Case Narrative No \_\_\_\_\_Yes - Details enclosed

I attest under the pains and penalties of perjury 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.

SIGNATURE:

PRINTED NAME: Nancy Stewart

2-20-01

POSITION: Laboratory Director (or designee)

Qualifiers: RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

ND - Not Detected at the Reporting Limit S - Spik J - Analyte detected below quantitation limits R - RPE

S - Spike Recovery outside accepted recovery limits

DATE:

R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

- E Value above quantitation range
- # Sce Case Narrative

CLIENT:	Weston & Sampson Engineers	Client Sample ID: TRIP BLANK	
Lab Order:	0102063	Tag Number:	
Project:	200317.A P-3 Roxbury	Collection Date: 2/7/01	
Lab ID:	0102063-07A	Matrix: AQUEOUS	

**RL** Qual Units

Result

		-			5
VOLATILE PETROLEUM HYDROCAR	BONS N	<b>IAVPH</b>			Analyst: SK
C5-C8 Aliphatic Hydrocarbons	ND	100	μg/L	1	2/16/01 12:38:00 PM
C9-C12 Aliphatic Hydrocarbons	ND	25	µg/L	1	2/16/01 12:38:00 PM
C9-C10 Aromatic Hydrocarbons	ND	25	µg/L	1	2/16/01 12:38:00 PM
Methyl tert-butyl ether	ND	2.0	µg/L	1	2/16/01 12:38:00 PM
Benzene	ND	2.0	µg/L	1	2/16/01 12:38:00 PM
Toluene	ND	2.0	µg/L	1	2/16/01 12:38:00 PM
Ethylbenzene	ND	2.0	µg/L	1	2/16/01 12:38:00 PM
m,p-Xylene	ND	2.0	µg/L	1	2/16/01 12:38:00 PM
o-Xylene	ND	2.0	µg/L	1	2/16/01 12:38:00 PM
Naphthalene	ND	5.0	μg/L	1	2/16/01 12:38:00 PM
Surr: 1,2-Dichloroethane-d4	94.5	70-130	%REC	1	2/16/01 12:38:00 PM
Surr: 2,5-Dibromotoluene	85.5	70-130	%REC	1	2/16/01 12:38:00 PM
Surr: 4-Bromofluorobenzene	99.5	70-130	%REC	1	2/16/01 12:38:00 PM
Surr: Dibromofluoromethane	101	70-130	%REC	1	2/16/01 12:38:00 PM
Surr: Toluene-d8	94.8	70-130	%REC	1	2/16/01 12:38:00 PM

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

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Analyses

Were all QA/QC procedures required by the VPH or EPH method followed:

Were all performance/acceptance standards for required QA/QC procedures achieved: Were any significant modifications made to the method as specified in section 11.3:

Yes \_\_\_\_\_ No - If No, See Case Narrative Yes \_\_\_\_\_ No - If No, See Case Narrative \_\_\_\_\_ No \_\_\_\_ Yes - Details enclosed

I attest under the pains and penalties of perjury 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.

SIGNATURE: PRINTED NAME: Nancy Stewart

DATE: 2-20-01

POSITION: Laboratory Director (or designee)

Date: 19-Feb-01

DF

**Date Analyzed** 

 Qualifiers:
 RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

 ND - Not Detected at the Reporting Limit
 S - Spike Recovery outside accepted recovery limits
 E - Val

 J - Analyte detected below quantitation limits
 R - RPD outside accepted recovery limits
 # - See

 B - Analyte detected in the associated Method Blank
 # - See



## METHOD BLANK

CLIENT:       Weston & Sampoon Engineers       QC SUMMARY REDORT         Vork Order:       200311/A       P.J.       Mathod Blank         Project:       200311/A       P.J.       Mathod Blank         Project:       200311/A       P.J.       Mathod Plank         Sample Dim Motodion1       Barth D. RY149       Mathod Plank       Mathod Plank         Sample Dim Motodion1       Barth D. RY149       Mathod Plank       Mathod Plank         Color       Color       Name       Seque:       1063001         Sample Dim Motodion1       Barth D. RY149       Mathod Plank       Mathod Plank         Color Administ Photodion2       No       00       public       Annoint         Color Administ Photodion3       NO       20       public       Annoint       Result       Mathodioni         Method Blank       Color Administ Photodionia       NO       20       public       Annoint       Seque:       00001         Color Administ Photodionia       NO       20       public       Annoint       Result       Mathodionia       Mathodionia         Color Administ Photodionia       00       20       public       200111       Result       Mathodionia         Methodi Blank       No       20<	AMRO Environmer	ital Laboratories	Corp.							Date: 12-Feb-01	
Method Blank Digit:         20011/L         P.3         Method Blank           Simple Dimble Could not be content in the cont	CLIENT: Weston &	k Sampson Engineers							QC SUN	IMARY REPO	DRT
Sample ID         matrix 0200601         Bitrix 110:         Trat Cade:         MAVPH         Units:         Joint         <	Work Order: UIU2065 Project: 200317.A	A P-3 Roxbury								Method I	Blank
Client (L):         Acid/TCD3AA         SetVic:         108:201           Amily:         C Sample         C Sample         C Sample         Amily:	Sample ID mblk 02/08/01	Batch ID: R7119	Test Code	B: MAVPH	Units: µg	1/r	Analysis	Date 2/8/01	2:33:00 PM	Prep Date 2/8/01	
Analytic         OC Sample         Analytic         Analytic         Analytic         Criginal Sample         Analytic	Client ID:		Run ID:	V-4_0102	08A		SeqNo:	106920			
Cd-GS Alphatic Hydrocarbons         ND         100         101         100         101           Cd-GS Alphatic Hydrocarbons         ND         25         191         2         2         101           Cd-GS Alphatic Hydrocarbons         ND         25         191         2         2         101           Cd-GS Alphatic Hydrocarbons         ND         20         101         2         101           Cd-GS Alphatic Hydrocarbons         ND         20         101         2         101           Methyl tarcholy after         ND         20         101         2         101         2           Methylame         ND         20         101         2	Analyte	QC Sample Result	RL	Units	QC Spike Origi Amount	inał Sample Result %REC	: LowLimit	HighLimit	Original Sample or MS Result	%RPD RPDLimi	Qua
AC-12 Aliphatic Hydrocarbons         ND         25         tp0L           C3C-10 Aliphatic Hydrocarbons         ND         20         tp0L           C3C-10 Aliphatic Hydrocarbons         ND         20         tp0L           C3C-10 Aliphatic Hydrocarbons         ND         20         tp0L           C3C-10 Aliphatic Hydrocarbons         ND         20         tp0L           Retrivioler         ND         20         tp0L           Ethydrocarbons         ND         20         tp0L           Ethydrocarbons         ND         20         tp0L           Colume         ND         20         tp0L         23           Strict 3-Difformoterane         23.4         0         tp0L         25         0           Strict 3-Difformoterane         23.4         0         tp0L         25         0         130         0           Strict 3-Difformoterane         23.4         0         tp0L         25         0         130         0         0           Strict 3-Difformoterane         23.4         0         tp0L         25         0         130         0         0           Strict 3-Difformoterane         23.6         0         102         70	C5-C8 Aliphatic Hydrocarbons	Q	100	µg/L			-				
OB-C10 Acomatic Hydrocarbons       ND       25       ppl Methyl Inrt-buyl ether       ND       20       ppl ppl         Methyl Inrt-buyl ether       ND       20       pgl ppl       20       pgl ppl         Tollene       ND       20       pgl ppl       20       pgl ppl         Ethylbersteine       ND       20       pgl ppl       23       10       20         Ethylbersteine       ND       20       pgl ppl       25       0       70       130       0         Surr 1-Bronnoflucehen       23.4       0       pgl ppl       25       0       102       70       130       0         Surr 1-Bronnoflucehene       23.4       0       pgl ppl       25       0       102       70       130       0         Surr 1-Bronnoflucehene       25.61       0       pgl ppl       25       0       102       70       130       0       0         Surr 1-Bronnoflucehene       25.61       0       pgl ppl       70       130       0	C9-C12 Aliphatic Hydrocarbons	QN	25	hg/L							
Metry left-cludy effer         ND         2.0         pg/L           Barzene         ND         2.0         pg/L           Cleane         ND         2.0         pg/L           Ethylberzene         ND         2.0         pg/L           Ethylberzene         ND         2.0         pg/L           String         2.0         pg/L         2.5         0         1.00         2.0           Aphthelene         ND         2.0         pg/L         2.5         0         3.6         7.0         1.30         0           Surr 1,2Hormonousene         2.0         pg/L         2.5         0         32.6         7.0         1.30         0           Surr 2,Flochnonousene         2.3.4         0         pg/L         2.5         0         32.6         7.0         1.30         0           Surr 2,Flochnonousene         2.3.4         0         pg/L         2.5         0         1.02         7.0         1.30         0           Surr 2,Hormonousene         2.3.4         0         pg/L         2.5         0         1.02         7.0         130         0           Surr 2,Hormonousene         2.5.51         0         pg/L         2	C9-C10 Aromatic Hydrocarbons	QN	25	hg/L							
Benzene         ND         20         pg/L           Culence         ND         20         pg/L           Tublenzene         ND         20         pg/L           Arrit2bilonochtaned         ND         20         pg/L           orXylene         ND         20         pg/L           orXylene         ND         20         pg/L           orXylene         ND         20         pg/L         25         0         100           orXylene         ND         20         pg/L         25         0         100         100         0           orXylene         ND         20         pg/L         25         0         102         70         130         0           orXir 25-bitomotolarene         23.4         0         pg/L         25         0         102         70         130         0           Surr 10uene-d8         25.61         0         pg/L         25         0         102         70         130         0           Surr 7ouene-d8         25.61         0         pg/L         25         0         102         70         130         0           Surr 7ouene-d8         25.61         0	Methyl tert-butyl ether	QN	2.0	hg/L							
Chlener         ND         2.0         ugU Lagl           Ethylherrzene         ND         2.0         ugU Lagl           Dx/Nerrzene         ND         2.0         ugU Lagl           Dx/Nerrzene         ND         2.0         ugU Lagl           Dx/Nerrzene         ND         2.0         ugU Lagl         2.0         ugU Lagl         2.0         ugU Lagl         2.0         ugU Lagl         2.0         1.00         2.0         1.00         0.0	Benzene	QN	2.0	hg/L							
Etyphenerene m.p-Vylene         ND         2.0         µg/L           m.p-Vylene         ND         2.0         µg/L           m.p-Vylene         ND         2.0         µg/L           Maphhalene         ND         5.0         µg/L         25         0         130         0           Naphhalene         ND         5.0         µg/L         25         0         130         0           Surr 1.2-Dichnorethane-d4         2.5.5         0         µg/L         25         0         130         0           Surr 1.2-Dichnorethane-d8         23.4         0         µg/L         25         0         130         0           Surr 2-Distonorthane         23.5.1         0         µg/L         25         0         102         70         130         0           Surr 7-Distonorthane         25.61         0         µg/L         25         0         102         70         130         0           Surr 7-Distonorthane         25.61         0         µg/L         25         0         102         70         130         0           Surr 7-Distonorthane         25.61         0         µg/L         25         0         102         70	Toluene	Q	2.0	µ9/L							
m.p.Xylene         ND         2.0         tg/L           o.Xylene         ND         2.0         tg/L           o.Xylene         ND         2.0         tg/L           o.Xylene         ND         5.0         tg/L           Surr 1,2.Dichloroethane-d4         25.5         0         tg/L         25         0         tg/L           Surr 1,2.Dichloroethane         23.4         0         tg/L         25         0         tg/L         25         0         130         0           Surr 2,5-Dichonoteluene         23.4         0         tg/L         25         0         tg/L         25         0         130         0           Surr Tobromoflucomethane         23.61         0         tg/L         25         0         102         70         130         0           Surr Tobromoflucomethane         23.61         0         pg/L         25         0         120         0           Surr Tobromoflucomethane         23.61         0         pg/L         25         0         130         0           Surr Toulene-d8         25.51         0         pg/L         25         0         120         0           Surr Toulene-d8	Ethyibenzene	Q	2.0	hg/L							
o-Vylene         ND         2.0         pg/L           AppMatiene         ND         5.0         pg/L         5.0         pg/L           Surr 1.2 Dichoncethane-d4         2.5.5         0         pg/L         25         0         9.26         70         130         0           Surr 1.2 Dichoncethane-d4         2.5.5         0         pg/L         2.5         0         9.26         70         130         0           Surr 1.2 Dichoncethane-d4         2.5.61         0         pg/L         2.5         0         9.22         70         130         0           Surr 1.2 Dichoncethane         2.6.52         0         pg/L         2.5         0         102         70         130         0           Surr 1.0 luene-d8         2.5.61         0         pg/L         2.5         0         102         70         130         0           Surr 1.0 luene-d8         2.5.61         0         pg/L         2.5         0         102         70         130         0           Surr 1.0 luene-d8         2.5.61         0         pg/L         2.5         0         102         70         130         0           Surr 1.0 luene-d8         2.5.61	m,p-Xylene	QN	2.0	hg/L							
Maphhalene         ND         5.0         µg/L         25         0         102         70         130         0           Surr. 1,2-Dichonothaned4         2.5.5         0         µg/L         25         0         µg/L         25         0         120         0         0           Surr. 1,2-Dichonothane         2.3.4         0         µg/L         25         0         9.2.6         70         130         0           Surr. 25-Dichonothane         2.3.4         0         µg/L         2.5         0         106         70         130         0           Surr. Dhromofluoronethane         28.52         0         µg/L         2.5         0         102         70         130         0           Surr. Toluene-d8         28.51         0         µg/L         2.5         0         102         70         130         0         0           Surr. Toluene-d8         25.61         0         µg/L         2.5         0         102         70         130         0         0           Surr. Toluene-d8         25.61         0         µg/L         2.5         0         102         70         130         0         0           Sur	o-Xylene	QN	2.0	µg/L							
Surr. 1,2-Dichloroethane-d4     25,5     0     µg/L     25     0     102     70     130     0       Surr. 2,5-Dibromotoluene     23,4     0     µg/L     25     0     92,2     70     130     0       Surr. 2,5-Dibromotoluene     23,4     0     µg/L     25     0     92,2     70     130     0       Surr. 2,5-Dibromotoluene     26,52     0     µg/L     25     0     102     70     130     0       Surr. Toluene-d8     25,61     0     µg/L     25     0     102     70     130     0       Surr. Toluene-d8     25,61     0     µg/L     25     0     102     70     130     0	Naphthalene	QN	5.0	µg/L							
Surr 2.5-Dibromotoluene       2.3.4       0       µg/L       2.5       0       9.3.6       70       130       0         Surr 4Bornofluoronethane       23.0.4       0       µg/L       2.5       0       9.2.2       70       130       0         Surr Dibromofluoronethane       26.52       0       µg/L       2.5       0       106       70       130       0         Surr Toluene-d8       25.61       0       µg/L       2.5       0       102       70       130       0         Qualifiers:       ND - Not Detected at the Reporting Limit       5       5 pike Recovery outside accepted recovery limits       B - Analyte detected in the associated Method Blank.	Surr: 1,2-Dichloroethane-d4	25.5	0	hg/L	25	0 102	20	130	0		
Surr. 4-Bromofluorobenzene     23.04     0     µg/L     25     0     92.2     70     130     0       Surr. Dihormofluoromethane     26.52     0     µg/L     25     0     106     70     130     0       Surr. Toluene-dB     25.61     0     µg/L     25     0     102     70     130     0       Quarifiers:     ND - Not Detected at the Reporting Limit     5 - Spike Recovery outside accepted recovery limits     B - Analyte detected in the essociated Method Blank.       J - Analyte detected below quantitation limits     R - RPD outside accepted recovery limits     M - Not applicable where J values or ND results occur	Surr: 2,5-Dibromotoluene	23.4	0	µg/L	25	0 93.6	70	130	0		
Surr. Dibromofluoromethane     26.52     0     µg/L     25     0     106     70     130     0       Surr. Toluene-d8     25.61     0     µg/L     25     0     102     70     130     0       Qualifiers:     ND - Not Detected at the Reporting Limit     5 - Spike Recovery outside accepted recovery limits     B - Analyte detected in the essociated Method Blank       J - Analyte detected below quantitation limits     R - RPD outside accepted recovery limits     M - Not applicable where J values or ND results occur	Surr: 4-Bromofluorobenzene	23.04	0	hg/L	25	0 92.2	20	130	0		
Surr. Toluene-d8     25.61     0     μg/L     25     0     102     70     130     0       Qualifiers:     ND - Not Detected at the Reporting Limit     S - Splike Recovery outside accepted recovery limits     B - Analyte detected in the associated Method Blank       J - Analyte detected below quantitation limits     R - RPD outside accepted recovery limits     N - Not applicable where J values or ND results occur	Surr: Dibromofluoromethane	26.52	0	hg/L	25	0 106	70	130	0		
Qualifiers:       ND - Not Detected at the Reporting Limit       S - Spike Recovery outside accepted recovery limits       B - Analyte detected in the associated Method Blank         J - Analyte detected below quantitation limits       R - RPD outside accepted recovery limits       NA - Not applicable where J values or ND results occur	Surr: Toluene-d8	25.61	0	µg/L	25	0 102	20	130	0		
Qualifiers:       ND - Not Detected at the Reporting Limit       S - Spike Recovery outside accepted recovery limits       B - Analyte detected in the associated Method Blank         J - Analyte detected below quantitation limits       R - RPD outside accepted recovery limits       NA - Not applicable where J values or ND results occur											
Qualifiers:       ND - Not Detected at the Reporting Limit       S - Spike Recovery outside accepted recovery limits       B - Analyte detected in the associated Method Blank         J - Analyte detected below quantitation limits       R - RPD outside accepted recovery limits       NA - Not applicable where J values or ND results occur											
J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits NA - Not applicable where J values or ND results occur	Qualifiers: ND - Not Detected	l at the Reporting Limit	S	- Spike Recov	very outside accep	oted recovery limits	B - Analy	yte detected in	the associated Met	hod Blank	
	J - Analyte detecte	ed below quantitation limits	R	- RPD outsid	e accepted recove	ry limits	NA - Not	t applicable w	tere J values or ND	results occur	

AMRO Env	ironment	tal Laboratories	Corp.								Date: 19-Feb	10-	
CLIENT:	Weston &	: Sampson Engineers						       		QC SUN	AMARY RE	PORT	
Work Order: Project:	0102063 200317.A	P-3 Roxbury									Meth	od Blank	
Sample ID mblk02	2/16/01	Batch ID: R7220	Test Code	MAVPH	Units:	hg/L		Analysis	Date 2/16/0	11 12:03:00 PM	Prep Date 2/16	/01	
Client ID:			Run ID:	V-2_0102	216A			SeqNo:	10795	-			
Analyte		QC Sample Result	RL	Units	QC Spike O Amount	)riginal Sam <b>;</b> Resu	ple IIt %REC	LowLimit	HighLimit	Original Sample or MS Result	%RPD RPD	Limit Qué	_
C5-C8 Aliphatic Hy	drocarbons	QN	100	hg/L									
C9-C12 Aliphatic H	lydrocarbons	QN	25	hg/L									
C9-C10 Aromatic H	<b>Hydrocarbons</b>	QN	25	hg/L									
Methyl tert-butyl etl	her	Q	2.0	hg/L									
Benzene			2.0	µg/L									
Toluene			2.U	µg/∟									
Ethylbenzene ***********************************			0 C	hg/L									
o-Xvlane			2.0	na/L									
Naphthalene		Q	5.0	ua/L									
Surr: 1.2-Dichlor	oethane-d4	24.47	0	hg/L	25		0 97.9	70	130	0			
Surr: 2,5-Dibrom	otoluene	23.29	0	hg/L	25		0 93.2	20	130	0			
Surr: 4-Bromoflu	torobenzene	24.69	0	hg/L	25		0 98.8	70	130	0			
Surr: Dibromoflu	oromethane	25.16	0	hg/L	25		0 101	70	130	0			
Surr: Toluene-dê	Ø	24.65	0	hg/L	25		0 98.6	20	130	0			
Qualifiers: ND.	- Not Detected	at the Reporting Limit	S.	Spike Recor	very outside at	ccepted recov	'ery limits	B - Anal	yte detected i	n the associated Me	thod Blank		
J-A	Analyte detected	d below quantitation limits	R.	RPD outsid	le accepted rec	overy limits		NA - No	t applicable w	vhere J values or NI	) results occur		
	•		and a second second										

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RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

## MATRIX SPIKE AND MATRIX SPIKE DUPLICATE

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	ironmen	al Laboratories	Corp.								Date: //	2-Feb-01	
CLIENT:	Weston &	Sampson Engineers								QC SUM	MARY	REPOI	I L
vork Urder: Project:	0102063 200317.A	P-3 Roxbury								Sample <b>N</b>	Aatrix Sp	ike Duplic	ate
ample ID 010204	15-08AMSD	Batch ID: R7119	Test Code	MAVPH	Units: µg/L			Analysis Di	ite 2/8/01 9.	50:00 PM	Prep Date	2/8/01	
lient ID:			Run ID:	V-4_0102	)8A			SeqNo:	106940				
		QC Sample			QC Spike Original	Sample			0	riginal Sample			
nalyte		Result	RL	Units	Amount	Result %	6REC	LowLimit	HighLimit	or MS Result	%RPD	RPDLimit	Qua
lethyl tert-butyl eth	her	81	10	hg/L	100	0	81	70	130	75.6	6.9	50	
enzene		101.8	10	hg/L	100	0	102	20	130	96.55	5.29	50	
oluene		101.2	10	hg/L	100	0	101	20	130	96.55	4.65	50	
thylbenzene		88.05	10	hg/L	100	0	88	20	130	86.55	1.72	50	
,p-Xylene		196.4	10	hg/L	200	0	98.2	20	130	189.4	3.63	50	
-Xylene		79.55	10	hg/L	100	0	79.6	70	130	77.6	2.48	50	
laphthalene		95.6	25	µg/L	100	0	95.6	70	130	83.5	13.5	50	
Surr: 1,2-Dichlor	oethane-d4	114.9	0	µ9/Г	125	0	91.9	20	130	0	o	0	
Surr: 2,5-Dibrom	otoluene	63.1	0	µg/L	125	0	50.5	70	130	0	0	0	S
Surr: 4-Bromoflu	orobenzene	141	0	hg/L	125	0	113	02	130	0	0	0	
Surr: Dibromoflu	oromethane	126.3	0	hg/L	125	0	101	70	130	0	0	0	
Surr: Toluene-d8	_	148.8	0	hg/L	125	0	119	70	130	0	0	0	

Project:         200311A, P3 Roxbury           Rample ID         0102079-04ms         Batch ID: R7220         Test Code: MAVPH         Unlik: µg/L         Analysis Date         217701 1:27:00 AM           Simple ID         0102079-04ms         Batch ID: R7220         Test Code: MAVPH         Unlik: µg/L         Analysis Date         217701 1:27:00 AM           Silent ID:         OC         Service         Cignal Sample         Complexity         Service         10350           Clear ID:         OC         Service         Run         Unlik: µg/L         Analysis Date         217701 1:27:00 AM           Clear ID:         OC         Service         Run         Unlik: µg/L         Analysis Date         217701 1:27:00 AM           Analysis Date         Analysis Date         Analysis Date         217701 1:27:00 AM         Analysis Date         217701 1:27:00 AM           Analysis Date         Analysis Date         Analysis Date         217701 1:27:00 AM         Analysis Date         217701 1:27:00 AM           Analysis Date         Analysis Date         Analysis Date         217701 1:27:00 AM         Analysis Date         217701 1:27:00 AM           Analysis Date         Analysis Date         Analysis Date         21770 1:20         Code         Code         Code         Code         Co	Project:         200317.A         Pag Nouly           Project:         200317.A         Pag Nouly           Sample ID         Batch ID: Nr220         Test Code: MAVH         Units upl.         Amalysis Date 21701 1.27:00 AM         Pag Date 21601           Clont ID:         V2_010216.A         Rent ID: Nr22078-04ms         Batch ID: Nr220         Feed Code: MAVH         Units upl.         Amalysis Date 21701 1.27:00 AM         Pag Date 21601           Clont ID:         V2_010216.A         Rent ID: Nr220         Clont ID: Nr22018-07         Service         Organi Sample           Clont ID:         V2_010216.A         Rent ID         Rent ID: Nr22010         ID         Pag Date         Pag Date           Admit Batch MM         Batch ID         Rent ID         Rent ID         Rent ID         Rent ID         Rent ID           Admit Batch MM         ID         ID         ID         ID         ID         ID         ID           Admit Batch MM         ID         ID         ID         ID         ID         ID         ID           Admit Batch MM         ID         ID         ID         ID         ID         ID         ID         ID         ID         ID         ID         ID         ID         ID         ID	CLIENT: Westo Work Order: 010200	n & Sampson Engineers 53								QC SUM	MARY REPOR	🌄 🕺
Ammbel D         D102073-04ms         Batch ID: R720         Test Code: MAVPH         Unlik: µg/L         Amalysis Date 2/17/01 1.27:00 AM           Clert LD:         Run ID:         V-2_m0216A         Run ID:         V-2_m0216A         SeqNo:         107970           Clert LD:         Account         Run ID:         V-2_m0216A         SeqNo:         107970           Amount         Constraine         RL         Unlik         Amount         Result         RFEC         LowLimit         HighLimit         or MS Result           Amount         Result         RL         Unlik         Amount         Result         SFFEC         LowLimit         HighLimit         or MS Result           Amount         Result         RL         Unlik         Amount         Result         SFFEC         LowLimit         HighLimit         or MS Result           Amount         10         µg/L         100         0         123         70         130           Amount         233.2         10         µg/L         100         0         125         70         130           Amount         233.2         10         µg/L         120         0         130           Amount         233.2         0         µg/L	Simple ID         D102079-04ms         Batch ID:         Trail of a D102079-04ms         Batch ID:         Trail of a D102079-04ms         Part ID:         Trail of a D102079-04ms         Part ID:         Trail of a D102079-04ms         Part ID:         Trail of a D102079-04ms         Part ID:         Trail of a D102079-04ms         Part ID:         Trail of a D102079-04ms         Part ID:         Trail of a D102079-04ms         Part ID:         Trail of a D102079-04ms         Part ID:         Trail of a D102079-04ms         Part ID:         Trail of a D102079-04ms         Part ID:         Trail of a D102079-04ms         Part ID:         Trail of a D102079-04ms         Part ID:         Trail of a D102079-04ms         Part ID:         Trail of a D102079-04ms         Part ID:         Trail of a D102079-04ms         Part ID:         Part ID:         Trail of a D102079-04ms         Part ID:	Project: 20031	/.A P-3 Koxbury										
Client ID:         Run ID:         V.2_010216A         SeqNo:         10370:           Consider         Result         RL         Units         Amount         Result $M_{\rm ID}$ Original Sample         Origiginal Sample         Original Sample <th>Client ID:         Run ID:         V.2_010216A         SerVo:         107370           columne         CC Single Occ         CG Single Occ         SerVoi         <math>0.00111</math>         SerVoi         <math>0.00111</math>         SerVoi         <math>0.00111</math>         SerVoi         <math>0.00111</math>         SerVoi         <math>0.00111</math>         SerVoi         <math>0.00111</math>         SerVoi         <math>0.00111</math>         SerVoi         <math>0.00111</math> <math>0.0111</math> <math>0.01111</math> <math>0.01111</math> <math>0.01111</math> <math>0.011111</math> <math>0.01111111</math> <math>0.011111111111111111111111111111111111</math></th> <th>Sample ID 0102079-04ms</th> <th>Batch ID: R7220</th> <th>Test Code</th> <th>MAVPH</th> <th>Units: µg/L</th> <th></th> <th></th> <th>Analysis Da</th> <th>ate 2/17/01</th> <th>1:27:00 AM</th> <th>Prep Date 2/16/01</th> <th></th>	Client ID:         Run ID:         V.2_010216A         SerVo:         107370           columne         CC Single Occ         CG Single Occ         SerVoi $0.00111$ SerVoi $0.00111$ SerVoi $0.00111$ SerVoi $0.00111$ SerVoi $0.00111$ SerVoi $0.00111$ SerVoi $0.00111$ SerVoi $0.00111$ $0.0111$ $0.01111$ $0.01111$ $0.01111$ $0.011111$ $0.01111111$ $0.011111111111111111111111111111111111$	Sample ID 0102079-04ms	Batch ID: R7220	Test Code	MAVPH	Units: µg/L			Analysis Da	ate 2/17/01	1:27:00 AM	Prep Date 2/16/01	
CC Sample         CC Spike         Amount         Result         RL         Units         Amount         Result         Amount<	Mayter         OC Sample         OC Splite Original Sample         Original Sample         Original Sample           Mayter         Result         RL         Units         Amount         Result         SRED         Original Sample           Mayter         Result         R1         Units         Amount         Result         SRED         Original Sample           Mayter         137         10         ppL         100         0         137         70         130         0           Mayter         137         10         ppL         100         0         137         70         130         0         0           Alter         253         ppL         100         0         127         70         130         0         0           Alter         253         ppL         120         0         127         10         127         10         127         10         177         10         130         0	Slient ID:		Run ID:	V-2_0102	16A			SeqNo:	107970			
right         Result         RL         Units         Amount         Result         %REC         Low/Imit         Hightlinit         or MS Result           (effyl tert-buyl ether         143.1         10 $\mu g/L$ 100         0         143         70         130           entrace         137         10 $\mu g/L$ 100         0         137         70         130           olucien         137         10 $\mu g/L$ 100         0         127         70         130           olucien         123.3         10 $\mu g/L$ 100         0         127         70         130           Affec         100 $\mu g/L$ 100         0         127         70         130           Affec         101.8         25         10 $\mu g/L$ 125         0         130           Affec         116.4         0 $\mu g/L$ 125         0         130           Surr: 12-Dibromothane-df         13.12         0 $\mu g/L$ 125         0         130           Surr: 14-Binombiocomentane         14.4.7         0 $\mu g/L$ 125         0	Image         Result         RL         Units         Amount         Result         %REC         Low         Mount         Result         %RED         RPDLimit           meraene         133         10         uplL         100         0         133         70         130         0           meraene         133         10         uplL         100         0         137         70         130         0           meraene         133         10         uplL         100         0         137         70         130         0           Myben-cene         133         10         uplL         100         0         137         70         130         0           Myben-cene         133         10         uplL         100         0         127         70         130         0           Myben-cene         131         0         uplL         126         0         127         70         130         0         0           Surr 24-Dimondoutene         154         0         uplL         125         0         131         70         130         0         0           Surr 14-Bionnototene         154         0		QC Sample			QC Spike Origina	al Sample			0	riginal Sample		
(eff)         (13)         (10) $\mu g/L$ (10)         (14)         (13)         (13)           (errare         (13)         (10) $\mu g/L$ (100)         (13)         (13)         (13)           oluene         (13)         (10) $\mu g/L$ (100)         (13)         (13)           oluene         (13)         (10) $\mu g/L$ (100)         (13)         (13)           oluene         (13) $\mu g/L$ (100)         (13)         (13)         (13)           (14)         (10) $\mu g/L$ (10) $\mu g/L$ (10)         (12)         (13)           (14)         (10) $\mu g/L$ (10) $\mu g/L$ (10)         (12)         (13)           (14)         (10) $\mu g/L$ (10) $\mu g/L$ (10)         (10)	derively tert-buryl terter-buryl terter-buryl tert-buryl tert-buryl tert-buryl tert-bur	unalyte	Result	RL	Units	Amount	Result %	%REC	LowLimit	HighLimit	or MS Result	%RPD RPDLimit	αļ
lenzene 12.3 10 $\mu$ g/L 100 0 124 70 130 intervente 127 10 $\mu$ g/L 100 0 137 70 130 intervente 125.4 10 $\mu$ g/L 100 0 127 70 130 $\mu$ p/k/here 253.4 10 $\mu$ g/L 100 0 127 70 130 $\lambda$ p/k/here 253.2 10 $\mu$ g/L 100 0 127 70 130 $\lambda$ p/k/here 12.0.4 10 $\mu$ g/L 100 0 127 70 130 $\lambda$ p/k/here 13.3 0 $\mu$ g/L 100 0 107 70 130 $\lambda$ p/k/here 13.3 0 $\mu$ g/L 125 0 107 70 130 surr 12-Dichnorothane 41 13.3 0 $\mu$ g/L 125 0 107 70 130 surr 12-Epriomotoluere 16.5 0 $\mu$ g/L 125 0 107 70 130 surr 12-Epriomotoluere 16.5 0 $\mu$ g/L 125 0 101 70 130 surr 12-Epriomotoluere 16.5 0 $\mu$ g/L 125 0 101 70 130 surr 12-Epriomotoluere 13.5 0 $\mu$ g/L 125 0 101 70 130 surr 12-Epriomotoluere 13.5 0 $\mu$ g/L 125 0 101 70 130 surr 12-Epriomotoluere 13.5 0 $\mu$ g/L 125 0 101 70 130 surr 10uene-d8 131.2 0 $\mu$ g/L 125 0 101 70 130 surr 10uene-d8 131.2 0 $\mu$ g/L 125 0 101 70 130 surr 10uene-d8 131.2 0 $\mu$ g/L 125 0 101 70 130 surr 10uene-d8 131.2 0 $\mu$ g/L 125 0 101 70 130 surr 10uene-d8 131.2 0 $\mu$ g/L 125 0 101 70 130 surr 10uene-d8 131.2 0 $\mu$ g/L 125 0 101 70 130 surr 10uene-d8 131.2 0 $\mu$ g/L 125 0 101 70 130 surr 10uene-d8 131.2 0 $\mu$ g/L 125 0 101 70 130 surr 10uene-d8 131.2 0 $\mu$ g/L 125 0 101 70 130 surr 10uene-d8 131.2 0 $\mu$ g/L 125 0 100 100 surr	enzene         12.3         10         µg/L         100         0         124         70         130         0           Oluene         137         10         µg/L         100         0         137         70         130         0           Oluene         157         10         µg/L         100         0         127         70         130         0           np.Xylene         253.2         10         µg/L         100         0         127         70         130         0           Aylene         23.3         0         µg/L         100         0         127         70         130         0           Surr. 1.2.Dichlorenthare-dis         13.3         0         µg/L         125         0         107         70         130         0           Surr. 1.2.Dichlorenthare-dis         131.2         0         µg/L         125         0         107         70         130         0           Surr. 1.2.Dichlorenthare-dis         131.2         0         µg/L         125         0         107         70         130         0           Surr. 1.2.Iouene-dis         131.2         0         µg/L         125         0	Aethyl tert-butyl ether	143.1	10	hg/L	100	0	143	70	130	0		.,
interme       137       10 $\mu g/L$ 100       0       137       70       130         Thylbenzene       125.4       10 $\mu g/L$ 100       0       127       70       130         Ty-Xylene       253.2       10 $\mu g/L$ 100       0       127       70       130         Xylene       233.2       10 $\mu g/L$ 100       0       127       70       130         Xylene       12.9       10 $\mu g/L$ 100       0       127       70       130         Xylene       12.9       10 $\mu g/L$ 100       0       127       70       130         Xylene       13.3.8       0 $\mu g/L$ 125       0       107       70       130         Surr: 12.Dichonotoluene       116.4       0 $\mu g/L$ 125       0       107       70       130         Surr: Dibromoflucomethrane       14.7       0 $\mu g/L$ 125       0       107       70       130         Surr: Dibromoflucomethrane       131.2       0 $\mu g/L$ 125       0       105       70       130         Surr:	Oldere         137         10         µg/L         100         0         137         70         130         0           it/Mencarea         1254         10         µg/L         100         0         125         70         130         0           it/Mencarea         233         10         µg/L         100         0         125         70         130         0           Aylere         12.0         10         µg/L         100         0         122         70         130         0           at/hit/men         13.3         0         µg/L         105         0         122         70         130         0           surr 1.2-Distributionthane-dist         131.2         0         µg/L         125         0         101         70         130         0           Surr 1.2-Distributionthane         131.2         0         µg/L         125         0         106         70         130         0           Surr 1.0         131.2         0         µg/L         125         0         106         70         130         0           Surr 1.0         131.2         0         µg/L         125         0         106	tenzene	123.9	10	hg/L	100	0	124	70	130	0		
Itylbenzene       125.4       10 $\mu gl.$ 100       0       125       70       130 $\mu X$ ylene       233.2       10 $\mu gl.$ 200       0       127       70       130 $X$ ylene       120.4       10 $\mu gl.$ 100       0       127       70       130 $X$ ylene       120.4       10 $\mu gl.$ 100       0       127       70       130 $X$ ylene       101.8       25 $\mu gl.$ 100       0       127       70       130         Surr. 12-Dichloroethane-d4       133       0 $\mu gl.$ 125       0       107       70       130         Surr. 25-Dichloroethane-d4       131.2       0 $\mu gl.$ 125       0       107       70       130         Surr. 25-Dichloroethane-d8       131.2       0 $\mu gl.$ 125       0       107       70       130         Surr. 7 oluene-d8       131.2       0 $\mu gl.$ 72       130       130         Surr. 7 oluene-d8       131.2       0 $\mu gl.$ 125       0       105       70       130	Rhyllenzene     12,4     10     µgl.     100     125     70     130     0       (h-Xylene     23,2     10     µgl.     200     0     127     70     130     0       (h-Xylene     123,4     10     µgl.     100     0     127     70     130     0       (h-Mylene     101,4     10     µgl.     125     10     µgl.     125     70     130     0       Surr. 12-Dichloroethane-dt     133,8     0     µgl.     125     0     107     70     130     0       Surr. 12-Dichloroethane-dt     131,2     0     µgl.     125     0     107     70     130     0       Surr. 10luene-dt     131,2     0     µgl.     125     0     105     70     130     0       Surr. 10luene-dt     131,2     0     µgl.     125     0     105     70     130     0       Surr. 10luene-dt     131,2     0     µgl.     125     0     105     70     130     0       Surr. 10luene-dt     131,2     0     µgl.     125     0     105     70     130     0       Surr. 10luene-dt     131,2     0     µgl.     125 <td>oluene</td> <td>137</td> <td>10</td> <td>hg/L</td> <td>100</td> <td>o</td> <td>137</td> <td>20</td> <td>130</td> <td>0</td> <td></td> <td>0,</td>	oluene	137	10	hg/L	100	o	137	20	130	0		0,
$n_p X$ ylene       253.2       10       µg/L       200       0       127       70       130         Xylene       120.4       10       µg/L       100       0       120       70       130         Aylene       12.0.4       10       µg/L       100       0       120       70       130         Laphthatene       10.1.8       25       µg/L       126       0       107       70       130         Surr: 12-Dictorethane-d4       15.4       0       µg/L       125       0       107       70       130         Surr: 25-Distorethane-d4       15.4       0       µg/L       125       0       107       70       130         Surr: 10-browfluorobenzene       126.2       0       µg/L       125       0       107       70       130         Surr: Toluene-d8       131.2       0       µg/L       125       0       105       70       130         Surr: Toluene-d8       131.2       0       µg/L       125       0       105       70       130	np-Xylene         233.2         10         upl.         200         0         127         70         130         0           -Vylene         120.4         10         upl.         100         0         120         70         130         0           Surr. 12-Dehorenthame-d4         133.8         0         upl.         125         0         107         70         130         0           Surr. 12-Dehorenthame-d4         133.8         0         upl.         125         0         107         70         130         0           Surr. 25-Disornotouene         116.4         0         upl.         125         0         107         70         130         0           Surr. 25-Disornotouene         131.2         0         upl.         125         0         107         70         130         0           Surr. 7blene-d8         131.2         0         upl.         125         0         106         70         130         0           Surr. 7blene-d8         131.2         0         upl.         125         0         106         70         130         0           Surr. 7blene-d8         131.2         0         upl.         125	cthylbenzene	125.4	10	hg/L	100	0	125	70	130	0		
Xylene $10$ $\mu gl.$ $100$ $0$ $120$ $70$ $130$ Taphhalene $11.2$ -Dichloroethane-d4 $133.8$ $0$ $\mu gl.$ $125$ $0$ $107$ $70$ $130$ Surr. 12-Dichloroethane-d4 $133.8$ $0$ $\mu gl.$ $125$ $0$ $107$ $70$ $130$ Surr. 25-Dibromotoluene $116.4$ $0$ $\mu gl.$ $125$ $0$ $107$ $70$ $130$ Surr. 25-Dibromotoluene $116.4$ $0$ $\mu gl.$ $125$ $0$ $107$ $70$ $130$ Surr. Dibromofluoromethane $116.1$ $125$ $0$ $101$ $70$ $130$ Surr. Toluene-d8 $131.2$ $0$ $\mu gl.$ $125$ $0$ $105$ $70$ $130$ Surr. Toluene-d8 $131.2$ $0$ $\mu gl.$ $125$ $0$ $105$ $70$ $130$ Surr. Toluene-d8 $131.2$ $0$ $\mu gl.$ $125$ $0$ $105$ $70$ $130$	Aylere     120.4     10     µg/L     100     0     120     70     130     0       aphnalene     101.8     25     µg/L     100     0     102     70     130     0       arr:     12.5.bitomotoluene     161.4     0     µg/L     125     0     107     70     130     0       surr:     12.5.bitomotoluene     161.4     125     0     101     70     130     0       surr:     2.5.bitomotoluene     161.1     125     0     101     70     130     0       surr:     2.5.bitomotoluene     13.1.2     0     µg/L     125     0     116     70     130     0       surr:     10tene-dB     13.1.2     0     µg/L     125     0     105     70     130     0       surr:     70     131.2     0     µg/L     125     0     105     70     130     0       surr:     70     131.2     0     µg/L     125     0     105     70     130     0       surr:     70     131.2     0     µg/L     125     70     130     0       surr:     70     131.2     0     µg/L     125 </td <td>, Yvlene</td> <td>253.2</td> <td>10</td> <td>hg/L</td> <td>200</td> <td>0</td> <td>127</td> <td>20</td> <td>130</td> <td>0</td> <td></td> <td></td>	, Yvlene	253.2	10	hg/L	200	0	127	20	130	0		
Lap/Ithatlene     101.8     25     µg/L     100     0     102     70     130       Surr: 12-Dichloroethane-d4     133.8     0     µg/L     125     0     107     70     130       Surr: 12-Dichloroethane-d4     116.4     0     µg/L     125     0     107     70     130       Surr: 25-Dibromotoluene     116.4     0     µg/L     125     0     101     70     130       Surr: 4-Biromofuoronethane     126.2     0     µg/L     125     0     101     70     130       Surr: 10luene-d8     131.2     0     µg/L     125     0     105     70     130       Surr: Toluene-d8     131.2     0     µg/L     125     0     105     70     130	Izpitualene     101.8     25     µg/L     100     0     102     70     130     0       surr 12-Dichroorethane-d4     13.3.8     0     µg/L     125     0     107     70     130     0       surr 12-Dichroorethane-d4     16.4     0     µg/L     125     0     107     70     130     0       surr 12-Dichroorethane-d1     16.4     0     µg/L     125     0     101     70     130     0       surr 12-Dichroorethane     13.1.2     0     µg/L     125     0     116     70     130     0       surr 12-Dichroorethane     13.1.2     0     µg/L     125     0     106     70     130     0       surr 12-Dichen-d8     131.2     0     µg/L     125     0     106     70     130     0       surr 12-Livene-d8     131.2     0     µg/L     125     0     106     70     130     0       surr 13-Livene-d8     131.2     0     µg/L     125     0     106     70     130     0       surr 13-Livene-d8     131.2     0     µg/L     125     0     106     70     130     0       surr 13-Livene-d8     131.2 <td< td=""><td>-Xvlene</td><td>120.4</td><td>10</td><td>hg/L</td><td>100</td><td>0</td><td>120</td><td>70</td><td>130</td><td>0</td><td></td><td></td></td<>	-Xvlene	120.4	10	hg/L	100	0	120	70	130	0		
Surr. 12-Dichloroethane-d4       133.8       0 $\mu g/L$ 125       0       107       70       130         Surr. 25-Dipromotoluene       116.4       0 $\mu g/L$ 125       0       93.2       70       130         Surr. 24-Bromofluorobenzene       126.2       0 $\mu g/L$ 125       0       101       70       130         Surr. 4-Bromofluorobenzene       126.2       0 $\mu g/L$ 125       0       101       70       130         Surr. 10bromofluorobenzene       131.2       0 $\mu g/L$ 125       0       105       70       130         Surr. Toluene-d8       131.2       0 $\mu g/L$ 125       0       105       70       130	Surr. 12-Dichloroethane-d4     13.8     0     µg/L     125     0     107     70     130     0       Surr. 25-Dibromotiouen     116.4     0     µg/L     125     0     131     0     130     0       Surr. 24-Dimomotionentiane     116.4     0     µg/L     125     0     131     0     0       Surr. 24-Dimomotionentiane     116.4     0     µg/L     125     0     130     0       Surr. Dimomotionentiane     13.12     0     µg/L     125     0     106     70     130     0       Surr. Toluene-d8     131.2     0     µg/L     125     0     105     70     130     0       Surr. Toluene-d8     131.2     0     µg/L     125     0     105     70     130     0       Outlines     131.2     0     µg/L     125     0     105     70     130     0       Outline-d8     131.2     0     µg/L     125     0     105     70     130     0       Outlines     0     0     105     70     130     0     0       Outline     0     105     70     130     0     1       Outline     0	laphthalene	101.8	25	hg/L	100	0	102	20	130	0		
Surr: 25-Dihomotoluene       16.4       0       µg/L       125       0       93.2       70       130         Surr: 4-Bromofluorobenzene       126.2       0       µg/L       125       0       101       70       130         Surr: Dihomofluoromethane       144.7       0       µg/L       125       0       116       70       130         Surr: Toluene-d8       131.2       0       µg/L       125       0       105       70       130         Surr: Toluene-d8       131.2       0       µg/L       125       0       105       70       130	Surr. 25-Dibromotoluene         16.4         0         µg/L         125         0         130         0           Surr. 4-Bromofluorobenzene         126.2         0         µg/L         125         0         101         70         130         0           Surr. 4-Bromofluorobenzene         126.2         0         µg/L         125         0         116         70         130         0           Surr. Toluene-d3         131.2         0         µg/L         125         0         105         70         130         0           Surr. Toluene-d3         131.2         0         µg/L         125         0         105         70         130         0           Outr: Toluene-d3         131.2         0         µg/L         125         0         105         70         130         0	Surr: 1,2-Dichloroethane-d	4 133.8	0	hg/L	125	0	107	20	130	0		
Sur: Hannofluorobenzene 126.2 0 µg/L 125 0 101 70 130 Sur: Dibromofluoromethane 14.7 0 µg/L 125 0 116 70 130 Sur: Toluene-d8 131.2 0 µg/L 125 0 105 70 130	Surr. Homomoluorobenzene         126.2         0         µg/L         125         0         101         70         130         0           Surr. Toluene-d8         131.2         0         µg/L         125         0         16         70         130         0           Surr. Toluene-d8         131.2         0         µg/L         125         0         105         70         130         0           Surr. Toluene-d8         131.2         0         µg/L         125         0         105         70         130         0           Out transition         131.2         0         µg/L         125         0         105         70         130         0           Out transition         131.2         0         µg/L         125         0         105         70         130         0	Surr: 2.5-Dibromotoluene	116.4	0	ng/L	125	0	93.2	70	130	0		
Surr. Toluene-dB 14.7 0 µg/L 125 0 116 70 130 Surr. Toluene-dB 131.2 0 µg/L 125 0 105 70 130	Surr Toluene-d8 131.2 0 µg/L 125 0 116 70 130 0 Surr Toluene-d8 131.2 0 µg/L 125 0 105 70 130 0 Out 10.0 100 0 Out 10.0 100 0	Surr: 4-Bromofluorobenzer	ne 126.2	0	na/L	125	0	101	20	130	0		
Sur: Toluene-d8 131.2 0 μg/L 125 0 105 70 130	Surr. Toluene-d8     131.2     0     µg/L     125     0     130     0       Mainteness     No     Database     No     130     0     0	Surr. Dibromofluoromethal	ne 144.7	0	ng/L	125	0	116	20	130	0		
	Qualifiers:       ND - Not Detected at the Reporting Limit       S - Spike Recovery outside accepted recovery limits       B - Analyte detected in the associated Method Blank         J - Analyte detected below quantitation limits       R - RPD outside accepted recovery limits       M - Not anoliceble where I values or ND results occure	Surr: Toluene-d8	131.2	o	hg/L	125	0	105	20	130	0		
	Qualifiers:       ND - Not Detected at the Reporting Limit       S - Spike Recovery outside accepted recovery limits       B - Analyte detected in the associated Method Blank         J - Analyte detected below quantitation limits       R - RPD outside accepted recovery limits       N - Not annlicable where J values or ND results occur												
	Qualifiers:       ND - Not Detected at the Reporting Limit       S - Spike Recovery outside accepted recovery limits       B - Analyte detected in the associated Method Blank         J - Analyte detected below quantitation limits       R - RPD outside accepted recovery limits       NA - Not analyte detected or ND results occur												
	Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits NA - Not anolicable where J values or ND results occur												
Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated N	J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits NA - Not applicable where J values or ND results occur	Qualifiers: ND - Not Deter	cted at the Reporting Limit	-S-	- Spike Recov	ery outside accepte	d recovery li	imits	B - Analyte	s detected in th	he associated Meth	nd Blank	1
I - Analyte detected below quantitation limits RPD outside accepted recovery limits NA - NA analyzed below grant									•				

