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Final Phase 2 Data Evaluation Report

BoRit Asbestos Superfund Site, Operable Unit 1

Ambler, Pennsylvania

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Final Phase 2 Data Evaluation Report
for
BoRit Asbestos Superfund Site
Operable Unit 1
Ambler, Pennsylvania

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Acronyms

%	percent
AA	ambient air
ABS	activity-based sampling
ACM	asbestos-containing material
AHERA	Asbestos Hazard Emergency Response Act
APMW	asbestos pile monitoring well
bgs	below ground surface
BTAG	Biological Technical Assistance Group
CARB	California Air Resource Board
CDM Smith	CDM Federal Programs Corporation
CLP	Contract Laboratory Program
Cr^{+3}	trivalent chromium
Cr^{+6}	hexavalent chromium
DQO	data quality objective
EPA	U.S. Environmental Protection Agency
ESAT	Environmental Services Assistance Team
f/cc	fibers per cubic centimeter
FS	feasibility study
GPR	ground-penetrating radar
HASP	Health and Safety Plan
HSA	hollow stem augers
HV	high volume
HQ	hazard quotient
ISO	International Organization for Standardization
IUR	inhalation unit risk
L/min	liters per minute
LV	low volume
MCL	maximum contaminant level
MET	meteorological
MFL	million fibers per liter
mg/kg	milligram per kilogram
MS/MSD	matrix spike/matrix spike duplicate
ng/kg	nanograms per kilogram
NIOSH	National Institute of Occupational Safety and Health
ORNL	Oak Ridge National Laboratory
OSHA	Occupational Safety and Health Administration
OSWER	Office of Solid Waste and Emergency Response

OU	operable unit
PADEP	Pennsylvania Department of Environmental Protection
PCBs	polychlorinated biphenyls
PCM	phase contrast microscopy
PCME	phase contrast microscopy equivalent
PLM	polarized light microscopy
Ppt	parts per trillion
PRG	preliminary remediation goal
PVC	poly vinyl chloride
QA	quality assurance
QC	quality control
RAC	Response Action Contract
RfD	reference dose
RI	remedial investigation
RI/FS	remedial investigation/feasibility study
RSL	Regional Screening Level
RVMW	reservoir monitoring well
s/cc	structures per cubic centimeter
Site	BoRit Asbestos Superfund Site, operable unit 1
SL	Screening Level
SLERA	Screening Level Ecological Risk Assessment
SMP	Site Management Plan
SVOC	semi-volatile organic compound
TAL	Target Analyte List
TCDD	tetrachlorodibenzo-p-dioxin
TCL	Target Compound List
TEM	transmission electron microscopy
TEQ	toxic equivalent quotient
TEF	toxic equivalency factor
TWA	time-weighted average
TWF	time weighting factor
µg/L	micrograms per liter
VOC	volatile organic compound
WA	work assignment
WAM	work assignment manager

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Executive Summary

Introduction

Under the U.S. Environmental Protection Agency (EPA) contract EP-S3-07-06, Work Assignment (WA) 029-RICO-A3EN CDM Federal Programs Corporation (CDM Smith) is conducting a Remedial Investigation/Feasibility Study (RI/FS) of the BoRit Asbestos Superfund Site Operable Unit 1 (OU-1), located in Ambler, PA (the Site). The RI field investigation is being performed in a phased approach. Phase 1 of the RI, performed between November 2009 and January 2010, provided an initial delineation of waste in soil, surface water and sediment. Phase 2 of the RI was designed to expand the delineation of waste in these media and collect data from groundwater sampling, activity-based sampling, and geotechnical investigations.

Purpose of Report

The purpose of this Phase 2 Data Evaluation Report is to present the Phase 2 field investigation data and make recommendations for additional field investigation activities to fill remaining data gaps.

Site Location and Description

The Site consists of three adjacent properties near the intersection of West Maple Street and Butler Pike in Ambler Borough, Montgomery County, Pennsylvania:

- The Asbestos Pile parcel is approximately 2.5 acres and contains an asbestos waste pile.
- The Park parcel is approximately 11 acres and contains a former asbestos disposal area (now the closed Whitpain Wissahickon Park).
- The Reservoir parcel is approximately 15 acres and contains a reservoir.

Three other areas in the Site vicinity were also sampled in Phase 2: walking trails along Wissahickon Creek, Kid's Park, and residential properties. The Site map depicting the three parcels is shown on **Figure ES-1**.

Phase 2 Investigation

The Phase 2 field investigation was designed to provide data to answer the investigative questions in the *Revised Final BoRit Asbestos Superfund Site Phase 2 Field Investigation Planning Guide,* dated August 4, 2010 (see Table 1-1). Field work was conducted in summer and fall 2010 and summer 2011. In addition, ambient air sampling was conducted approximately monthly from November 2010 through October 2011. The Phase 2 field investigation consisted of the following components:

- Collection of grab surface soil samples for asbestos analyses (and chemical analysis, where noted) from:
  - two locations in the Park parcel, one location in the Reservoir, and one location in the Asbestos pile parcel) where surface runoff is believed to exit the Site between the fence line and the roadway;
  - six previously-sampled composite soil sample locations in the Park parcel where asbestos levels greater than 12% were found in the cover/waste interface layer;

- five locations in the Park parcel on the stream bank cap along Wissahickon Creek and Rose Valley Creek;
- two locations at the Kid's Park adjacent to the Site on Oak Street;
- five locations, at three depth intervals, at the former fire training area at the Asbestos Pile parcel for target compound list (TCL) semi-volatile organic compounds (SVOCs) and dioxin analyses (no asbestos analysis);
- two locations at three depth intervals at the slag area at the Asbestos Pile parcel for TCL SVOCs, dioxins, and target analyte list (TAL) metals;
- six locations also selected for activity-based sampling (ABS) on the Park parcel;
- three ABS locations at the Asbestos Pile parcel;
- one ABS location at the Reservoir parcel;
- eight residential yards.

- A visual investigation of the banks of Wissahickon Creek, near walking trails, to evaluate the potential extent of asbestos-containing material (ACM) washed downstream from the Site;
- Collection of one seep water sample from one location on the Reservoir parcel for TCL volatile organic compounds (VOCs), SVOCs, polychlorinated biphenyls (PCBs), and pesticides, TAL metals, and asbestos analyses;
- ABS on the Park parcel, Reservoir parcel, Asbestos Pile parcel, walking trails, and at select residential properties;
- Utility clearing of all proposed boring locations in the Park parcel, Asbestos Pile and Reservoir berm (along the roadway between the Asbestos Pile parcel and the Reservoir parcel) and in floodplain areas;
- Subsurface soil sampling at each monitoring well location approximately 3 inches below the waste and native layer interface;
- Installation and sampling of monitoring wells on all three Site parcels for VOC, SVOC, PCB, pesticide, metal and asbestos analysis;
- A geotechnical evaluation of the Asbestos Pile and Park parcels for slope stability and settlement with soil samples analyzed for grain size, Atterberg limits, percent moisture, specific gravity, shear strength, and consolidation;
- Installation of piezometers in three of the geotechnical boreholes at the Asbestos Pile parcel;
- Hydrologic studies (a comprehensive round of measurements at monitoring wells, piezometers, and staff gauges) conducted at the Site parcels, in the reservoir, and in creeks;

- An ecological site survey conducted to identify the terrestrial, aquatic, and wetland habitats on the Site and to determine the potential plant and wildlife receptors inhabiting these areas. The findings of the survey will be presented in the Screening Level Ecological Risk Assessment (SLERA).

Results

Screening Criteria

The sample analytical results were screened against the following risk-based screening criteria:

- Non-asbestos contaminants in groundwater and soil analytical data were screened against the EPA Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites (May 2012). Groundwater and seep data were screened against tap water RSLs. Soil data was screened against residential soil RSLs. Groundwater and soil cancer RSLs were used as presented on the RSL table (corresponding to a 10^{-6} risk level). Groundwater and soil noncancer RSLs were adjusted (divided by 10 to a hazard quotient (HQ) =0.1) to account for the assumption of multiple chemicals with noncancer toxicity values based on the same toxic endpoint. Oak Ridge National Laboratory (ORNL) criteria for carcinogenic compounds are the EPA Regional Screening Levels (RSLs). Groundwater and soil non-carcinogen ORNL criteria were adjusted (divided by 10) to account for any additive effects.

- Dioxin total toxic equivalent quotients (TEQs) are based on the 2005 World Health Organization scheme. For dioxins detected in soil, the total TEQ was compared to the RSL for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD). In addition to dioxin data being compared to the RSL, it will also be compared to the risk-based clean-up goal for dioxin in residential soil, which is derived from the recently released oral reference dose (RfD).

- Soil data for asbestos were screened against criteria in EPA's Office of Solid Waste and Emergency Response (OSWER) Framework for Investigating Asbestos-Contaminated Superfund Sites, dated September 2008 (OSWER, 2008). Soil samples were screened to 1% asbestos.

- ABS air samples were screened against a preliminary remediation goal (PRG) of 0.04 structures/cubic centimeters (s/cc) calculated by the EPA Region 3 toxicologist specifically for a raking/lawn maintenance ABS scenario at the BoRit Site (EPA 2011a).

- EPA provided a screening level of 0.001 s/cc asbestos for ambient air in an email dated May 15, 2012 to CDM Smith.

- Asbestos in groundwater and the seep was screened against the May 2009 Federal Maximum Contaminant Level (MCL) of 7 million fibers per liter (MFL).

Table ES-1 provides a summary of the media exceeding screening criteria at each parcel or area.

Park Parcel

Samples collected from the Park Parcel include surface soil collected from two locations where surface runoff is believed to exit the Site, six previously-sampled composite sampling locations where asbestos levels greater than 12% were detected in the cover waste interface, and five locations along the stream bank cap. Subsurface soil and groundwater samples were collected during installation of Park parcel monitoring wells PKMW01 and

PKMW02. Personal and perimeter air samples were collected during ABS scenarios at six locations. Full Phase 2 analytical results are presented in **Appendix F.**

Surface and subsurface soil samples were analyzed for asbestos only by PLM using CARB 435B, 1000 point count. Significant results include:

- Three of the 13 grab surface soil samples (PKSS-01, PKSB-06 and PKSB-08) exceeded the asbestos fiber RSL of 1% with concentrations of 1.2%, 1.5%, and 1.1% chrysotile asbestos fibers, respectively.
- 30-point composite surface soil samples collected from the ABS locations did not exceed the asbestos fiber RSL.
- Subsurface soil samples collected at MW01 and MW02 did not exceed the asbestos fiber RSL.

Groundwater samples from the two bedrock wells were analyzed for TCL VOCs, SVOCs, pesticides, PCBs, TAL metals, and asbestos. Significant results include:

- No asbestos fibers were detected in the two Park parcel monitoring wells (MW01 and MW02)..
- Carbon tetrachloride was detected above the RSL of 0.39 microgram per liter (µg /L) in MW02 (5.8 µg/L);
- Tetrachloroethene was detected above the RSL of 3.5 µg/L in MW02 (22 µg/L);
- Bis (2-ethylhexyl)phthalate was detected above the RSL of 0.071 µg/L in MW02 (55 µg/L);
- Vanadium was detected above the RSL of 7.8 µg/L in the unfiltered metals sample from MW02 (10.6 J µg/L).

Bis(2-ethylhexyl)phthalate was detected above the RSL in the field blank; therefore, the presence of this compound in groundwater samples may not be due to Site contaminants.

Two-hour ABS raking activities were conducted in the Park parcel at six locations. Two high-volume (HV) and two low-volume (LV) personal air samples were collected. LV samples were only analyzed in the event that the HV samples were overloaded. This happened in two HV samples. Sample results ranged from 0 structures per cubic centimeter (s/cc) to 0.46 s/cc, and samples from all six locations exceeded the PRG of 0.04 s/cc.

Three HV and three LV perimeter air samples were also collected during the ABS raking activities, with one pump upwind and two pumps downwind on a 10-foot by 10-foot grid. Both HV air samples and several corresponding LV air samples collected were analyzed due to overload. Sample results ranged from 0 s/cc to 0.072 s/cc. Perimeter air samples analyzed from all six Park locations exceeded the PRG level of 0.04 s/cc.

Asbestos Pile

Surface soil samples were analyzed for asbestos, dioxin, SVOCs, and metals. Subsurface soil samples were analyzed for asbestos. Significant results are summarized below:

- No asbestos fibers were detected in the surface soil sample collected from a surface water runoff pathway;
- Dioxin TEQ values ranged from 2.73 to 46.15 ng/kg; 20 out of 22 sample results (91%) exceeded the RSL for 2,3,7,8 TCDD. Although 91% of the dioxin results exceed the RSL, none of the results exceed the risk based clean-up goal for dioxin in residential soils of approximately 50 ng/kg (which has been derived from the

recently released oral RfD). The observed range of dioxin detections is close to the expected background conditions for urban soils (EPA, December 2003);

- No samples from the slag area exceeded the asbestos soil RSL of 1%;
- Twenty-one of 22 samples had concentrations of two or more SVOCs that exceeded the RSLs;
- All samples from the slag area exceeded the RSLs for aluminum, chromium, iron, and manganese;
- 30-point composite surface soil samples collected from the three ABS locations contained asbestos at concentrations exceeding the RSL of 1% (2.2%, 3.5%, and 1.3% chrysotile asbestos fibers);
- No asbestos fibers were detected in native subsurface soil samples taken during monitoring well installation.

Groundwater samples from two bedrock monitoring wells were analyzed for VOCs, SVOCs, pesticides, PCBs, metals, and asbestos by TEM analyses. Significant results of these analyses include:

- No asbestos fibers were detected in the two Asbestos Pile parcel monitoring wells (MW05 and MW06).
- Arsenic was detected above the RSL of 0.045 µg/L, but below the MCL of 10 µg/L in unfiltered sample MW06 (5.2 J µg/L);
- Manganese was detected above the RSL of 32 µg/L in both unfiltered and filtered samples at MW05 (157 µg/Land 156 µg/L, respectively), and MW06 (450 µg/L and 426 µg/L, respectively);
- Selenium was detected above the RSL of 7.8 µg/L in filtered sample MW05 (14.3 J µg/L);
- Bis(2-ethylhexyl) phthalate was detected above the RSL of 0.071 µg/L for the unfiltered samples at MW05 and its duplicate analysis (42 µg/L and 26 µg/L, respectively) and at MW06 (14 µg/L).

It should be noted that bis(2-ethylhexyl)phthalate was detected above the RSL in the field blank; therefore, the presence of this compound in groundwater samples may not be Site-related.

Two-hour ABS raking activities were conducted at the Asbestos Pile parcel at three locations. Samples collected and analyzed from the activities include HV and LV personal air samples. One LV sample was analyzed because the corresponding HV sample was overloaded. Personal air sample results ranged from 0.058 s/cc to 0.13 s/cc. Personal air samples analyzed from all three Asbestos Pile locations exceeded the adult residential raking PRG level of 0.040 s/cc.

Three HV and three LV perimeter air samples were also collected during the ABS raking activities, with one pump located upwind and two pumps located downwind. Pumps were positioned at the edge of each sampling location grid. Sampling location grids were delineated at 10-foot by 10-foot and contained as many as three adjoining grids. Both HV air samples and several corresponding LV air samples collected were analyzed due to overload. Sample results ranged from 0 s/cc to 0.041 s/cc with one sample exceeding the PCME PRG level of 0.040 s/cc.

Reservoir

Surface soil samples were analyzed for asbestos, dioxin, SVOCs, and metals. Subsurface soil samples were analyzed for asbestos. The results are summarized below:

- A surface soil sample collected on a surface run-off pathway contained 1.5% chrysotile asbestos fibers, exceeding the RSL of 1%;
- No asbestos fibers were found in the composite surface soil sample collected from the ABS location;
- The subsurface soil sample at MW03 contained 1.50% chrysotile asbestos fiber, exceeding the RSL of 1%.

Groundwater samples collected from the two bedrock wells and a surface water sample collected from the seep on the western side of the Reservoir near Wissahickon Creek were analyzed for VOCs, SVOCs, pesticides, PCBs, metals, and asbestos. The results include:

- One unfiltered groundwater sample from MW04 had a detected level of asbestos (0.51 MFL) and the unfiltered seep sample RV-SPSW01 had a detected level of asbestos (5.1 MFL); neither exceeded the asbestos MCL;
- Arsenic was detected above the RSL (0.045 µg/L), but below the MCL of 10 µg/L in one filtered sample (7.6 J µg/L);
- Barium was detected above the RSL of 290 µg/L in both the unfiltered and filtered sample from one well (525 µg/L and 561 µg/L, respectively);
- Manganese was detected above the RSL of 32 µg/L in both unfiltered and filtered samples from both wells (9,190 µg/L and 9,620 µg/L, respectively in MW03, and 95.9 µg/L and 86.7 µg/L, respectively in MW04); as well as in the seep sample (52.9 µg/L).
- Bis(2-Ethylhexyl)phthalate was detected above the RSL of 0.071 µg/L in the seep sample duplicate (44 B µg/L) and in the unfiltered well sample at MW04 (3.0 J µg/L) .

It should be noted that bis(2-ethylhexyl)phthalate was detected above the RSL in the field blank; therefore, the presence of this compound in groundwater and seep samples may not be Site-related.

An ABS shoveling activity was conducted at one Reservoir parcel location. Two HV and two LV personal air samples were collected during the two-hour ABS shoveling scenario at the Reservoir ABS location. Asbestos was not detected in any of the samples.

Three HV and three LV perimeter air samples were also collected during the ABS shoveling activity, with one pump upwind and two pumps downwind on a 10-foot by 10-foot grid. Only the HV air samples collected were analyzed. Asbestos was not detected in any of the samples.

Walking Trails

Samples collected from walking trails include surface soil from two locations associated with ABS: the walking trail on the west side of the Wissahickon Creek across from the Park parcel and along the Green Ribbon Preserve Trail west of the Wissahickon Creek. No walking trail samples had asbestos results exceeding the RSL (1%).

The ABS activities along the walking trails including a mowing scenario and a hiking scenario. Samples included HV and LV personal air samples and perimeter air samples. Two HV and two LV personal air samples were collected. All HV air samples collected were analyzed with the exception of OW-ABS01 which required a

corresponding LV air sample be analyzed due to overload. Analytical results ranged from 0 s/cc to 0.0008 s/cc asbestos fibers; however, asbestos was not detected above the PRG of 0.040 s/cc.

Three HV and three LV perimeter air samples were also collected during the ABS scenarios, with one pump located upwind and two pumps located downwind in a 10-foot by 30-foot grid for the mowing sample and along a quarter-mile radius of the trail for the hiking scenario. All but one of the HV air samples were analyzed (a corresponding LV air was analyzed due to overload in the HV sample). Results ranged from 0 s/cc to 0.0052 s/cc; however, no samples exceeded the PRG of 0.040 s/cc.