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AMRC	) Environme	ental Laboratories	s Corp.								Date: //	9-Feb-01		
CLIENT	: Weston	n & Sampson Engineers		1	- - - - - - - - -	1	1.			QC SUI	MMARY	REPO]	RT	
Project:	200317	oo 7.A P-3 Roxbury								Sample	Matrix Sp	ike Dupli	cate	
Sample ID	0102079-04msd	Batch ID: R7220	Test Code	MAVPH	Units:	hg/L		Analysis	Date 2/17/	01 2:02:00 AM	Prep Date	e 2/16/01		
Client ID:			Run ID:	V-2_010	216A			SeqNo:	10797	-				
		QC Sample	i		QC Spike Or	iginal Sample	Ð			Original Sample				
Analyte		. Result	R	Units	Amount	Result	%REC	LowLimit	HighLimit	or MS Result	%RPD	RPDLimit	Qua	
Methyl tert	-butyl ether	123.7	10	р9/Г	100	0	124	20	130	143.1	14.5	50		
Benzene		109.4	10	µ9/L	100	0	109	70	130	123.9	12.5	50		
Toluene		118.5	10	hg/L	100	0	118	20	130	137	14.4	50		
Ethylbenze	ene	110.1	10	hg/L	100	0	110	20	130	125.4	13	50		
m,p-Xylen(	ď	219.7	10	р9/Г	200	0	110	20	130	253.2	14.2	50		
o-Xylene		106	10	р9/Г	100	0	106	70	130	120.4	12.7	50		
Naphthaler	Je	99.35	25	р9/Г	100	0	99.4	20	130	101.8	2.39	50		
Surr: 1,2	2-Dichloroethane-d4	4 133.8	0	hg/L	125	0	107	70	130	0	0	0		
Surr: 2,5	5-Dibromotoluene	123.6	0	р9/Г	125	0	98.9	20	130	0	0	0		
Surr: 4-E	Bromofluorobenzen	1e 125	0	hg/L	125	0	100	20	130	0	0	0		
Surr: Dit	bromofluoromethan	ne 145	0	р9/Г	125	0	116	20	130	0	0	0		
Surr: To	luene-d8	133.9	0	р9/Г	125	0	107	70	130	0	0	0		
				) -							,	,		
Qualifiers	ND - Not Detect	sted at the Reporting Limit	-S	Spike Reeo	vcry outside ace	cpted recover	y limits	B - Anal	yte detected i	n the associated Me	thod Blank			
	J - Analyte detec	cted below quantitation limits	R -	RPD outsic	le accepted reco	very limits		NA - No	t applicable w	here J values or NI	O results occur			
	RL - Reporting l	Limit; defined as the lowest co	incentration the	laboratory	can accurately q	uantitate.								



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AMRO Envire	onment	al Laborato	ries Corp									Date: 1.	2-Feb-01	
CLIENT: V Work Order: 0	Weston & 1 0102063	Sampson Engin	cers							ð	C SUM	MARY	REPO	RT
Project: 2	200317.A	P-3 Roxbury										Sam	ple Dupli	catc
Sample ID 0102009-(	01Adup	Batch ID: R7119	Test	Code: MAVP	ъ н	its: µg/L		Anal	ysis Date 2	8/01 4:10:0	NG DM	Prep Date	e 2/8/01	ļ
Client ID:			Run	D: V4_0	10208A			Seq	No: 10	6928				
Analyte		QC Sample Result	RL	Units	QC Spike Amoun	e Original S t	ample česult %F	Lowl	-imit Highl	Origin imit or l	al Sample MS Result	%RPD	RPDLimit	Qua
C5-C8 Aliphatic Hydro	carbons	Q	100	hg/L			0	0	0	0	0	0	50	
C9-C12 Aliphatic Hydr	rocarbons	QN	25	hg/L	U	0	0	0	0	0	0	0	50	
C9-C10 Aromatic Hydi	rocarbons	QN	25	hg/L	0	-	0	0	0	0	0	0	50	
Methyl tert-butyl ether		QN	2.0	hg/L	Ĵ	~	0	0	0	0	0	0	50	
Benzene		QN	2.0	hg/L	0	-	0	0	0	0	0	0	50	
Toluene		QN	2.0	hg/L	U	0	0	0	0	0	0	0	50	
Ethyłbenzene		0.71	2.0	hg/L	U	~	0	0	0	0	0	0	50	J,NA
m,p-Xylene		QN	2.0	hg/L	Ų	~	0	0	0	0	0	0	50	
o-Xylene		QN	2.0	hg/L	0	۴ ۲	0	0	0	0	0	0	50	
Naphthalene		Q	5.0	hg/L	0	~	0	0	0	0	0	0	50	
Surr: 1,2-Dichloroet	hane-d4	24.45	0	hg/L	55		0	7.8	70	130	0	0	0	
Surr: 2,5-Dibromoto	Juene	8.49	ο	hg/L	5		0	34	70	130	0	0	0	s
Surr: 4-Bromofluoro	benzene	23.16	0	hg/L	25		0	12.6	70	130	0	0	0	
Surr: Dibromofluoro	methane	25.72	0	hg/L	25	10	0	103	70	130	0	0	0	
Surr: Toluene-d8		24.83	0	hg/L	5	10	0	9.3	70	130	0	0	0	
Qualifiers: ND - Nc	or Detected a	t the Reporting Lin	it	S - Spike R	scovery outsic	le accepted r	ccovery lim	its B -	Analyte detee	ted in the as	sociated Meth	lod Blank	 : [	]
J - Anal	yte detected	below quantitation	limits	R - RPD ou	tside accepted	l recovery lin	nits	NA	- Not applica	ble where J	values or ND	results occur		
RL - Re	porting Limi	it; defined as the lov	vest concentrati	on the laborato	ry can accurat	icly quantitat	j.							

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CLENT:       Vestoria & Sampson Engineers         CLENT:       Vestoria & Sampson Engineers         Project:       2003/17.A P.3 Roxbury         Project:       2003/17.A P.3 Roxbury         Project:       2003/17.A P.3 Roxbury         Project:       Construction of the colspan="4">Control Symptement of the colspa="4">Control Symptement of the colspan="4">Control Sy	CLERNT:         Weston & Sampson Engineers           Work Order:         000063         Eaboratory Control Spike           Project:         2031/1.A         P-3 Roxbury         Eaboratory Control Spike           Project:         2031/1.A         P-3 Roxbury         Proprint         Proprint           Sample         Distribution         Run Distribution         Proprint         Proprot         Proprot         Proprint <th>AMRO E</th> <th>nvironmen</th> <th>tal Laboratorie</th> <th>s Corp.</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>Date: 12-F</th> <th>10-92.</th> <th></th>	AMRO E	nvironmen	tal Laboratorie	s Corp.								Date: 12-F	10-92.	
Work Order: $0102063$ Laboratory Control SpikeProject: $200317A$ P-3 RoxburyTest Code:MATHIndicatory Control SpikeEmericationRationTest Code:MATHIndicatory Control SpikeEmericationRationTest Code:MATHIndicatory Control SpikeClient ID:Client ID:ValueRationRationPerp Date ZaborClient ID:Client ID:Client ID:ValueResultResultResultClient ID:Client ID:Client ID:ValueResultResultResultResultClient ID:Client ID:Client ID:ValueResultResultResultResultResultResultClient ID:Client ID:Client ID:ValueClient ID:ValueNameResultResultResultResultResultResultClient ID:Client ID:Client ID:Client ID:ValueClient ID:ValueClient ID:ValueClient ID:<	Work Order:         200317.A P.3 Roxbury         Laboratory Control Spike           Project:         200317.A P.3 Roxbury         Test Cole:         MVH         Monitorial Sample         Laboratory Control Spike           Sample         Ran, D:         F7119         Test Cole:         MVH         Monitorial Sample         Proposition	CLIENT:	Weston &	z Sampson Engineers									MAPVE	DEPOI	ll É
Project:200317.AP. Jaboratory Control SpikeSample Lie Active LieBatch Lie ArtisTest Code:MAPHUnits: upl.Analysis Date 28041 127:00 PMPerp Date 28041Sample Lie Active LieBatch LieFaun LieV-4_012084SeqNo:106606Perp Date 28041Client Lie:Active LieRunV-4_01208ASeqNo:106606Perp Date 28041Analysis Date 28041RunMalysis Date 28041Perp Date 28041Perp Date 28041Analysis Date 2804RunUnitsAmountResultPerp Date 28041Analysis Date 2804RunNamountResultPerp Date 28041Perp Date 28041Analysis Date 2804RunNamountResultPerp Date 28041Perp Date 28041Analysis Date 2804ResultResultPerp Date 28041Perp Date 28041Perp Date 28041Analysis Date 2804ResultResultResultResultPerp Date 28041Perp Date 28041Analysis Date 2804ResultResultResultResultResultPerp Date 28041Analysis Date 2804ResultResultResultResultResultResultAnalysis Date 2804ResultResultResultResultResultResultAnalysis Date 2804ResultResultResultResultResultResultAnalysis Date 2804ResultResultResultResultResultResultAnalysis Date 2804ResultResultResultResult	Project:         2003.17.A. P3 Roxbury         Laboratory Control Spike         Laboratory Control Spike           Sample ID lea 200801         Bateri D: R7119         Test Code: MAVPH         Units: ugL         Analysis Dire 28011 (27:00 PM         Prop Date 2801           Clert (D:         Clert (D:         Clert (D:         V.4_010208A         SeqVe:         105606           Clert (D:         Clert (D:         Clert (D:         V.4_010208A         SeqVe:         1050           Clert (D:         Clert (D:         Clert (D:         V.4_010208A         SeqVe:         1050         Prop Date 2801           Clert (D:         Clert (D:         Clert (D:         V.4_010208A         SeqVe:         1050         D           Clert (D:         Clert (D:         Clert (D:         V.4_010208A         SeqVe:         1050         D           Clert (D:         Clert (D:         V.4_010208A         Clert (D:         V.4_010208A         SeqVe:         1050         D           Clert (D:         Clert (D:         Clert (D:         V.4_010208A         Clert (D:         V.4_010208A         SeqVe:         1050         D           Clert (D:         Clert (D:         V.4_010208A         Clert (D:         V.4_010208A         Clert (D:         V.4_010208A	Work Order	: 0102063												:
Barbin Line         Test Code:         MAVPH         Units:         Upd.         Analysis Date         28001 1:27:00 PM         Prop Date         28001           Diert (D:         Run (D:         VL_01203A         SeqNo:         109808         Prop Date         28001           Diert (D:         C         Sample         Run (D:         VL_01203A         SeqNo:         109808         Prop Date         28001           Diert (D:         C         Sample         Run (D:         VL_01203A         SeqNo:         109808         Prop Date         28001         Prop Date         28001 <td< th=""><th>Simple ID         Lat 200601         Batch ID: K119         Tast Code: MAVPH         Units: ugL         Analysis Date         28001         Pep Date         28011           Client (D:         V4_0102064         Run (D:         V4_0102064         Seqve: 106909         Seqve: 106909         Pep Date         28011           Client (D:         Client (D:         V4_0102064         Run (D:         V4_0102064         Seqve: 106909         Seqve: 106909           Client (D:         Client (D:         Client (D:         V4_0102064         Seqve: 106909         Seqve: 106909         Client (D:         Clien (D:         Clien (D:         Cli</th><th>Project:</th><th>200317.A</th><th>P-3 Roxbury</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>Lab</th><th>oratory Co</th><th>ntrol Sp</th><th>ا <del>ا</del>د</th></td<>	Simple ID         Lat 200601         Batch ID: K119         Tast Code: MAVPH         Units: ugL         Analysis Date         28001         Pep Date         28011           Client (D:         V4_0102064         Run (D:         V4_0102064         Seqve: 106909         Seqve: 106909         Pep Date         28011           Client (D:         Client (D:         V4_0102064         Run (D:         V4_0102064         Seqve: 106909         Seqve: 106909           Client (D:         Client (D:         Client (D:         V4_0102064         Seqve: 106909         Seqve: 106909         Client (D:         Clien (D:         Clien (D:         Cli	Project:	200317.A	P-3 Roxbury								Lab	oratory Co	ntrol Sp	ا <del>ا</del> د
	Client (D:         And/F         SeqVo:         Cleent (D:         And/F         SeqVo:         Cleent (D:         And/F         Center         And/F         And	Sample ID Ics	02/08/01	Batch ID: R7119	Test Code	MAVPH	Units: µg/L			Analysis Da	ate 2/8/01 1	:27:00 PM	Prep Date 2	2/8/01	
C Sample         Original Sample           Andyle         Result         RL         Unts         C Sple         Original Sample         Original Sample           webyl intrbubyl ether         Result         RL         Unts         Amount         Result         KRC         Low Limit         Griginal Sample           webyl intrbubyl ether         14.65         2.0         ppt         20         73         70         130         0           samene         19.25         2.0         ppt         20         0         73         70         130         0         0           Divension         19.25         2.0         ppt         20         0         1         0         130         0         0         0         0         0         1         0         1         0	Analyte         CC Splie         Orginal Sample         Orginal Sample         Orginal Sample           Answith (Hechnyl) ether         Result         RL         Unts         Amount         Result         SREE         Lowint         orginal Sample           Rehyl (Hechnyl) ether         1485         2.0         µg/L         20         73         70         130         0           Renzene         13.23         2.0         µg/L         20         0         132         70         130         0           Renzene         13.23         2.0         µg/L         20         0         17         70         130         0           Diplemate         13.23         2.0         µg/L         20         0         12         70         130         0         0           Apphrance         3.6         2.0         µg/L         20         0         12         70         130         0	Client ID:			Run ID:	V-4_0102(	)8A			SeqNo:	106908				
Anolyte         Result         NL         Units         Anount         Result         %RPD         RPDLinit         Ord         RPDLinit         Ord         RPDLinit         Ord         RPDLinit         Ord         RPDLinit         Ord         RPDLinit         Ord         RPDLinit         Ord         RPDLinit         Ord         RPDLinit         Ord         RPDLinit         Ord         RPDLinit         Ord         RPDLinit         Ord         RPDLinit         Ord         RPDLinit         Ord         RPDLinit         Ord         RPDLinit         Ord         Surf         Surf         TO         130         D         RPDLinit         Ord         Surf         Surf         TO         130         D         RPDLinit         Ord         Surf         Surf         TO         130         D         RPDLinit         Ord         Surf         Surf         Surf         ZO         ULL         ZO         ULL         ZO         ULL         ZO         ULL         ZO         ULL         ZO         ULL         ZO         ZO         ZO         ZO         ZO         ZO         ZO         ZO         ZO         ZO         ZO         ZO         ZO         ZO <thzo< th="">         ZO         <thzo< th=""> <thzo< th=""></thzo<></thzo<></thzo<>	Analytie         Re.uit         R.L.         Units         Amount         Result         %REC         LowLinni         Highlinni         or NS Result         %RPO         RPOLinni         Lo           Weinvierteburkvierher         1455         2.0         µg/L         20         0         7.32         70         130         0         0           Dielene         19.53         2.0         µg/L         20         0         81.7         70         130         0         0           Etrylbenzene         16.34         2.0         µg/L         20         0         81.7         70         130         0         0           AppNienzene         16.34         2.0         µg/L         20         0         130         0 <td></td> <td></td> <td>QC Sample</td> <td></td> <td>-</td> <td>QC Spike Original</td> <td>Sample</td> <td></td> <td></td> <td>0</td> <td>)riginal Sample</td> <td></td> <td></td> <td></td>			QC Sample		-	QC Spike Original	Sample			0	)riginal Sample			
Wertyl tertclutyl ether         14.65         2.0 $\mu gl.$ 20 $\mu gl.$ 20         33.2         70         130         0           anzene         13.96         2.0 $\mu gl.$ 20 $\mu gl.$ 20 $\mu gl.$ 20 $\mu gl.$ 20         130         0           intuene         15.34         2.0 $\mu gl.$ 20 $\mu gl.$ 20         0         130         0           Aprilene         15.34         2.0 $\mu gl.$ 20 $\mu gl.$ 20         130         0           Aprilene         14.99         2.0 $\mu gl.$ 20         0         130         0           Aprilene         24.9         0 $\mu gl.$ 25         0         130         130         0           Surr. 12.Dictionethane-df         24.49         0 $\mu gl.$ 25         0         130         130         130           Surr. 14.60         0 $\mu gl.$ 25         0         131         20         130         0           Surr. 14.60         0 $\mu gl.$ 25         0         130         130	Metryl tert-turyl etter         145         2.0         µg/L         20         0         73.2         70         130         0           Barzene         13.86         2.0         µg/L         20         0         73.2         70         130         0           Barzene         15.34         2.0         µg/L         20         0         81.7         70         130         0           Dryklenzene         16.34         2.0         µg/L         20         0         130         0         0           Dryklenzene         16.34         2.0         µg/L         20         0         130         0         0           Dryklenzene         16.34         2.0         µg/L         20         0         130         0         0           Dryklenzene         20.6         10         12         20         10         12         20         130         0           Dryklenzene         20.7         10         12         10         10         12         10         130         0           Surr. 10lene-d3         30.11         0         µg/L         25         0         12         70         130         0 <t< td=""><td>Analyte</td><td></td><td>Result</td><td>RL</td><td>Units</td><td>Amount</td><td>Result 9</td><td>%REC L</td><td>owLimit</td><td>HighLimit</td><td>or MS Result</td><td>%RPD R</td><td>RPDLimit</td><td>8</td></t<>	Analyte		Result	RL	Units	Amount	Result 9	%REC L	owLimit	HighLimit	or MS Result	%RPD R	RPDLimit	8
Barzene       18/8       2.0 $\mu g/L$ 20 $0$ 6.8       70       130       0         Rollene       19.23       2.0 $\mu g/L$ 20 $0$ 6.3       70       130       0         Rollene       16.34       2.0 $\mu g/L$ 20 $0$ $132$ 0       130       0         Aryleneme       36.87       2.0 $\mu g/L$ 20 $0$ $12/L$ 20 $0$ $12/L$ 20 $12/L$ 20 $12/L$ 20 $12/L$ 20 $12/L$ 20 $12/L$ 20 $12/L$ 20 $12/L$ 20 $12/L$ 20 $12/L$ 20 $12/L$ 20 $12/L$ 20 $12/L$ 20 $12/L$ 20 $12/L$ 20 $12/L$ 20 $12/L$ 20       2	Benzene         1896         2.0         upl.         2.0         upl.         2.0         upl.         2.0         upl.         2.0         upl.         2.0         upl.         2.0         upl.         2.0         upl.         2.0         upl.         2.0         upl.         2.0         upl.         2.0         upl.         2.0         upl.         2.0         upl.         2.0         1.0         0         2.2         7.0         1.30         0         0           mpX/tene         3.61         2.0         upl.         2.0         upl.         2.0         0         1.0         0	Methyl tert-buty	/  ether	14.65	2.0	hg/L	20	0	73.2	70	130	0			
Tollene         19.2         2.0 $\mu gl.$ 2.0 $\mu gl.$ 2.0 $\mu gl.$ 2.0 $\mu gl.$ 2.0 $\mu gl.$ 2.0 $\mu gl.$ 2.0 $\mu gl.$ 2.0 $\mu gl.$ 2.0 $\mu gl.$ 2.0 $\mu gl.$ 2.0 $\mu gl.$ 2.0 $\mu gl.$ 2.0 $\mu gl.$ 2.0 $\mu gl.$ 2.0 $\mu gl.$ 2.0 $\mu gl.$ 2.0 $1.3$ 7.0         130         0           Aphthalene         3.0 $\mu gl.$ 2.0 $\mu gl.$ 2.0 $1.3$ 7.0         130         0           Aphthalene         2.0.55         5.0 $\mu gl.$ 2.0 $1.0$ 2.2         7.0         130         0           Surr. 1.2-Dichonorbitane-d4         2.4,0         0 $\mu gl.$ 2.5         0 $1.0$ 1.0         1.0	Tollenee         19.23         2.0         ug/L         2.0         ug/L         2.0         ug/L         2.0         1.0         1.0         0         0           meXv/benzene         36.87         2.0         ug/L         2.0         ug/L         2.0         1.0         1.0         0         0           meXv/benzene         36.87         2.0         ug/L         2.0         0         1.7         70         130         0           meXviene         36.87         0         ug/L         2.0         0         1.2         1.30         0           strint 12-Ditemondurane         2.0         ug/L         2.5         0         1.1         70         130         0           Surr 12-Ditemondurane         2.7.2         0         ug/L         2.5         0         101         70         130         0           Surr 12-Ditemondurane         2.7.2         0         ug/L         2.5         0         101         70         130         0           Surr 12-Ditemondurane         2.7.2         0         ug/L         2.5         0         101         70         130         0           Surr 10ironehane         2.5.2         0	Benzene		18.96	2.0	hg/L	20	0	94.8	70	130	0			
Itylbenzene       16.34       2.0       µg/L       20       0       81.7       7.0       130       0         m.p-Xylene       3.687       2.0       µg/L       20       0       9.22       7.0       130       0         m.p-Xylene       3.687       2.0       µg/L       20       0       7.7       130       0         Arylene       3.687       2.0       µg/L       2.0       0       7.7       130       0         Arylene       2.1       1.99       2.0       µg/L       2.0       0       7.0       130       0         Arylene       2.14       0       µg/L       25       0       171       70       130       0         Surr.12.Distronthane       22.49       0       µg/L       25       0       101       70       130       0         Surr.14.Biomofluorenthane       25.22       0       µg/L       25       0       101       70       130       0         Surr.10uened8       30.11       0       µg/L       25       0       120       70       130       0         Surr.10uened8       30.11       0       µg/L       25       0	Ethylbenzene         15.34         2.0         µg/L         2.0         0         1.7         7.0         130         0           mpXvjene         36.87         2.0         µg/L         40         0         22.2         7.0         130         0           mpXvjene         36.87         2.0         µg/L         20         0         12.2         7.0         130         0           Mapfulation         20.56         5.0         µg/L         2.0         0         103         7.0         130         0           Surr. 12.Dibrioned         22.49         0         µg/L         25         0         17         7.0         130         0           Surr. 2.5.Dibrionediane         2.2.49         0         µg/L         25         0         101         7.0         130         0           Surr. 4.5.0         0         µg/L         25         0         µg/L         25         0         170         130         0           Surr. 4.5.0         0         µg/L         25         0         µg/L         25         0         170         130         0           Surr. 7.5.0         0.10         µg/L         25         0	Toluene		19.23	2.0	hg/L	20	0	96.2	70	130	0			
$n_p X y$ (here $36.87$ $2.0$ $\mu g/L$ $40$ $0$ $2.22$ $70$ $130$ $0$ $N y w (here)$ $14.99$ $2.0$ $\mu g/L$ $20$ $7$ $130$ $0$ $N p h t haten       14.99 2.0 \mu g/L 20 0 70 130 0 N t T 2 D is that e e e e e e e e e e e e e e e e e e e$	mp/Viene     38.87     2.0     µg/L     40     0     92.2     70     130     0       ovYthere     14.99     2.0     µg/L     20     0     75     70     130     0       ovYthere     21.49     0     µg/L     25     0     96.2     70     130     0       Surr. 12-Dicinocethare     22.49     0     µg/L     25     0     96.2     70     130     0       Surr. 25-Divomotoluene     22.49     0     µg/L     25     0     111     70     130     0       Surr. 25-Divomotoluene     27.72     0     µg/L     25     0     101     70     130     0       Surr. Toluene-dB     30.11     0     µg/L     25     0     101     70     130     0       Surr. Toluene-dB     30.11     0     µg/L     25     0     101     70     130     0       Surr. Toluene-dB     30.11     0     µg/L     25     0     101     70     130     0       Surr. Toluene-dB     30.11     0     µg/L     25     0     100     100     10       Surr. Toluene-dB     30.11     0     µg/L     25     0     1	Ethylbenzene		16.34	2.0	hg/L	20	0	81.7	70	130	0			
$\cdot$ Xylene14.992.0 $\mu g/L$ 20075701300aphthalene20565.0 $\mu g/L$ 200103701300Surr. 12-Dibloroethane-d42.4,040 $\mu g/L$ 25096.2701300Surr. 12-Dibloroethane-d42.4,040 $\mu g/L$ 25096.2701300Surr. 25-Dibloroethane27.720 $\mu g/L$ 250111701300Surr. 25-Dibronofluene27.720 $\mu g/L$ 250111701300Surr. 26-Dibronofluene27.720 $\mu g/L$ 250111701300Surr. 20 on 110 $\mu g/L$ 250101701300Surr. 70 uene-d830.110 $\mu g/L$ 250120701300	-Xylene     14.99     2.0     µg/L     20     75     70     130     0       Vaphthalene     20.56     5.0     µg/L     20     0     103     70     130     0       Surr. 12.5-Ditromotionene     2.4.44     0     µg/L     25     0     90     70     130     0       Surr. 4.Bromofluorohenzene     27.72     0     µg/L     25     0     111     70     130     0       Surr. 4.Bromofluorohenzene     27.72     0     µg/L     25     0     101     70     130     0       Surr. FoluenedB     30.11     0     µg/L     25     0     101     70     130     0       Surr. ToluenedB     30.11     0     µg/L     25     0     120     70     130     0       Surr. ToluenedB     30.11     0     µg/L     25     0     120     70     130     0       Surr. ToluenedB     30.11     0     µg/L     25     0     120     70     130     0       Surr. ToluenedB     30.11     0     µg/L     25     0     120     70     130     0       Surr. ToluenedB     30.11     0     µg/L     25     0 <td>n, p-Xylene</td> <td></td> <td>36.87</td> <td>2.0</td> <td>hg/L</td> <td>40</td> <td>0</td> <td>92.2</td> <td>20</td> <td>130</td> <td>0</td> <td></td> <td></td> <td></td>	n, p-Xylene		36.87	2.0	hg/L	40	0	92.2	20	130	0			
Applitatiene         20.56         5.0 $\mu g/L$ 20         0         103         70         130         0           Surr: 1.2-Dichloroethare-d4         24.04         0 $\mu g/L$ 25         0         96.2         70         130         0           Surr: 1.2-Dichloroethare-d4         22.49         0 $\mu g/L$ 25         0         96.2         70         130         0           Surr: 2.5-Dichorotoluere         22.49         0 $\mu g/L$ 25         0         111         70         130         0           Surr: A-Bromofluorobenzene         27.72         0 $\mu g/L$ 25         0         101         70         130         0           Surr: Dibromofluoromethane         25.12         0 $\mu g/L$ 25         0         101         70         130         0           Surr: Toluene-d8         30.11         0 $\mu g/L$ 25         0         120         70         130         0	Vaphthalene         20.56         5.0         µg/L         20         7.0         130         0           Surr. 1.2.Dichloroethane-d4         2.04         0         µg/L         25         0         96.2         70         130         0           Surr. 2.Dichloroethane-d4         2.0.49         0         µg/L         25         0         111         70         130         0           Surr. 2.Dichloroethane         2.7.72         0         µg/L         25         0         111         70         130         0           Surr. 20uene-d8         30.11         0         µg/L         25         0         120         70         130         0           Surr. 70uene-d8         30.11         0         µg/L         25         0         120         70         130         0           Surr. 70uene-d8         30.11         0         µg/L         25         0         120         70         130         0           Surr. 70uene-d8         30.11         0         µg/L         25         0         120         70         130         0           Surr. 70uene-d8         30.11         1         1         1         1         1	-Xylene		14.99	2.0	hg/L	20	0	75	70	130	0			
Surr. 1.2-Dichloroethrane-d4 $24.04$ 0 $µglL$ $25$ 0 $96.2$ 70       130       0         Surr. 2.5-Dibromotoluene $22.49$ 0 $µglL$ $25$ 0 $90$ 70       130       0         Surr. 4.Bromotoluene $27.72$ 0 $µglL$ $25$ 0 $111$ 70       130       0         Surr. 4.Bromotonomethane $27.72$ 0 $µglL$ $25$ 0 $111$ 70       130       0         Surr. Toluene-d8       30.11       0 $µglL$ $25$ 0 $100$ 70       130       0         Surr. Toluene-d8       30.11       0 $µglL$ $25$ 0 $120$ 70       130       0	Surr. 12. Olchloroethaae-d4       24.04       0       µg/L       25       0       96.2       70       130       0         Surr. 2.5 Obtomotoluene       22.49       0       µg/L       25       0       111       70       130       0         Surr. 2.5 Obtomotoluene       27.72       0       µg/L       25       0       101       70       130       0         Surr. Toluene-d3       30.11       0       µg/L       25       0       120       70       130       0         Surr. Toluene-d3       30.11       0       µg/L       25       0       120       70       130       0         Surr. Toluene-d3       30.11       0       µg/L       25       0       120       70       130       0         Surr. Toluene-d3       30.11       0       µg/L       25       0       120       70       130       0       0         Surr. Toluene-d3       30.11       0       µg/L       25       0       120       70       130       0       0         Surr. Toluene-d3       30.11       0       µg/L       25       0       120       70       130       0       130       0<	Vaphthalene		20.56	5.0	hg/L	20	0	103	20	130	0			
Surr. 2,5-Dibromotoluene       22,49       0 $\mu g/L$ 25       0       90       70       130       0         Surr. 4.Bromofluotobenzene       27.72       0 $\mu g/L$ 25       0 $111$ 70       130       0         Surr. Dibromofluotomethane       25.22       0 $\mu g/L$ 25       0 $111$ 70       130       0         Surr. Dibromofluotomethane       25.22       0 $\mu g/L$ 25       0 $120$ 70       130       0         Surr. Toluene-d8       30.11       0 $\mu g/L$ 25       0 $120$ 70       130       0	Surr. 2, S-Dibromotoluene         2.4.9         0         µg/L         2.5         0         11         70         130         0           Surr. 4 Picromofluorobenzene         27.72         0         µg/L         2.5         0         111         70         130         0           Surr. Toluene-d3         30.11         0         µg/L         2.5         0         120         70         130         0           Surr. Toluene-d3         30.11         0         µg/L         2.5         0         120         70         130         0           Qualifiers.         ND-Not Detected at the Reporting Limit         5         Splik Recovery outside neopted recovery limits         B Analyte detected in the associated Method Blank.	Surr: 1,2-Dic	hloroethane-d4	24.04	0	hg/L	25	0	96.2	20	130	0			
Surr. Homofluoobenzene       27.72       0 $\mu g/L$ 25       0       111       70       130       0         Surr. Dibromofluoomethane       25.22       0 $\mu g/L$ 25       0       101       70       130       0         Surr. Toluene-dB       30.11       0 $\mu g/L$ 25       0       120       70       130       0         Surr. Toluene-dB       30.11       0 $\mu g/L$ 25       0       120       70       130       0	Surr. Henom0luorobenzene         27.72         0         µg/L         25         0         111         70         130         0           Surr. Dibromofluoromethane         25.22         0         µg/L         25         0         101         70         130         0           Surr. Toluene-d8         30.11         0         µg/L         25         0         120         70         130         0           Quaritro Surr. Toluene-d8         30.11         0         µg/L         25         0         120         70         130         0           Quaritro Surr. Toluene-d8         30.11         0         µg/L         25         0         120         70         130         0	Surr: 2,5-Dib	romotoluene	22.49	0	hg/L	25	0	06	70	130	0			
Surr: Dibromofuoromethane       25.22       0       µg/L       25       0       130       0         Surr: Toluene-d8       30.11       0       µg/L       25       0       120       70       130       0         Surr: Toluene-d8       30.11       0       µg/L       25       0       120       70       130       0	Surr. Toluene-d8     25.22     0     µg/L     25     0     101     70     130     0       Surr. Toluene-d8     30.11     0     µg/L     25     0     120     70     130     0       Quarticers.     ND - Not Detected at the Reporting Limit.     5 - Shike Recovery outside accepted recovery limits.     B - Analyte detected in the associated Method Blank.	Surr: 4-Brom	ofluorobenzene	27.72	0	hg/L	25	0	111	70	130	0			
Surr. Toluene-d8 30.1 0 µg/L 25 0 120 70 130 0	Surr. Toluene-d8     30.11     0     µg/L     25     0     120     70     130     0       Qualifiers:     ND - Not Detected at the Reporting Limit     S - Spike Recovery outside accepted recovery limits     B - Analyte detected in the associated Method Blank, NA. Non-nitrobut control limits     R - RPD outside accepted recovery limits     NA. Non-nitrobut control limits	Surr: Dibrom	ofluoromethane	25.22	0	hg/L	25	0	101	70	130	0			
	Qualifiers:       ND - Not Detected at the Reporting Limit       5 - Spike Recovery outside accepted recovery limits       B - Analyte detected in the associated Method Blank         J - Analyte detected below entantiation limits       R - RPD outside accepted recovery limits       MA Analyte detected hold blank	Surr: Toluene	e-d8	30.11	0	hg/L	25	0	120	70	130	0			
	Qualifiers:       ND - Not Detected at the Reporting Limit       S - Spike Recovery outside accepted recovery limits       B - Analyte detected in the associated Method Blank         J - Analyte detected below quantitation limits       R - RPD outside accepted recovery limits       MA       Available output ou														
	Qualifiers:       ND - Not Detected at the Reporting Limit       S - Spike Recovery outside accepted recovery limits       B - Analyte detected in the associated Method Blan         J - Analyte detected below quantitation limits       R - RPD outside accepted recovery limits       MA And continention to the associated Method Blan														
	Qualifiers:       ND - Not Detected at the Reporting Limit       S - Spike Recovery outside accepted recovery limits       B - Analyte detected in the associated Method Blank         J - Analyte detected below quantitation limits       R - RPD outside accepted recovery limits       MA MAI analyte detected in the associated Method Blank														
	Qualifiers:       ND - Not Detected at the Reporting Limit       S - Spike Recovery outside accepted recovery limits       B - Analyte detected in the associated Method Blank         J - Analyte detected below quantitation limits       R - RPD outside accepted recovery limits       NA       MA <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>														
	Qualifiers:       ND - Not Detected at the Reporting Limit       S - Spike Recovery outside accepted recovery limits       B - Analyte detected in the associated Method Blank         J - Analyte detected below quantitation limits       R - RPD outside accepted recovery limits       MA Mod analyte detected below quantitation limits														
	J - Analyte detected below quantitation limits R - RPD outside accorted recovery limits	Qualifiers: }	ND - Not Detected	at the Reporting Limit	S -	Spike Recov	ery outside accepted	recovery l	imits	B - Analyte	detceted in t	he associated Meth	od Blank		
Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank		-													