Residential Properties

Surface soil composite samples and ABS samples were collected from eight residential properties: five along West Maple Street and three along Mercer Hill Drive and Betsy Lane. The sampling grids were in the backyards. Personal and perimeter air samples were also collected during ABS activities at the eight locations. A vacant lot was also included in this selection, because portions of it have been used as a community garden and makeshift playground for the neighborhood children.

A 30-point surface soil composite sample was collected at a depth of 0 to 3 inches below ground surface (bgs) at each location and analyzed for asbestos. No residential soil samples exceeded the asbestos RSL (1%).

Personal and perimeter air samples were collected during the ABS raking activities conducted at the same eight residential properties. Two HV and two LV personal air samples were collected and both HV air samples and several corresponding LV air samples collected were analyzed due to overload. Results ranged from 0 s/cc to 0.0094 s/cc. No sample results exceeded the PRG of 0.040 s/cc.

Three HV and three LV perimeter air samples were also collected during the ABS raking activities, with one pump upwind and two pumps downwind on a 10-foot by 10 foot grid. Both HV air samples and several corresponding LV air samples collected were analyzed due to overload. Sample results ranged from 0 s/cc to 0.039 s/cc. No sample results exceeded the PRG of 0.040 s/cc.

Kid's Park

The surface soil at the Kid's Park was covered with approximately 8 inches of wood chips. No ACM was visually observed in the wood chips or in the soil below. Two surface soil grab samples were collected at a depth of 0 to 3 inches below the natural grade (i.e., no wood chips were collected) beneath the swing sets and analyzed for asbestos. No asbestos fibers were detected in either sample.

Outdoor Ambient Air

Ambient air samples were collected approximately on a monthly basis at 7 locations outside the perimeter of the Site from November 2010 to October 2011. Detection of asbestos ranged from less than 0.00038 s/cc to 0.001174 s/cc. with one collected in September 2011 from the end of easement on the west side of the Wissahickon Creek which exceeded the PCME screening level of 0.001 s/cc.

Personal and Perimeter Air Samples

During intrusive site work (subsurface drilling) at the Park, Asbestos Pile and Reservoir Parcels air samples were collected from personal air sampling pumps and at the perimeter of the Site and screened against the Occupational Safety and Health Administration (OSHA) standards for asbestos. Note that these data were not used to determine the need for personal protective equipment requirements for site workers, because all

personnel working within the intrusive work zones were required to wear respirators in accordance with the Final Site Management Plan (SMP).

No personal air samples exceeded the 30-minute phase contrast microscopy (PCM) concentration (greater than 1.0 fiber/cc). The 8-hour time weighted average (TWA) PCM concentration from one sample exceeded the standard (greater than 0.1 fibers/cc). That sample was collected during the second day of drilling at the Asbestos Pile and had a concentration of at 0.15 fibers/cc. Perimeter air samples were collected daily during intrusive activities. Per the SMP, if more than 2 asbestos fibers were detected in perimeter air samples, engineering controls were to be used during subsequent intrusive activities. No perimeter air samples exceeded the 2 asbestos fibers "trigger" for engineering controls.

Groundwater Occurrence and Potentiometric Surface

The shallow groundwater levels were measured in January, April, June, September, and October 2011 and the data were used to create potentiometric surface maps. Generally, the shallow groundwater is found in the fractured upper bedrock, with discontinuous occurrences in the overburden material near Wissahickon Creek and in the Asbestos Pile. Shallow groundwater flows from north to south across the Park Parcel, discharging to Wissahickon Creek. It is noted that there is a lack of potentiometric data in the north central part of the Park parcel; however, the groundwater would be expected to flow towards the significant creeks. Local gradients indicate a component of site groundwater may be discharging to Rose Valley Creek, but not to Tannery Run.

Vertical hydraulic gradient is downward from the overburden into the fractured upper bedrock. Groundwater found within the unconsolidated material of the Asbestos Pile is discontinuous and may be described as perched water. If a pathway exists, this water would be expected to flow downward into the fractured upper bedrock.

Recommendations

CDM Smith recommends that EPA include the following activities in future fieldwork:

- Additional sampling of the existing groundwater monitoring wells at the Site to evaluate seasonal fluctuation of contaminants;
- Installation of one staff gauge in the breech dam in Wissahickon Creek and collection of additional rounds of water elevation data to evaluate the hydraulic connection of surface water to groundwater;
- Collection of background soil samples for VOCs, SVOCs, and metals to provide background organic and inorganic concentrations for the risk assessment;
- Installation and sampling of at least one upgradient monitoring well to provide background data for the human health risk assessment and water level data in the northern part of the Park Parcel; and
- Performance of a topographical and boundary extent survey of the Site to document existing (post-Removal Program) conditions for use as a base map in the RI report.

In addition, CDM Smith recommends that two assessments of the reservoir and its operation be performed: 1) a visual survey of the embankment and the reservoir to identify operating features and 2) an assessment of the safety features to identify potential deficiencies in the current condition of the reservoir that may contribute to mis-operation or failure of the system and threaten the health and safety of downstream populated areas and infrastructure.

Section 1
Introduction

1.1 Introduction

The U.S. Environmental Protection Agency (EPA) Region 3 has contracted CDM Federal Programs Corporation (CDM Smith) to conduct a Remedial Investigation/Feasibility Study (RI/FS) for the BoRit Asbestos Superfund Site Operable Unit 1 (OU-1) in Ambler, PA (the Site). This work is being performed under Work Assignment (WA) 029-RICO-A3EN of the EPA Region 3 Response Action Contract (RAC) 2 contract EP-S3-07-06. The RI will provide analytical data to support a comprehensive human health risk assignment (HHRA) and a screening level ecological risk assessment (SLERA).

The RI is being performed in a phased approach. Phase 1 of the RI was designed to provide information on the nature and extent of waste material and other contaminants in the Site soil, surface water, and sediment. The Phase 1 field investigation was conducted between November 2009 and January 2010, and the results were compiled in the report, *Phase 1 Data Evaluation Report, June 18, 2010* by CDM Smith (CDM Smith 2010a). Phase 2 of the RI was devised using the information collected from the Phase 1 field investigation to satisfy data gaps and was designed to expand the delineation of waste in these media. In addition, groundwater data, activity-based sampling (ABS), and geotechnical data were collected during the Phase 2 field investigation, which was conducted in the summer and fall of 2010 and in the summer of 2011. This Phase 2 Data Evaluation Report presents the data obtained during the Phase 2 field investigation and presents recommendations for collection of additional information needed to proceed with the RI/FS.

The Site consists of three adjacent properties near the intersection of West Maple Street and Butler Pike in Ambler Borough, Montgomery County, Pennsylvania. One property, located in Ambler Borough, (the Asbestos Pile parcel) is approximately 2.5 acres and contains an asbestos waste pile. Whitpain Township encompasses a second property (the Park parcel), which is approximately 11 acres and contains a former asbestos disposal area (now the closed Whitpain Wissahickon Park). The third property (the Reservoir parcel) is primarily located within Upper Dublin Township and is approximately 15 acres and contains a reservoir. These areas are located a few hundred yards northwest of the asbestos piles that became the Ambler Asbestos Piles Superfund Site (Ambler Asbestos Piles). The Site is approximately centered at 40.154769 degrees north latitude, 75.230341 degrees west latitude in the town of Ambler, Pennsylvania. The Site is bounded by residential properties to the north and northwest, Wissahickon Ambler Alley, Chestnut Avenue, West Maple Street, and commercial and residential areas to the northeast and east, commercial properties to the south and southeast, Montgomery County and Pennsylvania Department of Transportation open space to the southwest, and the Wissahickon Creek to the west. The Site location map is presented in **Figure 1-1**. The Site map depicting the three BoRit Asbestos Superfund Site parcels and the nearby former Ambler Asbestos Superfund Site is shown on **Figure 1-2**.

1.2 Scope of Phase 2 Field Investigation

The scope of the Phase 2 field investigation was defined in CDM Smith's *Revised Final BoRit Asbestos Superfund Site Phase 2 Field Investigation Planning Guide,* dated August 4, 2010. The Phase 2 field investigation was designed to provide data to answer the investigative questions in the Planning Guide listed in **Table 1-1.** Sampling activities were performed in accordance with the Final Site Management Plan (SMP) (*Final Site Management Plan for Remedial Investigation, Phase, 2 BoRit Asbestos Superfund Site, Operable Unit 1 Ambler, Pennsylvania, September 24, 2010*) and the SMP Addendum (*Addendum to the Final Phase 2 Site Management*

Plan for BoRit Asbestos Superfund Site OU-1 Remedial Investigation/Feasibility Studies, June 22, 2011). Health and safety procedures were performed in accordance with the Health and Safety Plan in Appendix B of the SMP and SMP Addendum.