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CLIR.MT:         Weston & Sampson Fingineers         OC SUMMARY REPORT           Work Onder:         1012053         Laboratory Control Splike           Project:         200317.A P.3 Roubury         Test Code: MAVPH         Units: upL         Analysis Date 21601 1051:00 AM         Prop Date 21601           Sampe ID: rea221601         Batch ID: R7220         Test Code: MAVPH         Units: upL         Analysis Date 21601 1051:00 AM         Prop Date 21601           Sampe ID: rea221601         Batch ID: R7220         Test Code: MAVPH         Units: upL         Analysis Date 21601 1051:00 AM         Prop Date 21601           Sampe ID: rea221601         Batch ID: R7220         Test Code: MAVPH         Units: upL         Analysis Date 21601 1051:00 AM         Prop Date 21601           Control         200317.A P.3         Sampson         Sampson         Sampson         Sampson         Sampson           Control         200317.A P.3         200         011         V2         200314         Sampson           Annota         Result         Result         Result         Sampson         2003101         2010         2010         2010         2010         2010         2010         2010         2010         2010         2010         2010         2010         2010         2010         2010	CLIENT:       Weston & Sampson Engineers         Vork Order:       0102063         Vork Order:       0102063         Project:       200317.A       P-3 Roxbury         iample ID Ics02/16/01       Batch ID: R7220       Test Code: MAVPH       Units: µg/L         iample ID Ics02/16/01       Batch ID: R7220       Test Code: MAVPH       Units: µg/L         iample ID Ics02/16/01       Batch ID: R7220       Test Code: MAVPH       Units: µg/L         iample ID ics02/16/01       Batch ID: R7220       Test Code: MAVPH       Units: µg/L         iample ID:       QC Sample       Run ID:       V-2_010216A         iamplyte       Result       RL       Units       Amount       Result         iambut lether       18:34       2.0       µg/L       20       µg/L       20         intylbenzene       2.14       2.0       µg/L       20       µg/L       20         Annount       2.16       0       µg/L       20       µg/L       20         Annount       2.14       0       µg/L       20       µg/L       20         Annount       2.14       0       µg/L       20       µg/L       20         Annotobenzene       2.16       0	Analysis Date 2/16/01 SeqNo: 107950 %REC LowLimit HighLimit 91.7 70 130 101 70 130 101 70 130 101 70 130 103 70 130 98.7 70 130	QC SUMMARY REPORT
Work Order:         1012063         Laboratory Control Splice           Project:         200317.A P.3 Roxbury         Eatch ID: AT220         Test Code: MAVH         Units: ppL         Annysis Date 2/1601 10:51:00 AN         Prog Date 2/1601           Sample         Discrete         200317.A P.3 Roxbury         Raun. Discrete         Raun. Discrete         Annysis Date 2/1601 10:51:00 AN         Prog Date 2/1601           Clear (D):         Annysis Date 2/1601         Ration Discrete         Santa         Santa         Prog Date 2/1601           Clear (D):         Prog Date 2/1601         Ration Discrete         Code Sample <th< th=""><th>Vork Order:         0102063           Project:         200317.A         P-3 Roxbury           Image ID         Leso2/16/01         Batch ID:         R7220         Test Code:         MAVPH         Units:         µg/L           Riample ID         Leso2/16/01         Batch ID:         R7220         Test Code:         MAVPH         Units:         µg/L           Riample ID         Leso2/16/01         Batch ID:         R7220         Test Code:         MAVPH         Units:         µg/L           Riant ID:         CC Sample         Run ID:         V-2_010216A         Amount         Res           Allower         Result         RL         Units         Amount         Res           Annount         Res         2:0         µg/L         2:0         µg/L         2:0           Annount         Res         2:0         µg/L         2:0         µg/L         2:0           Annount         Res         2:0         µg/L         2:0         µg/L         2:0           Annount         Res         2:0         µg/L         2:0         µg/L         2:0           Annount         Res         2:0         µg/L         2:0         µg/L         2:0</th><th>Analysis Date 2/16/01 SeqNo: 107950 %REC LowLimit HighLimit 91.7 70 130 101 70 130 101 70 130 101 70 130 101 70 130 103 70 130 98.7 70 130</th><th>I aboratory Control Snike</th></th<>	Vork Order:         0102063           Project:         200317.A         P-3 Roxbury           Image ID         Leso2/16/01         Batch ID:         R7220         Test Code:         MAVPH         Units:         µg/L           Riample ID         Leso2/16/01         Batch ID:         R7220         Test Code:         MAVPH         Units:         µg/L           Riample ID         Leso2/16/01         Batch ID:         R7220         Test Code:         MAVPH         Units:         µg/L           Riant ID:         CC Sample         Run ID:         V-2_010216A         Amount         Res           Allower         Result         RL         Units         Amount         Res           Annount         Res         2:0         µg/L         2:0         µg/L         2:0           Annount         Res         2:0         µg/L         2:0         µg/L         2:0           Annount         Res         2:0         µg/L         2:0         µg/L         2:0           Annount         Res         2:0         µg/L         2:0         µg/L         2:0           Annount         Res         2:0         µg/L         2:0         µg/L         2:0	Analysis Date 2/16/01 SeqNo: 107950 %REC LowLimit HighLimit 91.7 70 130 101 70 130 101 70 130 101 70 130 101 70 130 103 70 130 98.7 70 130	I aboratory Control Snike
Project:         200317.A         P.3.3 Roubury         Laboratory Control Splite           Sample ID         Rate ID:         RT220         Test Code:         MAVPH         Units. JugL         Analysis Data 216001         Prep Data 216001           Client ID:         Rate ID:         RT220         Test Code:         MAVPH         Units. JugL         Analysis Data 216001         Prep Data 216001           Client ID:         RT20         Rau         Units.         QCGSplete Original Sample         Ready         Prep Data         Zereot           Client ID:         RT20         R.L         Units.         Annoviri         Ready         Analysis Data         Colonationy Control Splite           Client ID:         RT20         RL         Units.         Annoviri         Ready         Analysis Data	Troject:         200317.A         P.3 Roxbury           iample ID         Ics02/16/01         Batch ID:         R7220         Test Code:         MAVPH         Units:         µg/L           ilent ID:         CC Sample         Run ID:         V-2_010216A         Units:         µg/L         Result         Result         RL         Units         Amount         Result	Analysis Date 2/16/01 SeqNo: 107950 SeqNo: 107950 %REC LowLimit HighLimit 91.7 70 130 101 70 130 101 70 130 101 70 130 103 70 130 98.7 70 130	
Sample ID         Icat Cole:         MAVPH         Inits:         Jpd.         Analysis         Date 21:601         Prep Date 21:601         Prep Date 21:601         Prep Date 21:601           Clent ID:         Amon         Raun ID:         V2_0102164         Result         KPP D         PPD Imin         Amon           Clent ID:         Clear ID:         Amount         Result         KFEC         Loudinininini         Service         103:963         Date         Prep Date         21:601         ID           Amount         Result         KFEC         Loudinini         Amount         Result         KFEC         IO         ID	Sample ID         Ics02/16/01         Batch ID:         R7220         Test Code:         MAVPH         Units:         µg/L           Sient ID:         QC Sample         Run ID:         V-2_010216A         QC Spike Original Sample           Malyte         QC Sample         Run ID:         V-2_010216A         Result	Analysis Date 2/16/01 SeqNo: 107950 SeqNo: 107950 %REC LowLimit HighLimit 91.7 70 130 101 70 130 101 70 130 101 70 130 103 70 130 98.7 70 130	
	Run ID:         V-2_010216A           Itent ID:         QC Spike Original San           Analyte         QC Spike Original San           Anount         Result           Rethyl tert-butyl ether         18.34           Itent butyl ether         18.34           Itenzene         2.0           Itenzene         20.14           Olvene         20.14           Ontene         20.14           Applic         20 <td>SeqNo: 107950 %REC LowLimit HighLimit 91.7 70 130 102 70 130 101 70 130 101 70 130 101 70 130 103 70 130 103 70 130 130 130</td> <td>0:51:00 AM Prep Date 2/16/01</td>	SeqNo: 107950 %REC LowLimit HighLimit 91.7 70 130 102 70 130 101 70 130 101 70 130 101 70 130 103 70 130 103 70 130 130 130	0:51:00 AM Prep Date 2/16/01
Analytic         CC Sprile         Original Sample         Original Sample         Original Sample           Analytic         Result         RL         Units         Announi         Result         SRCE         LowInni         Holdhmit         Original Sample           Rehytic         Result         Result         SRCE         LowInni         Holdhmit         Original Sample           Rehytic         Units         Z0         upfL         Z0         0         17         70         130         0           Renzene         2014         Z0         upfL         Z0         0         101         70         130         0           Diverse         2014         Z0         upfL         Z0         0         101         70         130         0           Anonothuse         214         20         upfL         Z0         0         101         70         130         0           Surr 12.Distructure         258         0         upfL         Z5         0         101         70         130         0           Surr 12.Distructure         258         0         upfL         Z5         0         101         70         130         0           <	CC Sample         CC Spike         Original Samolyte           Inalyte         Result         RL         Units         Amount         Res           fiethyl tert-butyl ether         18.34         2.0         µg/L         20           ienzene         20.39         2.0         µg/L         20           ienzene         20.14         2.0         µg/L         20           ithylbenzene         20.15         2.0         µg/L         20           .thylbenzene         19.74         2.0         µg/L         20           .Xylene         19.25         5.0         µg/L         20           Surr: 1,2-Dichloroethane-d4         25.14         0         µg/L         25           Surr: 2,5-Dibromotoluene         23.16         0         µg/L         25 <td>%REC         LowLimit         NighLimit           91.7         70         130           102         70         130           101         70         130           101         70         130           101         70         130           101         70         130           101         70         130           103         70         130           98.7         70         130</td> <td></td>	%REC         LowLimit         NighLimit           91.7         70         130           102         70         130           101         70         130           101         70         130           101         70         130           101         70         130           101         70         130           103         70         130           98.7         70         130	
Andreit         Net         Andreit         An	Maryle         Result         R.L         Units         Annount         Result           fethyl tert-butyl ether         18.34         2.0         µg/L         20           ienzene         20.39         2.0         µg/L         20           oluene         20.14         2.0         µg/L         20           .ithylbenzene         20.15         2.0         µg/L         20           .thylbenzene         20.15         2.0         µg/L         20           .thothone         19.74         2.0         µg/L         20           .thathalene         19.05         5.0         µg/L         20           Surr: 1,2-Dichloroethane-d4         25.14         0         µg/L         25           Surr: 2,5-Dibromotoluene         23.16         0         µg/L         25	91.7 70 130 91.7 70 130 102 70 130 101 70 130 101 70 130 103 70 130 98.7 70 130	riginal Sample
Methyl lert-buryl ether         1334         2.0         ppl.         2.0         17.7         7.0         13.0         0           Benzene         20.3         2.0         ppl.         2.0         0.17         7.0         13.0         0           Denzene         20.14         2.0         ppl.         2.0         0.10         7.0         13.0         0           Diverse         20.14         2.0         ppl.         2.0         0         10.1         7.0         13.0         0           AbyNee         13.14         2.0         ppl.         2.0         0         10.1         7.0         13.0         0           Starr.12.Delohooethane-d4         25.14         0         ppl.         2.5         0         10.1         7.0         13.0         0           Starr.12.Delohooethane-d4         25.14         0         ppl.         2.5         0         10.1         7.0         130         0           Starr.12.Delohooethane-d4         25.13         0         ppl.         2.5         0         10.1         7.0         130         0         0           Starr.2.Denonflooroethane-d3         25.13         0         ppl.         2.5 <td< td=""><td>flethyl tert-butyl ether         18.34         2.0         µg/L         20           tenzene         20.39         2.0         µg/L         20           oluene         20.39         2.0         µg/L         20           oluene         20.14         2.0         µg/L         20           cilvane         20.15         2.0         µg/L         20           tithylbenzene         20.15         2.0         µg/L         20           Aplene         20.15         2.0         µg/L         20           -Xylene         19.74         2.0         µg/L         20           -Xylene         19.74         2.0         µg/L         20           Surr: 1,2-Dichloroethane-d4         25.14         0         µg/L         25           Surr: 2,5-Dibromotoluene         23.16         0         µg/L         25           Surr: 4-Bromofluorobenzene         25.63         0         µg/L         25</td><td>91.7 70 130 102 70 130 101 70 130 101 70 130 103 70 130 98.7 70 130</td><td></td></td<>	flethyl tert-butyl ether         18.34         2.0         µg/L         20           tenzene         20.39         2.0         µg/L         20           oluene         20.39         2.0         µg/L         20           oluene         20.14         2.0         µg/L         20           cilvane         20.15         2.0         µg/L         20           tithylbenzene         20.15         2.0         µg/L         20           Aplene         20.15         2.0         µg/L         20           -Xylene         19.74         2.0         µg/L         20           -Xylene         19.74         2.0         µg/L         20           Surr: 1,2-Dichloroethane-d4         25.14         0         µg/L         25           Surr: 2,5-Dibromotoluene         23.16         0         µg/L         25           Surr: 4-Bromofluorobenzene         25.63         0         µg/L         25	91.7 70 130 102 70 130 101 70 130 101 70 130 103 70 130 98.7 70 130	
Benzene         203         20         pg/L         20         101         70         130         0           Ollenere         2014         20         pg/L         20         0         101         70         130         0           Diplemene         2015         20         pg/L         20         0         101         70         130         0           Arylene         3174         20         pg/L         20         0         101         70         130         0           Arylene         130.4         0         pg/L         20         0         101         70         130         0           Arylene         130.4         0         pg/L         25         0         101         70         130         0           Surr. 12.Dichlorentrane         25.13         0         pg/L         25         0         101         70         130         0         0           Surr. 2.Disonofloronetrane         25.13         0         pg/L         25         0         101         70         130         0         0           Surr. Toluene-d8         25.13         0         pg/L         25         0         101 <td>enzene 20.39 2.0 μg/L 20 oluene 20.14 2.0 μg/L 20 thylbenzene 20.15 2.0 μg/L 20 л, P-Xylene 41.07 2.0 μg/L 20 -Xylene 19.74 2.0 μg/L 20 Surr. 1,2-Dichloroethane-d4 25.14 0 μg/L 25 Surr. 2,5-Dibromotoluene 23.16 0 μg/L 25 Surr. 4-Bromofluorobenzene 25.63 0 μg/L 25</td> <td>102         70         130           101         70         130           101         70         130           103         70         130           98.7         70         130</td> <td>0</td>	enzene 20.39 2.0 μg/L 20 oluene 20.14 2.0 μg/L 20 thylbenzene 20.15 2.0 μg/L 20 л, P-Xylene 41.07 2.0 μg/L 20 -Xylene 19.74 2.0 μg/L 20 Surr. 1,2-Dichloroethane-d4 25.14 0 μg/L 25 Surr. 2,5-Dibromotoluene 23.16 0 μg/L 25 Surr. 4-Bromofluorobenzene 25.63 0 μg/L 25	102         70         130           101         70         130           101         70         130           103         70         130           98.7         70         130	0
Tollene         20.14         2.0         µg/L         2.0         1.0         7.0         1.30         0           Envylence         4.1.07         2.0         µg/L         2.0         0.1         7.0         1.30         0           ApyNence         1.3.74         2.0         µg/L         2.0         0.1         7.0         1.30         0           ApyNence         1.3.74         2.0         µg/L         2.0         0.1         7.0         1.30         0           ApyNence         1.3.74         2.0         µg/L         2.0         0.10         7.0         1.30         0           Astronofluctorlane-d4         2.14         0         µg/L         2.5         0         1.01         7.0         1.30         0           Surr. 1.2.Dicknotolane         2.5.68         0         µg/L         2.5         0         1.01         7.0         1.30         0           Surr. 1.2.Dicknotolane         2.5.63         0         µg/L         2.5         0         1.01         7.0         1.30         0           Surr. 1.2.Dicknotolane         2.5.63         0         µg/L         2.5         0         1.01         7.0         1.30	oluene         20.14         2.0         µg/L         20           ithylbenzene         20.15         2.0         µg/L         20           .hp-Xylene         41.07         2.0         µg/L         20           .xylene         19.74         2.0         µg/L         20           .sylene         19.74         2.0         µg/L         20           .sylene         19.74         2.0         µg/L         20           .surr. 1,2-Dichloroethane-d4         25.14         0         µg/L         25           Surr. 2,5-Dibromotoluene         23.16         0         µg/L         25           Surr. 4-Bromofluorobenzene         25.63         0         µg/L         25	101 70 130 101 70 130 103 70 130 98.7 70 130	0
Ethylemeter         2015         2.0         µg/L         2.0         101         7.0         130         0           mp-Xylene         11.07         2.0         µg/L         4.0         0         130         0           mp-Xylene         13.17         2.0         µg/L         2.0         130         0           AsyNthere         13.17         2.0         µg/L         2.0         130         0           AsyNthere         13.14         0         µg/L         2.0         0         130         0           Surr.12-Dichnorehane-d4         25.13         0         µg/L         25         0         130         0           Surr.25-Dinmorchane         25.13         0         µg/L         25         0         130         0           Surr.25-Dinmorchane         25.13         0         µg/L         25         0         130         0           Surr.70uene-d8         25.13         0         µg/L         25         0         101         70         130         0           Surr.70uene-d8         25.13         0         µg/L         25         0         101         70         130         0           Surr.70u	ithylbenzene     20.15     2.0     µg/L     20       .,p-Xylene     41.07     2.0     µg/L     40       -Xylene     19.74     2.0     µg/L     20       -Xylene     19.74     2.0     µg/L     20       Surr: 1,2-Dichloroethane-d4     25.14     0     µg/L     25       Surr: 2,5-Dibromotoluene     23.16     0     µg/L     25       Surr: 4-Bromohorobenzene     25.63     0     µg/L     25	101 70 130 103 70 130 98.7 70 130	0
mp/lytime     41.07     2.0     µg/L     2.0     µg/L     2.0     103     7.0     130     0       Systeme     19.14     2.0     µg/L     2.0     9.81     7.0     130     0       Systeme     19.14     2.0     µg/L     2.0     0     9.61     7.0     130     0       Start     35.14     0     µg/L     25     0     101     70     130     0       Surt<25.Diftomothane	λ,p-Xylene     41.07     2.0     μg/L     40       -Xylene     19.74     2.0     μg/L     20       -Xylene     19.74     2.0     μg/L     20       laphthalene     19.05     5.0     μg/L     20       Surr: 1,2-Dichloroethane-d4     25.14     0     μg/L     25       Surr: 2,5-Dibromotoluene     23.16     0     μg/L     25       Surr: 4-Bromofluorobenzene     25.63     0     μg/L     25	103 70 130 98.7 70 130	0
DeXyletter     19.74     2.0     µg/L     20     96.7     70     130     0       Namithelene     19.05     5.0     µg/L     22     0     95.2     70     130     0       Surr 12.5 Distornationers     25.14     0     µg/L     25     0     92.6     70     130     0       Surr 4.Bromofluere     23.14     0     µg/L     25     0     92.6     70     130     0       Surr 4.Bromofluere     23.63     0     µg/L     25     0     103     70     130     0       Surr 5.Disconducioner     25.63     0     µg/L     25     0     103     70     130     0       Surr 7oluen=dB     25.13     0     µg/L     25     0     101     70     130     0       Surr 7oluen=dB     25.13     0     µg/L     25     0     101     70     130     0       Surr 7oluen=dB     25.13     0     µg/L     25     0     101     70     130     0       Surr 7oluen=dB     25.13     0     µg/L     25     0     101     70     130     0       Surr 7oluenedB     2     2     101     70     130 <td< td=""><td>-Xylene 19.74 2.0 μg/L 20 laphthalene 19.05 5.0 μg/L 20 Surr: 1,2-Dichloroethane-d4 25.14 0 μg/L 25 Surr: 2,5-Dibromotoluene 23.16 0 μg/L 25 Surr: 4-Bromofluorobenzene 25.63 0 μg/L 25</td><td>98.7 70 130</td><td>0</td></td<>	-Xylene 19.74 2.0 μg/L 20 laphthalene 19.05 5.0 μg/L 20 Surr: 1,2-Dichloroethane-d4 25.14 0 μg/L 25 Surr: 2,5-Dibromotoluene 23.16 0 μg/L 25 Surr: 4-Bromofluorobenzene 25.63 0 μg/L 25	98.7 70 130	0
Naphthalene         19.05         5.0         µg/L         20         0         101         70         130         0           Surr. 12-Dichlorechane-d4         25:14         0         µg/L         25         0         101         70         130         0           Surr. 12-Dichlorechane-d4         25:14         0         µg/L         25         0         103         70         130         0           Surr. 2Diconolusene         25:68         0         µg/L         25         0         103         70         130         0           Surr. Toluen-d8         25:13         0         µg/L         25         0         101         70         130         0         0           Surr. Toluen-d8         25:13         0         µg/L         25         0         101         70         130         0         0           Surr. Toluen-d8         25:13         0         µg/L         25         0         101         70         130         0         0           Surr. Toluen-d8         25:13         0         µg/L         25         0         101         70         130         0         0           Surr. Toluene-d8         25:	laphthalene 19.05 5.0 μg/L 20 Surr: 1,2-Dichloroethane-d4 25.14 0 μg/L 25 Surr: 2,5-Dibromotoluene 23.16 0 μg/L 25 Surr: 4-Bromofluorobenzene 25.63 0 μg/L 25		0
Surr. 12. Dichloroethane-d4     25.14     0     µg/L     25     0     101     70     130     0       Surr. 2.5 Dibromotoluene     23.16     0     µg/L     25     0     103     70     130     0       Surr. 2.5 Dibromotoluene     25.63     0     µg/L     25     0     103     70     130     0       Surr. Dibromotonethane     25.63     0     µg/L     25     0     101     70     130     0       Surr. Toluene-d8     25.13     0     µg/L     25     0     101     70     130     0       Surr. Toluene-d8     25.13     0     µg/L     25     0     101     70     130     0       Gut     12     2     0     101     70     130     0     0       Out     2     1     2     0     101     70     130     0       Out     2     1     70     130     0     0     0       Surr. Toluene-d8     2     2.5/jk Recovery outside accepted covery limits     70     130     0       Out     1     2     0     101     70     130     0       Out     1     2     0     101	Surr. 1,2-Dichloroethane-d4 25.14 0 µg/L 25 Surr. 2,5-Dibromotoluene 23.16 0 µg/L 25 Surr. 4-Bromofluorobenzene 25.63 0 µg/L 25	95.2 70 130	0
Surr. 15, Dibromotoluene         23.16         0         µg/L         25         0         92.6         70         130         0           Surr. 4 Bromofluorobenizene         25.63         0         µg/L         25         0         103         70         130         0           Surr. Toluene-d8         25.13         0         µg/L         25         0         101         70         130         0           Surr. Toluene-d8         25.13         0         µg/L         25         0         101         70         130         0           Surr. Toluene-d8         25.13         0         µg/L         25         0         101         70         130         0           Qualitiers.         ND-Not Deceded at the Reporting Limit         5         5/spike Recovery outside accepted recovery limits         B Analyte detected in the associated Method Blank.	Surr: 2,5-Dibromotoluene 23.16 0 µg/L 25 Surr: 4-Bromofluorobenzene 25.63 0 µg/L 25	101 70 130	0
Surr. Homomuluorothane     25.63     0 $\mu g/L$ 25     0     103     70     130     0       Surr. Toluene-d8     25.13     0 $\mu g/L$ 25     0     103     70     130     0       Surr. Toluene-d8     25.13     0 $\mu g/L$ 25     0     101     70     130     0       Surr. Toluene-d8     25.13     0 $\mu g/L$ 25     0     101     70     130     0       Quartization function     25.13     0 $\mu g/L$ 25     0     101     70     130     0	Surr: 4-Bromofluorobenzene 25.63 0 µg/L 25	92.6 70 130	0
Surr: Toluene-d8     25.68     0     µg/L     25     0     130     0       Surr: Toluene-d8     25.13     0     µg/L     25     0     101     70     130     0       Record: Toluene-d8     25.13     0     µg/L     25     0     101     70     130     0       Qualitiers: ND - Not Detected at the Reporting Limit     S - Spike Recovery outside accepted recovery limits     B - Analyte detected in the associated Method Blank		103 70 130	0
Surr. Toluene-d8     25.13     0     Lg/L     25     0     101     70     130     0       Qualifiers:     ND - Not Detected at the Reporting Limit     5 - Spike Recovery unside accepted recovery limits     B - Analyte detected in the associated Method Blank	Surr: Dibromofluoromethane 25.68 0 µg/L 25	103 70 130	0
Qualifiers:       ND - Not Detected at the Reporting Limit       S - Spike Recovery outside accepted recovery limits       B - Analyte detected in the associated Method Blank         1 - Analyte detected helow entantilation limits       R - RPD outside accepted recovery limits       N A Material Limit Lower AND enterted in the associated Method Blank	Surr: Toluene-d8 25.13 0 µg/L 25	101 70 130	0
Qualifiers:       ND - Not Detected at the Reporting Limit       S - Spike Recovery outside accepted recovery limits       B - Analyte detected in the associated Method Blank         1 - Analyte detected helow cuantitation limits       R - RPD outside accepted recovery limits       N A Not method in the associated Method Blank			
Qualifiers:       ND - Not Detected at the Reporting Limit       S - Spike Recovery outside accepted recovery limits       B - Analyte detected in the associated Method Blank         1. Analyte detected helow quantitation limits       R - RPD outside accepted recovery limits       NA       NA       NA       NA       Analyte detected in the associated Method Blank			
Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank T - Analyte detected helow quantitation limits R - RPD outside accepted recovery limits NA Not analyte detected in the associated Method Blank			
1 - Analyte detected below quantitation limits RPD outside accepted recovery limits NIA - Not analyte where I volume or NIV secule accepted recovery limits	Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery	y limits B - Analyte detected in the	ne associated Method Blank
	I - Analyte detected helow quantitation limits R-RPD outside accepted recovery limit	NA - Not seeline to N	a Luchuse of MD eacules Addus

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## EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) WATER

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# SAMPLE RESULTS

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CLIENT:Weston & Sampson EngineersLab Order:0102063Project:200317.ALab ID:0102063-01B

Client Sample ID: WS-12 Tag Number: Collection Date: 2/6/01 Matrix: AQUEOUS

Date: 19-Feb-01

Analyses	Result	RL Qu	al Units	DF	Date Analyzed
EPH PAHS BY SIM	M	AEPH			Analyst: KEM
C11-C22 Aromatic Hydrocarbons	160	100	µg/L	1	2/12/01 10:08:00 PM
C19-C36 Aliphatic Hydrocarbons	ND	100	µg/L	1	2/12/01 10:08:00 PM
C9-C18 Aliphatic Hydrocarbons	ND	100	µg/L	1	2/12/01 10:08:00 PM
Naphthalene	ND	0.10	µg/L	1	2/14/01 5:57:00 PM
2-Methylnaphthalene	ND	0.10	µg/L	1	2/14/01 5:57:00 PM
Acenaphthylene	ND	0.10	µg/L	1	2/14/01 5:57:00 PM
Acenaphthene	ND	0.10	µg/L	1	2/14/01 5:57:00 PM
Fluorene	ND	0.10	µg/L	1	2/14/01 5:57:00 PM
Phenanthrene	ND	0.10	µg/L	1	2/14/01 5:57:00 PM
Anthracene	ND	0.10	µg/L	1	2/14/01 5:57:00 PM
Fluoranthene	ND	0.10	µg/L	1	2/14/01 5:57:00 PM
Pyrene	ND	0.10	μg/L	1	2/14/01 5:57:00 PM
Benz(a)anthracene	ND	0.10	µg/L	1	2/14/01 5:57:00 PM
Chrysene	ND	0.10	µg/L	1	2/14/01 5:57:00 PM
Benzo(b)fluoranthene	ND	0.10	μg/L	1	2/14/01 5:57:00 PM
Benzo(k)fluoranthene	ND	0.10	µg/L	1	2/14/01 5:57:00 PM
Benzo(a)pyrene	ND	0.10	μg/L	1	2/14/01 5:57:00 PM
Dibenz(a,h)anthracene	ND	0.10	µg/L	1	2/14/01 5:57:00 PM
Indeno(1,2,3-cd)pyrene	ND	0.10	µg/L	1	2/14/01 5:57:00 PM
Benzo(g,h,i)perylene	ND	0.10	μg/L	1	2/14/01 5:57:00 PM
Surr: 1-Chlorooctadecane	55.4	40-140	%REC	1	2/12/01 10:08:00 PM
Surr: 2-Bromonaphthalene	85.2	40-140	%REC	1	2/12/01 10:08:00 PM
Surr: 2-Fluorobiphenyl	80.1	40-140	%REC	1	2/12/01 10:08:00 PM
Surr: o-Terphenyl	71.3	40-140	%REC	1	2/12/01 10:08:00 PM

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

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Were all QA/QC procedures required by the VPH or EPH method followed:

Were all performance/acceptance standards for required QA/QC procedures achieved:

Were any significant modifications made to the method as specified in section 11.3:

Yes No - If No, See Case Narrative Yes No - If No, See Case Narrative No Yes - Details enclosed

I attest under the pains and penalties of perjury 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.

SIGNATURE:

PRINTED NAME: Nancy Stewart

2-20-01 DATE:

POSITION: Laboratory Director (or designee)

 Qualifiers:
 RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

 ND - Not Detected at the Reporting Limit
 S - Spike Recovery outside accepted recovery limits
 E - Val

 J - Analyte detected below quantitation limits
 R - RPD outside accepted recovery limits
 # - See

 B - Analyte detected in the associated Method Blank
 # - See

- E Value above quantitation range
- # See Case Narrative

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Date: 19-Feb-01

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Data Analyzad

CLIENT:Weston & Sampson EngineersLab Order:0102063Project:200317.ALab ID:0102063-02B

Client Sample ID: WS-10 Tag Number: Collection Date: 2/6/01 Matrix: AQUEOUS

	Kesun			DF	Date Analyzed
EPH PAHS BY SIM	M	AEPH			Analyst: KEM
C11-C22 Aromatic Hydrocarbons	ND	100	µg/L	1	2/12/01 10:43:00 PM
C19-C36 Aliphatic Hydrocarbons	ND	100	µg/L	1	2/12/01 10:43:00 PM
C9-C18 Aliphatic Hydrocarbons	ND	100	µg/L	1	2/12/01 10:43:00 PM
Naphthalene	ND	0.10	µg/L	1	2/14/01 6:28:00 PM
2-Methylnaphthalene	ND	0.10	µg/L	1	2/14/01 6:28:00 PM
Acenaphthylene	ND	0.10	µg/L	1	2/14/01 6:28:00 PM
Acenaphthene	ND	0.10	μg/L	1	2/14/01 6:28:00 PM
Fluorene	ND	0.10	µg/L	1	2/14/01 6:28:00 PM
Phenanthrene	ND	0.10	μg/L	1	2/14/01 6:28:00 PM
Anthracene	ND	0.10	μg/L	1	2/14/01 6:28:00 PM
Fluoranthene	ND	0.10	µg/L	1	2/14/01 6:28:00 PM
Pyrene	ND	0.10	μg/L	1	2/14/01 6:28:00 PM
Benz(a)anthracene	ND	0.10	µg/L	1	2/14/01 6:28:00 PM
Chrysene	ND	0.10	μg/L	1	2/14/01 6:28:00 PM
Benzo(b)fluoranthene	ND	0.10	µg/L	1	2/14/01 6:28:00 PM
Benzo(k)fluoranthene	ND	0.10	μg/L	1	2/14/01 6:28:00 PM
Benzo(a)pyrene	ND	0.10	µg/L	1	2/14/01 6:28:00 PM
Dibenz(a,h)anthracene	ND	0.10	µg/L	1	2/14/01 6:28:00 PM
Indeno(1,2,3-cd)pyrene	ND	0.10	µg/L	1	2/14/01 6:28:00 PM
Benzo(g,h,i)perylene	ND	0.10	μg/L	1	2/14/01 6:28:00 PM
Surr: 1-Chlorooctadecane	64.8	40-140	%REC	1	2/12/01 10:43:00 PM
Surr: 2-Bromonaphthalene	86.9	40-140	%REC	1	2/12/01 10:43:00 PM
Surr: 2-Fluorobiphenyl	79.5	40-140	%REC	1	2/12/01 10:43:00 PM
Surr: o-Terphenyl	71.9	40-140	%REC	1	2/12/01 10:43:00 PM

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Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

Were all QA/QC procedures required by the VPH or EPH method followed:

Were all performance/acceptance standards for required QA/QC procedures achieved:

Were any significant modifications made to the method as specified in section 11.3:

Yes \_\_\_\_ No - If No, See Case Narrative \_\_\_\_ Yes \_\_\_\_ No - If No, See Case Narrative \_\_\_\_ No \_\_\_ Yes - Details enclosed

I attest under the pains and penalties of perjury 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.