Phase 2 field investigation activities were conducted on August 17, 2010, October 4, 2010 through December 3, 2010, and July 6, 2011 through July 20, 2011. In addition, ambient air sampling was conducted from November 14, 2010 through October 23, 2011. The Phase 2 field investigation consisted of the following components:

- Collection of surface soil samples for asbestos (and other parameters, as noted) analysis from:
  - four locations at three parcels (Park parcel -two locations, Reservoir parcel -one location, Asbestos Pile parcel -one location), where surface runoff is believed to exit the Site between the fence line and the roadway;
  - six previously-sampled composite soil sample locations at the Park parcel, where asbestos levels greater than 12% were found in the cover/waste interface layer;
  - five locations in the Park parcel on the stream bank cap along Wissahickon Creek and Rose Valley Creek;
  - two locations at a nearby Kid's Park adjacent to the Site on Oak Street;
  - five locations at three distinct depth intervals (five from 0 to 3 inches, five from 0 to 6 inches, and five from 6 to 24 inches) at the former fire training area at the Asbestos Pile parcel, and analysis for target compound list (TCL) semi-volatile organic compounds (SVOCs) and dioxin (no asbestos analysis);
  - two locations at three distinct depth intervals (two from 0 to 3 inches, two from 0 to 6 inches, and two from 6 to 24 inches) at the slag area at the Asbestos Pile parcel, and analysis for TCL SVOCs, dioxins, and target analyte list (TAL) metals;
  - six ABS-corresponding locations at the Park parcel. Locations were chosen for ABS due to elevated asbestos concentrations in surface soil;
  - three ABS-corresponding locations at the Asbestos Pile parcel;
  - one ABS-corresponding location at the Reservoir parcel; and
  - eight ABS-corresponding locations at residential properties.
- A visual investigation of the banks of Wissahickon Creek, near walking trails, to evaluate the potential extent of asbestos-containing material (ACM) washed downstream from the Site (**Figure 1-2**);
- Seep water samples collected at one location on the Reservoir parcel, and analysis for TCL volatile organic compounds (VOCs), SVOCs, polychlorinated biphenyls (PCBs), pesticides, TAL metals, and asbestos;
- ABS on the Park parcel, Reservoir parcel, Asbestos Pile parcel, walking trails, and at select residential properties, and analysis for asbestos using Transmission Election Microscopy (TEM) method International Organization for Standardization (ISO) 10312. Each ABS location included personal (adult and child) and three perimeter air samples;

- Utility clearing of all proposed boring locations in the Park parcel, Asbestos Pile parcel, and Reservoir parcel berm (along the roadway between the Asbestos Pile parcel and the Reservoir parcel);
- Subsurface soil sampling at each monitoring well location approximately 3 inches below the waste and native layer interface, and analysis for asbestos;
- Installation of six monitoring wells installed among the three Site parcels;
- Groundwater sampling from the six monitoring wells and analysis for TCL VOCs, SVOCs, PCBs, pesticides, TAL metals, and asbestos;
- Performance of a geotechnical investigation to provide a preliminary evaluation of the potential for slope stability and settlement, with soil sample analysis for: grain size, Atterberg limits, percent moisture, specific gravity, shear strength, and consolidation;
- Installation of piezometers in three of the geotechnical boreholes (GT-6, GT-7, and GT-8) at the Asbestos Pile parcel;
- Hydrologic studies (comprehensive round of measurements at monitoring wells, piezometers and staff gauges) conducted at the three Site parcels and adjacent creeks;
- Ambient air sampling conducted monthly from November 2010 through October 2011 at seven locations outside the perimeter of the Site, and asbestos analysis by TEM method ISO 10312; and
- An ecological site survey conducted to identify the terrestrial, aquatic, and wetland habitats on the Site and to determine the potential plant and wildlife receptors inhabiting these areas. The findings of the survey will be presented in the SLERA.

1.3 Report Organization

The remainder of this Phase 2 Data Evaluation Report is organized as follows:

- Section 2 provides details on the field sampling activities.
- Section 3 is a summary of the analytical, geotechnical, and hydrogeologic results.
- Section 4 provides recommendations for further investigation based on results from the Phase 2 analytical data received.
- Section 5 provides references.

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Section 2
Phase 2 Field Investigation Summary

The BoRit RI Phase 2 investigation encompasses all activities performed from August 2010 through October 2011. The three Phase 2 mobilization periods are detailed below. Summaries of all samples collected during the Phase 2 field investigation are presented in **Tables 2-1 through 2-5**.

2.1 August 2010 Field Activities

The first Phase 2 mobilization occurred in August 2010. In total, 15 surface soil samples were collected on August 17th. Samples were collected from four locations along the three parcels to determine if asbestos exists at the property extent, especially at areas where steep slopes could result in surface runoff exiting the Site. Samples were also collected at six locations in the Park parcel where asbestos was detected above 12 percent during Phase 1 and from five locations on the stream bank cap along Wissahickon Creek and Rose Valley Creek to determine whether the stream banks already stabilized by EPA's Removal Program are being cross-contaminated during the next stages of EPA's Removal Program actions. Surface soil sampling locations are shown on **Figure 2-1**.

All samples were collected from 0 to 3 inches below ground surface (bgs), in accordance with the requirements of the HHRA. Disposable sampling equipment was used, eliminating the need to collect an aqueous rinsate blank.

2.2 October and November 2010 Field Activities

The second Phase 2 mobilization occurred in October and November 2010 and consisted of the following activities:

- Surface soil sampling at the Kid's Park, Asbestos Pile parcel (fire training area and slag area), Park parcel and residential properties;
- Visual ACM investigation;
- Seep sampling at the Reservoir parcel;
- ABS for a single location only (PK05);
- Utility clearance;
- Monitoring well installation at the Park parcel, the Asbestos Pile parcel, and the Reservoir parcel;
- Groundwater sampling at the Park parcel, the Asbestos Pile parcel ,and the Reservoir parcel;
- Geotechnical investigation at the Park parcel and the Asbestos Pile parcel;
- Staff gauge installation; and
- Piezometer installation and water level measurements.

The CDM Smith field team collected surface soil samples beneath both swing sets at the Kid's Park located at the corner of West Maple Street and Oak Street to determine if asbestos has migrated off the Site. Two samples were collected, and a visual inspection was performed to identify the depth of wood chips and the presence of visible ACM. Woodchips were observed to a depth of 8 inches, and soil samples were collected from the soil surface (beneath the wood chips) to a depth of 3 inches. Sample locations are shown on **Figure 2-1**.

Fifteen grab surface soil samples were collected at the former fire training area on the Asbestos Pile parcel to determine if SVOCs or dioxin are present. Five samples, designated as "A", were collected from 0 to 3 inches bgs to support the HHRA, while five samples designated as "B" (from 0 to 6 inches bgs) and five samples, designated as "C" (from 6 to 24 inches bgs) were collected in support of the ecological risk assessment. A duplicate soil sample and an aqueous rinsate blank were collected for SVOCs and dioxin analyses in accordance with the Final SMP. These surface soil sample locations are shown on **Figure 2-3**.

Six grab surface soil samples were collected at the slag area near the West Maple Street entrance to the Asbestos Pile parcel to determine if metals, SVOCs, asbestos, or dioxin are present. Two samples were collected from 0 to 3 inches bgs to support the HHRA, while two samples from 0 to 6 inches and two samples from 6 to 24 inches were collected in support of the ecological risk assessment. In accordance with the Final SMP, a duplicate soil sample and an aqueous rinsate blank were collected for metal analysis. Slag sampling locations are shown on **Figure 2-3**.

Eight 30-point composite surface soil samples were collected from residential yards adjacent to the Site to determine if asbestos has migrated off the Site and if there are risks to human health while performing day-to-day activities within residential yards. Each sample was collected from 0 to 3 inches bgs. The general areas where residential surface soil samples were collected are shown on **Figure 2-2**.

Six 30-point composite surface soil samples were collected in the Park parcel where asbestos was detected above 12 percent during Phase 1. The sampling locations were designated for ABS raking activities. Each sample was collected from 0 to 3 inches bgs. Park parcel surface soil sample locations are shown on **Figure 2-1**.

A visual investigation for ACM was carried out along the banks of Wissahickon Creek near walking trails. Observations were documented in the logbook and photographs were taken as appropriate. Locations of bulk ACM debris were flagged during the investigation and information was relayed to the EPA Removal Program.

A water sample was collected from the seep on the western side of the Reservoir parcel, near Wissahickon Creek to determine if VOCs, SVOCs, pesticides, PCBs, metals, or asbestos are present. The seep sample location is shown on **Figure 2-4**.

One ABS raking scenario was completed on October 18th at the Park parcel at Phase 1 location PKSB-10 (PK-ABS05) (**Figure 2-1**). No additional ABS scenarios were conducted due to high soil moisture from recent heavy rainfall. Two high-volume personal air samples were collected, with one at shoulder height (4 to 6 feet) to simulate the breathing zone of an adult, and one at waist height (2.5 to 3.5 feet) to simulate the breathing zone of a child. Flow rates were set at 5.0 liters per minute (L/min) for the high volume samples. Three perimeter air samples were also collected during the ABS activity, with one pump upwind and two pumps downwind of the raking scenario. Flow rates of personal and perimeter pumps were checked at 30-minute intervals and re-calibrated as necessary. Soil moisture content was measured at 10 locations in a 10-foot by 10-foot area before sampling. The scenario was started after it was confirmed that soil moisture criteria were met. There were two soil moisture criteria that had to be met before sampling proceeded:

1. any single measurement could not exceed 50 percent soil moisture and
2. the average of all measurements could not exceed 30 percent soil moisture.

These criteria were used to ensure that data were not biased low. A DustTrak aerosol monitor was set up in the dominant downwind direction near the perimeter of the ABS sampling location to log particulate concentrations. Data from this event were irretrievable due to technical difficulties. A portable meteorological (MET) station was also set up in proximity to the ABS sampling area and collected wind speed, wind direction, relative humidity, temperature, and barometric pressure.

Site-wide utility clearance was conducted at all proposed boring locations in the Park parcel, Asbestos Pile parcel, Reservoir parcel berm, and floodplain areas. Ground-penetrating radar (GPR) and a pipe locator were utilized by the geophysical subcontractor to locate all utilities and metal debris within 15 feet of each proposed soil boring and monitoring well location. The utility clearance report is in **Appendix A**.

Two monitoring wells were installed at each of the three Site parcels (**Figure 2-5**). A nominal three and a quarter-inch inner diameter hollow stem auger (HSA) was advanced to bedrock with continuous split spoon sample collection of the overburden. A 10-inch diameter air hammer drill was used to advance the borehole ten feet into competent bedrock. A 6-inch inner diameter steel casing was grouted into the competent bedrock and allowed to cure for a minimum of 12 hours. A two-foot stickup was left in place with a locking well cap.

A 6-inch diameter hole was then advanced through the 10-inch casing using air percussion drilling until a water bearing fracture was encountered. Well construction consisted of 2-inch diameter poly vinyl chloride (PVC) well screens (ten feet long) and risers. Well construction details can be found in **Table 2-3**. Wells were completed with a sand filter pack in the borehole annulus from the bottom of the borehole to a depth of two feet above the well screen. This was followed by a two-foot thick plug of bentonite above the sand pack and bentonite grout up to three feet below grade.

After allowing the grout to cure for 24 to 48 hours, depending on the grout manufacturer's specifications, each of the six wells was developed using a submersible pump and disposable tubing. Development continued until pH, conductivity, dissolved oxygen, and temperature readings of the purge water were stabilized for three consecutive readings, and three well volumes had been purged. After well development, each well was sampled using EPA Region 3's Recommended Procedure for Low-Flow Purging and Sampling of Groundwater Monitoring Wells (EPA 1997).

Three geotechnical boreholes (GT-1 through GT-3) were drilled at the Park parcel, and six geotechnical boreholes (GT-4 through GT-9) were drilled at the Asbestos Pile parcel (**Table 2-3, Figure 2-5**). Borings were drilled with HSA with continuous standard penetration tests. Soil samples were collected for geotechnical analysis (grain size, Atterberg limits, percent moisture, specific gravity, shear strength, and/or consolidation). Material was visually logged every two feet through waste and soil.

Three geotechnical boreholes (GT-6 through GT-8) at the Asbestos Pile parcel were converted into piezometers to provide additional data for determining the groundwater flow direction. Each boring was advanced ten feet into the water table. One foot of sand pack was placed at the bottom of each borehole, and a one-inch diameter PVC piezometer with a ten-foot long 0.010-inch slot screen was installed. The annular space was filled (from bottom to top) with a sand pack to a depth of two feet above the top of the screen, two feet of bentonite, and bentonite grout to a depth of three feet below grade.

After allowing the grout to cure for 24 to 48 hours, depending on the grout manufacturer's specifications, each piezometer was developed using disposable tubing fitted with a check valve. Development continued until pH, conductivity, dissolved oxygen, oxidation-reduction potential, and temperature readings of the purge water were stabilized for three consecutive readings, and three well volumes had been purged.

Four staff gauges were installed to provide additional data to establish the relationship between groundwater and surface water flow. Two staff gauges were set on the Wissahickon Creek upstream and downstream of the site. One gauge was set in Rose Valley Creek and another in Tannery Run.

Static water levels were measured at monitoring wells, piezometers, and staff gauges on the Site parcels, and creeks. A partial round of measurements was collected in November, 2010 during groundwater sampling prior to installation of staff gauges and piezometers at GT-6 through GT-8. A comprehensive round of measurements

was collected in January, April, June, September, and October 2011. **Figures 2-6 through 2-10** present the groundwater and surface water elevations and potentiometric lines.

Results from the geotechnical investigation conducted on the Park and Asbestos Pile parcels are presented in the geotechnical report, *Preliminary Geotechnical Engineering Evaluation,* included in **Appendix B**. Monitoring well boring logs and piezometer boring logs are in **Appendix C**.

Personal air samplers, which were worn at all times by all CDM Smith and subcontractor personnel within the exclusion zone during intrusive activities, were collected and submitted for laboratory analysis daily. Perimeter air samples were collected daily during intrusive activities and submitted for analysis the first two days of intrusive work at each parcel as well as additional days per EPA's direction.

2.3 July 2011 Field Activities

The third Phase 2 mobilization was focused on ABS. The CDM Smith field team performed one ABS raking scenario at the Asbestos Pile parcel on July 6th, with thunderstorms preventing the team from starting a second scenario. Two additional raking scenarios at the Asbestos Pile parcel were completed on July 11th. Eight residential raking scenarios, six raking scenarios at the Park parcel, one hiking scenario along the walking trail, one mowing scenario along the walking trail on the other side of Wissahickon Creek, and one shoveling scenario at the Reservoir parcel were completed between July 11th and July 19th. ABS sampling locations are shown on **Figures 2-1 through 2-4.**

Two high-volume (HV) and two low-volume (LV) personal air samples were collected during each two-hour ABS scenario. Four pumps were attached to a belt, with two cassettes positioned at the sampler's shoulder (to simulate an adult's breathing zone) and two cassettes positioned at the sampler's waist (to simulate a child's breathing zone). Only HV samples were analyzed, unless they were found to be overloaded, in which case the corresponding LV sample was then analyzed. Flow rates were set at 5.0 L/min for the HV samples and 2.5 L/min for the LV samples. Three perimeter air samples were also collected during the ABS activities, with one pump positioned upwind of the activities (to establish background fiber levels) and two pumps located downwind (to indicate if asbestos was leaving the Site). Flow rates of personal and perimeter pumps were checked at 30-minute intervals and re-calibrated as necessary. Soil moisture content was measured at 10 locations in a 10-foot by 10-foot area before sampling. The scenario was started after soil moisture criteria were met. A DustTrak aerosol monitor was set up in the dominant downwind direction near the perimeter of the ABS sampling location to log particulate concentrations. A summary of the particulate data collected is included in **Appendix D**. A portable MET station was also set up in proximity to the sampling area and collected wind speed, wind direction, relative humidity, temperature, and barometric pressure (**Table E-1**, **Appendix E**).

A 30-point composite surface soil sample was collected at the ABS activity areas at the Asbestos Pile parcel, both walking trails, one alternate residential property, and the Reservoir parcel. All samples were collected from 0 to 3 inches bgs prior to the ABS scenario. Surface soil sampling locations associated with the ABS scenarios are shown on **Figures 2-1 through 2-4.**

Upon completion of ABS activities at the Asbestos Pile parcel, EPA's Removal Contractor removed the trees and covered the top of the Asbestos Pile with clean fill.

2.4 Additional Air Sampling

In addition to the air sampling conducted during the three mobilizations described above, ambient air monitoring was conducted periodically from November 2010 to October 2011. Sampling was conducted at seven locations in the residential/commercial area surrounding the Site (**Table 2-5, Figure 2-11**). In total, 14 sampling events were performed, with at least one event per month. Each sampling event was 24 hours in duration. In the case of rainfall prior to an ambient air (AA) sampling event, sampling was delayed at least 24 hours for less than 0.5 inches of cumulative rainfall, and at least 48 hours for more than 0.5 inches of cumulative rainfall.

A summary of AA sampling events is presented in **Table 2-5.** Contingency plans specified that LV samples would be collected for submission to the laboratory in the event that the HV samples were compromised. Low volume samples were never submitted for analysis, because no HV samples were compromised.

2.5 Deviations from the SMP

During the Phase 2 field investigation, various conditions necessitated deviations from the approved SMP and SMP Addendum. All deviations were approved by the EPA Work Assignment Manager (WAM). The deviations include:

- No extra sample volumes for matrix spike/matrix spike duplicate (MS/MSD) for asbestos analysis (for any media) were collected after October 7, 2010. The asbestos laboratory did not require extra sample volumes for MS/MSD, because asbestos quality control (QC) reference standards differ from other constituent QCs;
- The sample identification scheme was modified in the SMP Addendum to clarify the sample identification. The modifications included adding the Kid's Park as a parcel type and a child, LV air sample type. Also, designations (A, B, or C) were added for various depths of surface soil collected at the former fire training and slag areas of the Asbestos Pile parcel;
- At the request of the asbestos laboratory, water samples for asbestos were collected in 1 liter polyethylene unpreserved bottles instead of 1 liter amber glass bottles, to avoid breakage while the samples were in transit;
- Soil samples collected during ABS were not submitted for percent moisture content analysis, because moisture content was measured in the field using a soil moisture probe. The data were required in the field to assess the suitability of soil moisture for sample collection. The data collected in the field are considered to be of sufficient quality for their intended use;
- Low volume flow rates during ABS were set at 2.5 L/min instead of 2.0 L/min as stated in the SMP Addendum. This change was made to allow for easier calibration of the LV sample pumps;
- On July 15, 2011, only three ABS scenarios were performed at the Asbestos Pile parcel versus the four scoped, and one ABS scenario was performed at the Park parcel, because PKSB-40 (PK-ABS06) had been covered with new topsoil and vegetated by the Removal Program Contractor. This change brought the total to 20 ABS locations instead of 22;
- Only 14 ambient air sampling events were conducted (instead of the proposed 15 events) due to extremely wet weather during typically dry periods of the year. Additionally, only one event was conducted in July and in September, instead of the proposed two events for July, August and September, as conditions did not meet the sampling criteria for weather; and
- The initial location selected for MW04 at the Reservoir parcel was closer to the Reservoir berm on the Reservoir access road. However, the utility clearance GPR survey identified a possible subsurface trench at the initial MW04 location. Therefore, the location was moved to within three feet from the bottom of the Asbestos Pile parcel on the Reservoir access road. The well was also constructed as a flush mount

to avoid being damaged by heavy machinery. Due to the relocation of MW04, samples collected during drilling activities (i.e. subsurface soil and air samples) at this location were inadvertently mislabeled in the field as being related to the Asbestos Pile parcel (APMW) instead of the Reservoir parcel (RVMW).

Section 3
Phase 2 Field Investigation Analytical Results

The results of the Phase 2 analytical, geotechnical, and hydrogeological investigations are presented in this section. Analytical data were screened against established risk-based values to provide context. These criteria are described in Section 3.1.