SIGNATURE: PRINTED NAME: Nancy Stewart

DATE:

POSITION: Laboratory Director (or designee)

 Qualifiers:
 RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

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 S - Spike Recovery outside accepted recovery limits
 E - Val

 J - Analyte detected below quantitation limits
 R - RPD outside accepted recovery limits
 # - See

 B - Analyte detected in the associated Method Blank
 # - See

E - Value above quantitation range # - See Case Narrative

Analysas

Date: 19-Feb-01

CLIENT: Weston & Sampson Engineers Lab Order: 0102063 Project: 200317.A P-3 Roxbury Lab ID: 0102063-03B

Client Sample ID: WS-9 Tag Number: Collection Date: 2/6/01 Matrix: AQUEOUS

Analyses	Result		al Units	DF	Date Analyzed
EPH PAHS BY SIM	м	AEPH			Analyst: KEM
C11-C22 Aromatic Hydrocarbons	ND	110	µg/L	1	2/12/01 11:19:00 PM
C19-C36 Aliphatic Hydrocarbons	ND	1 <b>1</b> 0	μg/L	1	2/12/01 11:19:00 PM
C9-C18 Aliphatic Hydrocarbons	ND	110	µg/L	1	2/12/01 11:19:00 PM
Naphthalene	ND	0.11	µg/L	1	2/14/01 7:00:00 PM
2-Methylnaphthalene	ND	0.11	µg/L	1	2/14/01 7:00:00 PM
Acenaphthylene	ND	0.11	µg/L	1	2/14/01 7:00:00 PM
Acenaphthene	ND	0.11	µg/L	1	2/14/01 7:00:00 PM
Fluorene	ND	0.11	µg/L	1	2/14/01 7:00:00 PM
Phenanthrene	ND	0.11	µg/L	1	2/14/01 7:00:00 PM
Anthracene	ND	0.11	µg/L	1	2/14/01 7:00:00 PM
Fluoranthene	ND	0.11	µg/L	1	2/14/01 7:00:00 PM
Pyrene	ND	0.11	µg/L	1	2/14/01 7:00:00 PM
Benz(a)anthracene	ND	0.11	µg/L	1	2/14/01 7:00:00 PM
Chrysene	ND	0.11	µg/L	1	2/14/01 7:00:00 PM
Benzo(b)fluoranthene	ND	0.11	µg/L	1	2/14/01 7:00:00 PM
Benzo(k)fluoranthene	ND	0.11	µg/L	1	2/14/01 7:00:00 PM
Benzo(a)pyrene	ND	0. <b>1</b> 1	μg/L	1	2/14/01 7:00:00 PM
Dibenz(a,h)anthracene	ND	0.11	µg/L	1	2/14/01 7:00:00 PM
Indeno(1,2,3-cd)pyrene	ND	0.11	µg/L	1	2/14/01 7:00:00 PM
Benzo(g,h,i)perylene	ND	0.11	µg/L	1	2/14/01 7:00:00 PM
Surr: 1-Chlorooctadecane	61.2	40-140	%REC	1	2/12/01 11:19:00 PM
Surr: 2-Bromonaphthalene	81.9	40-140	%REC	1	2/12/01 11:19:00 PM
Surr: 2-Fluorobiphenyl	78.7	40-140	%REC	1	2/12/01 11:19:00 PM
Surr: o-Terphenyl	70.0	40-140	%REC	1	2/12/01 11:19:00 PM

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH; C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

Were all QA/QC procedures required by the VPH or EPH method followed: Were all performance/acceptance standards for required QA/QC procedures achieved:

Were any significant modifications made to the method as specified in section 11.3:

Ves \_\_\_\_ No - If No, See Case Narrative \_\_\_\_Yes \_\_\_\_ No - If No, See Case Narrative \_\_\_\_Yes - Details enclosed No

I attest under the pains and penalties of perjury 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.

SIGNATURE:

PRINTED NAME: Nancy Stewart

DATE:

POSITION: Laboratory Director (or designee)

Qualifiers: RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate. ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits B - Analyte detected in the associated Method Blank

E - Value above quantitation range # - See Case Narrative

CLIENT:Weston & Sampson EngineersLab Order:0102063Project:200317.A P-3 RoxburyLab ID:0102063-04B

Date: 19-Feb-01

ampson EngineersClient Sample ID:WS-7Tag Number:P-3 RoxburyBMatrix:AQUEOUS

Analyses	Result	RL Q	ial Units	DF	Date Analyzed
EPH PAHS BY SIM	M	AEPH			Analyst: KEM
C11-C22 Aromatic Hydrocarbons	ND	100	µg/L	1	2/12/01 11:54:00 PM
C19-C36 Aliphatic Hydrocarbons	ND	100	µg/L	1	2/12/01 11:54:00 PM
.C9-C18 Aliphatic Hydrocarbons	ND	100	µg/L	1	2/12/01 11:54:00 PM
Naphthalene	ND	0.10	µg/L	1	2/14/01 7:31:00 PM
2-Methylnaphthalene	ND	0.10	µg/L	1	2/14/01 7:31:00 PM
Acenaphthylene	ND	0.10	µg/L	1	2/14/01 7:31:00 PM
Acenaphthene	ND	0.10	µg/L	1	2/14/01 7:31:00 PM
Fluorene	ND	0.10	µg/L	1	2/14/01 7:31:00 PM
Phenanthrene	ND	0.10	µg/L	1	2/14/01 7:31:00 PM
Anthracene	ND	0.10	µg/L	1	2/14/01 7:31:00 PM
Fluoranthene	ND	0.10	µg/L	1	2/14/01 7:31:00 PM
Pyrene	ND	0.10	µg/L	1	2/14/01 7:31:00 PM
Benz(a)anthracene	ND	0.10	μg/L	1	2/14/01 7:31:00 PM
Chrysene	ND	0.10	µg/L	1	2/14/01 7:31:00 PM
Benzo(b)fluoranthene	ND	0.10	µg/L	1	2/14/01 7:31:00 PM
Benzo(k)fluoranthene	ND	0.10	µg/L	1	2/14/01 7:31:00 PM
Benzo(a)pyrene	ND	0.10	µg/L	1	2/14/01 7:31:00 PM
Dibenz(a,h)anthracene	ND	0.10	µg/L	1	2/14/01 7:31:00 PM
Indeno(1,2,3-cd)pyrene	ND	0.10	µg/L	1	2/14/01 7:31:00 PM
Benzo(g,h,i)perylene	ND	0.10	µg/L	1	2/14/01 7:31:00 PM
Surr: 1-Chlorooctadecane	64.8	40-140	%REC	1	2/12/01 11:54:00 PM
Surr: 2-Bromonaphthalene	90.2	40-140	%REC	1	2/12/01 11:54:00 PM
Surr: 2-Fluorobiphenyl	82.2	40-140	%REC	t	2/12/01 11:54:00 PM
Surr: o-Terphenyl	74.3	40-140	%REC	1	2/12/01 11:54:00 PM

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

Were all QA/QC procedures required by the VPH or EPH method followed: Were all performance/acceptance standards for required QA/QC procedures achieved:

Were any significant modifications made to the method as specified in section 11.3:

Yes No - If No, See Case Narrative No - If No, See Case Narrative No - If No, See Case Narrative Yes - Details enclosed

I attest under the pains and penalties of perjury 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.

SIGNATURE:

PRINTED NAME: Nancy Stewart

DATE:

POSITION: Laboratory Director (or designee)

 Qualifiers:
 RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

 ND - Not Detected at the Reporting Limit
 S - Spike Recovery outside accepted recovery limits
 E - Val

 J - Analyte detected below quantitation limits
 R - RPD outside accepted recovery limits
 # - See

 B - Analyte detected in the associated Method Blank
 # - See

- E Value above quantitation range
- # See Case Narrative

Date: 19-Feb-01

CLIENT: Weston & Sampson Engineers Lab Order: 0102063 Project: 200317.A P-3 Roxbury Lab ID: 0102063-05B

Client Sample ID: WS-5 **Tag Number:** Collection Date: 2/7/01 Matrix: AQUEOUS

Analyses	Result	RL Qu	ual Units	DF	Date Analyzed
EPH PAHS BY SIM	M	AEPH			Analyst: KEM
C11-C22 Aromatic Hydrocarbons	ND	110	µg/L	1	2/13/01 12:30:00 AM
C19-C36 Aliphatic Hydrocarbons	ND	110	µg/L	1	2/13/01 12:30:00 AM
C9-C18 Aliphatic Hydrocarbons	ND	110	µg/L	1	2/13/01 12:30:00 AM
Naphthalene	ND	0.11	µg/L	1	2/14/01 8:02:00 PM
2-Methylnaphthalene	ND	0.11	µg/L	1	2/14/01 8:02:00 PM
Acenaphthylene	ND	0.11	µg/L	1	2/14/01 8:02:00 PM
Acenaphthene	ND	0.11	µg/L	1	2/14/01 8:02:00 PM
Fluorene	ND	0.11	µg/L	1	2/14/01 8:02:00 PM
Phenanthrene	ND	0.11	µg/L	1	2/14/01 8:02:00 PM
Anthracene	ND	0.11	µg/L	1	2/14/01 8:02:00 PM
Fluoranthene	ND	0.11	µg/L	1	2/14/01 8:02:00 PM
Pyrene	ND	0.11	µg/L	1	2/14/01 8:02:00 PM
Benz(a)anthracene	ND	0.11	µg/L	1	2/14/01 8:02:00 PM
Chrysene	ND	0.11	µg/L	1	2/14/01 8:02:00 PM
Benzo(b)fluoranthene	ND	0.11	µg/L	1	2/14/01 8:02:00 PM
Benzo(k)fluoranthene	ND	0.11	µg/L	1	2/14/01 8:02:00 PM
Benzo(a)pyrene	ND	0.11	µg/L	1	2/14/01 8:02:00 PM
Dibenz(a,h)anthracene	ND	0.11	µg/L	1	2/14/01 8:02:00 PM
Indeno(1,2,3-cd)pyrene	ND	0.11	µg/L	1	2/14/01 8:02:00 PM
Benzo(g,h,i)perylene	ND	0.11	µg/L	1	2/14/01 8:02:00 PM
Surr: 1-Chlorooctadecane	67.0	40-140	%REC	1	2/13/01 12:30:00 AM
Surr: 2-Bromonaphthalene	106	40-140	%REC	1	2/13/01 12:30:00 AM
Surr: 2-Fluorobiphenyl	102	40-140	%REC	1	2/13/01 12:30:00 AM
Surr: o-Terphenyl	75.6	40-140	%REC	1	2/13/01 12:30:00 AM

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

Were all QA/QC procedures required by the VPH or EPH method followed:

Were all performance/acceptance standards for required QA/QC procedures achieved: Were any significant modifications made to the method as specified in section 11.3:

Yes \_\_\_\_ No - If No, See Case Narrative \_\_\_\_ Yes \_\_\_\_ No - If No, See Case Narrative \_\_\_\_ No \_\_\_ Yes - Details enclosed

1 attest under the pains and penalties of perjury 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.

SIGNATURE:

PRINTED NAME: Nancy Stewart

2-20-01 DATE:

POSITION: Laboratory Director (or designee)

Qualifiers: RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate. ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits B - Analyte detected in the associated Method Blank

- E Value above quantitation range
- # See Case Narrative

Date: 19-Feb-01

CLIENT:Weston & Sampson EngineersClient Sample ID:WS-3Lab Order:0102063Tag Number:Project:200317.A P-3 RoxburyCollection Date:2/7/01Lab ID:0102063-06BMatrix:AQUEOUS

Analyses	Result	RL Qu	al Units	DF	Date Analyzed
EPH PAHS BY SIM	M	AEPH			Analyst: KEM
C11-C22 Aromatic Hydrocarbons	ND	110	µg/L	1	2/13/01 1:05:00 AM
C19-C36 Aliphatic Hydrocarbons	ND	110	µg/L	1	2/13/01 1:05:00 AM
C9-C18 Aliphatic Hydrocarbons	ND	110	µg/L	1	2/13/01 1:05:00 AM
Naphthalene	ND	0.11	µg/L	1	2/14/01 8:34:00 PM
2-Methylnaphthalene	ND	0.11	µg/L	1	2/14/01 8:34:00 PM
Acenaphthylene	ND	0.11	µg/L	1	2/14/01 8:34:00 PM
Acenaphthene	ND	0.11	µg/L	1	2/14/01 8:34:00 PM
Fluorene	ND	0,11	µg/L	1	2/14/01 8:34:00 PM
Phenanthrene	ND	0.11	μg/L	1	2/14/01 8:34:00 PM
Anthracene	ND	0.11	µg/L	1	2/14/01 8:34:00 PM
Fluoranthene	ND	0.11	µg/L	1	2/14/01 8:34:00 PM
Pyrene	ND	0.11	µg/L	1	2/14/01 8:34:00 PM
Benz(a)anthracene	ND	0.11	µg/L	1	2/14/01 8:34:00 PM
Chrysene	ND	0.11	µg/L	1	2/14/01 8:34:00 PM
Benzo(b)fluoranthene	ND	0.11	µg/L	1	2/14/01 8:34:00 PM
Benzo(k)fluoranthene	ND	0.11	µg/L	1	2/14/01 8:34:00 PM
Benzo(a)pyrene	ND	0.11	µg/L	1	2/14/01 8:34:00 PM
Dibenz(a,h)anthracene	ND	0.11	µg/L	1	2/14/01 8:34:00 PM
Indeno(1,2,3-cd)pyrene	ND	0.11	μg/l.	1	2/14/01 8:34:00 PM
Benzo(g,h,i)perylene	ND	0.11	µg/L	1	2/14/01 8:34:00 PM
Surr: 1-Chlorooctadecane	63.7	40-140	%REC	1	2/13/01 1:05:00 AM
Surr: 2-Bromonaphthalene	86.1	40-140	%REC	1	2/13/01 1:05:00 AM
Surr: 2-Fluorobiphenyl	80.0	40-140	%REC	1	2/13/01 1:05:00 AM
Surr: o-Terphenyl	72.2	40-140	%REC	1	2/13/01 1:05:00 AM

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

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Were all QA/QC procedures required by the VPH or EPH method followed: Were all performance/acceptance standards for required QA/QC procedures achieved:

Yes \_\_\_\_ No - If No, See Case Narrative V Yes \_\_\_\_ No - If No, See Case Narrative No VYes - Details enclosed

Were any significant modifications made to the method as specified in section 11.3: \_\_\_\_\_ No \_\_\_\_ Yes - Details enclosed I attest under the pains and penalties of perjury 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.

SIGNATURE: PRINTED NAME: Nancy Stewart

2-20-01 DATE:

POSITION: Laboratory Director (or designee)

 Qualifiers:
 RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

 ND - Not Detected at the Reporting Limit
 S - Spike Recovery outside accepted recovery limits
 E - Val

 J - Analyte detected below quantitation limits
 R - RPD outside accepted recovery limits
 # - See

 B - Analyte detected in the associated Method Blank
 # - See

E - Value above quantitation range

# METHOD BLANK

19-Feb-01	<b>Y REPORT</b> Method Blank	ite 2/8/01 RPDLimit Qua		
Date:	QC SUMMAR	5:24:00 PM Prep Do Driginal Sample or MS Result %RPD	0000	the associated Method Blank
		Analysis Date 2/12/01 SeqNo: 107814 CowLimit HighLimit	40 40 40 40 40 41 40 140	B - Analyte detected in 1
		L lal Sample Result %REC	0 47.1 0 88.1 0 59 59	ted recovery limits
		PH Units: µg/ _010212B QC Spike Origin Amount	2 2 2 2	tecovery outside accept
Corp.		Test Code: MAEF Run ID: SV-2_ RL Units	100 µg/L 100 µg/L 0 µg/L 0.10 µg/L 0.10 µg/L	S - Spike R R - RPD ou
l Laboratories	ampson Engineers -3 Roxbury	3atch ID: 3797 QC Sample Result	ND 9.42 17.62 16.06 11.8	the Reporting Limit elow quantitation limits
Environmenta	Weston & S sr: 0102063 200317.A F	18-3797	matic Hydrocarbons atic Hydrocarbons orooctadecane monaphthalene orobiphenyl phenyl	ND - Not Detected at 1 - Analyte detected by
AMRO I	CLIENT: Work Orde Project:	Sample ID M Client ID: Anatyte	C11-C22 Aror C19-C36 Alipli Surr: 1-Chli Surr: 2-Fluc Surr: 2-Fluc Surr: 0-Terj	Qualifiers:

11.1

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AMRO Enviro	nmental Labora	atories Corp.							Date: /	9-Feb-01	
CLIENT: W	eston & Sampson En;	gineers						QC SUM	MARY	REPO	RT
Work Order: 01 Project: 20	02063 0317.A P-3 Roxbury								A	Method B	ank
Sample ID MB-3797	Batch ID: 379	37 Test C	Code: MAEPH	Units: µg/l		Analysis	Date 2/14/01	5:25:00 PM	Prep Date	e 2/8/01	
Client ID:		Run II	0: SV-1_010	1214A		SeqNo:	107650				
	QC Samp	ele	2	QC Spike Origin	al Sample			riginal Sample			Ċ
Analyte	Resi	ult RL	Units	Amount	Result %KEC		HIGHLIMIT	OL MS Kesult	14X%		dua
Naphthalene	<b>Z</b>	4D 0.10	hg/L	0	0	0	0	0			
2-Methylnaphthalene	z	<b>1</b> 0 0.10	hg/L	0	0	0	0	0			
Acenaphthylene	z	<b>1D</b> 0.10	hg/L	0	0	0	0	0			
Acenaphthene	z	<b>1D</b> 0.10	hg/L	0	0	0	0	0			
Fluorene	z	JD 0.10	hg/L	0	0	0	0	0			
Phenanthrene	z	<b>JD</b> 0.10	hg/L	0	0	0	0	0			
Anthracene	z	4D 0.10	hg/L	0	0	0	0	0			
Fluoranthene	z	ID 0.10	hg/L	0	0	0	0	0			
Pyrene	z	4D 0.10	hg/L	0	0	0	0	0			
Benz(a)anthracene	z	JD 0.10	H9/L	0	0	0	0	0			
Chrysene	z	JD 0.10	hg/L	0	0	0	0	0			
Benzo(b)fluoranthene	z	JD 0.10	hg/L	0	0	0	0	0			
Benzo(k)fluoranthene	z	4D 0.10	hg/L	0	0	0	0	0			
Benzo(a)pyrene	z	ID 0.10	р9/L	0	0	0	0	0			
Dibenz(a,h)anthracene	z	4D 0.10	hg/L	0	0	0	0	0			
Indeno(1,2,3-cd)pyrene	z	UD 0.10	hg/L	0	0	0	0	0			
Benzo(g,h,i)perylene	Z	0.10	hg/L	o	0	0	0	0			
Qualifiers: ND - Not	Detected at the Reporting	Limit	S - Spike Reco	very outside accept	ed recovery limits	B - Ana	lyte detected in 1	he associated Met	lod Blank	-	
J - Analyt	te detected below quantitat	tion limits	R - RPD outsic	le accepted recover	/ limits	N - VN	ot applicable who	ere J values or ND	results occur		
RL - Rep(	orting Limit; defined as the	e lowest concentratio	in the laboratory (	can accurately quan	titate.						



# MATRIX SPIKE

AMRO Enviror	nmental	Laboratories	corp.							Ţ	Jate: 19.	Feb-01	
CLIENT: W	'eston & Sa	ampson Engineers			í					MMI	VGVI	DEPOI	E
Work Order: 01	102063												
Project: 20	0317.A P-	-3 Roxbury								Ś	ample N	Aatrix Sp	ike
Sample ID 0102045-05E	BMS Ba	tch ID: 3798	Test Code	e: MAEPH	Units: µg	2		Analysis D	ate 2/12/01 7:10:00 PI	<b>1</b>	rep Date	2/8/01	
Client ID: LE-1			Run ID:	SV-2_01(	0212B			SeqNo:	107802				
Analyte		QC Sample Result	RL	Units	QC Spike Origii Amount	nal Sample Result	%REC	LowLimit	Origínal Sar HiahLimit or MS R	mple esult	%RPD	RPDLimit	ō
D-Eicosane		18.09	1.1	na/L	27.17	0	66.6	40	140	0			
-Nonadecane		21.01	1.1	hg/L	27.17	0	77.3	40	140	0			
1-Nonane		13.66	1.1	hg/L	27.17	1.525	44.6	40	140	0			
-Octacosane		20.11	1.1	hg/L	27.17	0	74	40	140	0			
h-Tetradecane		17.49	1.1	<u>н</u> 9/Г	27.17	1.345	59.4	40	140	0			
Vaphthalene		21.23	1.1	hg/L	27.17	2.255	69.8	40	140	0			
Acenaphthene		18.15	1.1	hg/L	27.17	0	66.8	40	140	0			
Anthracene		18.45	1.1	р9/Г	27.17	0	67.9	40	140	0			
yrene		16.83	1.1	hg/L	27.17	0	61.9	40	140	0			
Chrysene		17.32	1.1	hg/L	27.17	0	63.7	40	140	0			
Surr: 1-Chlorooctadec:	ane	12.86	1.1	hg/L	21.74	0	59.2	40	140	0			
Surr: 2-Bromonaphtha	lene	19.57	1.1	hg/L	21.74	0	06	40	140	0			
Surr: 2-Fluorobiphenyi		17.4	1.1	hg/L	21.74	0	80	40	140	0			
Surr: o-Terphenyl		15.65	1.1	hg/L	21.74	0	72	40	140	0			
:	-	-										:	
Qualifiers: ND - Not L	Detected at the	e Reporting Linrit	S	- Spike Reco	very outside accep	ated recovery	limits	B - Analyte	c detected in the associate	ed Method I	Blank	1	1
J - Anaryte	detected pero	VIUTINI TOTICITATION VIC			A A A A A A A A A A A A A A A A A A A								

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	AMRO En	viron	nental	Labor	atories	Corp.									Date: /	9-Feb-01		
	CLIENT:	Wes	ton & Sa	ampson E	ngineers	÷.				1				QC SUN	AMARY	( REPO	RT	
	Work Order: Project:	010. 200;	2063 317.A P	-3 Roxbu	λ									,	Sam	ıple Dupli	cate	
	Sample ID 0102	045-06BI	OUP B	atch ID: 37	798	Test Co(	de: MAEPH	- Uni	ts: µg/L		Ans	alysis Date	2/12/01 8:	21:00 PM	Prep Dat	le 2/8/01		
	Client ID: LE-2	**		<del>(</del> 7)	191	Run ID:	SV-2_0	10212B			Sec	:oNp	107804					
				QC San	nple			QC Spike	Original S	ample			Orio	ginal Sample				
	Analyte			Re	sult	R	Units	Amoun		Result %	REC LOW	/Limit Hig	phLimit o	or MS Result	%RPD	RPDLimit	Qua	
	C9-C18 Aliphatic	Hydroca	rbons		QN	120	hg/L	0	-	0	0	0	0	130.5	0	50	٨Ņ	
	C19-C36 Aliphati	ic Hydroc	arbons		QN	120	hg/L	0	~	0	0	0	0	0	0	50		
	C11-C22 Aromati	ic Hydroc	arbons		QN	120	hg/L	0	~	0	0	0	0	122.6	0	50	AN	
	Naphthalene				QN	1.2	hg/L	0	~	0	0	0	0	0	0	50		
	2-Methylnaphthal	lene			QN	1.2	hg/L	0	~	0	0	0	0	0	Ō	. 50		
	Acenaphthylene				QN	1.2	µg/L	0	~	0	0	0	0	0	0	50		
	Acenaphthene				Q	1.2	hg/L	0	~	0	0	0	0	0	0	50		
	Fluorene				Q	1.2	hg/L	0	~	0	0	0	0	0	0	50		
	Phenanthrene				QN	1.2	hg/L	0	~	0	0	0	0	0	0	50		
	Anthracene				QN	1.2	hg/L	0	~	0	0	0	0	0	0	50		
	Fluoranthene				Q	1.2	hg/L	0	~	0	0	0	0	0	0	50		
	Pyrene				QN	1.2	hg/L	0	~	0	0	0	0	0	0	50		
	Benz(a)anthracer	пе			QN	1.2	hg/L	0	~	0	0	0	0	0	0	50		
	Chrysene				QN	1.2	hg/L	J	~	0	0	0	0	0	0	50		
	Benzo(b)fluorant	hene			QN	1.2	hg/L	0	~	0	0	0	0	0	0	50		
	Benzo(k)fluoranth	hene			QN	1.2	hg/L	0	~	0	0	0	0	0	0	50		
	Benzo(a)pyrene				QN	1.2	hg/L	0	~	0	0	0	0	0	0	50		
	Dibenz(a,h)anthri	acene			QN	1.2	hg/L	0	~	0	0	0	0	0	0	50		
	Indeno(1,2,3-cd)p	pyrene			Q	1.2	hg/L	0	~	0	0	0	0	0	0	50		
	Benzo(g,h,i)peryk	lene			Q	1.2	hg/L	0	~	0	0	0	0	0	0	50		
	Surr: 1-Chloroc	octadeca	he	¥	0.81	1.2	hg/L	25		0	43.2	40	140	0	0	0		
	Surr: 2-Bromor	naphthale	aue	2,	2.05	1.2	hg/L	25		0	88.2	40	140	0	0	0		
	Surr: 2-Fluorot	biphenyl		20	0.41	1.2	hg/L	25		0	81.7	40	140	0	0	0		
	Surr: o-Terphe	lyne		¥	5.92	1.2	hg/L	25		0	67.7	40	140	0	0	0		
	Oualifiers: NI	D - Not D	stected at 1		ie Limit		S - Spike Re	covery outsid	e accepted r	ecovery lin	ils B.	- Analyte de	:tected in the	associated Me	thod Blank		;	
	· -	- Analyte (	fetected be	low quantit	ation limits		R - RPD out	side accepted	recovery lir	níts	Ž	A - Not appl	icable where	I values or NE	) results ocenr			
	c			1 oc   c - 3 - 1			ta lakaratar	formeric erec	aline months	1	-				THE PARTY AND A PARTY			
51	R	l, - Kepun	ing Limit,	dellineu as	נווכ וטאבא הי	סווככוונופרועיי	106 130013101	א המון זורנווימו	eriy quantum	Ŀ.								



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CLUENT:         Version & Sampson Engineers         OC SUMMARY REPORT           Project:         200317.A P.3 Roxbury         Laboratory Control Spike           Project:         200317.A P.3 Roxbury         Eaboratory Control Spike           Sample ID LCS-3793         Eator ID         Fast Code: AMEPH         Units upL         Analysis Date 21201 559:00 PM         Prop Date 21201           Sample ID LCS-3793         Eator ID         533         Teat Code: AMEPH         Units upL         Sacho:         107801         Prop Date 21201         Prop Date 21201         Prop Date 21201         Prop Date 21201         Prop Date 21201         Date 2	AMRO Env	ironment	al Laboratories	s Corp.								Date: /5	-1-60-01	
Project:         2003/17.A         Part Bloby         Laborationy Control Splite           Project:         2003/17.A         P.3 Roxbury         Laborationy Control Splite           Sample ID         Loss of the member ID         2739         Test Cole:         MEPH         Units         Laborationy Control Splite           Sample ID         Loss of the member ID         2739         Test Cole:         MEPH         Units         Seque         107001         Prop Date 24001           Clert ID:         Sample ID         Laborations         Clerk ID         Amalysis Date 21401 (SSS0.0 PM         Prep Date 24001           Clert ID:         Sample ID         Sample ID         Sample ID         Sample ID         Amalysis Date 21401 (SSS0.0 PM         Prep Date 24001           Clerk ID         Result         Result         Sample ID         Prep Date 24001         Prep Date 24001           Clerk ID         Result         Result         Sample ID         Prep Date 24001         Prep Date 24001           Clerk ID         Result         Result         Result         Result         Result         Result         Result         Result         Result         Result         Result         Result         Result         Result         Result         Result         Result	CLIENT:	Weston &	Sampson Engineers	Eł							OC SUM	MARY	REPOR	E
Sample ID. LCS-3798         Test Cole:         MAEPH         Units         End.         Tage Cole:         Page Cole: <th>Work Order: Project:</th> <th>0102063 200317.A</th> <th>P-3 Roxbury</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>Lab</th> <th>oratory (</th> <th>ontrol Spi</th> <th>k.</th>	Work Order: Project:	0102063 200317.A	P-3 Roxbury								Lab	oratory (	ontrol Spi	k.
Clear LD:         Scarbo         TOT 201           Analyse         CC Sinke Organit Sample         CC Sinke Organit Sample         Organit Sample           Analyse         CC Sinke Organit Sample         CC Sinke Organit Sample         Organit Sample           Analyse         CC Sinke Organit Sample         CC Sinke Organit Sample         Organit Sample           Analyse         CC Sinke Organit Sample         CC Sinke Organit Sample         Organit Sample           Analyse         10         Hg/L         25         0         72         40         140         0           Antonafecane         133         10         Hg/L         25         0         73         40         140         0           Antonafecane         133         10         Hg/L         25         0         73         40         140         0           Antonafecane         13         10         Hg/L         25         0         73         40         140         0           Antonation         10         Hg/L         25         0         73         40         140         0         0           Antonation         11         10         Hg/L         25         0         71         140         0<	Sample ID LCS-37	862	Batch ID: 3798 3797	Test Code	e: MAEPH	Units: µg/L			Analysis Da	ite 2/12/01 5	:59:00 PM	Prep Date	2/8/01	
Contraction         Contraction	Client ID:		•	Run ID:	SV-2_010	212B			SeqNo:	107801				
Mathematication         Next         And the second field of the second field field field of the second field of the second field field field field of the second field of the second field field field of the second field field field field field field of the second field of the second field field field field of the second field field field field field field field field of the second field field field field field of the second fiel			QC Sample	ō		OC Spike Original	Sample		timi luno	Or Internet	iginal Sample		ייייין וכסס	ē
Refloctant         13         10         191         25         0         772         40         140         0           Monadescine         133         10         191         25         0         772         40         140         0           Monadescine         103         10         101         25         0         335         40         140         0           Monadescine         136         10         101         25         0         335         40         140         0           Priories         13         10         101         25         0         535         40         140         0           Anthracene         17.25         10         10         101         25         0         64         40         140         0           Anthracene         17.75         10         101         25         0         64         40         140         0           Anthracene         17.75         10         101         26         0         71         40         140         0           Surr 1-Chrocodadesare         17.35         10         101         20         27         40         140 <td>Anaiyte</td> <td></td> <td>Kesul</td> <td>צ</td> <td></td> <td></td> <td>Kesuit</td> <td>2440</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>B </td>	Anaiyte		Kesul	צ			Kesuit	2440						B
Monadecare         13         10         pg/L         25         0         77.2         40         10         0           Advaname         103         10         pg/L         25         0         31.4         40         140         0           Advaname         23.4         10         pg/L         25         0         33.6         40         140         0           Anthracene         13.8         10         pg/L         25         0         33.6         40         140         0           Anthracene         17.25         10         pg/L         25         0         53.6         40         140         0           Anthracene         17.75         10         pg/L         25         0         63.8         40         140         0           AcreanyInterene         16.1         10         pg/L         25         0         63.8         40         140         0           AcreanyInterene         15.4         10         pg/L         25         0         64.7         40         140         0           Surr :-Educonaphratene         16.5         10         pg/L         20         0         140 <td< td=""><td>n-Eicosane</td><td></td><td>19.5</td><td>1.0</td><td>hg/L</td><td>25</td><td>0</td><td>78</td><td>40</td><td>140</td><td>0</td><td></td><td></td><td></td></td<>	n-Eicosane		19.5	1.0	hg/L	25	0	78	40	140	0			
Orbitation         10.36         10         Hpl.         25         0         414         40         10         0           Colacosare         1.33         1.0         Hpl.         25         0         936         40         140         0           Arenaphthere         1.480         1.0         Hpl.         25         0         596         40         140         0           Naphthalene         1.61         1.0         Hpl.         25         0         596         40         140         0           Naphthalene         1.61         1.0         Hpl.         25         0         596         40         140         0           Surr 2-Fluorobithene         1.0         Hpl.         25         0         713         40         140         0           Surr 2-Fluorobithenyl         1.5         1.0         Hpl.         25         0         713         40         140         0           Surr 2-Fluorobithenyl         15.6         1.0         Hpl.         25         0         713         40         140         0           Surr 2-Fluorobithenyl         15.4         1.0         Hpl.         20         0         713	n-Nonadecane		19.3	1.0	µg/L	25	0	77.2	40	140	0			
Oclaeosate         23.4         1.0         µg/L         25         0         35         40         140         0           n°Terradecane         14.88         10         µg/L         25         0         539         40         140         0           Remaphifere         16.1         10         µg/L         25         0         54.4         40         140         0           Antracene         17.25         10         µg/L         25         0         64.4         40         140         0           Pyree         17.75         10         µg/L         25         0         73.1         40         140         0           Surr 1-Chlorooctadecane         17.75         10         µg/L         20         73.1         40         140         0           Surr 2-Eleonolphenyl         15.5         10         µg/L         20         0         77.5         40         140         0           Surr 2-Eleonolphenyl         15.4         10         µg/L         20         0         77.5         40         140         0           Surr 2-Eleonolphenyl         15.4         10         µg/L         20         0         71.9	n-Nonane		10.36	1.0	hg/L	25	0	41.4	40	140	0			
Afferadecame         14.38         10         µg/L         25         0         59.6         40         140         0           Naphthere         1         10         µg/L         25         0         59.6         40         140         0           Naphthere         1         10         µg/L         25         0         69.4         40         140         0           Antracene         17.7         10         µg/L         25         0         73.3         40         140         0           Pyrene         17.77         10         µg/L         25         0         73.3         40         140         0           Surr. 2-Fluoronaphthere         15.4         10         µg/L         20         0         77.5         40         140         0           Surr. 2-Fluoronaphthere         15.4         10         µg/L         20         0         77.5         40         140         0           Surr. 2-Fluoronaphtherey         15.5         10         µg/L         20         0         77.5         40         140         0           Surr. 2-Fluoronaphtherey         15.5         10         µg/L         20         77.5	n-Octacosane		23.4	1.0	hg/L	25	0	93.6	40	140	0			
Naphthalene         13         10         µg/L         25         0         54         40         140         0           Acenaphthene         16.1         1.0         µg/L         25         0         64.4         40         140         0           Actificacie         17.25         1.0         µg/L         25         0         7.1         40         140         0           Prime         17.77         1.0         µg/L         25         0         7.1         40         140         0           Start -Chloroodtadecane         17.77         1.0         µg/L         25         0         7.1         40         140         0           Start 2-Floroodtadecane         15.4         1.0         µg/L         20         0         7.1         40         140         0           Start 2-Floroodtadecane         15.4         1.0         µg/L         20         0         7.7         40         140         0           Start 2-Floroodtadecane         15.4         1.0         µg/L         20         0         7.7         40         140         0           Surr 2-Floroodtadecane         15.4         1.0         µg/L         20	n-Tetradecane		14.98	1.0	hg/L	25	0	59.9	40	140	0			
Acenaphthene         16.1         1.0         µg/L         2.5         0         64.4         4.0         14.0         0           Antivasciene         17.25         1.0         µg/L         2.5         0         6.9         4.0         14.0         0           Pyreine         17.25         1.0         µg/L         2.5         0         7.1         4.0         14.0         0           Pyreine         17.77         1.0         µg/L         2.5         0         7.1         4.0         14.0         0           Surr 1-Chloroodadecare         12.56         1.0         µg/L         2.0         6.2.8         4.0         14.0         0           Surr 2-Bromonaphhalene         16.5         1.0         µg/L         2.0         6.2.8         4.0         14.0         0           Surr 2-Inorobibionyl         15.4         1.0         µg/L         2.0         0         7.5         4.0         14.0         0           Surr 0-Terphenyl         15.4         1.0         µg/L         2.0         0         7.5         4.0         14.0         0           Surr 0-Terphenyl         15.4         1.0         µg/L         2.0         0	Naphthalene		14.89	1.0	hg/L	25	0	59.6	40	140	0			
Anthracene         17.25         1.0         µg/L         2.5         0         6.9         4.0         1.40         0           Pyrene         18.07         1.0         µg/L         2.5         0         7.23         4.0         1.40         0           Chrysene         18.07         1.0         µg/L         2.5         0         7.1         4.0         1.40         0           Chrysene         1.2.56         1.0         µg/L         2.0         7.1         4.0         1.40         0           Sur: 2-Fluotobihenyi         15.5         1.0         µg/L         2.0         7.7.5         4.0         1.40         0           Sur: 2-Fluotobihenyi         15.4         1.0         µg/L         2.0         7.7.5         4.0         1.40         0           Sur: 0-Terphenyi         15.4         1.0         µg/L         2.0         7.7.5         4.0         1.40         0           Sur: 0-Terphenyi         15.4         1.0         µg/L         2.0         7.7.5         4.0         1.40         0           Sur: 0-Terphenyi         15.4         1.0         µg/L         2.0         7.7         4.0         1.40         0	Acenaphthene		16.1	1.0	hg/L	25	0	64.4	40	140	0			
Pyrene         18.07         1.0         µg/L         25         0         7.23         40         140         0           Chrysene         17.77         10         µg/L         25         0         7.11         40         140         0           Surr 1-Chloroodadecare         12.77         10         µg/L         20         6.28         40         140         0           Surr 2-Flouoolphenyl         15.4         1.0         µg/L         20         0         7.7         40         140         0           Surr 2-Flouoolphenyl         15.4         1.0         µg/L         20         0         7.7         40         140         0           Surr 0-Terphenyl         15.4         1.0         µg/L         20         0         7.7         40         140         0           Surr 0-Terphenyl         15.4         1.0         µg/L         20         0         7.7         40         140         0           Surr 0-Terphenyl         15.4         1.0         µg/L         20         0         77         40         140         0         0           Surr 0-Forcet art the Reporting Limit         SSpik Recovery outside accepted recovery limits <t< td=""><td>Anthracene</td><td></td><td>17.25</td><td>1.0</td><td>hg/L</td><td>25</td><td>0</td><td>69</td><td>40</td><td>140</td><td>0</td><td></td><td></td><td></td></t<>	Anthracene		17.25	1.0	hg/L	25	0	69	40	140	0			
Chrystene         17.77         1.0         µg/L         2.5         0         7.11         4.0         1.0         0           Surr 1-Chloroocladecane         12.56         1.0         µg/L         2.0         0         6.3         4.0         1.40         0           Surr 2-Bromonaphhalme         16.94         1.0         µg/L         2.0         0         8.7         4.0         1.40         0           Surr 2-Fuorobjhenyl         15.5         1.0         µg/L         2.0         0         77.5         4.0         1.40         0           Surr 0-Terphenyl         15.4         1.0         µg/L         2.0         0         77         4.0         1.40         0           Outlifters:         N. Or terphenyl         15.4         1.0         µg/L         2.0         0         77         4.0         1.40         0           Outlifters:         N. Or terphenyl         15.4         1.0         µg/L         2.0         0         77         4.0         14.0         0           Outlifters:         N. Or terpted at the reporting time         5.5         7.0         0         77         4.0         14.0         0           Multifters: <t< td=""><td>Pyrene</td><td></td><td>18.07</td><td>1.0</td><td>hg/L</td><td>25</td><td>0</td><td>72.3</td><td>40</td><td>140</td><td>0</td><td></td><td></td><td></td></t<>	Pyrene		18.07	1.0	hg/L	25	0	72.3	40	140	0			
Surr 1-Chloroodadecane       12.56       1.0       µg/L       20       0       62.8       40       140       0         Surr 2-Fluorobibhenyl       15.5       1.0       µg/L       20       0       84.7       40       140       0         Surr 2-Fluorobibhenyl       15.5       1.0       µg/L       20       0       77.5       40       140       0         Surr 0-Terphenyl       15.4       1.0       µg/L       20       0       77       40       140       0         Quartifers:       ND - Non Deccreted at the Reporting Limit       5-Shike Recovery outside accepted recovery limits       0       77       40       140       0	Chrysene		17.71	1.0	hg/L	25	0	71.1	40	140	0			
Surr. 2-Bromonaphthalene       16.94       1.0       µg/L       20       0       84.7       40       140       0         Surr. 2-Fluorobiphenyl       15.5       1.0       µg/L       20       0       77.5       40       140       0         Surr. 0-Terphenyl       15.4       1.0       µg/L       20       0       77       40       140       0         Quarterse       1.0       µg/L       20       0       77       40       140       0         Quarterse       1.0       µg/L       20       0       77       40       140       0	Surr: 1-Chlorood	tadecane	12.56	1.0	hg/L	20	0	62.8	40	140	0			
Surr: 2-Fluorobiphenyl     15.5     1.0     µg/L     20     0     77.5     40     140     0       Surr: 0-Terphenyl     15.4     1.0     µg/L     20     0     77     40     140     0       Surr: 0-Terphenyl     15.4     1.0     µg/L     20     0     77     40     140     0       Qualifiers:     ND-Noil Detected at the Reporting Limit     5 - Spike Recovery outside accepted recovery limits     B - Analyte detected in the associated Method Blank       1 Analyte detected below outside accepted recovery limits     A - Analyte detected in the associated Method Blank	Surr: 2-Bromonal	phthalene	16.94	1.0	hg/L	20	0	84.7	40	140	0			
Surr. o-Terphenyl     15.4     1.0     µg/L     20     0     77     40     140     0       Qualifiers:     ND - Not Detected at the Reporting Limit     S - Spike Recovery outside accepted recovery limits     B - Analyte detected in the associated Method Blank       1 - Analyte detected below quantitation limits     R - RPD outside accepted recovery limits     N.A. No modicide detected in the associated Method Blank	Surr: 2-Fluorobip	henyl	15.5	1.0	hg/L	20	0	77.5	40	140	0			
Qualifiers:       ND - Not Detected at the Reporting Limit       S - Spike Recovery outside accepted recovery limits       B - Analyte detected in the associated Method Blank         1 - Analyte detected below quantitation limits       R - RPD outside accented recovery limits       N A. Not on-lively environt transmission	Surr: o-Terpheny	1	15.4	1.0	hg/L	20	0	77	40	140	0			
Qualifiers:       ND - Not Detected at the Reporting Limit       S - Spike Recovery outside accepted recovery limits       B - Analyte detected in the associated Method Blank         1 - Analyte detected below quantitation limits       R - RPD outside accented recovery limits       NA       NA       NA       NA       Analyte detected in the associated Method Blank														
Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank 1 - Analyte detected below quantitation limits R - RPD outside accented recovery limits NA Not analyte detected in the associated Method Blank														
1. Analyte detected below quantitation limits R+RPD outside accented recovery limits NA . Not analyze the where A volues of ND results accent	Qualifiers: ND -	- Not Detected a	at the Reporting Limit	S	- Spike Recov	ery outside accepted	recovery l	limits	B - Analyte	detected in th	ie associated Metho	od Blank		1
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CLIENT:	Weston & Sampson Engi	neers		C	lient Sample ID	WS-12	
Lab Order: Project: Lab ID:	0102063 200317.A P-3 Roxbury 0102063-01C				Collection Date Matrix	2/6/01 AQUE	OUS
Analyses		Result	RL	Qual	Units	DF	Date Analyzed
EAD, DISSOL	VED	ND	<b>SW7421</b> 5.0		µg/L	1	Analyst: APL 2/13/01
							·
Qualifiers:	ND - Not Detected at the Report	ting Limit	ìta		S - Spike Recovery of	utside acce	pted recovery limits
	J - Analyte detected below quar	nutation lim	IIS		K - KPD outside acce	pied recove	ry limits
	<ul> <li>* Analyte detected in the asso</li> <li>* - Value exceeds Maximum Co</li> </ul>	ontaminant			E - value above quan # - See Case Narrativ		<u>е</u> ~