3.1 Screening Criteria

Phase 2 groundwater and soil analytical data were screened against the EPA Region 3 Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites (May 2012). Groundwater and seep data were screened against tap water RSLs. The results discussion will also compare arsenic against the May 2009 tap water Maximum Contaminant Level (MCL). Soil data were screened against residential soil RSLs. Groundwater and soil cancer RSLs were used as presented on the RSL table (corresponding to a 10^{-6} risk level). Groundwater and soil non-cancer RSLs were adjusted (divided by 10 to a hazard quotient (HQ) = 0.1) to account for the assumption of multiple chemicals with non-cancer toxicity values based on the same toxic endpoint. The dioxin total toxic equivalents quotient (TEQ) is based on the 2005 World Health Organization scheme. For dioxins detected in soil, the total TEQ was compared to the RSL for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD). Dioxin results will also be discussed compared to the risk-based clean-up goal for residential soils which has been derived from the recently released oral RfD. Soil sample data for asbestos were screened against the EPA's Office of Solid Waste and Emergency Response (OSWER) *Framework for Investigating Asbestos-Contaminated Superfund Sites*, dated September 2008. Soil samples were screened to 1 percent asbestos. RSLs and the asbestos soil screening level used to screen these data are included in the data tables.

The preliminary remediation goal (PRG) for ABS air samples was calculated by the EPA Region 3 toxicologist specifically for the Site for a raking/lawn maintenance scenario for an adult (EPA 2011a). The starting age of exposure is assumed to be at six years. With a risk screening level of $1E^{-04}$, an inhalation unit risk (IUR) based on a 20-year exposure of 0.094 risk per fibers/cubic centimeter (f/cc), and a time weighting factor (TWF) of 0.02, the PRG was calculated at 0.04 f/cc using the formula:

$$PRG = Risk / (IUR * TWF)$$

EPA provided a screening level of 0.001 f/cc asbestos for ambient air in an email dated October 27, 2011(EPA 2011b) to CDM Smith. The analytical method used for asbestos air, TEM method ISO 10312, is the method recommended for ambient air sampling in EPA's OSWER *Framework for Investigating Asbestos-Contaminated Superfund Sites* (September 2008). Under TEM method ISO 10312, results for asbestos in air can be reported in four ways, known as "binning categories." Per the OSWER guidance, the only binning category used to develop the HHRA is the phase contrast microscopy equivalent (PCME) count. However, the data are presented in all binning categories for completeness.

Figures and tables showing exceedances by parcel and media are discussed below and included in **Appendix F.** Data quality will be discussed in the RI Report. **Table ES-1** provides a summary of the media at each parcel or area that exceed screening criteria.

3.2 Park Parcel

Samples collected from the Park parcel include surface soil collected from two locations where surface runoff is believed to exit the Site, six previously sampled locations where asbestos levels greater than 12 percent were detected in the cover/waste interface, and five locations along the stream bank cap. Subsurface soil and groundwater samples were collected during installation of PKMW01 and PKMW02. Personal and perimeter air samples were collected during ABS scenarios at six locations. Full Phase 2 analytical results are presented in **Appendix F.**

3.2.1 Surface Soil and Subsurface Soil

Surface and subsurface soil samples were analyzed for asbestos only by polarized light microscopy (PLM) using the California Air Resource Board CARB 435B, 1000 point count. All surface soil grab samples collected in August 2010 fall within the ABS locations except PK-ABS03. The initial location (PKSB-06) was found to be covered with asphalt in August 2010, and that location would not be conducive to an ABS raking activity; therefore, the location was moved to an alternate location close by. A 30-point composite sample was collected at the new sampling location. Concentrations of asbestos detected in surface and subsurface soil samples are presented on **Table 3-1,** and those results exceeding screening levels are shown on **Figure 3-1.** The results exceeding screening levels are summarized below:

- Grab surface soil samples, PKSS-01, PKSB-06, and PKSB-08 exceeded the asbestos fiber screening level of 1 percent at 1.2 percent, 1.5 percent, and 1.1 percent chrysotile asbestos fibers, respectively;
- 30-point composite surface soil samples collected from the ABS locations did not exceed the asbestos fiber screening level. All concentrations were less than 0.1 percent asbestos fibers; and
- Subsurface soil samples collected at MW01 and MW02 did not exceed the asbestos fiber screening level; concentrations of asbestos fibers were less than 0.1 percent.

3.2.2 Groundwater

Groundwater samples were collected from the two bedrock wells in the Park parcel MW01A and MW02. Location MW01A was sampled twice, once at its shallower depth of 53 feet (MW01) and once at its final depth of 73 feet (MW01A). While collecting water quality parameters at MW01, high pH levels were detected, possibly due to grout contamination, MW01 was then drilled deeper at the same location and MW01A was installed. Samples were submitted and analyzed for EPA Contract Laboratories Program (CLP) TCL VOCs, SVOCs, pesticides, PCBs, CLP TAL metals, and asbestos by TEM analyses. Only results from samples collected at the final depth, MW01A, are reported and will be used for the risk assessment. Groundwater compounds exceeding RSLs are summarized below. Compounds and asbestos detected in groundwater sampled at each monitoring well during Phase 2 are summarized on **Tables 3-2 and 3-3**.

Both filtered and unfiltered samples were collected for analysis of inorganic constituents (metals). Analysis of filtered samples provides the concentration of dissolved constituents and analysis of unfiltered samples provides the total (dissolved and undissolved) concentration of the constituent. Only dissolved inorganic (metal) concentrations are reported on the figure; however, for completeness total inorganic concentrations exceeding RSLs are included in the summary below:

- No samples from locations MW01A or MW02 had asbestos results exceeding the MCL (7 million fibers per liter [MFL]);

- Carbon tetrachloride was detected above the RSL of 0.39 microgram per liter (µg /L) in MW02 (5.8 µg/L);
- Tetrachloroethene was detected above the RSL of 3.5 µg/L in MW02 (22 µg/L);
- Bis (2-ethylhexyl)phthalate was detected above the RSL of 0.071 µg/L in MW02 (55 µg/L); and
- Vanadium was detected above the RSL of 7.8 µg/L in the unfiltered metals sample from MW02 at 10.6 J µg/L. The "J" flag indicates that the analyte was present. The reported value may not be accurate or precise.

It should be noted that bis(2-ethylhexyl)phthalate was detected above the RSL in the field blank; therefore, the presence of this compound in groundwater samples may not be due to Site contaminants. Mercury was also detected slightly above the RSL in the MW01A sample; however, because it was detected in the rinsate blank, all values are flagged "B" indicating that the analyte was not detected substantially above the level reported in laboratory or field blanks. Methylene chloride was detected in all Park monitoring well samples including the field blanks, trip blanks, and a rinsate blank; therefore, all results are flagged "B."

3.2.3 ABS

ABS raking activities were conducted in the Park parcel at six locations selected based on results from the pre-ABS soil samples: PK-ABS01 (CKSB07), PK-ABS02 (PKSS01), PK-ABS03 (PKSB06), PK-ABS04 (PKSB08), PK-ABS05 (PKSB10) and PK-ABS07 (CKSS01). All ABS samples were analyzed for asbestos by TEM ISO 10312 Method. Soil moisture at all the Park parcel ABS locations was within the threshold (**Table E-1**, **Appendix E**). Results for asbestos fibers detected in Park parcel samples are presented in **Table 3-4.**

3.2.3.1 Personal Air Samples

Two HV and two LV air samples were collected during each two-hour ABS raking scenario at the Park parcel ABS locations. All HV personal air samples collected at the Park parcel locations were analyzed with the exception of PK-ABS03 and PK-ABS07, which required the corresponding LV samples be analyzed due to filter overload.

Sample results ranged from 0 structures per cubic centimeter (s/cc) to 0.46 s/cc. The following samples from all six Park parcel locations contained asbestos and exceed the adult residential raking PCME PRG level of 0.04 s/cc:

- Asbestos was detected in samples PK01-ABRK01-CH and PK01-ABRK01-H at concentrations of 0.04 s/cc and 0.16 s/cc, respectively;
- Asbestos was detected in sample PK02-ABRK01-CH at a concentration of 0.074 s/cc;
- Asbestos was detected in sample PK03-ABRK01-CL at a concentration of 0.086 s/cc;
- Asbestos was detected in sample PK04-ABRK01-CH at a concentration of 0.057 s/cc;
- Asbestos was detected in samples PK05-ABRK01-CH and PK05-ABRK01-H at concentrations of 0.2 s/cc and 0.46 s/cc, respectively; and
- Asbestos was detected in sample PK07-ABRK01-CH at a concentration of 0.044 s/cc.

3.2.3.2 Perimeter Air Samples

Three HV and three LV perimeter air samples were also collected during the ABS raking activities at each location, with one pump upwind and two pumps downwind. Pumps were positioned at the edge of each sampling location grid. Sampling location grids were delineated at 10-foot by 10-foot and contained as many as three adjoining grids. Both HV air samples and several corresponding LV air samples collected were analyzed due to filter overload.

Sample results ranged from 0 s/cc to 0.17 s/cc. The following PCME results for perimeter air samples exceeded the PRG level of 0.040 s/cc:

- Asbestos was detected in sample PK01-PA02-L at a concentration of 0.14 s/cc;
- Asbestos was detected in samples PK03-PA01-H, PK03-PA02-L and PK03-PA03-L at concentrations of 0.072 s/cc, 0.09 s/cc, and 0.17 s/cc, respectively; and
- Asbestos was detected in samples PK05-PA01-H and PK05-PA02-L at concentrations of 0.056 s/cc and 0.05 s/cc, respectively.