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#### AMRO Environmental Laboratories Corp. Date: 20-Feb-01 CLIENT: Weston & Sampson Engineers Client Sample ID: WS-10 Lab Order: 0102063 Project: Collection Date: 2/6/01 200317.A P-3 Roxbury Matrix: AOUEOUS Lab ID: 0102063-02C **RL** Qual Units Analyses Result DF **Date Analyzed** LEAD, DISSOLVED SW7421 Analyst: APL

5.0

µg/L

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2/13/01

ND

Qualifiers:

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Lead

ND - Not Detected at the Reporting Limit J - Analyte detected below quantitation limits S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limitsE - Value above quantitation range

B - Analyte detected in the associated Method Blank

\* - Value excccds Maximum Contaminant Level

# - Sce Case Narrative

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Date: 20-Feb-01

······						
CLIENT:	Weston & Sampson Er	ngineers	C	lient Sample	ID: WS-9	
Lab Order:	0102063					
Project:	200317.A P-3 Roxbur	у		Collection D	ate: 2/6/01	l
Lab ID:	0102063-03C			Ma	trix: AQUI	EOUS
Analyses		Result	RL Qual	Units	DF	Date Analyzed
LEAD, DISSOL	_VED	SV	V7421			Analyst: APL
Lead		ND	5.0	µg/L	1	2/13/01

Qualifiers:

ND - Not Detected at the Reporting Limit

- J Analyte detected below quantitation limits B - Analyte detected in the associated Method Blank
- \* Value exceeds Maximum Contaminant Level
- S Spike Recovery outside accepted recovery limits
- R RPD outside accepted recovery limits
- E Value above quantitation range
  - # See Case Narrative

# Date: 20-Feb-01 AMRO Environmental Laboratories Corp. : ...... CLIENT: Weston & Sampson Engineers Client Sample ID: WS-7 Lab Order: 0102063 Collection Date: 2/7/01 Project: 200317.A P-3 Roxbury Matrix: AQUEOUS Lab ID: 0102063-04C Analyses Result **RL** Qual Units DF **Date Analyzed** LEAD, DISSOLVED SW7421 Analyst: APL ND Lead 5.0 µg/L 2/13/01 1

Qualifiers:

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ND - Not Detected at the Reporting Limit J - Analyte detected below quantitation limits S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

B - Analyte detected in the associated Method Blank

\* - Value exceeds Maximum Contaminant Level

# - See Case Narrative

#### AMRO Environmental Laboratories Corp. Date: 20-Feb-01 \_\_\_\_\_ \_\_\_\_\_ CLIENT: Weston & Sampson Engineers Client Sample ID: WS-5 Lab Order: 0102063 Project: Collection Date: 2/7/01 200317.A P-3 Roxbury Lab ID: Matrix: AQUEOUS 0102063-05C

Analyses	Result	RL Q	ual Units	DF	Date Analyzed
LEAD, DISSOLVED	SI	N7421			Analyst: APL
Lead	ND	5.0	µg/L	1	2/13/01

Qualifiers:

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ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

\* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

# - See Case Narrative

# AMRO Environmental Laboratories Corp. Date: 20-Feb-01 CLIENT: Weston & Sampson Engineers Client Sample ID: WS-3 Lab Order: 0102063

 Lab Order:
 0102063

 Project:
 200317.A P-3 Roxbury

 Lab ID:
 0102063-06C

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Collection Date: 2/7/01

Matrix: AQUEOUS

Analyses	Result	RL Qu	ial Units	DF	Date Analyzed
LEAD, DISSOLVED	S	W7421			Analyst: APL
Lead	ND	5.0	µg/L	1	2/13/01

Qualifiers:

ND - Not Detected at the Reporting Limit J - Analyte detected below quantitation limits S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits E - Value above quantitation range

# - See Case Narrative

B - Analyte detected in the associated Method Blank

\* - Value exceeds Maximum Contaminant Level

# METHOD BLANK

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-		<b>DRT</b> Blank	õ		
	-Feb-01	REPC fethod E	2/12/01 RPDLimit		
	Date: 16	MARY <sup>N</sup>	Prep Date %RPD		od Blank esults occur
		QC SUM	ginal Sample or MS Result		associated Methuely values or ND r
			Date 2/13/01 107425 Oriç HighLimit		te detected in the applicable where
			Analysis [ SeqNo: LowLimit		B - Analy NA - Not
			mple sult %REC		overy limits Is
			iits: µg/L 13А .e Original Sa nt Re		de accepted rec d recovery limi tely quantitate.
			Ur 000_0102 QC Spik Amour	•	very outsi de acceptec can accura
			: SW7421 GFAA-60 Units	Г	Spike Reco RPD outsic laboratory
	Corp.		Test Code Run ID: RL	о. v	S - R - ncentration the
	atories	lgineers y	04 ple sult	Q	Limit tion limits to lowest cor
· /	Labor	mpson En 3 Roxbur	atch ID: 38 QC Sam Res		e Reporting ow quantita lefined as th
	mental	ton & Sa 2063 317.A P-	Ĕ		etected at th detected bel ing Limit; d
	nviron	Wes 0100 2000	-3804		VD - Not De I - Analyte ( RL - Report
	AMRO E	CLIENT: Work Order Project:	Sample ID: ME Client ID: Analyte	Lead	Qualifiers: ]
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LIENT: Weston & Samp	ork Order: 0102063 oject: 200317.A P-3 R	mple ID: 0102063-01CMS Batch ent ID: WS-12	Qi Jiyte	p	nple ID: 0102063-01CMSD Batch ant ID: WS-12	Qi Jilte	Ð	unlifiers: ND - Not Detected at the Re
	son Engincers toxbury	ID: 3804	tC Sample Result	47.9	ID: 3804	iC Sample Result	<b>4</b> 9.36	eporting Limit
		Test Code: Run ID:	RL	5.0	Test Code: Run ID:	RL	о. v	- S
		SW7421 GFAA-600	Units	р9/L	SW7421 GFAA-600	Units	µg/L	Snike Recov
		Units: µg/L 10_010213A	QC Spike Origins Amount	50	Units: µg/L	QC Spike Origins Amount	20	erv outside accente
			al Sample Result	2.006		I Sample Result	2.006	d recovery
			%REC 1	91.8		%REC 1	7. 40	imits
		Analysis Da SeqNo:	LowLimit	75	Analysis Da SeqNo:	-owLimit		B - Analvte
		ate 2/13/01 107395	) HighLimit	125	ite 2/13/01 107398	C HighLimit	125	detected in t
	QC SUM		Driginal Sample or MS Result	0		Driginal Sample or MS Result	0, 0,	the accordated Meth
	[MARY Sample	Prep Date	%RPD		Prep Date	%RPD	m	ad Blank
	REPO Matrix S	5 2/12/01	RPDLimit		: 2/12/01	RPDLimit	5	*
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	- <i>Feb-01</i>	REPO Control S	2/12/01	RPDLimit		
	Date: 16	MARY oratory C	Prep Date	%RPD		
		QC SUM Lab		iginal Sample or MS Result	0	
 			te 2/13/01 107422	Or HighLimit	120	
] 1			Analysis Da SeqNo:	LowLimit F	80	
]] -				%REC	104	
J				Sample Result	0	
]]			nits: µg/L 13A	e Original nt	Q	
			000_0102	QC Spik Amour	ß	
J			e: SW7421 GFAA-6	Units	hg/L	
Ì,	Corp.		Test Code Run ID:	RL	5.0	
	atories	ngineers y	04	iple sult	60.	
	ıl Labor	iampson Ei -3 Roxbur	Batch ID: 38	QC Sar Rei	52	
	ımenta	eston & S 02063 0317.A F				
	3nviror	r: 01( 20(	CS-3804			
	AMRO F	CLIENT: Work Orde Project:	Sample ID: LC	Inalyte	-ead	
]				4	_	

NA - Not applicable where J values or ND results occur R - RPD outside accepted recovery limits RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate. J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits

ND - Not Detected at the Reporting Limit

Qualifiers:

B - Analyte detected in the associated Method Blank

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Appendix E-3

Surface Soil

Weston & Sampson



111 Herrick Street, Merrimack, NH 03054 TEL: (603) 424-2022 · FAX: (603) 429-8496 روز 4/13/01

April 10, 2001

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Annika Willis Weston & Sampson Engineers 5 Centennial Drive Peabody, MA 019607985 TEL: (978) 532-1900 FAX: (978) 977-0100

RE: 200317A BRA P3-Roxbury

Order No.: 0104006

Dear Annika Willis:

AMRO Environmental Laboratories Corp. received 10 samples on 3/30/01 for the analyses presented in the following report.

AMRO operates a Quality Assurance Program which meets or exceeds National Environmental Laboratory Accreditation Conference (NELAC), state, and EPA requirements. A copy of the appropriate state and/or NELAC Certificate is attached.

The enclosed Sample Receipt Checklist details the condition of your sample(s) upon receipt. Please be advised that any unused sample volume and sample extracts will be stored for a period of thirty (30) days from this report date. After this time, AMRO will properly dispose of the remaining sample(s). If you require further analysis, or need the samples held for a longer period, please contact us immediately.

This report consists of a total of  $\underline{39}$  pages. This letter is an integral part of your data report. If you have any questions regarding this project in the future, please refer to the Order Number above.

Sincerely,

Nancy Stewart Vice President / Lab Director

Date: 10-Apr-01

\_\_\_\_\_\_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ .\_\_\_ **CLIENT:** Weston & Sampson Engineers Project: 200317A BRA P3-Roxbury Lab Order: 0104006 Date Received: 3/30/01

### Work Order Sample Summary

	Lab Sample ID	Client Sample ID	Collection Date
	0104006-01A	SS-1	3/29/01
	0104006-01B	SS-1	3/29/01
	0104006-02A	SS-2	3/29/01
	0104006-02B	SS-2	3/29/01
	0104006-03A	SS-3	3/29/01
ľ	0104006-03B	SS-3	3/29/01
	0104006-04A	SS-4	3/29/01
	0104006-04B	SS-4	3/29/01
	0104006-05A	DUP	3/29/01
	0104006-06A	SP-1	3/29/01
	0104006-06B	SP-1	3/29/01
	0104006-06C	SP-1	3/29/01
	0104006-06D	SP-1	3/29/01
	0104006-07A	SP-2	3/29/01
	0104006-07B	SP-2	3/29/01
	0104006-07C	SP-2	3/29/01
l	0104006-07D	SP-2	3/29/01
	0104006-08A	SP-3	3/29/01
ļ	0104006-08B	SP-3	3/29/01
	0104006-08C	SP-3	3/29/01
ľ	0104006-08D	SP-3	3/29/01
	0104006-09A	DUP2	3/29/01
l	0104006-09B	DUP2	3/29/01
	0104006-09C	DUP2	3/29/01
	0104006-09D	DUP2	3/29/01
	0104006-10A	Trip Blank	3/29/01
l			
CLIENT:Weston & Sampson EngineersProject:200317ABRA P3-RoxburyLab Order:0104006

## **CASE NARRATIVE**

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## METALS

1. Analytical Comments for METHOD HG\_7471, SAMPLE SP-1(0104006-06D): The %R for the Matrix Spike Duplicate and the % RPD for the Duplicate were outside laboratory control limits due to sample non-homogeneity.

## Method 8082

1. The Laboratory Control Sample (LCS-4212) had the recovery for the Aroclor-1260 at 126% outside the laboratory control limits (61-125%).

## MADEP-EPH

1. The duplicate 0104006-08A had several %RPD's outside the laboratory control limits.

#### AMRO Environmental Laboratories Corp. Date: 10-Apr-01 - -------- -----**CLIENT:** Weston & Sampson Engineers Client Sample ID: SS-1 Lab Order: 0104006 Collection Date: 3/29/01 **Project:** 200317A BRA P3-Roxbury Lab ID: Matrix: SOIL 0104006-01A Analyses Result **RL** Qual Units DF Date Analyzed PERCENT MOISTURE D2216 Analyst: CW Percent Moisture 21.4 0 4/4/01 wt% 1

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Mcthod Blank

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H - Method prescribed holding time exceeded

- S Spike Recovery outside accepted recovery limits
- R RPD outside accepted recovery limits
- E Value above quantitation range
- # See Case Narrative

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#### **AMRO Environmental Laboratories Corp.** Date: 10-Apr-01 ----CLIENT: Weston & Sampson Engineers Client Sample ID: SS-1 Lab Order: 0104006 Collection Date: 3/29/01 Project: 200317A BRA P3-Roxbury Lab ID: 0104006-01B Matrix: SOIL Result **RL** Qual Units Analyses DF **Date Analyzed** ICP METALS TOTAL SW-846 - 3051/6010 SW6010B Analyst: REB Lead 200 4.0 mg/Kg-dry 4/4/01 5:54:16 PM 1

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J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

- H Method preseribed holding time exceeded
- S Spike Recovery outside accepted recovery limits
- R RPD outside accepted recovery limits
- E Value above quantitation range
- # See Case Narrative

## Date: 10-Apr-01 AMRO Environmental Laboratories Corp. \_\_\_\_\_ **CLIENT:** Weston & Sampson Engineers Client Sample ID: SS-2 Lab Order: 0104006 Collection Date: 3/29/01 **Project:** 200317A BRA P3-Roxbury Matrix: SOIL Lab ID: 0104006-02A Result **RL** Qual Units Analyses DF Date Analyzed PERCENT MOISTURE D2216 Analyst: CW Percent Moisture 19.6 0 wt% 1 4/4/01

Qualifiers:

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ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

H - Method prescribed holding time exceeded

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

# - See Case Narrative

CLIENT:	Weston & Sampson Eng	ineers	<del></del>	 C	lient Sample ID:	SS-2	
Lab Order: Project: Lab ID:	0104006 200317A BRA P3-Roxb 0104006-02B	ригу			Collection Date: Matrix:	3/29/01 SOIL	
Analyses		Result	RL (	Qual	Units	DF	Date Analyzed
ICP METALS T	OTAL SW-846 - 3051/6010	s	W6010B				Analyst: REB
Lead		300	3.7		mg/Kg-dry	1	4/4/01 5:58:48 PM
Qualifiers:	ND - Not Detected at the Repo	rting Limit			S - Spike Recovery ou	tside accept	ted recovery limits
	J - Analyte detected below qua B - Analyte detected in the asso	ntitation limits	; d Blank		R - RPD outside accep E - Valuc above quant	ted recover	y limits e
	H - Method prescribed holding	time exceeded	1		# - See Case Narrative	;	-

Date: 10-Apr-01

CLIENT:Weston & Sampson EngineersLab Order:0104006Project:200317A BRA P3-RoxburyLab ID:0104006-03A

Client Sample ID: SS-3

Collection Date: 3/29/01 Matrix: SOIL

Analyses	Result	RL Qu	al Units	DF	Date Analyzed
PERCENT MOISTURE	D2	2216		Analyst: CW	
Percent Moisture	16.9	0	wt%	1	4/4/01

Qualifiers: ND - N

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

- H Method prescribed holding time exceeded
- S Spike Recovery outside accepted recovery limits
- R RPD outside accepted recovery limits
- E Value above quantitation range
- # See Case Narrative

CLIENT:	Weston & Sampson Engi	neers			lient Sample ID:	SS-3	
Lab Order: Project: Lab ID:	0104006 200317A BRA P3-Roxb 0104006-03B	ury			Collection Date: Matrix:	3/29/01 SOIL	
Analyses		Result	RL	Qual	Units	DF	Date Analyzed
CP METALS T	OTAL SW-846 - 3051/6010		SW6010B				Analyst: RE
Lead		220	3.8		mg/Kg-dry	1	4/4/01 6:11:17 PM
			·				
Qualifiers:	ND - Not Detected at the Repor	rting Limit			S - Spike Recovery ou	tside accep	ted recovery limits
	J - Analyte detected below quar B - Analyte detected in the asso	ntitation lim	uits hod Blank		R - RPD outside accep E - Value above quant	ted recover	ry limits ge
	H - Method prescribed holding	time exceed	dcd		# - See Case Narrative	2	

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Date: 10-Apr-01

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Date Analyzed

4/4/01

Analyst: CW

- · --- ----\_\_\_\_\_ **CLIENT:** Weston & Sampson Engineers Client Sample ID: SS-4 Lab Order: 0104006 Collection Date: 3/29/01 **Project:** 200317A BRA P3-Roxbury Matrix: SOIL Lab ID: 0104006-04A Result **RL** Qual Units DF Analyses PERCENT MOISTURE D2216

15.9

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wt%

Percent	Moisture	
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Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

- H Method prescribed holding time exceeded
- S Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

- E Value above quantitation range
- # See Case Narrative

Date: 10-Apr-01

CLIENT:Weston & Sampson EngineersLab Order:0104006Project:200317A BRA P3-RoxburyLab ID:0104006-04B

Client Sample ID: SS-4

Collection Date: 3/29/01 Matrix: SOIL

Analyses	Result	RL	Qual Units	DF	Date Analyzed
ICP METALS TOTAL SW-846 - 3051/6010		SW6010B			Analyst: REB
Lead	310	3.5	mg/Kg-dr	y 1	4/4/01 6:16:06 PM

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

H - Method prescribed holding time exceeded

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

# - Sce Case Narrative

Date: 10-Apr-01

CLIENT:	Weston & Sampson Eng	ineers		С	lient Sample ID:	DUP	
Dab Order.	2002174 DDA D2 Dave				Collection Date:	3/20/01	
Fluject:	200317A BKA P3-K0X0	bury			concetton Date.	5129101	
Lab 1D:	0104006-05A				Matrix:	SOIL	
Analyses		Result	RL	Qual	Units	DF	Date Analyzed
ICP METALS T	OTAL SW-846 - 3051/6010	_	SW6010B	-			Analyst: REB
Lead		340	3.6		mg/Kg-dry	1	4/4/01 6:21:00 PM
PERCENT MO	ISTURE		D2216				Analyst: CW
Percent Moistu	re	16.2	0		wt%	1	4/4/01

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Qualifiers: ND - No

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

H - Method prescribed holding time exceeded

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

# - See Case Narrative

Date: 10-Apr-01

-----\_ ----\_\_\_\_ \_\_\_\_\_ Weston & Sampson Engineers CLIENT: Client Sample ID: SP-1 Lab Order: 0104006 Project: Collection Date: 3/29/01 200317A BRA P3-Roxbury Matrix: SOIL Lab ID: 0104006-06D Result **RL** Qual Units DF Analyses Date Analyzed

ICP METALS TOTAL SW-846 - 3051/6010	s	W6010B			Analyst: REB
Arsenic	15	6.3	mg/Kg-dry	1	4/4/01 5:30:33 PM
Barium	61	25	mg/Kg-dry	1	4/4/01 5:30:33 PM
Cadmium	ND	0.63	mg/Kg-dry	1	4/4/01 5:30:33 PM
Chromium	28	1.3	mg/Kg-dry	1	4/4/01 5:30:33 PM
Lead	85	3.2	mg/Kg-dry	1	4/4/01 5:30:33 PM
Selenium	ND	10	mg/Kg-dry	1	4/4/01 5:30:33 PM
Silver	ND	1 <i>.</i> 8	mg/Kg-d <b>ry</b>	1	4/4/01 5:30:33 PM
MERCURY, 7471A	S	SW7471A			Analyst: MT
Mercury	0.34	0.026	mg/Kg-dry	1	4/4/01
PERCENT MOISTURE	E	02216			Analyst: CW
Percent Moisture	10.1	0	wt%	1	4/4/01

Qualifiers: ND

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

H - Method prescribed holding time exceeded

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

# - See Case Narrative

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## AMRO Environmental Laboratories Corp.

Date: 10-Apr-01

Analyses		Result	RL Qual	Units	DF	Date Analyzed
Lab ID:	0104006-07D			Matrix:	SOIL	
Project:	200317A BRA P3-	Roxbury		<b>Collection Date:</b>	3/29/01	
Lab Order:	0104006					
CLIENT:	Weston & Sampson	Engineers	С	lient Sample ID:	SP-2	

ICP METALS TOTAL SW-846 - 3051/6010	5	5W6010B			Analyst: REB
Arsenic	20	7.4	mg/Kg-dry	1	4/4/01 6:25:50 PM
Barium	54	29	mg/Kg-dry	1	4/4/01 6:25:50 PM
Cadmium	ND	0.74	mg/Kg-dry	1	4/4/01 6:25:50 PM
Chromium	16	1.5	mg/Kg-dry	1	4/4/01 6:25:50 PM
Lead	170	3.7	mg/Kg-dry	1	4/4/01 6:25:50 PM
Selenium	ND	12	mg/Kg-dry	1	4/4/01 6:25:50 PM
Silver	ND	2.1	mg/Kg-dry	1	4/4/01 6:25:50 PM
MERCURY, 7471A	5	SW7471A			Analyst: MT
Mercury	0.45	0.027	mg/Kg-dry	1	4/4/01
PERCENT MOISTURE		D2216			Analyst: CW
Percent Moisture	16.6	0	wt%	1	4/4/01

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

H - Method prescribed holding time exceeded

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

# - See Case Narrative

Date: 10-Apr-01

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CLIENT:Weston & Sampson EngineersLab Order:0104006Project:200317A BRA P3-RoxburyLab ID:0104006-08D

Client Sample ID: SP-3

Collection Date: 3/29/01 Matrix: SOIL

Analyses	Result	RL	Qual U	nits	DF	Date Analyzed
ICP METALS TOTAL SW-846 - 3051/6010		SW6010B				Analyst: REB
Arsenic	9.1	6.8	mg	g/Kg-dry	1	4/4/01 6:30:33 PM
Barium	47	27	mg	g/Kg-dry	1	4/4/01 6:30:33 PM
Cadmium	ND	0.68	mg	g/Kg-dry	1	4/4/01 6:30:33 PM
Chromium .	12	1.4	mg	g/Kg-dry	1	4/4/01 6:30:33 PM
Lead	160	3.4	mg	g/Kg-dry	1	4/4/01 6:30:33 PM
Selenium	ND	11	mg	g/Kg-dry	1	4/4/01 6:30:33 PM
Silver	ND	1.9	m	g/Kg-dry	1	4/4/01 6:30:33 PM
MERCURY, 7471A		SW7471A				Analyst: MT
Mercury	0.16	0.029	m	g/Kg-dry	1	4/4/01
PERCENT MOISTURE		D2216			r	Analyst: CW
Percent Moisture	9.5	0	wt	%	1	4/4/01

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Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

H - Method prescribed holding time exceeded

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

# - See Case Narrative

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Date: 10-Apr-01

Analyses	Result	RL Qual Units	DF	Date Analyz	zed
Lab ID:	0104006-09D	Matrix:	SOIL		
Project:	200317A BRA P3-Roxbury	Collection Date:	3/29/01		
Lab Order:	0104006				
CLIENT:	Weston & Sampson Engineers	Client Sample ID:	DUP2		

	Resur				
ICP METALS TOTAL SW-846 - 3051/6010	S	W6010B		-	Analyst: REB
Arsenic	11	6.8	mg/Kg-dry	1	4/4/01 6:35:19 PM
Barium	69	27	mg/Kg-dry	1	4/4/01 6:35:19 PM
Cadmium	ND	0.68	mg/Kg-dry	1	4/4/01 6:35:19 PM
Chromium	23	1.4	mg/Kg-dry	1	4/4/01 6:35:19 PM
Lead	120	3.4	mg/Kg-dry	1	4/4/01 6:35:19 PM
Selenium	ND	11	mg/Kg-dry	1	4/4/01 6:35:19 PM
Silver	ND	1.9	mg/Kg-dry	1	4/4/01 6:35:19 PM
MERCURY, 7471A	S	W7471A			Analyst: MT
Mercury	0.41	0.031	mg/Kg-dry	1	4/4/01
PERCENT MOISTURE	D	2216			Analyst: CW
Percent Moisture	12.9	0	wt%	1	4/4/01

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte dctected in the associated Mcthod Blank

H - Method prescribed holding time exceeded

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

# - See Case Narrative

Date: 10-Apr-01

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CLIENT:Weston & Sampson EngineersLab Order:0104006Project:200317A BRA P3-RoxburyLab ID:0104006-06C

## Client Sample ID: SP-1

Collection Date: 3/29/01 Matrix: SOIL

Analyses	Result	RL Q	ual Units	DF	Date Analyzed
PCBS BY EPA8082	SV	V8082			Analyst: RAP
Aroclor 1016	ND	27	µg/Kg-dry	1	4/9/01 8:06:00 PM
Aroclor 1221	ND	27	µg/Kg-dry	1	4/9/01 8:06:00 PM
Aroclor 1232	ND	27	µg/Kg-dry	1	4/9/01 8:06:00 PM
Aroclor 1242	ND	27	µg/Kg-dry	1	4/9/01 8:06:00 PM
Aroclor 1248	ND	27	µg/Kg-dry	1	4/9/01 8:06:00 PM
Aroclor 1254	48	27	µg/Kg-dry	1	4/9/01 8:06:00 PM
Aroclor 1260	ND	27	µg/Kg-dry	1	4/9/01 8:06:00 PM

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ND - Not Detected at the Reporting Limit

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

H - Method prescribed holding time exceeded

E - Value above quantitation range# - See Case Narrative

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

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Date: 10-Apr-01

Analyses	Result	RL Qual Units	DF	Date Analyzed
Lab ID:	0104006-07C	Matrix:	SOIL	
Project:	200317A BRA P3-Roxbury	Collection Date:	3/29/01	
Lab Order:	0104006			
CLIENT:	Weston & Sampson Engineers	Client Sample ID:	SP-2	

PCBS BY EPA8082	SV	/8082			Analyst: RAP
Aroclor 1016	ND	29	µg/Kg-dry	1	4/9/01 8:33:00 PM
Aroclor 1221	ND	29	µg/Kg-dry	1	4/9/01 8:33:00 PM
Aroclor 1232	ND	29	µg/Kg-dry	1	4/9/01 8:33:00 PM
Aroclor 1242	ND	29	µg/Kg-dry	1	4/9/01 8:33:00 PM
Aroclor 1248	ND	29	µg/Kg-dry	1	4/9/01 8:33:00 PM
Aroclor 1254	68	29	µg/Kg-dry	1	4/9/01 8:33:00 PM
Aroclor 1260	ND	29	µg/Kg-dry	1	4/9/01 8:33:00 PM

Qualifiers:

ND - Not Detected at the Reporting Limit

- J Analyte detected below quantitation limits
- B Analyte detected in the associated Method Blank
- H Method prescribed holding time exceeded
- S Spike Recovery outside accepted recovery limits
- R RPD outside accepted recovery limits
- E Value above quantitation range
- # See Case Narrative

Date: 10-Apr-01

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4/9/01 9:00:00 PM

4/9/01 9:00:00 PM 4/9/01 9:00:00 PM

4/9/01 9:00:00 PM

CLIENT: Weston & Sampson Engineers Lab Order: 0104006		Engineers		Client Sample I	<b>D:</b> SP-3	
Project:	200317A BRA P3-	Roxbury		Collection Da	te: 3/29/01	
Lab ID:	0104006-08C	,		Matr	ix: SOIL	
Analyses		Result	RL Qu	al Units	DF	Date Analyzed
PCBS BY EPA	8082	SV	V8082			Analyst: RAP
Aroclor 1016		ND	27	µg/Kg-dry	1	4/9/01 9:00:00 PM
Aroclor 1221		ND	27	µg/Kg-dry	1	4/9/01 9:00:00 PM
Aroclor 1232		ND	27	µg/Kg-dry	1	4/9/01 9:00:00 PM

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µg/Kg-dry

µg/Kg-dry

µg/Kg-dry

µg/Kg-dry

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ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

H - Method prescribed holding time exceeded

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

# - See Case Narrative

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

Aroclor 1242

Aroclor 1248

Aroclor 1254

Aroclor 1260

Date: 10-Apr-01

PCBS BY EPA8082		S	W8082		Analyst: RAP
Analyses		Result	RL Qual Units	DF	Date Analyzed
Lab ID:	0104006-09C		Matrix:	SOIL	
Project:	200317A BRA P3-Ro	xbury	Collection Date:	3/29/01	
Lab Order:	0104006				
CLIENT:	Weston & Sampson En	gineers	Client Sample ID:	DUP2	
	·····				

CD3 D1 LFA0002	
Aroclor 1016	
Aroclor 1221	
Aroclor 1232	

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Aroclor 1016	ND	28	µg/Kg-dry	1	4/9/01 9:26:00 PM
Aroclor 1221	ND	28	µg/Kg-dry	1	4/9/01 9:26:00 PM
Aroclor 1232	ND	28	µg/Kg-dry	1	4/9/01 9:26:00 PM
Aroclor 1242	ND	28	µg/Kg-dry	1	4/9/01 9:26:00 PM
Aroclor 1248	ND	28	µg/Kg-dry	1	4/9/01 9:26:00 PM
Aroclor 1254	ND	28	µg/Kg-dry	1	4/9/01 9:26:00 PM
Aroclor 1260	ND	28	µg/Kg-dry	1	4/9/01 9:26:00 PM

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

H - Method prescribed holding time exceeded

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

# - See Case Narrative

Date: 10-Apr-01

CLIENT:	Weston & Sampson Engineers	Client Sample ID: SP-1
Lab Order:	0104006	Tag Number:
Project:	200317A BRA P3-Roxbury	Collection Date: 3/29/01
Lab ID:	0104006-06B	Matrix: SOIL
Project: Lab ID:	200317A BRA P3-Roxbury 0104006-06B	Collection Date: 3/2 Matrix: SC

Analyses	Result	RL C	Qual Units	DF	Date Analyzed	
OLATILE PETROLEUM HYDROCARBON	S	MAVPH			Analyst: SK	
C5-C8 Aliphatic Hydrocarbons	ND	2.8	mg/Kg-dry	1	4/3/01 7:25:00 PM	
C9-C12 Aliphatic Hydrocarbons	ND	0.69	mg/Kg-dry	1	4/3/01 7:25:00 PM	
C9-C10 Aromatic Hydrocarbons	ND	0.69	mg/Kg-dry	1	4/3/01 7:25:00 PM	
Methyl tert-butyl ether	ND	0.056	mg/Kg-dry	1	4/3/01 7:25:00 PM	
Benzene	ND	0.056	mg/Kg-dry	1	4/3/01 7:25:00 PM	
Toluene	ND	0.056	mg/Kg-dry	1	4/3/01 7:25:00 PM	
Ethylbenzene	ND	0.056	mg/Kg-dry	1	4/3/01 7:25:00 PM	
m,p-Xylene	ND	0.056	mg/Kg-dry	1	4/3/01 7:25:00 PM	
o-Xylene	ND	0.056	mg/Kg-dry	1	4/3/01 7:25:00 PM	
Naphthalene	ND	0.14	mg/Kg-dry	1	4/3/01 7:25:00 PM	
Surr: Dibromofluoromethane	84.5	70-130	%REC	1	4/3/01 7:25:00 PM	
Surr: 1,2-Dichloroethane-d4	95.0	70-130	%REC	1	4/3/01 7:25:00 PM	
Surr: Toluene-d8	87.9	70-130	%REC	1	4/3/01 7:25:00 PM	
Surr: 4-Bromofluorobenzene	93.8	70-130	%REC	1	4/3/01 7:25:00 PM	
Surr: 2,5-Dibromotoluene	99.0	70-130	%REC	1	4/3/01 7:25:00 PM	

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

Were all QA/QC procedures required by the VPH or EPH method followed: Were all performance/acceptance standards for required QA/QC procedures achieved: Were any significant modifications made to the method as specified in section 11.3: No Vers - Details enclosed

I attest under the pains and penalties of perjury 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.

SIGNATURE:

PRINTED NAME: Nancy Stewart

4-10-01 DATE:

POSITION: Laboratory Director (or designee)

Qualifiers: RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate. ND - Not Detected at the Reporting Limit J - Analyte detceted below quantitation limits B - Analyte detected in the associated Method Blank

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

- H Method prescribed holding time exceeded
- E Value above quantitation range
- # See Case Narrative

CLIENT:	Weston & Sampson	Engineers		Clie	ent Sample ID:	SP-2	
Lab Order:	0104006				Tag Number:		
Project:	200317A BRA P3-	Roxbury		С	ollection Date:	3/29/01	
Lab ID:	0104006-07B	2			Matrix:	SOIL	
Analyses		Result	RL	Qual U	Jnits	DF	Date Analyzed
VOLATILE PET		BONS N	/IAVPH				Analyst: S
C5-C8 Aliphatic	Hydrocarbons	ND	2.9	n	ng/Kg-dry	1	4/3/01 8:02:00 PM
C9-C12 Aliphati	ic Hydrocarbons	ND	0.73	n	ng/Kg-dry	1	4/3/01 8:02:00 PM
C9-C10 Aromat	ic Hydrocarbons	ND	0.73	п	ng/Kg-dry	1	4/3/01 8:02:00 PM
Methyl tert-buty	l ether	ND	0.058	п	ng/Kg-dry	1	4/3/01 8:02:00 PM
Benzene		ND	0.058	n	ng/Kg-dry	1	4/3/01 8:02:00 PM
Toluene		ND	0.058	n	ng/Kg-dry	1	4/3/01 8:02:00 PM
Ethylbenzene		ND	0.058	n	ng/Kg-dry	1	4/3/01 8:02:00 PM
m,p-Xylene		ND	0.058	n	ng/Kg-dry	1	4/3/01 8:02:00 PM
o-Xylene		ND	0.058	n	ng/Kg-dry	1	4/3/01 8:02:00 PM
Naphthalene		ND	0.15	n	ng/Kg-dry	1	4/3/01 8:02:00 PM
Surr: Dibrom	ofluoromethane	85.5	70-130	9	%REC	1	4/3/01 8:02:00 PM
Surr: 1,2-Dic	hloroethane-d4	92.7	7 <b>0</b> -130	9	%REC	1	4/3/01 8:02:00 PM
Surr: Toluene	e-d8	85.6	70-130	9	%REC	1	4/3/01 8:02:00 PM
Surr: 4-Brom	ofluorobenzene	90.0	70-130	9	%REC	1	4/3/01 8:02:00 PM
Surr: 2,5-Dib	romotoluene	93.1	70-130	0	%REC	1	4/3/01 8:02:00 PM

#### CERTIFICATION

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Were all QA/QC procedures required by the VPH or EPH method followed:

AMRO Environmental Laboratories Corp.

\_\_\_\_ No - If No, See Case Narrative V Yes No - If No, See Case Narrative Yes - Details enclosed

Were all performance/acceptance standards for required QA/QC procedures achieved: 🖌 Yes Were any significant modifications made to the method as specified in section 11.3: \_\_\_\_ No

I attest under the pains and penalties of perjury 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.

SIGNATURE:

PRINTED NAME: Nancy Stewart

10-0 DATE:

Date: 10-Apr-01

POSITION: Laboratory Director (or designee)

Qualifiers: RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate. ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits B - Analyte detected in the associated Method Blank H - Method prescribed holding time exceeded

- E Value above quantitation range
- # See Case Narrative

Date: 10-Apr-01

Analyses	Result	RL Qual Units	DF	Date Analyzed
Lab ID:	0104006-08B	Matrix:	SOIL	
Project:	200317A BRA P3-Roxbury	Collection Date:	3/29/01	
Lab Order:	0104006	Tag Number:		
CLIENT:	Weston & Sampson Engineers	Client Sample ID:	SP-3	

VOLATILE PETROLEUM HYDROCARBONS		MAVPH			Analyst: SK
C5-C8 Aliphatic Hydrocarbons	ND	2.7	mg/Kg-dry	1	4/3/01 9:13:00 PM
C9-C12 Aliphatic Hydrocarbons	ND	0.67	mg/Kg-dry	1	4/3/01 9:13:00 PM
C9-C10 Aromatic Hydrocarbons	ND	0.67	mg/Kg-dry	1	4/3/01 9:13:00 PM
Methyl tert-butyl ether	ND	0.053	mg/Kg-dry	1	4/3/01 9:13:00 PM
Benzene	ND	0.053	mg/Kg-dry	1	4/3/01 9:13:00 PM
Toluene	ND	0.053	mg/Kg-dry	1	4/3/01 9:13:00 PM
Ethylbenzene	ND	0.053	mg/Kg-dry	1	4/3/01 9:13:00 PM
m,p-Xylene	ND	0.053	mg/Kg-dry	1	4/3/01 9:13:00 PM
o-Xylene	ND	0.053	mg/Kg-dry	1	4/3/01 9:13:00 PM
Naphthalene	ND	0.13	mg/Kg-dry	1	4/3/01 9:13:00 PM
Surr: Dibromofluoromethane	89.7	70-130	%REC	1	4/3/01 9:13:00 PM
Surr: 1,2-Dichloroethane-d4	95.1	70-130	%REC	1	4/3/01 9:13:00 PM
Surr: Toluene-d8	88.8	70-130	%REC	1	4/3/01 9:13:00 PM
Surr: 4-Bromofluorobenzene	95.3	70-130	%REC	1	4/3/01 9:13:00 PM
Surr: 2,5-Dibromotoluene	99.5	70-130	%REC	1	4/3/01 9:13:00 PM

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

Were all QA/QC procedures required by the VPH or EPH method followed: Were all performance/acceptance standards for required QA/QC procedures achieved: Ves \_\_\_\_ No - If No, See Case Narrative

Were any significant modifications made to the method as specified in section 11.3:

Yes \_\_\_\_ No - If No, See Case Narrative \_\_\_\_ No \_\_\_\_ Yes - Details enclosed

I attest under the pains and penalties of perjury 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.

SIGNATURE:

PRINTED NAME: Nancy Stewart

4-10-01 DATE:

POSITION: Laboratory Director (or designee)

Qualifiers: RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate. ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits B - Analyte detected in the associated Method Blank H - Method prescribed holding time exceeded

- E Value above quantitation range
- # See Case Narrative

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Date: 10-Apr-01

CLIENT: Weston & Sampson Engineers Lab Order: 0104006			Client Sample ID: Tag Number:				
Project:	200317A BRA P3-	Roxbury		C	ollection Date:	3/29/01	
Lab ID:	0104006-09B				Matrix:	SOIL	
Analyses		Result	RL	Qual L	Jnits	DF	Date Analyzed
	FROLEUM HYDROCAF	RBONS	MAVPH				Analyst: Sk
C5-C8 Aliphatic	c Hydrocarbons	ND	2.8	m	ng/Kg-dry	1	4/3/01 9:49:00 PM
C9-C12 Aliphat	ic Hydrocarbons	ND	0.69	'n	ng/Kg-dry	1	4/3/01 9:49:00 PM
C9-C10 Aromat	tic Hydrocarbons	ND	0.69	m	ng/Kg-dry	1	4/3/01 9:49:00 PM
Methyl tert-buty	/i ether	ND	0.055	n	ng/Kg-dry	1	4/3/01 9:49:00 PM
Benzene		ND	0.055	n	ng/Kg-dry	1	4/3/01 9:49:00 PM
Toluene		ND	0.055	n	ng/Kg-dry	1	4/3/01 9:49:00 PM
Ethylbenzene		ND	0.055	ň	ng/Kg-dry	1	4/3/01 9:49:00 PM
m,p-Xylene		ND	0.055	ń	ng/Kg-dry	1	4/3/01 9:49:00 PM
o-Xylene		ND	0.055	n	ng/Kg-dry	1	4/3/01 9:49:00 PM
Naphthalene		ND	0.14	· n	ng/Kg-dry	1	4/3/01 9:49:00 PM
Surr: Dibrom	ofluoromethane	87.9	70-130	%	6REC	1	4/3/01 9:49:00 PM
Surr: 1,2-Dic	chloroethane-d4	86.6	70-130	9	6REC	1	4/3/01 9:49:00 PM
Surr: Toluen	e-d8	88.0	70-130	9	6REC	1	4/3/01 9:49:00 PM
Surr: 4-Brom	nofluorobenzene	92.9	70-130	9	6REC	1	4/3/01 9:49:00 PM
Surr: 2,5-Dit	promotoluene	97.0	70-130	9	6REC	1	4/3/01 9:49:00 PM

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

Were all QA/QC procedures required by the VPH or EPH method followed: Were all performance/acceptance standards for required QA/QC procedures achieved: Were any significant modifications made to the method as specified in section 11.3: No - If No, See Case Narrative Yes \_\_\_\_\_ No - If No, See Case Narrative Yes \_\_\_\_\_ Yes \_\_\_\_ No - If No, See Case Narrative Yes -\_\_\_\_\_ Ves \_\_\_\_ No - If No, See Case Narrative Yes -\_\_\_\_\_ Ves \_\_\_\_ No - If No, See Case Narrative

I attest under the pains and penalties of perjury 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.

SIGNATURE:

PRINTED NAME: Nancy Stewart

4-10-01 DATE:

POSITION: Laboratory Director (or designee)

Qualifiers: RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate. ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

- E Value above quantitation range
- # See Case Narrative

B - Analyte detected in the associated Method Blank

H - Method prescribed holding time exceeded

Date: 10-Apr-01

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Analyses	Result	RL Qual Units	DF Date Analyzed
Lab ID:	0104006-10A	Matrix:	SOIL
Project:	200317A BRA P3-Roxbury	Collection Date:	3/29/01
Lab Order:	0104006	Tag Number:	
CLIENT:	Weston & Sampson Engineers	Client Sample ID:	Trip Blank

VOLATILE PETROLEUM HYDROCARBONS		MAVPH			Analyst: SK
C5-C8 Aliphatic Hydrocarbons	ND	2.5	mg/Kg	1	4/3/01 6:49:00 PM
C9-C12 Aliphatic Hydrocarbons	ND	0.62	mg/Kg	1	4/3/01 6:49:00 PM
C9-C10 Aromatic Hydrocarbons	ND	0.62	mg/Kg	1	4/3/01 6:49:00 PM
Methyl tert-butyl ether	ND	0.050	mg/Kg	1	4/3/01 6:49:00 PM
Benzene	ND	0.050	mg/Kg	1	4/3/01 6:49:00 PM
Toluene	ND	0.050	mg/Kg	1	4/3/01 6:49:00 PM
Ethylbenzene	ND	0.050	mg/Kg	1	4/3/01 6:49:00 PM
m,p-Xylene	ND	0.050	mg/Kg	1	4/3/01 6:49:00 PM
o-Xylene	ND	0.050	mg/Kg	1	4/3/01 6:49:00 PM
Naphthalene	NÐ	0.12	mg/Kg	1	4/3/01 6:49:00 PM
Surr: Dibromofluoromethane	90.6	70-130	%REC	1	4/3/01 6:49:00 PM
Surr: 1,2-Dichloroethane-d4	107	70-130	%REC	1	4/3/01 6:49:00 PM
Surr: Toluene-d8	<b>97.2</b>	70-130	%REC	1	4/3/01 6:49:00 PM
Surr: 4-Bromofluorobenzene	103	70-130	%REC	1	4/3/01 6:49:00 PM
Surr: 2,5-Dibromotoluene	98.2	70-130	%REC	1	4/3/01 6:49:00 PM

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

Were all QA/QC procedures required by the VPH or EPH method followed: Were all performance/acceptance standards for required QA/QC procedures achieved: Were any significant modifications made to the method as specified in section 11.3: No - If No, See Case Narrative No - If No, See Case Narrative Vers \_\_\_\_\_\_ No - If No, See Case Narrative I attest under the pains and penalties of perjury 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.

SIGNATURE:

PRINTED NAME: Nancy Stewart

4-10-01 DATE:

POSITION: Laboratory Director (or designee)

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate. Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits B - Analyte detected in the associated Method Blank H - Method prescribed holding time exceeded

E - Value above quantitation range

# - See Case Narrative

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	CLIENT:	Weston &
	Lab Order:	0104006
	Project: Lab ID:	200317A 0104006
	Analyses	
. interest	EXTRACTABL	E PETROLE
Π	C9-C18 Aliphat C19-C36 Alipha	ic Hydrocarbo atic Hydrocarb
U	C11-C22 Arom	atic Hydrocart
_	Naphthalene	
	2-Methylnaphth	alene
$\cup$	Acenaphthylen	9
	Fluorene	
	Phenanthrene	
	Anthracene	
CT	Fluoranthene	
5 F	Pyrene	
0	Benz(a)anthrac	æne
Ē	Benzo(b)fluora	nthene
	Benzo(k)fluora	nthene
_	Benzo(a)pyren	e
	I Dibenz(a,h)ant	hracene
U	Indeno(1,2,3-co	1)pyrene
	Surr: 1-Chlo	rooctadecane
	Surr: 2-Brom	nonaphthalene
Ľ	Surr: 2-Fluor	robiphenyl
	Surr: o-Terp	henyl
	-	
Ċ	Hydrocarbon ra	nge data exclu
	Aromatic Hydro	carbons exclu
周	this range and c	concentration
_	CERTIFICATIO	N
	Were all QA/QC	procedures r
ί.	Were all perform	nance/accepta
	Were any signif	icant modifica
i c	information, the	e pains and p material cont
U		, /
	SIGNATURE:	L
1 1945	PRINTED NAM	E: Nancy St
Ľ	l.	
Ē	Qualifiers: R	L - Reporting I
₩I	ND - Not Detecte	ed at the Report
9	J - Analyte detec	ted below quan
60	B - Analyte detec	cted in the asso

& Sampson Engineers N BRA P3-Roxbury

Client Sample ID: SS-1 **Tag Number:** Collection Date: 3/29/01 Matrix: SOIL -01A Result **RL** Qual Units DF Date Analyzed UM HYDROCARBONS MAEPH Analyst: GG ns ND 63 mg/Kg-dry 1 4/5/01 4:39:00 PM 63 ND 4/5/01 4:39:00 PM ons mg/Kg-dry 1 oons 100 63 mg/Kg-dry 1 4/5/01 4:39:00 PM ND 0.32 mg/Kg-dry 1 4/5/01 4:39:00 PM ND 0.32 4/5/01 4:39:00 PM mg/Kg-dry 1 0.62 0.32 mg/Kg-dry 4/5/01 4:39:00 PM 1 0.87 0.32 4/5/01 4:39:00 PM mg/Kg-dry 1 0.32 4/5/01 4:39:00 PM 1.0 mg/Kg-dry 1 0.32 9.6 mg/Kg-dry 1 4/5/01 4:39:00 PM 0.32 2.2 mg/Kg-dry 4/5/01 4:39:00 PM 1

Fluoranthene	11	0.32	mg/Kg-dry	1	4/5/01 4:39:00 PM
Pyrene	9.0	0.32	mg/Kg-dry	1	4/5/01 4:39:00 PM
Benz(a)anthracene	5.2	0.32	mg/Kg-dry	1	4/5/01 4:39:00 PM
Chrysene	4.8	0.32	mg/Kg-dry	1	4/5/01 4:39:00 PM
Benzo(b)fluoranthene	6.4	0.32	mg/Kg-dry	1	4/5/01 4:39:00 PM
Benzo(k)fluoranthene	2.2	0.32	mg/Kg-dry	1	4/5/01 4:39:00 PM
Benzo(a)pyrene	5.0	0.32	mg/Kg-dry	1	4/5/01 4:39:00 PM
Dibenz(a,h)anthracene	0.83	0.32	mg/Kg-dry	1	4/5/01 4:39:00 PM
Indeno(1,2,3-cd)pyrene	3.7	0.32	mg/Kg-dry	1	4/5/01 4:39:00 PM
Benzo(g,h,i)perylene	3.1	0.32	mg/Kg-dry	1	4/5/01 4:39:00 PM
Surr: 1-Chlorooctadecane	99.2	40-140	%REC	1	4/5/01 4:39:00 PM
Surr: 2-Bromonaphthalene	116	40-140	%REC	1	4/5/01 4:39:00 PM
Surr: 2-Fluorobiphenyl	123	40-140	%REC	1	4/5/01 4:39:00 PM
Surr: o-Terphenyl	104	40-140	%REC	1	4/5/01 4:39:00 PM
lydrocarbon range data exclude concent	trations of any surro	date(s) and/or in	ternal standards elu	tino in that	range, EPH: C11-C22

de the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the coneluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in of C9-C10 Aromatic Hydrocarbons.

ations made to the method as specified in section 11.3:

required by the VPH or EPH method followed: ance standards for required QA/QC procedures achieved: Yes No - If No, See Case Narrative \_\_\_\_ No 🖌 Yes - Details enclosed

penalties of perjury that, based upon my inquiry of those individuals immediately responsible for obtaining the tained in this report is, to the best of my knowledge and belief, accurate and complete.

DATE

ewar

4-10-01

POSITION: Laboratory Director (or designee)

Limit; defined as the lowest concentration the laboratory can accurately quantitate.

- S Spike Recovery outside accepted recovery limits ting Limit ntitation limits
  - R RPD outside accepted recovery limits

ciated Method Blank

H - Method prescribed holding time exceeded

E - Value above quantitation range

# - See Case Narrative

CLIENT:	Weston & Sampson	Engineers		Client	Sample ID:	SS-2	
Lab Order:	0104006			T	ag Number:		
Project:	200317A BRA P3-	Roxbury		Coll	ection Date:	3/29/01	
Lab ID:	0104006-02A				Matrix:	SOIL	
Analyses		Result	RL	Qual Uni	ts	DF	Date Analyzed
EXTRACTABL	E PETROLEUM HYDR	OCARBONS	MAEPH				Analyst: G
C9.C18 Aliphat	ie Hydrocarbone		61	mal	(a.do)	1	4/5/01 5:13:00 DM
C19-C36 Alinha	tic Hydrocarbons	ND	10	mg/l	∖g-ury Ka_drv	1	4/5/01 5:13:00 PM
C11-C22 Arom:	atic Hydrocarbons	190	61	ma/l	kg-dry Ka-dry	1	4/5/01 5:13:00 PM
Nanhthalene		0.31	0.30	ma/l	Kg-dry Ka-dry	1	4/5/01 5:13:00 PM
2-Methvinaphth	alene	ND	0.30	ma/l	(g-dry	1	4/5/01 5:13:00 PM
Acenaphthylen	2	ND	0.30	ma/l	(g.dry	1	4/5/01 5:13:00 PM
Acenaphthene	-	1.6	0.30	ma/l	Ka-drv	1	4/5/01 5:13:00 PM
Fluorene		1.4	0.30	ma/l	Ka-drv	1	4/5/01 5:13:00 PM
Phenanthrene		18	0.30	ma/l	Ka-dry	1	4/5/01 5:13:00 PM
Anthracene		3.7	0.30	mg/l	Kg-dry	1	4/5/01 5:13:00 PM
Fluoranthene		20	0.30	mg/l	Kg-dry	1	4/5/01 5:13:00 PM
Pyrene		16	0.30	mg/l	Kg-dry	1	4/5/01 5:13:00 PM
Benz(a)anthrac	ene	9.4	0.30	mg/l	Kg-dry	1	4/5/01 5:13:00 PM
Chrysene		9.1	0.30	mg/l	Kg-dry	1	4/5/01 5:13:00 PM
Benzo(b)fluorar	nthene	12	0.30	mg/l	Kg-dry	1	4/5/01 5:13:00 PM
Benzo(k)fluorar	hthene	4.4	0.30	mg/l	Kg-dry	1	4/5/01 5:13:00 PM
Benzo(a)pyrene	e	8.7	0.30	mg/l	Kg-dry	1	4/5/01 5:13:00 PM
Dibenz(a,h)antl	hracene	1.6	0.30	mg/l	Kg-dry	1	4/5/01 5:13:00 PM
Indeno(1,2,3-cc	l)pyrene	7.0	0.30	mg/	Kg-dry	1	4/5/01 5:13:00 PM
Benzo(g,h,i)per	ylene	6.1	0.30	mg/	Kg-dry	1	4/5/01 5:13:00 PM
Surr: 1-Chior	rooctadecane	80.6	40-140	%RI	EC	1	4/5/01 5:13:00 PM
Surr: 2-Brom	onaphthalene	114	40-140	%RI	EC	1	4/5/01 5:13:00 PM
Surr: 2-Fluor	obiphenyl	114	40-140	%RI	EC	1	4/5/01 5:13:00 PM
Surr: o-Terpl	henyl	90.2	40-140	%R	EC	1	4/5/01 5:13:00 PM

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

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Were all QA/QC procedures required by the VPH or EPH method followed:

Were all performance/acceptance standards for required QA/QC procedures achieved: Were any significant modifications made to the method as specified in section '11.3:

Yes No - If No, See Case Narrative Yes No - If No, See Case Narrative No Ves - Details enclosed

I attest under the pains and penalties of perjury 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.

DATE:

SIGNATURE:

PRINTED NAME: Nancy Stewart

POSITION: Laboratory Director (or designee)

 Qualifiers:
 RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

 ND - Not Detected at the Reporting Limit
 S - Spike Recovery outside accepted recovery limits
 E - Val

 J - Analyte detected below quantitation limits
 R - RPD outside accepted recovery limits
 # - See

 B - Analyte detected in the associated Method Blank
 H - Method preseribed holding time exceeded

E - Value above quantitation range

# - See Case Narrative

CLIENT:	Weston & Sampson	n Engineers		C	lient Sample ID:	SS-3	
Lab Order:	0104006				Tag Number:		
Project:	200317A BRA P3	-Roxbury			Collection Date:	3/29/01	
Lab ID:	0104006-03A				Matrix:	SOIL	
Analyses		Result	RL	Qual	Units	DF	Date Analyzed
EXTRACTABL		OCARBONS N	AEPH				Analyst: G
C9-C18 Aliphat	ic Hydrocarbons	ND	59		mg/Kg-dry	1	4/5/01 5:48:00 PM
C19-C36 Alipha	atic Hydrocarbons	ND	59		mg/Kg-dry	1	4/5/01 5:48:00 PM
C11-C22 Arom	atic Hydrocarbons	170	59		mg/Kg-dry	1	4/5/01 5:48:00 PM
Naphthalene		0.69	0.30		mg/Kg-dry	1	4/5/01 5:48:00 PM
2-Methylnaphth	alene	0.35	0.30		mg/Kg-dry	1	4/5/01 5:48:00 PM
Acenaphthylen	e	0.67	0.30		mg/Kg-dry	1	4/5/01 5:48:00 PM
Acenaphthene		1.3	0.30		mg/Kg-dry	1	4/5/01 5:48:00 PM
Fluorene		1.4	0.30		mg/Kg-dry	1	4/5/01 5:48:00 PM
Phenanthrene		12	0.30		mg/Kg-dry	1	4/5/01 5:48:00 PM
Anthracene		3.4	0.30		mg/Kg-dry	1	4/5/01 5:48:00 PM
Fluoranthene		14	0.30		mg/Kg-dry	1	4/5/01 5:48:00 PM
Pyrene		11	0.30		mg/Kg-dry	1	4/5/01 5:48:00 PM
Benz(a)anthrac	ene	7.1	0.30		mg/Kg-dry	1	4/5/01 5:48:00 PM
Chrysene		6.3	0.30		mg/Kg-dry	1	4/5/01 5:48:00 PM
Benzo(b)fluora	nthene	8.3	0.30		mg/Kg-dry	1	4/5/01 5:48:00 PM
Benzo(k)fluora	nthene	3.2	0.30		mg/Kg-dry	1	4/5/01 5:48:00 PM
Benzo(a)pyren	e	6.8	0.30		mg/Kg-dry	1	4/5/01 5:48:00 PM
Dibenz(a,h)ant	hracene	1.1	0.30		mg/Kg-dry	1	4/5/01 5:48:00 PM
Indeno(1,2,3-c	d)pyrene	4.6	0.30		mg/Kg-dry	1	4/5/01 5:48:00 PM
Benzo(g,h,i)pe	rylene	4.0	0.30		mg/Kg-dry	1	4/5/01 5:48:00 PM
Surr: 1-Chlo	rooctadecane	91.8	40-140		%REC	1	4/5/01 5:48:00 PM
Surr: 2-Bron	nonaphthalene	124	40-140		%REC	1	4/5/01 5:48:00 PM
Surr: 2-Fluo	robiphenyl	125	40-140		%REC	1	4/5/01 5:48:00 PM
Sun o-Terp	nenyi	90.1	40-140		3REC	ı	4/3/01 3.46.00 FM
Hydrocarbon ra Aromatic Hydro centration of tar this range and o	nge data exclude concent carbons exclude the conc get analytes eluting in this concentration of C9-C10 A	rations of any surro entration of target F s range. C9-C12 Al romatic Hydrocarb	ogate(s) and/ PAH analytes liphatic Hydrons.	or inten s. VPH: ocarbon	nal standards eluting C5-C8 Aliphatic Hy is exclude the conce	in that ran drocarbon ntration of	ge. EPH: C11-C22 s exclude the con- target analytes eluting

standards for required UAVQC p Were any significant modifications made to the method as specified in section 11.3: \_\_\_\_ No

ative ative Yes - Details enclosed

I attest under the pains and penalties of perjury 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.

SIGNATURE:

I

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PRINTED NAME: Nancy Stewart

4-10-01 DATE:

POSITION: Laboratory Director (or designee)

Qualifiers: RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate. ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits H - Method prescribed holding time exceeded B - Analyte detected in the associated Method Blank

E - Value above quantitation range

# - See Case Narrative

ji.	CLIENT:	Weston & Sam
	Lab Order:	0104006
	Project:	200317A BRA
	Lab ID:	0104006-04A
	Analyses	
	EXTRACTABL	E PETROLEUM H
Π	C9-C18 Aliphat	ic Hydrocarbons
-	C19-C36 Alipha	atic Hydrocarbons
<b>F</b>	Naphthalene	atic Hydrocarbons
	2-Methylnaphth	nalene
LJ	Acenaphthylen	e
<b>F</b> -1	Acenaphthene	
	Fluorene	
	Phenanthrene	
<b>1</b> 1	Fluoranthene	
	Pyrene	
السدا	Benz(a)anthrac	æne
<b>۲</b> -1	Chrysene	
ļ	Benzo(b)fluora	nthene
	Benzo(k)fluora	nthène
	Dibenz(a,h)ant	hracene
L	Indeno(1,2,3-c	d)pyrene
	Benzo(g,h,i)pe	rylene
Π	Surr: 1-Chlo	rooctadecane
	Surr: 2-Bron	nonaphthalene
	Surr: 2-Fluo	robipnenyi henvi
Π		licity
IJ		
_	Hydrocarbon ra	nge data exclude co
1	centration of tai	get analytes eluting
لنا	this range and o	concentration of C9-0
ا <del>ب</del> ا	CERTIFICATIO	N
:	Were all QA/QC	C procedures require
	Were all perform	nance/acceptance st
	/ attest under th	e pains and penaltie
<u>,  </u>	information, the	material contained i
Π	SIGNATURE:	
	I PRINTED NAM	E: Nancy Stewart
	1	
	Qualifiers: R	L - Reporting Limit; d
U	ND - Not Detect	ed at the Reporting Lir
_	B - Analyte detec	cted in the associated h
ш		

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# AMRO Environmental Laboratories Corp.

LIENT:	Weston & Sampsor	Engineers		Client Sample ID	: SS-4		
ab Order:	0104006			Tag Number	:		
roject:	200317A BRA P3-	Roxbury		Collection Date	: 3/29/01		
ab ID:	0104006-04A	-		Matrix	SOIL		
nalyses		Result	RL	Qual Units	DF	Date Analyzed	
TRACTABL	E PETROLEUM HYDR	OCARBONS	MAEPH			Analyst: GG	
C9-C18 Aliphat	ic Hydrocarbons	ND	59	mg/Kg-dry	1	4/5/01 6:22:00 PM	
C19-C36 Alipha	atic Hydrocarbons	ND	59	mg/Kg-dry	1	4/5/01 6:22:00 PM	
C11-C22 Aroma	atic Hydrocarbons	ND	59	mg/Kg-dry	1	4/5/01 6:22:00 PM	
Naphthalene		ND	0.30	mg/Kg-dry	1	4/5/01 6:22:00 PM	
2-Methylnaphth	alene	ND	0.30	mg/Kg-dry	1	4/5/01 6:22:00 PM	
Acenaphthylen	e	ND	0.30	mg/Kg-dry	1	4/5/01 6:22:00 PM	
Acenaphthene		0.35	0.30	mg/Kg-dry	1	4/5/01 6:22:00 PM	
Fluorene		0.41	0.30	mg/Kg-dry	1	4/5/01 6:22:00 PM	
Phenanthrene		4.4	0.30	mg/Kg-dry	1	4/5/01 6:22:00 PM	
Anthracene		1.1	0.30	mg/Kg-dry	1	4/5/01 6:22:00 PM	
Fluoranthene		5.3	0.30	mg/Kg-dry	1	4/5/01 6:22:00 PM	
Pyrene		4.7	0.30	mg/Kg-dry	1	4/5/01 6:22:00 PM	
Benz(a)anthrac	æne	2.8	0.30	mg/Kg-dry	1	4/5/01 6:22:00 PM	
Chrysene		2.6	0.30	mg/Kg-dry	1	4/5/01 6:22:00 PM	
Benzo(b)fluora	nthene	3.3	0.30	. mg/Kg-dry	1	4/5/01 6:22:00 PM	
Benzo(k)fluora	nthene	1.1	0.30	mg/Kg-dry	1	4/5/01 6:22:00 PM	
Benzo(a)pyren	e	2.5	0.30	mg/Kg-dry	1	4/5/01 6:22:00 PM	
Dibenz(a,h)ant	hracene	0.42	0.30	mg/Kg-dry	1	4/5/01 6:22:00 PM	
Indeno(1,2,3-c	d)pyrene	1.8	0.30	mg/Kg-dry	1	4/5/01 6:22:00 PM	
Benzo(g,h,i)pe	rylene	1.5	0.30	mg/Kg-dry	1	4/5/01 6:22:00 PM	
Surr: 1-Chlo	rooctadecane	90.5	40-140	%REC	1	4/5/01 6:22:00 PM	
Surr: 2-Brom	nonaphthalene	104	40-140	%REC	1	4/5/01 6:22:00 PM	
Surr: 2-Fluor	robiphenyi	105	40-140	%REC	1	4/5/01 6:22:00 PM	
Surr: o-Terp	henyl	92.8	40-140	%REC	1	4/5/01 6:22:00 PM	
oun o roip		02.0	40 140		•		

data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 bons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the conanalytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in centration of C9-C10 Aromatic Hydrocarbons.

ocedures required by the VPH or EPH method followed:

in the associated Method Blank

ce/acceptance standards for required QA/QC procedures achieved: nt modifications made to the method as specified in section 11.3:

 ✓
 Yes
 \_\_\_\_\_\_\_ No - If No, See Case Narrative

 \_\_\_\_\_\_ Yes
 ✓
 No - If No, See Case Narrative

 \_\_\_\_\_\_ No
 ✓
 Yes - Details enclosed

ains and penalties of perjury that, based upon my inquiry of those individuals immediately responsible for obtaining the aterial contained in this report is, to the best of my knowledge and belief, accurate and complete.

DATE:

POSITION: Laboratory Director (or designee)

Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate. t the Reporting Limit S - Spike Recovery outside accepted recovery limits

H - Method prescribed holding time exceeded

below quantitation limits R - RPD outside accepted recovery limits

- E Value above quantitation range
  - # See Case Narrative

AMRO En	Date: 10-Apr-01           Weston & Sampson Engineers 0104006         Client Sample ID: SP-1 0104006           Q0317A BRA P3-Roxbury 0104006-06A         Collection Date: 3/29/01 Matrix: SOIL           Result         RL Qual Units         DF         Date Analyzed           SLE PETROLEUM HYDROCARBONS         MAEPH         Analyst: GG           ND         55         mg/Kg-dry         1         4/5/01 6:57:00 PM           wratic Hydrocarbons         ND         55         mg/Kg-dry         1         4/5/01 6:57:00 PM           ND         0.28         mg/Kg-dry         1         4/5/01 6:57:00 PM           wratic Hydrocarbons         ND         0.28         mg/Kg-dry         1         4/5/01 6:57:00 PM           ND         0.28         mg/Kg-dry         1         4/5/01 6:57:00 PM           wratic Hydrocarbons         ND         0.28         mg/Kg-dry         1         4/5/01 6:57:00 PM           matic Hydrocarbons         ND         0.28         mg/Kg-dry         1         4/5/01 6:57:00 PM           matic Hydrocarbons         ND         0.28         mg/Kg-dry         1         4/5/01 6:57:00 PM           me         ND         0.28         mg/Kg-dry         1         4/5/01 6:57:00 PM     <					
CLIENT:	Weston & Sampson	Engineers		Client Sample ID	: SP-1	
Lab Order:	0104006			Tag Number	:	
Project:	200317A BRA P3-	Roxbury		Collection Date	: 3/29/01	
Lab ID:	0104006-06A	-		Matrix	SOIL	
Analyses		Result	RL (	Qual Units	DF	Date Analyzed
EXTRACTABL	E PETROLEUM HYDR	OCARBONS M	AEPH			Analyst: GG
C9-C18 Aliphati	ic Hydrocarbons	ND	55	mg/Kg-dry	1	4/5/01 6:57:00 PM
C19-C36 Alipha	tic Hydrocarbons	ND	55	mg/Kg-dry	1	4/5/01 6:57:00 PM
C11-C22 Aroma	atic Hydrocarbons	73	55	mg/Kg-dry	1	4/5/01 6:57:00 PM
Naphthalene		ND	0.28	mg/Kg-dry	1	4/5/01 6:57:00 PM
2-Methylnaphth	alene	ND	0.28	mg/Kg-dry	1	4/5/01 6:57:00 PM
Acenaphthylene	e	ND	0.28	mg/Kg-dry	1	4/5/01 6:57:00 PM
Acenaphthene		0.89	0.28	mg/Kg-dry	1	4/5/01 6:57:00 PM
Fluorene		0.73	0.28	mg/Kg-dry	1	4/5/01 6:57:00 PM
Phenanthrene		7.1	0.28	mg/Kg-dry	1	4/5/01 6:57:00 PM
Anthracene		1.7	0.28	mg/Kg-dry	1	4/5/01 6:57:00 PM
Fluoranthene		7.9	0.28	mg/Kg-dry	1	4/5/01 6:57:00 PM
Pyrene		6.8	0.28	mg/Kg-dry	1	4/5/01 6:57:00 PM
Benz(a)anthrac	ene	3.9	0.28	mg/Kg-dry	1	4/5/01 6:57:00 PM
Chrysene		3.6	0.28	mg/Kg-dry	1	4/5/01 6:57:00 PM
Benzo(b)fluorar	nthene	4.9	0.28	mg/Kg-dry	1	4/5/01 6:57:00 PM
Benzo(k)fluorar	nthene	1.5	0.28	mg/Kg-dry	1	4/5/01 6:57:00 PM
Benzo(a)pyrene	e	3.7	0.28	mg/Kg-dry	1	4/5/01 6:57:00 PM
Dibenz(a,h)antl	hracene	0.55	0.28	mg/Kg-dry	1	4/5/01 6:57:00 PM
Indeno(1,2,3-co	d)pyrene	2.4	0.28	mg/Kg-dry	1	4/5/01 6:57:00 PM
Benzo(g,h,i)per	ylene	2.2	0.28	mg/Kg-dry	1	4/5/01 6:57:00 PM
Surr: 1-Chlor	rooctadecane	97.6	40-140	%REC	1	4/5/01 6:57:00 PM
Surr: 2-Brom	onaphthalene	108	40-140	%REC	1	4/5/01 6:57:00 PM
Surr: 2-Fluor	obiphenyl	108	40-140	%REC	1	4/5/01 6:57:00 PM
Surr: o-Terpl	henyl	88.8	40-140	%REC	1	4/5/01 6:57:00 PM

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

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Were all QA/QC procedures required by the VPH or EPH method followed:

Were all performance/acceptance standards for required QA/QC procedures achieved: Were any significant modifications made to the method as specified in section 11.3:

I attest under the pains and penalties of perjury 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.

DATE:

SIGNATURE:

PRINTED NAME: Nancy Stewart

4-10-01

POSITION: Laboratory Director (or designee)

Qualifiers: RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate. ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

J - Analyte detected below quantitation limits B - Analyte detected in the associated Method Blank H - Method prescribed holding time exceeded

E - Value above quantitation range

Yes
 No - If No, See Case Narrative

 Yes
 No - If No, See Case Narrative

 No
 Yes - Details enclosed

Weston & Sampson Engineers 0104006

Result

MAEPH

200317A BRA P3-Roxbury 0104006-07A

## Date: 10-Apr-01

Client Sample ID: SP-2

Matrix: SOIL

DF

**Tag Number:** Collection Date: 3/29/01 \_\_\_\_\_

Date Analyzed

Analyst: GG

4/5/01 7:31:00 PM C9-C18 Aliphatic Hydrocarbons ND 60 mg/Kg-dry 1 C19-C36 Aliphatic Hydrocarbons ND 60 mg/Kg-dry 1 4/5/01 7:31:00 PM 4/5/01 7:31:00 PM C11-C22 Aromatic Hydrocarbons 66 60 mg/Kg-dry 1 ND 0.30 mg/Kg-dry 1 4/5/01 7:31:00 PM ND 0.30 mg/Kg-dry 1 4/5/01 7:31:00 PM ND 0.30 4/5/01 7:31:00 PM 1 mg/Kg-dry 0.47 0.30 1 4/5/01 7:31:00 PM mg/Kg-dry 0.37 0.30 1 4/5/01 7:31:00 PM mg/Kg-dry 4.2 0.30 mg/Kg-dry 1 4/5/01 7:31:00 PM 0.95 0.30 4/5/01 7:31:00 PM mg/Kg-dry 1 3.9 0.30 mg/Kg-dry 1 4/5/01 7:31:00 PM 0.30 1 4/5/01 7:31:00 PM 4.1 mg/Kg-dry 22 0.30 mg/Kg-dry 1 4/5/01 7:31:00 PM 4/5/01 7:31:00 PM 2.3 0.30 mg/Kg-dry 1 2.4 0.30 mg/Kg-dry 1 4/5/01 7:31:00 PM 0.64 0.30 4/5/01 7:31:00 PM mg/Kg-dry 1 1.9 0.30 mg/Kg-dry 1 4/5/01 7:31:00 PM 0.30 4/5/01 7:31:00 PM 0.32 mg/Kg-dry 1 1.2 0.30 mg/Kg-dry 1 4/5/01 7:31:00 PM 0.30 4/5/01 7:31:00 PM 1.2 mg/Kg-dry 1 Surr: 1-Chlorooctadecane 105 40-140 %REC 4/5/01 7:31:00 PM %REC 4/5/01 7:31:00 PM Surr: 2-Bromonaphthalene 119 40-140 4/5/01 7:31:00 PM 118 40-140 %REC Surr: 2-Fluorobiphenyl 88.2 40-140 %REC 1 4/5/01 7:31:00 PM

**RL** Qual Units

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

### CERTIFICATION

Were all QA/QC procedures required by the VPH or EPH method followed: Were all performance/acceptance standards for required QA/QC procedures achieved: \_\_\_\_ Yes 🗹 No - If No, See Case Narrative

🗸 Yes 🔄

No - If No, See Case Narrative \_\_\_ No V Yes - Details enclosed

Were any significant modifications made to the method as specified in section 11.3: I attest under the pains and penalties of perjury 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.