3.3 Asbestos Pile

Samples collected from the Asbestos Pile Parcel include surface soil collected from one location where surface runoff is believed to exit the Site, five locations at the former fire training area, two locations at the slag area, and three undisturbed locations at the top of the Asbestos Pile corresponding to ABS locations. Subsurface soil and groundwater samples were collected during installation of wells MW05 and MW06. Personal and perimeter air samples were collected during ABS at three locations.

3.3.1 Surface Soil and Subsurface Soil

Surface soil samples were analyzed for asbestos by PLM using CARB 435B, 1000 point count, dioxin, SVOCs, and metals. Subsurface soil samples were analyzed for asbestos by PLM using 435B, 1000 point count. Results for dioxins and the total dioxin TEQ values exceeding the RSL for 2,3,7,8-TCDD(4.5 ng/kg)) are reported on **Table 3-5.** Samples exceeding the SVOC RSLs are presented on **Table 3-5**. Samples exceeding the inorganic RSLs are presented on **Table 3-6**. Samples exceeding the asbestos screening levels are presented on **Table 3-1**. The results are summarized below:

- Sample APSS-01 was collected at a location where surface run-off is believed to exit the Site and was analyzed for asbestos by PLM using CARB 435B, 1000 point count. No asbestos fibers were detected;
- Dioxin TEQ values ranged from 2.73 to 46.15 ng/kg (also known as parts per trillion [ppt]). Twenty of the 22 samples (91%) exceeded the RSL for 2,3,7,8 TCDD. Although 91% of the dioxin results exceeded the RSL, none of the results exceeded the risk based clean-up goal of approximately 50 ng/kg and are within the range of detections close to expected background conditions for urban soils (EPA, December 2003).
- No samples collected and analyzed for asbestos from the former fire training and slag areas exceeded the soil screening level of 1%. However, asbestos fibers were detected in three samples ranging from 0.20 percent to 0.80% in the slag areas;
- Twenty-one of 22 samples had concentrations of two or more SVOCs that exceeded the RSLs;

- Aluminum was detected above the RSL of 7,700 mg/kg in all the slag area samples with results ranging from 15,400 mg/kg to 22,600 mg/kg;
- Arsenic was detected above the RSL of 0.39 mg/kg in all the slag area samples, with results ranging from 2.7 mg/kg to 6.4 mg/kg. It should be noted that although arsenic was detected above the RSL, the observed concentrations in soil samples are within the background range expected in unpolluted areas of this region (Shacklette and Boerngen, 1984);
- Chromium was detected above the RSL for hexavalent chromium (Cr^{+6}) of 0.29 mg/kg, but below the RSL for trivalent chromium (Cr^{+3}) of 12, 000 mg/kg in all the slag area samples, with results ranging from 22.3 K mg/kg to 37.6 K mg/kg. All results were flagged with "K", indicating that the reported value may be biased high and the actual value is expected to be lower;
- Iron was detected above the RSL of 5,500 mg/kg in all the slag area samples, with results ranging from 15,700 mg/kg to 28,400 mg/kg;
- Manganese was detected above the RSL of 180 mg/kg in all the slag area samples, with results ranging from 336 J mg/kg to 659 J mg/kg. All results were flagged "J";
- Thallium was detected above the RSL of 0.078 mg/kg in one slag area sample with a value of 3.1 mg/kg;
- 30-point composite surface soil samples collected from ABS locations (AP-ABSS01-A, AP-ABSS02-A, and AP-ABSS03-A) contained asbestos at concentrations exceeding the screening level of 1 percent (2.2 percent, 3.5 percent, and 1.3 percent chrysotile asbestos fibers, respectively); and
- No asbestos fibers were detected in subsurface samples.

3.3.2 Groundwater

Groundwater samples were collected from the two bedrock monitoring wells at the Asbestos Pile, MW05 and MW06. Groundwater contaminants exceeding RSLs are summarized below. Summary tables showing analytes and asbestos detected in Phase 2 groundwater samples are presented on **Table 3-2**. Samples were analyzed for VOCs, SVOCs, pesticides, PCBs, metals, and asbestos by TEM analyses.

Both filtered and unfiltered samples were analyzed for inorganic constituents (metals). Total inorganics concentrations exceeding RSLs are included in the list below. No samples from MW05 or MW06 had asbestos results exceeding the MCL.

- Bis (2-ethylhexyl)phthalate was detected above the RSL of 0.071 µg/L in MW05 and MW06 at concentrations of 42 µg/L and 14 µg/L, respectively;
- Arsenic was detected above the RSL of 0.045 µg/L, but below the MCL of 10 µg/L in unfiltered sample MW06 (5.2 J µg/L);
- Manganese was detected above the RSL of 32 µg/L in both unfiltered and filtered samples at MW05 (157 µg/L and 156 µg/L, respectively), and MW06 (450 µg/L and 426 µg/L, respectively); and
- Selenium was detected above the RSL of 7.8 µg/L in filtered sample MW05 (14.3 J µg/L).

It should be noted that bis(2-ethylhexyl)phthalate was detected above the RSL in the field blank; therefore, the presence of this compound in groundwater samples may not be Site-related. This will be further evaluated in the RI Report. Methylene chloride was detected in all samples including field blanks, trip blanks, and a rinsate blank; therefore, all results are flagged "B."

3.3.3 ABS

ABS raking activities were conducted at the Asbestos Pile parcel at three locations: AP-ABS01, AP-ABS02 and AP-ABS03. Samples collected and analyzed from the activities include HV and LV personal (air cassettes worn by an adult actor) and perimeter (air cassettes placed in vicinity of ABS location) air samples. All ABS samples were analyzed for asbestos by TEM ISO 10312 Method. Soil moisture at all Asbestos Pile parcel ABS locations was within the threshold (**Table E-1**, **Appendix E**). Results for asbestos fibers detected in Asbestos Pile parcel samples are presented in **Table 3-4.**

3.3.3.1 Personal Air Samples

Two HV and two LV air samples were collected during each two-hour ABS raking scenario at the Asbestos Pile parcel ABS locations. All HV personal air samples collected at the Asbestos Pile parcel locations were analyzed with the exception of AP-ABS01, which required the corresponding LV air sample be analyzed due to filter overload.

Personal air sample results ranged from 0.04 s/cc to 0.13 s/cc. The following PCME results for Personal air samples analyzed from all three Asbestos Pile locations exceeded the adult residential raking PRG level of 0.04 s/cc:

- Asbestos was detected in samples AP01-ABRK01-CH and AP01-ABRK01-L at concentrations of 0.044 s/cc and 0.058 s/cc, respectively;
- Asbestos was detected in samples AP02-ABRK01-CH and AP02-ABRK01-H at concentrations of 0.04 s/cc and 0.1 s/cc, respectively; and
- Asbestos was detected in samples AP03-ABRK01-CH and AP03-ABRK01-H at concentrations of 0.065 s/cc and 0.13 s/cc, respectively.

3.3.3.2 Perimeter Air Samples

Three HV and three LV perimeter air samples were also collected during the ABS raking activities at each Asbestos Pile parcel location, with one pump located upwind and two pumps located downwind. Pumps were positioned at the edge of each sampling location grid. Sampling location grids were delineated at 10-foot x 10-foot and contained as many as three adjoining grids. Both HV air samples and several corresponding LV air samples collected were analyzed due to filter overload.

Sample results ranged from 0 s/cc to 0.041 s/cc with one sample, AP01-PA02-L (0.041 s/cc) exceeding the PCME PRG level of 0.04 s/cc.

3.4 Reservoir

Samples collected from the Reservoir parcel include surface soil collected from one location where surface runoff is believed to exit the Site and one location corresponding to ABS locations. Subsurface soil and groundwater samples were collected during installation of wells MW03 and MW04, and a seep sample was collected at one location. The initial ABS location selected was abandoned due to visible saturation of soil from its close proximity to the reservoir bank. With soil moisture content exceeding the limit threshold, such

saturation would affect the result of the ABS activity with a biased low result; therefore, after consulting with the EPA WAM, the ABS location was moved. Personal and perimeter air samples were collected during ABS at one location.

3.4.1 Surface Soil and Subsurface Soil

Surface soil and subsurface soil samples were analyzed for asbestos by PLM using CARB 435B, 1000 point count. The results are summarized below and shown on **Table 3-1**:

- Sample RVSS-01 was collected at a location where surface runoff is believed to exit the Site and was analyzed for asbestos. The sample result, 1.5 percent chrysotile asbestos fibers, exceeded the screening level of 1 percent;
- No asbestos fibers were found in the composite surface soil sample collected from ABS location RV-ABS01; and
- The subsurface soil sample collected during installation of well MW03 contained 1.5 percent chrysotile asbestos fiber, exceeding the screening level of 1 percent.

3.4.2 Groundwater

Groundwater samples were collected from the two bedrock wells (MW03 and MW04) and at RV-SPSW-01, the seep on the western side of the reservoir near Wissahickon Creek. Samples were submitted and analyzed for VOCs, SVOCs, pesticides, PCBs, metals, and asbestos by TEM analysis.

Summary tables showing constituents detected in groundwater samples are presented on **Tables 3-2 and 3-3**.

Both filtered and unfiltered samples were collected for analysis of inorganic constituents (metals). Total inorganics concentrations exceeding RSLs are included in the summary below. No samples had asbestos results exceeding the MCL (7 million fibers per liter [MFL]), and only two samples (MW04 and the seep RV-SPSW-01, both unfiltered) had a detected level of asbestos, 0.51 and 5.1 MFL, respectively.