SIGNATURE:

PRINTED NAME: Nancy Stewart

4-10-01 DATE:

POSITION: Laboratory Director (or designee)

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate. **Oualifiers:** ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits B - Analyte detected in the associated Method Blank H - Method prescribed holding time exceeded

E - Value above quantitation range

# - See Case Narrative

CLIENT:	Weston & Sampson	n Engineers	-	Client Sample II	D: SP-3	
.ab Order:	0104006			Tag Numbe	er:	
Project:	200317A BRA P3	Roxbury		<b>Collection Dat</b>	e: 3/29/01	
.ab ID:	0104006-08A	,		Matri	x: SOIL	
nalyses		Result	RL	Qual Units	DF	Date Analyzed
XTRACTABL		OCARBONS	MAEPH			Analyst: G
C9-C18 Aliphat	ic Hydrocarbons	ND	54	mg/Kg-dry	1	4/5/01 8:06:00 PM
C19-C36 Alipha	atic Hydrocarbons	55	54	mg/Kg-dry	1	4/5/01 8:06:00 PM
C11-C22 Aroma	atic Hydrocarbons	92	54	mg/Kg-dry	1	4/5/01 8:06:00 PM
Naphthalene		0.29	0.27	mg/Kg-dry	1	4/5/01 8:06:00 PM
2-Methylnaphth	alene	0.31	0.27	mg/Kg-dry	1	4/5/01 8:06:00 PM
Acenaphthylene	e	0.30	0.27	mg/Kg-dry	1	4/5/01 8:06:00 PM
Acenaphthene		1.2	0.27	mg/Kg-dry	1	4/5/01 8:06:00 PM
Fluorene		1.3	0.27	mg/Kg-dry	1	4/5/01 8:06:00 PM
Phenanthrene		8.0	0.27	mg/Kg-dry	1	4/5/01 8:06:00 PM
Anthracene		2.3	0.27	mg/Kg-dry	1	4/5/01 8:06:00 PM
Fluoranthene		8.6	0.27	mg/Kg-dry	1	4/5/01 8:06:00 PM
Pyrene		7.3	0.27	mg/Kg-dry	1	4/5/01 8:06:00 PM
Benz(a)anthrac	æne	4.3	0.27	mg/Kg-dry	1	4/5/01 8:06:00 PM
Chrysene		4.1	0.27	mg/Kg-dry	1	4/5/01 8:06:00 PM
Benzo(b)fluorai	nthene	5.1	0.27	mg/Kg-dry	1	4/5/01 8:06:00 PM
Benzo(k)fluorai	nthene	2.0	0.27	mg/Kg-dry	1	4/5/01 8:06:00 PM
Benzo(a)pyrene	e	4.2	0.27	mg/Kg-dry	1	4/5/01 8:06:00 PM
Dibenz(a,h)ant	hracene	0.60	0.27	mg/Kg-dry	1	4/5/01 8:06:00 PM
Indeno(1,2,3-cc	d)pyrene	2.8	0.27	mg/Kg-dry	1	4/5/01 8:06:00 PM
Benzo(g,h,i)per	rylene	2.5	0.27	mg/Kg-dry	1	4/5/01 8:06:00 PM
Surr: 1-Chlor	rooctadecane	81.6	40-140	%REC	1	4/5/01 8:06:00 PM
Surr: 2-Brom	nonaphthalene	119	40-140	%REC	1	4/5/01 8:06:00 PM
Surr: 2-Fluor	obiphenyl	116	40-140	%REC	1	4/5/01 8:06:00 PM
Surr: o-Terpl	henyl	97.8	40-140	%REC	1	4/5/01 8:06:00 PM

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

Were all QA/QC procedures required by the VPH or EPH method followed:

Were all performance/acceptance standards for required QA/QC procedures achieved: \_\_\_\_ Yes Were any significant modifications made to the method as specified in section 11.3: \_\_\_\_ No

No - If No, See Case Narrative Yes Yes Z No - If No, See Case Narrative 🖌 Yes - Details enclosed

I attest under the pains and penalties of perjury 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.

SIGNATURE:

PRINTED NAME: Nancy Stewart

4-10-01 DATE:

POSITION: Laboratory Director (or designee)

 Qualifiers:
 RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

 ND - Not Detected at the Reporting Limit
 S - Spike Recovery outside accepted recovery limits
 E - Val

 J - Analyte detected below quantitation limits
 R - RPD outside accepted recovery limits
 # - See

 B - Analyte detected in the associated Method Blank
 H - Method prescribed holding time exceeded

- E Value above quantitation range
- # See Case Narrative

AMRO En	ivironmental La	boratorie	es Corp.		Date: 10-Ap	pr-01
CLIENT:	Weston & Sampson	Engineers		Client Sam	ole ID: DUP2	<u>-</u> · · - ·
Lab Order:	0104006			Tag Nu	mber:	
Project:	200317A BRA P3-	Roxbury		Collection	Date: 3/29/0	)1
Lab ID:	0104006-09A	·		N	fatrix: SOIL	
Analyses		Result	RL	Qual Units	DF	Date Analyzed
EXTRACTABL	E PETROLEUM HYDRO	CARBONS	MAEPH			Analyst: G
C9-C18 Aliphat	lic Hydrocarbons	ND	57	mg/Kg-dry	1	4/5/01 9:15:00 PM
C19-C36 Alipha	atic Hydrocarbons	65	57	mg/Kg-dry	1	4/5/01 9:15:00 PM
C11-C22 Aroma	atic Hydrocarbons	ND	57	mg/Kg-dry	1	4/5/01 9:15:00 PM
Naphthalene		ND	0.29	mg/Kg-dry	1	4/5/01 9:15:00 PM
2-Methylnaphth	nalene	ND	0.29	mg/Kg-dry	1	4/5/01 9:15:00 PM
Acenaphthylen	e	ND	0.29	mg/Kg-dry	1	4/5/01 9:15:00 PM
Acenaphthene		0.36	0.29	mg/Kg-dry	1	4/5/01 9:15:00 PM
Fluorene		0.32	0.29	mg/Kg-dry	1	4/5/01 9:15:00 PM
Phenanthrene		3.8	0.29	mg/Kg-dry	1	4/5/01 9:15:00 PM
Anthracene		0.99	0.29	mg/Kg-dry	1	4/5/01 9:15:00 PM
Fluoranthene		4.4	0.29	mg/Kg-dry	1	4/5/01 9:15:00 PM
Pyrene		4.1	0.29	mg/Kg-dry	1	4/5/01 9:15:00 PM
Benz(a)anthrac	cene	2.3	0.29	mg/Kg-dry	1	4/5/01 9:15:00 PM
Chrysene		2.2	0.29	mg/Kg-dry	1	4/5/01 9:15:00 PM
Benzo(b)fluora	nthene	2.6	0.29	mg/Kg-dry	1.	4/5/01 9:15:00 PM
Benzo(k)fluorai	nthene	0.81	0.29	mg/Kg-dry	1	4/5/01 9:15:00 PM
Benzo(a)pyren	e	2.0	0.29	mg/Kg-dry	1	4/5/01 9:15:00 PM
Dibenz(a,h)ant	hracene	0.34	0.29	mg/Kg-dry	1	4/5/01 9:15:00 PM
Indeno(1,2,3-co	d)pyrene	1.3	0.29	mg/Kg-dry	1	4/5/01 9:15:00 PM
Benzo(g,h,i)pe	rylene	1.2	0.29	mg/Kg-dry	1	4/5/01 9:15:00 PM
Surr: 1-Chlor	rooctadecane	85.8	40-140	%REC	1	4/5/01 9:15:00 PM
Surr: 2-Brom	nonaphthalene	112	40-140	%REC	1	4/5/01 9:15:00 PM
Surr: 2-Fluor	robiphenyl	106	40-140	%REC	1	4/5/01 9:15:00 PM
						4/5/04 0.45.00 DM

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

#### CERTIFICATION

**J** 

Were all QA/QC procedures required by the VPH or EPH method followed:

Were all performance/acceptance standards for required QA/QC procedures achieved:

Were any significant modifications made to the method as specified in section 11.3:

Yes \_\_\_\_\_ No - If No, See Case Narrative Yes \_\_\_\_\_ No - If No, See Case Narrative No \_\_\_\_\_ Yes - Details enclosed

I attest under the pains and penalties of perjury 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.

SIGNATURE:

PRINTED NAME: Nancy Stewart

10-0

POSITION: Laboratory Director (or designee)

Qualifiers: RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits

- S Spike Recovery outside accepted reco
- J Analyte detected below quantitation limits R RPD outside accepted reco
- R RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank H - Method

ry limits # - See Cas

DATE:

H - Method prescribed holding time exceeded

- E Value above quantitation range
- # See Case Narrative

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				Analysis Dat	4/5/0	4/4/0	4/4/0	4/5/0	4/4/0	4/4/0	4/5/0	4/4/0	4/4/0	4/5/0	4/4/0	4/4/0	4/4/0	4/4/0	4/5/0	4/3/0	4/9/0	4/4/0	4/4/0	4/4/0	4/5/0	4/3/0	4/9/0	4/4/0	4/4/0	4/4/0	4/5/0	4/3/0
			KI																													
			KEY	ep Date	1/01		10/1	10/1		10/1	1/01		1/01	10/1		10/1	10/1		1/01	10/63	2/01	10/1	10/1		1/01	10/63	2/01	1/01	1/01		1/01	10/6
	4m-01-		S.H. I. A	ate Pr	4/7		4/4	4/4		4/7	4//		4/4	4/4		4/4	4/4		4/4	3/2	4/(	4/4	4/4		4/4	3/2	4/6	4/4	4/4		4/4	3/2
	-07	f	AUL A	TCLP D																												
				1																IS						S						S
							1/6010			1/6010			1/6010			1/6010	1/6010			Hydrocarbor	LIDS	1/6010				Hydrocarbon	LIDS	1/6010				Hydrocarbon
	÷			вте	ioil, Full List	t Moisture	ETALS, 305	ioil, Full List	t Moisture	ETALS, 305	oil, Full List	t Moisture	ETALS, 305	oil, Full List	t Moisture	ETALS, 305	ETALS, 305	i Moisture	oil, Full List	e Petroleum	IN SOIL/SOI	ETALS, 305	URY, Soil	t Moisturc	oil, Full List	e Petroleum	IN SOIL/SOI	ETALS, 305	URY, Soil	Moisture	oil, Full Lîst	e Petroleum
				Test N	EPH, S	Pcrcent	ICP MI	EPH, S	Pcrcent	ICP MI	EPH, S	Pcrcent	ICP MI	EPH, S	Percent	ICP MI	ICP MI	Percent	EPH, S	Volatile	PCBS 1	ICP MI	MERC	Percent	EPH, S	Volatile	PCBS I	ICP MI	MERC	Percent	EPH, S	Volatile
				Matrix	Soil																											
	<u>corp.</u>			ate																												
	Uries (		ers y	ollection Da	3/29/01																											
	abura		on Engine 3-Roxbur																													
	ental T	9	& Samps A BRA P	ple ID																												
	ILOUTIN	010400	Weston 200317	Client Sam	I-SS			SS-2			SS-3			SS-4			DUP		SP-1						SP-2						SP-3	
The second second second second second second second second second second second second second second second se	COEUV	der:		D	01A		01B	02A		02B	03 <b>A</b>		03B	04A		04B	05A		06A	06B	06C	06D			07A	07 <b>B</b>	07C	07D			<b>D8A</b>	08B
	-AIVIH	Lab Or	Client: Project	Sample I	0104006-		0104006-	0104006-		0104006-	01040064		0104006-	0104006-		0104006-	0104006-		01040064	01040064	01040064	01040064			0104006-(	0104006-(	0104006-(	0104006-(			0104006-(	0104006-

AWRO EI	nvironmentai <u>tabo</u>	ratories Corp				
Lab Order: Client: Project:	0104006 Weston & Sampson En, 200317A BRA P3-Rox	gineers kbury			DATES REPO	ORT
Sample ID	Client Sample ID	Collection Date N	Matrix	Test Name	TCLP Date Prep Date	Analysis Date
0104006-08C	SP-3	3/29/01	Soil	PCBS IN SOIL/SOLIDS	4/6/01	4/9/01
0104006-08D				ICP METALS, 3051/6010	4/4/01	4/4/01
				MERCURY, Soil	4/4/01	4/4/01
				Percent Moisture		4/4/01
0104006-09A	DUP2			EPH, Soil, Full List	4/4/01	4/5/01
0104006-09B				Volatile Petroleum Hydrocarbons	3/29/01	4/3/01
0104006-09C				PCBS IN SOIL/SOLIDS	4/6/01	4/9/01
0104006-09D				ICP METALS, 3051/6010	4/4/01	4/4/01
				MERCURY, Soil	4/4/01	4/4/01
				Percent Moisture		4/4/01
0104006-10A	Trip Blank			Volatile Petroleum Hydrocarbons	3/29/01	4/3/01

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AMRO Environmental Laboratories Corporation 111 Herrick Street Merrimack, NH 03054

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## Volatile Petroleum Hydrocarbons (VPH) Massachusetts Department of Environmental Protection (MADEP) Method 1.0 - January 1998 AMRO Modifications

This modification is based on the use of a purge and trap gas chromatography mass spectrometer (GC/MS) system to analyze samples for VPH. The hydrocarbon ranges are quantified using predominant mass fragmentation ions which are characteristic for the range being measured. This approach eliminates potential false positives for the target analytes while providing accurate hydrocarbon range data.

The chromatographic column is an HP-624 capillary column which has been validated by GC/MS analysis of a gasoline standard to correctly identify the marker compounds and elution order of specific gasoline components. Batch quality control includes, at a minimum, method blank, laboratory control sample, and duplicate analysis. A matrix spike and/or matrix spike duplicate is analyzed if sufficient sample is submitted to the laboratory.

The Reporting Limit (RL) of this method for each of the collective aliphatic and aromatic ranges is approximately 0.6-2.8 mg/kg in soil and 25-110  $\mu$ g/L in water. The RL of this method for the target analytes ranges from approximately 0.05-0.13 mg/kg in soil and 2.0-5.0  $\mu$ g/L for water samples.

## Extractable Petroleum Hydrocarbons (EPH) Massachusetts Department of Environmental Protection (MADEP) Method 1.0 - January 1998 AMRO Modifications

This modification is based on a solvent extraction and gas chromatography mass spectrometer (GC/MS) analysis. The hydrocarbon ranges are quantified using predominant mass fragmentation ions which are characteristic for the range being measured. This approach eliminates the silica gel solid-phase fractionation step. False positives for targeted PAH analytes are eliminated by using GC/MS as the primary analysis technique.

The chromatographic column is a J&W Scientific DB-5ms capillary column.

Internal standard calibration is performed using  $5\alpha$ -Androstane at a concentration of 40 ng/µL. o-Terphenyl and 1-Chlorooctadecane are added as surrogate compounds at 20 ng/µL in the sample extract. These two surrogates monitor the effects of the sample matrix and extraction efficiency. Two additional surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, are added to the finished extract prior to analysis to monitor instrument performance. Batch quality control includes, at a minimum, a procedure blank, laboratory control sample and duplicate sample analysis. A matrix spike is analyzed if sufficient sample is submitted to the laboratory.

The Reporting Limit (RL) of this method for each of the collective aliphatic and aromatic ranges is approximately 2-15 mg/kg in soil and 10-50  $\mu$ g/L in water. The RL of this method for the Target PAH analytes ranges from approximately 0.25 to 0.5mg/kg in soil; 1.0 $\mu$ g/L for water when operating the GC/MS in full scan mode, and 0.1 to 1.0 $\mu$ g/L when operating the GC/MS in SIM mode. For sites requiring the lowest levels cited in the Massachusetts Contingency Plan for water, GC/MS in the Selected Ion Monitoring (SIM) mode is used.

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## SAMPLE RECEIPT CHECKLIST

Client: 4143	AMRO	D:	0	104006,000, =2==
Project Name: 2003/7A BRA P3 - ROXBURY	Date Re	<b>c</b> .:		3-30-01
Ship via: (circle one) Fed Ex., UPS(, AMRO Courier)	Date Du	e:		4-11-01
land Del., Other Courier, Other:				
tems to be Checked Upon Receipt	Yes	No	NA	Comments
Army Samples received in individual plastic baos?			~	
2 Custody Seals present?			~	
3 Custody Seals Intact?				\$
Air Bill included in folder if received?			~	
5 is COC included with samples?			-	
5 Is COC signed and dated by client?			<b></b>	
7 Laboratory receipt temperature. TEMP = $3^{\circ}$		L		
Samples rec. with ice vice packs neither				·
Were samples received the same day they were sampled?				
Is client temperature 4°C ± 2°C?				· ·
If no obtain authorization from the client for the analyses.				
Client authorization from: Date: Obtained by:				
a. Is the COC filled out correctly and completely?				
10. Does the info on the COC match the samples?		-		· · · · · · ·
11. Were samples rec. within holding time?				
12. Were all samples properly labeled?				· · · · · · · · · · · · · · · · · · ·
13. Were all samples properly preserved?	~			
14. Were proper sample containers used?			1	
15. Were all samples received intact? (none broken or leaking)	$\overline{\mathbf{Z}}$			
16. Were VOA vials rec. with no air bubbles?			V	
17. Were the sample volumes sufficient for requested analysis?				
18. Were all samples received?				
19. VPH and VOA Soils only:				
Sampling Method VPH (circle one): M=Methanol, E=EnCore (air-tight	container	r)		
Sampling Method VOA (circle one): M=Methanol, SB=Sodium Bisulfat	e, E=EnC	ore, 8=8	Bulk	
If M or SB:				
Does preservative cover the soil?	~			
If NO then client must be faxed.				
Does preservation level come close to the fill line on the vial?				
If NO then client must be faxed.				
Were vials provided by AMRO?	$\checkmark$			
If NO then weights MUST be obtain	ned from	client		
Was dry weight aliquot provided?			V	
If NO then fax client and inform th	e VOA la	b ASAP		
20. Subcontracted Samples:				
What samples sent:				
Where sent:			·	
Date:				
Analysis:				
				1
21. Information entered into:				
Internal Tracking Log?				
Dry Weight Log?		+		
Client Log?				
Composite Log?				

NA= Not Applicable

11.1  qc/qcmemos/forms/samplerec Rev.18 06/0@7

AMRO Environmental L	aboratories Corj	poration	CHAIN-OF-C	USTODY RECON		ice: ( <u>603)</u> 424-2022	
Merrimack, NH 03054					00100	0640-674 (COD) :XE	ľ
Project No.: 200317 A	Project Name:	BEA P3	- Roxbury	Project Manager:A	Wika Will's Samplers (Signature):	MRO Project No.: 01033072 c.	
	Project State:	Ŵ	4		Service Strand	)	
Sample 1D	Date/Timc	Matrix	Total #	V	nalysis Required	Remarks .	
	Sampled	A= Air S= Soil	of Cont. & Size	5147			
		GW= Ground W.	IH9	W 8			
		WW≓ Waste W. DW= Drinking W.	<u> ~</u> ~	H.			
	-	O= Oil Other= Specify	EUH	179 29 11			
1 - 55	3/29/01 085C	5	NozA 1 Let X X				
5.3	0840	~	402.4.1402 XXX				
55-3	0000	Ś	1 UDIN 1404 X X				
4- SS	0830	S	X X DEAL ARUNI		7		
Dup		N	X SYNAMA				
1:92	5693	~	3 SUR X	XXX			
59-2	000 /	S	2 202 (40L X	XXX			
58.3	1030	S	3 BUCH X	XXX			
Dued	1	Ś	X Mage	XXX			
The Blank	 ->	MLOH	1 1001			7	
Preservative: VCI-HCI, MeOH, N-HN	03, S-H2SO4, Na	-NaOH, 0- Other		M.0H - +			
Container Lype: P- Plastic, U-Glass,	, V-VIAI, I- 1 CIIO	n, U-Utner	9191	1910191			
lease print crearly, regiony and could lime	clock will not sta	art until any	FAX No .: 978	0010 FFP	NULES: Freservauves, special reporting mills, known	Contamination, etc;	
ambiguities are resolved.		L <del>.,</del>					
Send Results To: ANN, YCA	Will's						
D. abook	MA NA	01960			Seal Infact? GW-1 GW-2 G	W-3	
					Yes No (N/A) MCP Level Needed: KCS-	( (avid))	
Relinquished By	Date/ Time	Bec	ceived By	Date/Time	P.O. No:	D	
2 Radon	= 10/0E/E	U XI	elito	\$ 121/01	Before submitting samples for expedited	UTHORIZATION TAT, you must have requested	
		0	2		Results Needed in advance and received a coded TAT A By: 7 (0) AdvTHORIZATION No.	UTHORIZATION NUMBER BY:	
E halles	3/20/01	/ du la	st/	3.30-01 1510	SHEET 1	0F	
White: Lab Copy	Yellow: Accomp	anies Report	Z Pink: Clie	nt Copy			
### The Commonwealth of Massachusetts



### Department of Environmental Protection

Division of Environmental Analysis Senator William X. Wall Experiment Station

### certifies

M-NH012

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AMRO ENVIRONMENTAL LAB 111 HERRICK ST MERRIMACK, NH 03054-0000

Laboratory Director: Nancy Stewart

for the analysis of NON POTABLE WATER (CHEMISTRY) POTABLE WATER (CHEMISTRY)

pursuant to 310 CMR 42.00

This certificate supersedes all previous Massachusetts certificates issued to this laboratory. The laboratory is regulated by and shall be responsible for being in compliance with Massachusetts regulations at 310 CMR 42.00.

This certificate is valid only when accompanied by the latest dated Certified Parameter List . as issued by the Massachusetts D.E.P. Contact the Division of Environmental Analysis to verify the current certification status of the laboratory.

Certification is no guarantee of the validity of the data. This certification is subject to unannounced laboratory inspections.

a C. Carola

Director, Division of Environmental Analysis

Issued: 01 JUL 2000 Expires: 30 JUN 2001

### **APPENDIX F**

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Risk Characterization Summary Tables

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## Area 1 - Unpaved Lot Behind Fomer Connolly's Tavern Summary Data Table Surficial Soil (0 to 3 feet) **BRA PARCEL P-3**

										Sam	ple Locati	uo								I
		SS-1	SS-2	SS-3	SS-4	B-101	B-102	B-103	B-104	B-105	<b>B-1</b> 06	<b>B-1</b> 07	B-108	B-109	B-110	B-111	B-112	B-113	B-114	B-115
Parameter	Units	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	1-2.5	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	 	1-3	1-3	1-3	2
EPH Parameters																				
C <sub>9</sub> -C <sub>18</sub> Aliphatics	mg/kg	31.5	30.5	29.5	29.5	,			•	•		1				•		•		
C <sub>19</sub> -C <sub>36</sub> Alíphaties	mg/kg	31.5	30.5	29.5	29.5	•	•				•	•	•	•	•	•	. ;	•	• •	
C <sub>11</sub> -C <sub>22</sub> Aliphatics*	mg⁄kg	100	190	170	29.5	500	440	160	320	I40	450	140	220	230	170	190	500	290	480	140
PAHS					•															
2-Methylnaphthalene	mg/kg	0.16	0.15	0.35	0.15	0.07	0.1	0.03	0.4	0.8	0.2	0.03	0.03	0.2	0.7	0.03	0.1	0.3	0.1	0.3
Acenaphthene	mg/kg	0.87	1.6	1.3	0.35	0.3	0.8	0.2	1.0	1.9	0.4	0.2	0.2	0.5	6.0	0.1	0.5	l.l	1.0	0.3
Acenaphthylene	mg/kg	0.62	0.15	0.67	0.15	0.07	0.1	0.03	0.2	0.4	0.1	0.03	0.03	0.1	0.1	0.03	0.1	0.3	0.1	0.3
Anthracene	mg/kg	2.2	3.7	3.4	1.1	0.7	2.1	0.4	2.0	3.9	1.0	0.4	0.4	1.1	0.7	0.3	0.9	1.9	2.0	0.6
Benzolalanthraeene	mg/kg	5.2	9.4	7.1	2.8	1.8	4.3	1.0	5.5	8.1	1.9	1.1	1.1	2.0	1.7	6.0	2.2	6.1	4.2	1.5
Benzofalpyrene	mg/kg	5.0	8.7	6.8	2.5	1.8	4.0	1.0	5.6	7.5	<u>8</u> .	1.0	1.1	1.9	1.7	0.9	2.2	5.6	3.9	1.3
Benzo[b]fluoranthene	mg/kg	6.4	12	8.3	<b>3</b> .3	1.3	2.9	0.7	4.2	5.3	1.2	0.7	0.8	1.3	1.8	0.7	2.2	4.8	3.1	1.1
Benzolg.h.ilpervlene	mg/kg	3.1	6.1	4.0	1.5	1.6	2.8	0.6	1.4	5.8	1.0	0.5	0.5	0.6	0.4	0.7	0.5	1.1	2.1	0.3
BenzofkIlluoranthene	mg/kg	2.2	4.4	3.2	1.1	1.5	2.9	0.7	4.5	5.5	<u>.</u> .	0.7	0.8	1.5	1.7	0.7	2.4	5.0	3.2	:
Chrysene	mg/kg	4.8	9.1	6.3	2.6	1.9	4.3	1.1	5.7	8.7	1.9	I.1	I.1	2.0	1.8	1.0	2.3	9.9	4.4	1.6
Dibenzola.hlanthracene	mg/kg	0.83	1.6	1.1	0.42	0.5	1.1	0.3	0.7	2.0	0.4	0.2	0.2	0.3	0.2	0.3	0.3	0.5	0.1	0.3
Fluoranthene	mg/kg	Ξ	20	14	5.3	3.8	9.6	2.0	12.0	16.0	5.8	2.1	2.3	6.0	4.5	1.9	6.2	13.0	9.3	3.0
Fluorene	me/kg	1,0	1.4	1.4	0.41	0.2	0.8	0.2	1.1	1.9 I	0.4	0.1	0.2	0.5	0.3	0.1	0.5	1.0	0.9	0.3
Indeno[1,2,3-cd]nvrene	me/kg	3.7	7.0	4.6	1.8	L.I	3.2	0.6	1.5	1.8	1.0	0.5	0.5	0.7	0.5	0.7	0.6		1.8	0.3
Nanhthalene	mg/ke	0.16	0.31	0.69	0.15	0.07	0.6	0.1	0.7	1.6	0.3	0.1	0.1	0.3	0.1	0.1	0.2	0.4	0.1	0.3
Phenanthrene	mg/kg	9.6	18	12	4.4	3.2	7.9	1.8	9.6	15.0	5.1	1.7	1.8	5.4	2.4	1.2	5.4	12.0	9.5	2.2
Pyrene	mg/kg	9.0	16	=	4.7	3.8	8.7	2.1	10.0	14.0	4.8	1.9	2.0	5.0	4.2	1.7	5.9	13.0	9.6	2.8
Metals	,					;	1	1	5	7.0	5	5	64		сц Г	54	2	EU	na	па
Arsenic, Total	mg/kg	na	па	вп	Па	ВЛ	112	112	114	0.1	זוק	112		2	1		1			
Cadmium, Total	mg/kg	na	па	na	пa	na	ра	ពង	Па	2.4	na	na	па	na	па	7	па	na	пa	ла
Chromium, Total	mg/kg	na	ца	па	na	Па	na	na	na	38	па	Па	па	na	па	21	па	па	ца	BU
Lead, Total	mg/kg	200	300	220	310	210	200	170	270	940	150	280	450	190	240	200	150	90 00 00	390	170
Mercury, Total	mg/kg	na	па	па	па	na	па	na	па	0.32	na	na	na	na	па	0.21	па	па	па	па
														GAHar	mage/Ride Ass	essments/BRAV	P.3 Parcel/Risk	AssessmentVA	L. L. L. L. L. L. L. L. L. L. L. L. L. L. L	uficial Soil Data

Notes:

Italics = one-half the laboratory method detection limit.

na = not analyzed. Concentrations shown for B-101 through B-115 are total TPH by GC/FID results.

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Area 1 - Unpaved Lot Behind Fomer Connolly's Tavern Surficial Soil (0 to 3 feet) Statistical Summary **BRA PARCEL P-3** 

							Upper 95th	Upper 95th	Percentile
		No. of	No. of	Maximum	Average	Standard	Confidence	Concent	trations
Parameter	Units	Samples	Detects	Concentration	Concentration	Deviation	Limit	Site	CA/T
EPH Parameters									
C <sub>9</sub> -C <sub>18</sub> Aliphatics	mg/kg								
C <sub>19</sub> -C <sub>36</sub> Aliphatics	mg/kg					,		1	
C <sub>11</sub> -C <sub>22</sub> Aliphatics*	mg/kg	19	18	500	256	148	67	323	I
PAHs									
2-Methylnaphthalene	mg/kg	19	80	0.82	0.2	0.2	0.1	0.3	2.2
Acenaphthene	mg/kg	19	18	1.9	0.7	0.5	0.2	0.9	4.1
Acenaphthylene	mg/kg	19	10	0.67	0.2	0.2	0.1	0.3	1.9
Anthracene	mg/kg	19	19	3.9	1.5	1.2	0.5	2.0	10
Benzolalanthracene	mg/kg	19	61	9.4	3.6	2.6	1.2	4.8	19
Benzofalpvrene	mg/kg	19	61	8.7	3.4	2.5	1.1	4.5	17
Benzo[b]fluoranthene	mg/kg	19	19	12	3.3	3.0	1.4	4.6	18
Benzofg.h.ilpervlene	mg/kg	19	18	6.1	1.8	1.8	0.8	2.6	7.7
Benzofklfluoranthene	mg/kg	19	19	5.5	2.3	1.6	0.7	3.0	9.7
Chrysene	mg/kg	19	19	9.1	3.6	2.6	1.2	4.8	18
Dibenzo[a.h]anthracene	mg/kg	19	17	2	0.6	0.5	0.2	0.8	2.1
Fluoranthene	mg/kg	19	19	20	7.8	5.3	2.4	10.2	33
Fluorene	mg/kg	19	18	1.9	0.7	0.5	0.2	0.9	5.5
Indeno[1,2,3-ed]pyrene	mg/kg	19	18	7	1.7	1.7	0.8	2.5	7
Naphthalene	mg/kg	19	14	1.6	0.3	0.4	0.2	0.5	3
Phenanthrene	mg/kg	61	19	18	6.7	5.0	2.2	9.0	38
Pyrenc	mg/kg	19	19	16	6.9	4.5	2.0	8.9	35
Matals									
Interais Arcanio Total	mo/ko	2	2	7.8	6.6	1.7	2.4	9	21
Codmium Total	mo/ko	- 6	2	2.4	2.2	0.3	0.4	ŝ	5
Chamiltani, Forta	au,a			38	29.5	12.0	16.7	46	50
CITUILIUII, LUIAI	ma/ka	- 19	- 6	940	281	178.5	80.3	361	1,100
Mercury Total	me/ke	2	6	0.321	0.3	0.1	0.1	0.4	2.6
INICILUITY, I VIGI	۵ ۵	1	I						

Notes: CA/T Background Concentrations source: "Backgound Soil Contaminant Assessment", CDM, April 1996.

		·														
Li.J				<b>B-1</b> 01	B-102	<b>B</b> -103	<b>B-104</b>	B-109	<b>B</b> -110	B-111	B-112	B-113	<b>B-114</b>	<b>B</b> -115	B-201	WS-12/ TP-1
		Parameter	Units	4.5-6.5	4-6	4-6	4-6	7-9	- 7-9	7-9	7-9	7-9	7-9	7 <b>-9</b>	10-12	11.5 - 12
1 ANY TIME	EPĤ	<b>Parameters</b> $C_9$ - $C_{18}$ Aliphatics $C_{19}$ - $C_{36}$ Aliphatics $C_{19}$ - $C_{36}$ Aliphatics	mg/kg mg/kg mg/kg	350	380	270	240	. 700	110	1,300	970	730	450	2.400	290	8,400
		1		220	200	2.0	2.0			ŕ				,		•
Water Party and	PAL	2-Methylnaphthalene Acenaphthene Acenaphthylene	mg/kg mg/kg mg/kg	0.3 0.6 0.2	0.2 0.4 0.1	0.1 0.5 0.03	0.03 0.1 0.04	0.2 0.4 0.1	0.15 0.5 0.15	0.15 1.0 0.15	4.1 20.0 0.8	0.8 2.6 0.4	1.6 4.4 0.7	0.2 0.5 0.2	1.3 6.3 0.8	23 3.4 0.8
<u>[]</u>		Anthracene	mg/kg	1.3	0.9	0.8	0.4	, 1.0	1.2	1.7	0.6	4.9	8.8	1.2	8.9	2.7
[]		Benzo[a]anthracene Benzo[a]pyrene Benzo[b]fluoranthene	mg/kg mg/kg mg/kg mg/kg	2.8 2.6 1.7	1.9 1.8 1.2	1.8 1.7 1.2	0.9 0.9 1.0	1.9 2.0 1.8	2.5 2.5 2.5	4.0 3.7 2.7 3.0	35.0 35.0 29.0 6.4	9.5 8.7 7.6	15 14 11 10	2.7 2.6 2.0 0.7	14 19 7.8	1.4 1.2 0.18
		Benzo[g,n,1]perylene Benzo[k]fluoranthene	mg/kg	1.9	1.4 1.3	1.0	1.0	1.8	2.7	3.0 4.2	29.0 40.0	8.5 10.0	10 15	2.3 3.1	5.5	1.3
_		Dibenzo{a,h]anthracene	mg/kg	0.8	0.5	0.4	0.1	, 0.3	0.15	0.9	3.0	0.9	3.5	0.3	2.6	0.18
		Fluoranthene Fluorene	mg/kg mg/kg	5.7 6.4	5.6 0.4	5.2 0.4	2.0 0.2	0.4	5.3 0.6	9.3 0.9	96.0 17.0	21.0	36 4.4	6.2 0.5	41 4.9	4 3.9
U		Indeno[1,2,3-cd]pyrene Naphthalene	mg/kg mg/kg	1.8 0.3	1.3 0.3	1.0 0 2	0.2	0.6	0.6	2.5	7.2 14.0	2.1 1.6	8.9 3	0.7 0.3	9.5 2.8	0.18 1
		Phenanthrene Pyrene	mg/kg mg/kg	5.4 5.8	4.6 4.3	4.6 4.2	1.2 1.9	4.9 5.4	5.0 6.6	8.1	80.0	20.0 20.0	36 30	4.8 5.7	37 31	11 4.1
_	Met	ails														
		Arsenic, Total Cadmium, Total Chromium, Total Lead, Total Mercury, Total	mg/kg mg/kg mg/kg mg/kg mg/kg	na na 360 na	na na 150 na	na na 10 na	na na 270 na	na na 280 na	na na 670 na	6 3.6 23 1,400 0.36	па па 5,000 па	па па 140 па	па па 470 ла	па па 1,200 па	па па 620 па	4 1.7 27 120 0.01
	Not							):\Hazwasic	Risk Assess	ments\BRA\J	-3 Parcel\Ri:	sk Assessmer	M\[Area 1 soil	.xts]Soil data	4 10 15 feet	<u> </u>

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Notes: CAM Background Concentrations source: "Backgound Soil Contaminant Assessment", CDM

Italics = one-half the laboratory method detection limit. na = not analyzed. Bold indicates concentration exceeds CA/T Background Concentration

Hazwaste\Risk Assessments\BRA\P-3 Parcel\Risk Assessment\[Area 1 soil.xts]Soil data 4 to 15 feet

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### Area 1 - Unpaved Lot Behind Fomer Connolly's Tavern Subsurface Soil (4 to 15 feet) Statistical Summary **BRA PARCEL P-3**

						Upper 95th		CA/T 95th	Method 1
		No. of	No. of	<b>50th Percentile</b>	Standard	Confidence	95th Percentile	Percentile	Standards
Parameter	Units	Samples	Detects	Mean	Deviation	Limit	Mean	Mean	S1/GW-3**
C9-C18 Aliphatics	mg/kg								
C19-C36 Aliphatics	mg/kg								
C <sub>11</sub> -C <sub>22</sub> Aliphatics	mg/kg	32	31	1,038	1,819	630	1,668	,	800
PAHs									
2-Methylnaphthalene	mg/kg	32	22	1.2	4.1	<b>1</b> .4	2.6	2.2	500
Acenaphthene	mg/kg	32	27	1.8	3.9	1.3	3.2	4.1	1,000
Acenaphthylene	mg/kg	32	18	0.2	0.3	0.1	0.3	1.9	100
Anthracene	mg/kg	32	28	2.2	2.9	1.0	3.2	10	1,000
Benzo[a]anthracene	mg/kg	32	28	5.4	8.3	2.9	8.3	19	0.7
Benzo[a]pyrene	mg/kg	32	28	5.0	7.5	2.6	7.6	17	0.7
Benzo[b]fluoranthene	mg/kg	32	28	4.2	6.6	2.3	6.5	18	0.7
Benzo[g,h,i]perylene	mg/kg	32	27	2.1	3.4	1.2	3.3	7.7	1,000
Benzo[k]fluoranthene	mg/kg	32	28	3.9	6.1	2.1	6.0	9.7	7
Chrysene	mg/kg	32	28	5.5	8.4	2.9	8.4	18	7
Dibenzo[a,h]anthracene	mg/kg	32.	25	0.8	1.2	0.4	1.2	2.1	0.7
Fluoranthene	mg/kg	32	29	13.1	20.4	7.1	20.2	33	1,000
Fluorene	mg/kg	32	26	1.8	3.3	1.1	2.9	5.5	1,000
Indeno[1,2,3-cd]pyrene	mg/kg	32	27	2.1	3.3	1.2	3.3	7	1
Naphthalene	mg/kg	32	25	1.1	2.6	0.9	6.1	ę	100
Phenanthrene	mg/kg	32	29	12.5	21.3	7.4	19.9	38	100
Pyrenc	mg/kg	32	29	11.0	16.3	5.6	16.6	35	700
Metals									
Arsenic, Total	mg/kg	4	4	5.3		ł	,	,	30
Cadmium, Total	mg/kg	4	2	2.0			1	ł	30
Chromium, Total	mg/kg	4	4	23.8	7.1	7.0	31	50	1,000
Lead, Total	mg/kg	32	28	525.0	908.4	314.7	840	1,100	300
Mercury, Total	mg/kg	2	4	0.5	,			·	20

Notes: CA/T Background Concentrations source: "Backgound Soil Contaminant Assessment", CDM, April 1996.

G:/Hazwarte/Risk Assessments/BRA/P-3 Parce/IRisk Assessment/Area 1 soil xls]Subsurface soil statistics ]Subsurface soil statistics

Soil Data and Statistical Summary **AREA 2 - Paved Area Behind WSHC TPH and PAH Concentrations BRA PARCEL P-3** 0 to 15 feet depth

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4				AREA 2			,
		B-116	<b>B-117</b>	B-202(S)	B-203(S)	B-204(S)	WS-4
Parameters	Units	1-3	1-3	5-7'	5-7'	5-7'	10-12
TPH Eq. C11 -C22 Aromatics	mg/kg	110	110	520	110	30.5	115
PAHs							
2-Methylnaphthalene	mg/kg	0.2	0.3	2.6	0.57	0.155	ı
Acenaphthylene	mg/kg	0.8	1.2	5.0	1.2	0.155	ı
Acenaphthene	mg/kg	0.2	0.3	1.3	0.145	0.155	·
Anthracene	mg/kg	1.5	2.6	11	2.1	0.50	
Benzo[a]anthracene	mg/kg	3.3	5.1	61	4.0	1.0	•
Benzo[a]pryene	mg/kg	3.1	4.5	15	3.7	0.90	•
Benzo[b]fluoranthene	mg/kg	2.4	3.0	17	4.3	I:1	•
Benzo[g,h,i]perylene	mg/kg	0.7	0.9	8.4	2.3	0.55	ı
Benzo[k]fluoranthene	mg/kg	2.7	3.7	5.9	1.5	0.34	
Chrysene	mg/kg	3.5	5.2	18	3.8	0.99	ı
Dibenzo[a,h]anthracene	mg/kg	0.3	0.5	2.6	0.62	0.155	,
Fluoranthene	mg/kg	7.6	11.0	41	9.6	2.3	
Fluorene	mg/kg	0.8	1.3	5.0	1.0	0.155	,
Indeno[1,2,3-cd]pyrene	mg/kg	0.8	0.1	9.2	2.6	0.59	,
Naphthalene	mg/kg	0.4	0.4	4.0	0.74	0.155	1
Phenanthrene	mg/kg	7.2	11.0	48	9.7	2.1	•
Pyrene	mg/kg	7.3	9.9	40	8.2	2.0	

**NOTES:** 

G: Hazwaste'Risk Assessments/BRA\P-3 Parcel\Risk Assessment{Area 2 soil XLS]Data summary

mg/kg = milligrams per kilogram (parts per million)

Bold = Exceeds applicable Method 1 Cleanup Standard
Bold/Shade = Exceeds applicable Method 1 Cleanup Standard and CA/T background concentrations Italics = one-half MDL

Equivalent C11-C22 aromatics analyzed by TPH Method 8100M.

**AREA 2 - Paved Area Behind WSHC TPH and PAH Concentrations Statistical Summary BRA PARCEL P-3** 0 to 15 feet depth

							Upper 95th	Upper 95th	Percentile
		No of	No. of	Maximum	Average	Standard	Confidence	Concent	trations
Parameters	Units	Samples	Detects	Concentration	Concentration	Deviation	Limit	Site	CA/T
TPH Eq. C11 -C22 Aromatics	mg/kg	9	4	520	166	176	141	307	,
PAHs									
2-Methylnaphthalene	mg/kg	5	4	3	0.8	1.0	0.9	1.7	2.2
Acenaphthylene	mg/kg	5	4	5	1.7	1.9	1.7	3.3	4.1
Acenaphthene	mg/kg	ŝ	e	1	0.4	0.5	0.4	0.8	1.9
Anthracene	mg/kg	5	5	11	3.5	4.2	3.7	7.3	10
Benzo[a]anthracene	mg/kg	5	5	19	6.5	7.2	6.3	12.8	19
Benzo[a]pryene	mg/kg	5	S	15	5.4	5.5	4.8	10.3	17
Benzo[b]fluoranthene	mg/kg	5	ŝ	17	5.6	6.5	5.7	11.3	18
Benzo[g,h,i]perylene	mg/kg	5	5	80	2.6	3.3	2.9	5.5	7.7
Benzo[k]fluoranthene	mg/kg	5	5	6	2.8	2.1	1.9	4.7	9.7
Chrysene	mg/kg	5	5	18	6.3	6.7	5.9	12.2	18
Dibenzo[a,h]anthracene	mg/kg	5	4	3	0.8	1.0	0.9	1.7	2.1
Fluoranthene	mg/kg	5	5	41	14.3	15.3	13.4	27.7	33
Fluorene	mg/kg	5	4	5	1.6	1.9	1.7	3.3	5.5
Indeno[1,2,3-cd]pyrene	mg/kg	5	ŝ	6	2.8	3.6	3.2	6.0	7
Naphthalene	mg/kg	S	4	4	1.1	1.6	1.4	2.6	ñ
Phenanthrene	mg/kg	5	S	48	15.6	18.4	16.2	31.8	38
Pyrene	mg/kg	5	S	40	13.5	15.1	13.2	26.7	35

**NOTES:** 

mg/kg = milligrams per kilogram (parts per million) Bold = Exceeds applicable Method I Cleanup Standard

G:Hazwaste/Risk Assessments/BRA\P-3 Parce/Risk Assessmenti/Area 2 soll:XLS)Stat summary

Boid/Shade - Exceeds applicable Method 1 Cleanup Standard and CA/T background concentrations Italics = one-half MDL

Equivalent C11-C22 aromatics analyzed by TPH Method 8100M.

## SOIL SAMPLING RESULTS BRA PARCEL P-3 AREA 2 - Lead Concentrations

Upper Urban	nce 95th Background	Mean CA/T	317 1,100
95th	Confide	Limi	80 80 80
	Standard	Deviation	135.9
		Меап	229
	No.	Detects	20
	No.	Samples	6
	B-212	5-7'	33 -
	B-210	5-7'	250 <1.0
	B-209	10-12*	
	B-209	6-8'	- 33
Area 2	B-208	5-7"	230
	B-204(S)	S-7'	230 -
	B-203(S)	5-7*	460
	B-117	I-3	270
	B-116	1-3	. 30 30
		Units	ygm Ngm
		Parameters	Total TCLP

OTES:

TCLP = Toxicity Charactristic Leaching Procedure mg/rg = milityamu per kilogram (parts per militon) BoMShade = Exceeds applicable Method I Cleanup Sundard and UCL • = Method I S.-NCW-3 soil sundard • • = RCRA Hazzardous Waste Limit • • = Lot atalyzed

## Soil Data and Statistical Summary Area 3 - Western Portion 0 to 15 feet depth BRA PARCEL P-3

ŕ				- -	Area 3				1		CA/T 95th
		WS-5	MS-6	WS-7	B-205(S)	B-206(S)	B-207(S)	No. of	No. of	Maximum	Percentile
Parameters	Units	10-12'	10-12'	10-12'	3-5'	3-5'	3-5'	Samples	Detects	Concentration	Mean
VOCs by Method 8260	mg/kg	0.0135	0.012	0.0135	Па	na	na	e	0	0.0135	ı
TPH by Method 8100	mg/kg	55	45	50	25	55	28	Q	0	55	ı
PAHs 2-Methylnaphthalene	mg/kg	na	Па	па	0.125	0.28	0.14	ŝ	Ś	0.3	2.2
Acenaphthylene	mg/kg	па	па	na	0.125	0.28	0.14	ŝ	ę	0.3	4.1
Acenaphthene	mg/kg	na	na	na	0.125	0.28	0.14	ę	ę	0.3	1.9
Anthracene	mg/kg	na	па	па	0.125	0.28	0.46	ę	1	0.5	10
Benzo[a]anthracene	mg/kg	na	na	па	0.125	1.4	1.1	e	7	1.4	19
Benzo[a]pyrene	mg/kg	na	na	na	0.125	1.3	0.94	ę	7	1.3	17
Benzo[b]fluoranthene	mg/kg	na	Па	Пâ	0.125	1.7	1.3	e	7	1.7	18
Benzo[g,h,i]perylene	mg/kg	na	na	na	0.125	0.83	0.58	e	7	0.8	<i>L.T</i>
Benzo[k]fluoranthene	mg/kg	na	na	na	0.125	0.28	0.33	m	1	0.3	9.7
Chrysene	mg/kg	na	па	na	0.125	1.4	1.0	ю	7	1.4	18
Dibenzo[a,h]anthracene	mg/kg	na	na	na	0.125	0.28	0.14	m	0	0.3	2.1
Fluoranthene	mg/kg	na	na	na	0.125	2.7	2.3	3	2	2.7	33
Fluorene	mg/kg	na	na	na	0.125	0.28	0.14	m	0	0.3	5.5
Indeno[1,2,3-cd]pyrene	mg/kg	na	na	na	0.125	0.97	0.62	m	7	1.0	7
Naphthalene	mg/kg	na	na	na	0.125	0.28	0.14	m	0	0.3	ę
Phenanthrene	mg/kg	Пâ	na	na	0.125	1.6	1.9	m	2	1.9	38
Pyrcne	mg/kg	па	na	Па	0.125	2.6	2.1	ę	2	2.6	35
Metars Lead, Total	mg/kg	na	na	ца	10	98	220	ŝ	ю	220	1,100
								A 15:044		1	the state of the state of the

Notes: CA/T Background Concentrations source: "Backgound Soil Contaminant Assessment", CDM, April 1996. ltalics = one-half method detection limit na = not analyzed.

MA DEP BSPT ORS and BWSC
Residential, Exposure, Scenario
Diesel / #2 Fuel Assessment v2.0 (12/31/97)

## **INPUT DATA TABLE**

		CAS	Exposure Point Concentration ‡ SOIL	Exposure Point Concentration ‡ DRINKING WATER	Exposure Point Concentration ‡ INDOOR AIR
			Ry/Rill	ia)II/ĥn	
BENZENE	(F)	71432			
ETHYLBENZENE	E	100414			
TOLUENE	Ē	108883			
XYLENES	(1)	1330207			
ACENAPHTHENE	(2)	83329			ess likelv to be found in air l
2-METHYLNAPHTHALENE	(7)	91576			
NAPHTHALENE	3	91203			
PHENANTHRENE	(2)	85018			ess likely to be found in air
I TOTAL PETROLEUM HYDROCARBON	(4)	generic			
	(2)				
C9 - C12 Aliohatic	e) (C	HdV			
C9 - C18 Aliphatic		EPH			
C19 - C36 Aliphatic		ЕРН		Ļ	ess likely to be found in air
AROMATIC HYDROCARBONS					
C9 - C10 Aromatic	(3)	HdV			
C11 - C22 Aromatic		EPH	1,968		

METHOD 3 ASSESSMENTS MUST CONSIDER SAFETY, PUBLIC WELFARE AND THE ENVIRONMENT SEPARATELY.

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	<b>J BWSC</b>						
Alternational Provide Alternational Provide	ORS and						
	EP BSPT						
	MA DI	roach"	y 1995).				
		ЕРН Арр	trations. Is ation (Jul		indoor aii		
		EP VPH/	upplies. c concent ound leve aracterize		provides		
	io	n of MAD	areas. Ig water s on-specifi al backgr		rm (1992) els may		
	re Scenal	mentatio	(GW-1) a sar drinkir with fracti than typic sposal Sit		n ckground I ShortFoi iround lev		
	al Exposu	ss: Imple	sensitive water if ne nbination o be less nce for Di		ncentratic evels. Ide soil ba Residentia ater backg		
	Residentia	ated Site h 4.	dwater or in ground is only. sed in con <u>instrated</u> t		Point Co kground I will provi al. The F groundwa	onsistent	
-		Contamin 1 throug	ow groun or PAHs el release nnot be us are <u>demo</u> sction 2.3		Exposure ual to bac sterization ance is fin il, air and	ould be c ance for	
	)	troleum C ut notes	s in shall /g. Test f sel/#2 Fu thod. Car λir which α		ether the nan or equ sk Charac traft guida oecific soi	ations sh f the Guid	
	(12/31/97	ed by Pe	let Analyte   > 500 µg RESH Die lytical me water or <i>i</i> evaluatior	y Table:	ermine wh n is less th al Site Ria n current o Cs. Site si	Concent tion 5.8 o	
	nent v2.0	lisks Pos	s are Targ soil if TPH tions in FF priate ana li, Ground from this	Data Entr	ck to dete or fractiou or Dispos soil wher some VO(	sure Point ed in Sec acterizatio	
	Assessn	erizing R nal detai	ompounds PAHs in s VPH fract an approp ans in Soi excluded	es for the	Tould che chemical uidance f s in urban evels for s ed.	ted Expos ce provid tisk Chara	
	l / #2 Fue	"Charact	BTEX cc Test for I Test for by a TPH by a ncentration may be a	ional Note	ie User sh fied for a AADEP G for PAHs ground" k	e calculat ne guidan sal Site R	
H	Diese	See	+ (5) (3) (1) + Co	Additi	<ol> <li>Th identi The N levels</li> <li>"backi also b</li> </ol>	2. Th with th Dispo	
- University							

-;:**)** ------[] ļ ļ | Diesel / #2 Fuel Assessment v2.0 (12/31/97) 

Residential Soils Exposure Scenario

# MA DEP BSPT ORS and BWSC

# SUMMARY TABLE - SOILS

	Exposure Point	SUBCHRONIC HAZARD INDEX	CHRONIC HAZARD INDEX	ELCR
	Concentration SOIL	SOIL INGESTION &	SOIL INGESTION &	SOIL INGEST &
OIL OR HAZARDOUS MATERIAL	mg/kg	DERMAL	DERMAL	DERMAL
BENZENE ETHYLBENZENE TOLUENE XYLENES			:	
ACENAPHTHENE 2-METHYLNAPHTHALENE VAPHTHALENE PHENANTHRENE				
TOTAL PETROLEUM HYDROCARBON				
ALIPHATIC HYDROCARBONS C5 - C8 Aliphatic C9 - C12 Aliphatic C9 - C18 Aliphatic C19 - C36 Aliphatic				
AROMATIC HYDROCARBONS C9 - C10 Aromatic C11 - C22 Aromatic	1.97E+03	5.6E-02	4.9E-01	

METHOD 3 ASSESSMENTS MUST CONSIDER SAFETY, PUBLIC WELFARE AND THE ENVIRONMENT SEPARATELY.

4.9E-01

5.6E-02

TOTALS:

	<b>BWSC</b>
	ORS and
	EP BSPT
Ĩ	MAC
	nario
	sure Sce
	toils Expo
	sidential S
	Res
	_
1	12/31/97)
į	ent v2.0 (
R	Assessm
Í	/#2 Fuel
an ya	Diesel
n i navjera. Na odko	

### EQUATIONS:

(EPC/RfD) x ((3.4 x RAForal) + (30.6 x RAFdermal))/1,000,000 (EPC/RfD) x ((2.51 x RAForal) + (28.5 x RAFdermal))/1,000,000	(EPC x ((0.37 x RAForal) + (7.3 x RAFdermal)) x CSF / 1,000,000	<ul> <li>EPC = Exposure Point Concentration, column B</li> <li>RfD = Reference Dose, subchronic (Toxicity sheet column B) or chronic (Toxicity sheet column D)</li> <li>RAF = Relative Absorption Factor, oral or dermal (Toxicity sheet columns R through W)</li> <li>CSF = Cancer Slope Factor (Toxicity sheet column J)</li> <li>3.4 = Normalized Average Daily Soil Intake Rate, subchronic, threshold effects</li> <li>30.6 = Normalized Average Daily Soil Intake Rate, subchronic, threshold effects</li> <li>2.51 = Normalized Average Daily Soil Intake Rate, chronic, threshold effects</li> <li>2.51 = Normalized Average Daily Soil/Skin Contact Rate, chronic, threshold effects</li> <li>2.51 = Normalized Lifetime Average Daily Soil/Skin Contact Rate, nonthreshold effects</li> <li>2.37 = Normalized Lifetime Average Daily Soil/Skin Contact Rate, nonthreshold effects</li> <li>7.3 = Normalized Lifetime Average Daily Soil/Skin Contact Rate, nonthreshold effects</li> <li>7.3 = Normalized Lifetime Average Daily Soil/Skin Contact Rate, nonthreshold effects</li> <li>7.3 = Normalized Lifetime Average Daily Soil/Skin Contact Rate, nonthreshold effects</li> <li>7.3 = Normalized Lifetime Average Daily Soil/Skin Contact Rate, nonthreshold effects</li> </ul>
Subhronic Hazard Index: Chronic Hazard Index:	Excess Lifetime Cancer Risk:	Where:

:j] and a second sec 10.10 10

Diesel / Fuel #2 Asse	<pre>&gt;&gt;sment v2.0 (12/31/97) SUMMARY TABLE - HOMEGROWN VEGETABLES</pre>	Residential Ex <sub>l</sub> Fruit Vegetable	oosure: Intake		MA DEP E	ISPT ORS and BWSC
	OIL OR HAZARDOUS MATERIAL	Exposure Point Concentration SOIL mg/kg	SUBCHRONIC HI VEGETABLE INGESTION	CHRONIC HI VEGETABLE INGESTION	ELCR VEGETABLE INGESTION	
	BENZENE ETHYLBENZENE TOLUENE XYLENES					
	ACENAPHTHENE 2-METHYLNAPHTHALENE NAPHTHALENE PHENANTHRENE				<u> </u>	
	TOTAL PETROLEUM HYDROCARBON					
	ALIPHATIC HYDROCARBONS C5 - C8 Aliphatic C9 - C12 Aliphatic C9 - C18 Aliphatic C19 - C36 Aliphatic					
	AROMATIC HYDROCARBONS C9 - C10 Aromatic C11 - C22 Aromatic	1.97E+03	2.3E-01	2.0E+00		
		TOTALS:	2.3E-01	2.0E+00		

MA DEP BSPT ORS and BWSC. Name of Street, Street Residential Exposure Scenario: Cumulative Receptor Risk 0 Diesel / #2 Fuel Assessment v2.0 (12/31/97) î L ľ 

SUMMARY TABLE - CUMULATIVE RECEPTOR RISK RESIDENTIAL SCENARIO

EXPOSURE MEDIUM	EXPOSURE ROUTES		SUBCHRONIC HAZARD INDEX	CHRONIC HAZARD INDEX	EXCESS LIFETIME CANCER RISK
SOIL	INGESTION DERMAL	~ ~	5.6E-02	4.9E-01	
DRINKING WATER	INGESTION DERMAL INHALATION	_ ^ ~			
VEGETABLES HOMEGROWN	INGESTION	^	2.3E-01	2.0E+00	
INDOOR AIR	INHALATION	^			
	TOTAL:		2.9E-01	2.5E+00	

METHOD 3 ASSESSMENTS MUST CONSIDER SAFETY, PUBLIC WELFARE AND THE ENVIRONMENT SEPARATELY.

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#### APPENDIX G

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BWSC Form 108 Public Notification Letters Remedial Action Plan Legal Notice

Weston & Sampson

	Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup
	COMPREHENSIVE RESPONSE ACTION TRANSMITTAL Release Tracking FORM & PHASE I COMPLETION STATEMENT
L.	Pursuant to 310 CMR 40.0484 (Subpart D) and 40.0800 (Subpart H)
	Site LOCATION:           Site Name: (optional)         Parcel P-3
	Street: Tremont and Whittier Street Location Aid: UTMs: 4688700mN, 327800mE
0	City lown: Boston (Roxbury) ZIP 02120-0000
П	Related Release Tracking Numbers that this Form Addresses:
	If ier Classification:       (check one of the following)       Tier IA       Tier IB       Tier IC       Tier II       Not Tier Classified         If a Tier I Permit has been issued, state the Permit
<b>F</b>	E. THIS FORM IS BEING USED TO: (check all that apply)
<b>,   </b> '	Submit a Phase I Completion Statement, pursuant to 310 CMR 40.0484 (complete Sections A, B, F, Last, C, V L
r D	Submit a Phase II Scope of Work, pursuant to 310 CMR 40.0834 (complete Sections A, B, C, G, H, I and J). APR 5 2002
	Submit a final Phase II Comprehensive Site Report and Completion Statement, pursuant to 310 CMR 40.0836 (complete Sections A, B, C, D, G, H, I and J).
	Submit a Phase III Remedial Action Plan and Completion Statement, pursuant to 310 CMR 40.0862 (complete Sections ONAL, OFEnd
	Submit a Phase IV Remedy Implementation Plan, pursuant to 310 CMR 40.0874 (complete Sections A, B, C, G, H, I and J).
a	Submit an As-Built Construction Report, pursuant to 310 CMR 40.0875 (complete Sections A, B, C, G, H, I and J).
I.	Submit a Phase IV Final Inspection Report and Completion Statement, pursuant to 310 CMR 40.0878 and 40.0879 (complete Sections A, B, C, E, G, H, I and J).
	Submit a periodic Phase V Inspection & Monitoring Report, pursuant to 310 CMR 40.0892 (complete Sections A, B, C, G, H, 1 and J).
	Submit a final Phase V Inspection & Monitoring Report and Completion Statement, pursuant to 310 CMR 40.0893
	You must attach all supporting documentation required for each use of form indicated, including copies of any Legal Notices and Notices to Public Officials required by 310 CMR 40.1400.
	C. RESPONSE ACTIONS:
	Check here if any response action(s) that serves as the basis for the Phase submittal(s) involves the use of Innovative Technologies. (DEP is interested in using this information to create an Innovative Technologies Clearinghouse.)
ļ	Specify the outcome of the Phase II Comprehensive Site Assessment;
	Additional Comprehensive Response Actions are necessary at this Site, based on the results of the Phase II Comprehensive Site
K	The requirements of a Class A Response Action Outcome have been met and a completed Response Action Outcome Statement (BWSC-104) will be submitted to DEP.
Π	The requirements of a Class B Response Action Outcome have been met and a completed Response Action Outcome Statement (BWSC-104) will be submitted to DEP.
<u> </u>	Rescoring of this Site using the Numerical Ranking System is necessary, based on the results of the final Phase II Report.
<b>1</b>	E PHASE IV COMPLETION STATEMENT:
ľ	Specify the outcome of Phase IV activities: Phase V operation, maintenance or monitoring of the Comprehensive Response Action is necessary to achieve a Response Action
Π	(This site will be subject to a Phase V Operation, Maintenance and Monitoring Annual Compliance Fee.)
	The requirements of a Class A Response Action Outcome have been met. No additional operation, maintenance or monitoring is necessary to ensure the integrity of the Response Action Outcome. A completed Response Action Outcome Statement (BWSC-104) will be submitted to DEP.
:	The requirements of a Class C Response Action Outcome have been met. No additional operation, maintenance or monitoring is necessary to ensure the integrity of the Response Action Outcome. A completed Response Action Outcome Statement (BWSC-104) will be submitted
رتبا	SECTION E IS CONTINUED ON THE NEXT PAGE
	Revised 3/30/95 Supersedes Forms BWSC-010 (in part) and 013 Page 1 o

<b>[</b> ]		Massachusetts Department of Environmental Pro	otection	BWSC-108
U		Bureau of Waste Site Cleanup		5000-100
		COMPREHENSIVE RESPONSE ACTION TRANSM	ITTAL	Release Tracking
ניי		FORM & PHASE I COMPLETION STATEMENT		3 - 15009
Π		PLISUART to 310 CMR 40.0484 (Subpart D) and 40.0800 (Subpart H)		
		The requirements of a Class C Response Action Outcome have been met. Further operation, mainte	enance or monitor	ing of the remedial
		action is necessary to ensure that conditions are maintained and that further progress is made toward Response Action Outcome Statement (BWSC-104) will be submitted to DEP.	d a Permanent So	plution. A completed
<u>(</u>		Indicate whether the operation and maintenance will be Active or Passive. (Active Operation and Ma	aintenance is defi	ned at 310 CMR
[]]		Active Operation and Maintenance OPassive Operation and	Maintenance	
	ЦL	(Active Operation and Maintenance makes the Site subject to a Post-RAO Class C Active Operation	and Maintenance	Annual Compliance Fee.)
-	F	PHASE V COMPLETION STATEMENT:		
	ι Sp	Specify the outcome of Phase V activities:		
ت	╽╟	The requirements of a Class A Response Action Outcome have been met and a completed Respons (BWSC-104) will be submitted to DEP.	se Action Outcom	e Statement
		The requirements of a Class C Response Action Outcome have been met. No additional operation, to ensure the integrity of the Response Action Outcome. A completed Response Action Outcome St DEP.	maintenance or n atement (BWSC-	nonitoring is necessary 104) will be submitted to
		The requirements of a Class C Response Action Outcome have been met. Further operation, mainter action is necessary to ensure that conditions are maintained and that further progress is made towar Response Action Outcome Statement (BWSC-104) will be submitted to DEP.	enance or monito d a Permanent So	ring of the remedial plution. A completed
۳		Indicate whether the operation and maintenance will be Active or Passive. (Active Operation and Ma	aintenance is defi	ned at 310 CMR
		Active Operation and Maintenance     Passive Operation and	Maintenance	
		(Active Operation and Maintenance makes the Site subject to a Post-RAO Class C Active Operation	and Maintenance	Annual Compliance
	G	LSP OPINION:		
	fc sta	   attest under the pains and penalties of perjury that I have personally examined and am familiar with the i form, including any and all documents accompanying this submittal. In my professional opinion and judgr glandard of care in 309 CMR 4.02(1), (ii) the applicable provisions of 309 CMR 4.02(2) and (3), and (iii) the tract of my here there in formation and believe the applicable provisions of 309 CMR 4.02(2) and (3), and (iii) the	information contai ment based upon ne provisions of 30	ned in this transmittal application of (i) the 99 CMR 4.03(5), to the
The second secon	7 8 2 5 8	if Section B indicates that a Phase I, Phase II, Phase III, Phase IV or Phase V Completion Statemen action(s) that is (are) the subject of this submittal (i) has (have) been developed and implemented in acco M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, and (iii) complies(y) with the identified papprovals identified in this submittal;	It is being submitti rdance with the a of such response provisions of all o	ed, the response pplicable provisions of action(s) as set forth in rders, permits, and
14	∧-t3-4- 2-51	$A_{i}^{\dagger}$ if Section B indicates that a Phase II Scope of Work or a Phase IV Remedy Implementation Plan is in that is (are) the subject of this submittal (i) has (have) been developed in accordance with the applicable pt 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) a $A_{i}^{\dagger}$ G.L. c. 21E and 310 CMR 40.0000, and (iii) complies(y) with the identified provisions of all orders, permistion in the submittal;	being submitted, t provisions of M.G is set forth in the a nits, and approval	he response action(s) L. c. 21E and 310 CMR applicable provisions of s identified in this
; ;	->-re-2-a-a	If Section B indicates that an As-Built Construction Report or a Phase V Inspection and Monitoring response action(s) that is (are) the subject of this submittal (i) is (are) being implemented in accordance w 2 E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such re applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, and (iii) complies(y) with the identified prov approvals identified in this submittal.	g Report is being with the applicable esponse action(s) visions of all order	submitted, the provisions of M.G.L. c. as set forth in the s, permits, and
÷	l a	im aware that significant penalties may result, including, but not limited to, possible fines and imprisonm to be false, inaccurate or materially incomplete.	nent, if I submit inf	ormation which I know
į		Check here if the Response Action(s) on which this opinion is based, if any, are (were) subject to an issued by DEP or EPA. If the box is checked, you MUST attach a statement identifying the applicable N	y order(s), permitile provisions there	(s) and/or approval(s) eof.
_		LSP Name: <u>Prasanta K. Bhunia</u> LSP #: <u>2999</u> Stamp:	THOFMASCA	
		Telephone: 978-532-1900 Ext.: 2287	RASANTA	
		BH Po-Bhunia	No. 2999	Shunia
Ľ	D	Deite: 4 19 02	EGISTERES STEPROT	51,
i.	Re	Relised 3/30/95 Supersedes Forms BWSC-010 (in part) and 013	A A A A A A A A A A A A A A A A A A A	Page 2 of 3
Ш		Do Not Alter This Form		
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		Massachusetts Department of Env	vironmental Pr	otection	B	NSC-108
_		Bureau of Waste Site Cleanup				
		COMPREHENSIVE RESPONSE AC	TION TRANSP	AITTAL	Release Tra	licking
		Pursuant to 310 CMR 40.0484 (Subpart D) and 4	40.0800 (Subpart H)	)	3 -	15009
	H	PERSON UNDERTAKING RESPONSE ACTION(S):				
-	Ň	Yame of <u>Boston Redevelopment Authority</u>				
	Ń	ame ofNoah Luskin	Title: <u>Senior</u>	<u>Project M</u>	anager be Auth	ority
1	ş	treet: <u>1 City Hall Plaza</u>	not as an	individual.	ne Autri	OIICy
	¢	ity/Town: <u>Boston</u>	State: MA	ZIP Code: _022(	01-1007	
		elephone: <u>617-722-4300</u> Ext.:	FAX: <u>617</u>	-248-1937		
ات	[	Check here if there has been a change in the person undertaking the Respondence Action.	nse			
	1.	RELATIONSHIP TO SITE OF PERSON UNDERTAKING RESPONSE	ACTION(S):	(check one)		
		🕅 RP or PRP Specify: 🕡 Owner 🔿 Operator 🔿 Generator 🔿 Tr	ransporter Other RP of	or PRP:		
	ļţ	Fiduciary, Secured Lender or Municipality with Exempt Status (as defined by	M.G.L. c. 21E, s. 2)			
<u> </u>		Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s. 5)	ü))			
[]]		Any Other Person Undertaking Response Action Specify				
	H	CERTIFICATION OF PERSON UNDERTAKING RESPONSE ACTIO	N(S):			
Ũ		, attest under the pains a familiar with the information contained in this submittal, including any and all docu inquiry of those individuals immediately responsible for obtaining the information, by knowledge and belief, true, accurate and complete, and (iii) that I am fully autresponsible for this submittal. I/the person or entity on whose behalf this submittal including, but not limited to, possible fines and imprisonment, for willfully submitting	and penalties of perjun iments accompanying the material informatio nonized to make this at all is made am/is aware ng false, inaccurate, or	y (i) that I have per- this transmittal form in contained in this testation on behalf that there are sign incomplete inform	sonally exam n, (ii) that, ba submittal is, of the entity l ificant penalt ation.	ined and am sed on my to the best of egally ies,
		y tanger	Title: Sr. Project 1	ringes		
		or: <u>Boston Redevelopment Authority</u> (print name of person or entity recorded in Section H)	Date: 32902			
		Iter address of the person providing certification, if different from address recom	ded in Section H:			
		 City/Town:	State:	ZIP Code:		
		Telephone: Ext.:	FAX: (optional)			
		YOU MUST COMPLETE ALL RELEVANT SECTIONS OF THIS INCOMPLETE. IF YOU SUBMIT AN INCOMPLETE FOR A REQUIRED DEA	FORM OR DEP MA RM, YOU MAY BE P ADLINE.	Y RETURN THE	E DOCUME MISSING	NT AS
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Weston & Sampson ENGINEERS, INC.



Weston & Sampson Engineers, Inc. Five Centennial Drive Peabody, MA 01960-7985 www.westonandsamnson.com Tel: (978) 532-1900 Fax: (978) 977-0100

Innovative Solutions since 1899

**Boston Redevelopment Authority** WSE Project No. 200317.A

April 19, 2002

Mr. John Auerbach Boston Public Health Commission Environmental Health Department 1010 Massachusetts Avenue Boston, Massachusetts 02118

Public Notification of Phase II/III Re: Comprehensive Site Assessment and Remedial Action Plan Submittal Boston Redevelopment Authority, Parcel P-3 Tremont and Whittier Streets, Roxbury, Massachusetts Release Tracking Number 3-15009

Dear Mr. Auerbach:

Weston & Sampson Engineers, Inc. was contracted by the Boston Redevelopment Authority (BRA) to prepare a Phase II-Comprehensive Site Assessment and Phase III-Remedial Action Plan for the Parcel P-3 property located at Tremont and Whittier Streets (the Site).

The Phase II/III report was prepared in accordance with the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000 and was submitted to the Department of Environmental Protection's Northeast Regional Office (DEP-NERO) in Wilmington, Massachusetts, where it is available for public review. If you have any questions regarding this Site, please contact George Naslas of Weston & Sampson at (978) 532-1900 or Noah Luskin, Senior Project Manager, BRA at (617) 722-4300.

Very truly yours,

WESTON & SAMPSON ENGINEERS, INC.

Bhunia

Prasanta K. Bhunia, Ph.D., LSP Vice President

cc: DEP-NERO, Wilmington, MA Mark Maloney, Director, BRA, Boston, MA The Honorable Thomas M. Menino, Mayor, Boston, MA File

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Massachusetts (110) Five Centennial Drive

Peabody, MA 01960-7985

Massachusetts 100 Foxborough Blvd, Suite 250 Foxborough, MA 02035 Glastonbury, CT 06033-1093

Connecticu 2928 Main Street

Rhode Island 2348 Post Road, Suite 8

Warwick, RI 02886-2271

Portsmouth, NH 03801

New Hampshire 195 Hanover Street, Suite 28

Maine PO Box 189 York, ME 03909

Weston & Sampson ENGINEERS, INC.



Weston & Sampson Engineers, Inc. Five Centennial Drive Peabody, MA 01960-7985 www.westonandsampson.com Tel: (978) 532-1900 Fax: (978) 977-0100

Innovative Solutions since 1899

**Boston Redevelopment Authority** WSE Project No. 200317.A

April 19, 2002

The Honorable Thomas M. Menino Mayor's Office One Boston City Hall Office Boston, Massachusetts 02108

Re: Public Notification of Phase II/III Comprehensive Site Assessment and Remedial Action Plan Submittal Boston Redevelopment Authority, Parcel P-3 Tremont and Whittier Streets, Roxbury, Massachusetts Release Tracking Number 3-15009

Dear Mayor Menino:

Weston & Sampson Engineers, Inc. was contracted by the Boston Redevelopment Authority (BRA) to prepare a Phase II-Comprehensive Site Assessment and Phase III-Remedial Action Plan for the Parcel P-3 property located at Tremont and Whittier Streets (the Site).

The Phase II/III report was prepared in accordance with the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000 and was submitted to the Department of Environmental Protection's Northeast Regional Office (DEP-NERO) in Wilmington, Massachusetts, where it is available for public review. If you have any questions regarding this Site, please contact George Naslas of Weston & Sampson at (978) 532-1900 or Noah Luskin, Senior Project Manager, BRA at (617) 722-4300.

Very truly yours,

WESTON & SAMPSON ENGINEERS, INC.

Po Bhunia

Prasanta K. Bhunia, Ph.D., LSP Vice President

cc: DEP-NERO, Wilmington, MA Mark Maloney, Director, BRA, Boston, MA Mr. John Auerbach, Boston Public Health Commission, Boston, MA File

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Massachusetts (HQ) Five Centennial Drive Peabody, MA 01960-7985

100 Foxborough Blvd, Suite 250

Massachusetts Foxborough, MA 02035

Connecticut 2928 Main Street Glastonbury, CT 06033-1093

2348 Post Road, Suite 8 Warwick, RI 02886-2271

Rhode Island

New Hampshire 195 Hanover Street, Suite 28 Portsmouth, NH 03801

Maine PO Box 189 York, ME 03909

#### NOTICE OF A REMEDIAL ACTION PLAN

### BOSTON REDEVELOPMENT AUTHORITY PARCEL P-3 TREMONT AND WHITTIER STREETS ROXBURY, MA RTN 3-15009

A Remedial Action Plan (310 CMR 40.0861) has been developed for the above-referenced site pursuant to the Massachusetts Contingency Plan (310 CMR 40.1406). This disposal site was classified as Tier II on April 10, 1998.

The **Remedial Action Plan** proposes the following measures to respond to a release of oil and/or hazardous material at this disposal site:

- Excavation and off-site disposal of the lead-contaminated soil "hot spot".
- Restricting future residential use of a portion of the site using an Activity and Use Limitation (AUL).

M.G.L. c. 21E and the Massachusetts Contingency Plan provide additional opportunities for public notice of and involvement in decisions regarding response actions at disposal sites: 1) The Chief Municipal Official and Board of Health of the community in which the site is located will be notified of major milestones and events, pursuant to 310 CMR 40.1403; and 2) Upon receipt of a petition from ten or more residents of the municipality in which the disposal site is located, or of a municipality potentially affected by the disposal site, a plan for involving the public in decisions regarding response actions at the site will be prepared and implemented, pursuant to 310 CMR 40.1405.

To obtain more information on this disposal site and the opportunities for public involvement during its remediation, please contact Mr. Noah Luskin, Senior Project Manager, Boston Redevelopment Authority, 1 City Hall Plaza, Boston, MA at (617) 722-4300.

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