- Arsenic was detected above the RSL (0.045 µg/L), but below the MCL of 10 ug/L in filtered sample MW03 (7.6 J µg/L);
- Barium was detected above the RSL of 290 µg/L in both unfiltered and filtered MW03 at concentrations of 525 µg/L and 561 µg/L, respectively; and
- Manganese was detected above the RSL of 32 µg/L in both unfiltered and filtered samples in MW03 (9,190 µg/L and 9,620 µg/L, respectively), and in MW04 (95.9 µg/L and 86.7 µg/L, respectively); as well as in the reservoir seep sample, RV-SPSW-01(52.9 µg/L).
- Bis(2-ethylhexyl)phthalate was detected above the RSL of 0.071 µg/L in the seep sample duplicate (44 µg/L B).

It should be noted that bis(2-ethylhexyl)phthalate was detected above the RSL in the field blank; therefore, the presence of this compound in groundwater samples may not be due to Site contaminants. This will be further evaluated in the RI Report. Methylene chloride was detected in all samples including field blanks, trip blanks, and a rinsate blank; therefore, all results are flagged “B.”

3.4.3 ABS

An ABS shoveling activity was conducted at one Reservoir parcel location: RV-ABS01. All ABS samples were analyzed for asbestos by TEM ISO 10312 Method. Soil moisture at the RV-ABS01 was within the threshold (**Table E-1**, **Appendix E**). No asbestos fibers were detected in these samples.

3.4.3.1 Personal Air Samples

Two HV and two LV air samples were collected during the two-hour ABS shoveling scenario at the Reservoir parcel ABS location.

Asbestos was not detected in any of the samples.

3.4.3.2 Perimeter Air Samples

Three HV and three LV perimeter air samples were also collected during the Reservoir parcel ABS shoveling activity, with one pump upwind and two pumps downwind. Pumps were positioned at the edge of the sampling location grid. The sampling location was contained within a 10-foot by 10-foot grid. Only the HV air samples collected were analyzed.

Asbestos was not detected in any of the samples.

3.5 Walking Trails

Samples collected from walking trails include surface soil from two locations associated with ABS. Personal and perimeter air samples were collected during ABS at two locations.

3.5.1 Surface Soil

Surface soil samples were collected at a depth of 0 to 3 inches bgs and analyzed for asbestos by PLM using 435B, 1000 point count. Samples were collected from along the walking trail located on the west side of Wissahickon Creek across the creek from the Park parcel (OW-ABSS01) and along the Green Ribbon Preserve Trail west of Wissahickon Creek behind the Wissahickon Valley Watershed Association offices (WT-ABSS01).

No walking trail samples had asbestos results exceeding the screening level (1 percent); however, WT-ABSS01 had a detected level of chrysotile asbestos fiber of 0.30 percent (see **Table 3-1)**.

3.5.2 ABS

ABS activities were conducted between July 13th and 15th, 2011 along the walking trail at the two locations: a mowing scenario at OW-ABS01 and a hiking scenario at WT-ABS01. Samples collected and analyzed from the activities include HV and LV personal (air cassettes worn by adult actor) and perimeter (air cassettes placed in vicinity of ABS location) air samples. All ABS samples were analyzed for asbestos by TEM ISO 10312 Method. Soil moisture at OW-ABS01 and WT-ABS01 were within the threshold (**Table E-1, Appendix E**). Results for asbestos fibers detected in the Walking Trail samples are presented in **Table 3-4.**

3.5.2.1 Personal Air Samples

Two HV and two LV air samples were collected during each two-hour ABS scenario at the Walking Trail ABS locations. All HV air samples collected were analyzed with the exception of OW-ABS01, which required a corresponding LV air sample to be analyzed due to filter overload.

Analytical results ranged from 0 s/cc to 0.0008 s/cc asbestos fibers; however, asbestos was not detected above the PCME adult residential PRG level of 0.04 s/cc.

3.5.2.2 Perimeter Air Samples

Three HV and three LV perimeter air samples were also collected during the ABS scenarios at each location, with one pump located upwind and two pumps located downwind. Pumps were positioned at the edge of the sampling location grids. The sampling location for OW-ABS01 was contained within a 10-foot by 30-foot grid on a grassy patch of the trail. The sampling location for WT-ABS01 was contained within a quarter-mile radius on the trail. All HV air samples collected were analyzed with the exception of WT-ABS01 (WT01-PA03-L),which required a corresponding LV air sample be analyzed due to filter overload.

Results ranged from 0 s/cc to 0.0052 s/cc asbestos fibers, however, no sample results exceeded the PCME adult residential PRG level of 0.04 s/cc.

3.6 Residential Properties

Surface soil composite samples were collected from eight residential properties prior to performing ABS. Five of the properties are along West Maple Street and three are along Mercer Hill Drive and Betsy Lane. A sampling grid area was delineated with flags, sketched, and surveyed with a GPS prior to soil sampling. Sampling locations were selected to be in a vegetated area as close as possible within the property. The sampling grids were in the backyards, facing the Site. Personal and perimeter air samples were also collected during ABS activities at the eight locations. The residential properties were selected to obtain a good distribution of the possible extent of asbestos contamination. A vacant lot was also included in this selection because portions of it have been used as a community garden and makeshift playground for the neighborhood children. Access permission was granted to EPA by each property owner before sampling was conducted.

3.6.1 Surface Soil

A 30-point surface soil composite sample was collected at a depth of 0 to 3 inches bgs at each location and analyzed for asbestos by PLM using 435B, 1000 point count. Samples were collected from the following locations on October 13, 2010 (soil sample identification in parentheses): RS01 (RS01-ABSS-A), RS02 (RS02-ABSS-A), RS03 (RS03-ABSS-A), RS04 (RS04-ABSS-A), RS05 (RS05-ABSS-A), RS06 (RS06-ABSS-A), RS07 (RS07-ABSS-A), and RS08 (RS08-ABSS-A). However, on July 14, 2011, EPA's WAM gave the approval to relocate RS07 to an alternate location due to complaints from a neighboring resident. Subsequently, an alternate ABS sampling grid area was chosen on the same property, a soil sample was collected at the new sampling location and labeled RS07-ABSS2-A.

No residential soil samples exceeded the asbestos screening level (1 percent); however, RS04-ABSS-A had a concentration of 0.60 percent chrysotile asbestos (**Table 3-1**). It is possible that this result may have been impacted by non-native soil used as topsoil. The homeowner at location RS04 noted that 17 yards of screened topsoil had been placed in the lower level of the backyard in 2007 and an additional 4 yards of fill were added in 2010. The screened topsoil was purchased from a nursery in Montgomeryville, Pennsylvania, but the source is unknown. Although CDM Smith attempted sampling within vegetated areas that were thought to consist of native soil (i.e., were not filled in 2007 and 2010) uncertainty remains concerning the exact location of the fill and foreign topsoil.

3.6.2 ABS

ABS raking activities were conducted at the same eight residential properties where surface soil samples were collected. Samples collected and analyzed from the residential ABS activities include HV and LV personal (air cassettes worn by adult actor) and perimeter (air cassettes placed in vicinity of ABS location) air samples. All ABS samples were analyzed for asbestos by TEM ISO 10312 Method. Soil moisture readings at all residential sampling

locations were within the soil moisture threshold (**Table E-1, Appendix E**). Results for asbestos fibers detected in the residential property samples are presented in **Table 3-4.**

3.6.2.1 Personal Air Samples

Two HV and two LV air samples were collected during each two-hour ABS raking scenario at the residential locations. Both HV air samples and several corresponding LV air samples collected were analyzed due to overload.

Sample results ranged from 0 s/cc to 0.0094 s/cc asbestos fibers. No sample results exceeded the PCME adult residential PRG level of 0.04 s/cc.

3.6.2.2 Perimeter Air Samples

Three HV and three LV perimeter air samples were also collected at each location during the residential ABS raking activities, with one pump upwind and two pumps downwind. Pumps were positioned at the edge of the sampling location grids. Sampling location grids were delineated at 10-foot by 10-foot and contained as many as three adjoining grids. Both HV air samples and several corresponding LV air samples collected were analyzed due to filter overload.

Sample results ranged from 0 s/cc to 0.039 s/cc. No sample results exceeded the PCME adult residential PRG level of 0.04 s/cc.

3.7 Kid's Park

Surface soil samples were collected at the Kid's Park to determine whether asbestos has migrated off the Site to this public area. The surface soil was covered with approximately 8 inches of wood chips. No ACM was visually observed in the wood chips or in the soil below.

Two surface soil grab samples were collected at a depth of 0 to 3 inches below the natural grade (i.e., no wood chips were collected) and analyzed for asbestos by PLM using 435B, 1000 point count. Samples were collected beneath the swing sets at the following locations on October 14, 2010: KPSS-01A and KPSS-02A. No asbestos fibers were detected in either sample. Phase 2 analytical results are presented in **Appendix F**.

3.8 Outdoor Ambient Air

Ambient air sampling was conducted at least once per month for a year, beginning in November 2010, to provide a representative data set for the area surrounding the Site. Each sampling event was performed for a 24-hour period approved by the EPA. No samples were collected during precipitation events in order to bias the samples toward dustier conditions and avoid damage to the sampling equipment. Meteorological data (MET data) were collected for a total of four days associated with each sampling event: two days before sampling, on the sampling event start date and on the sampling event stop date. The collected MET data includes temperature, humidity, wind speed, precipitation, and wind direction, and the MET data indicate that sampling events occurred in various types of weather conditions (**Table E-2**, **Appendix E**).

Ambient air samples were collected at seven locations outside the perimeter of the Site **(Figure 2-11)**: CM01-AA (at the end of the easement west of Wissahickon Creek), CM02-AA (at the Post Office employee parking lot), CM03-AA (at the fountain at the local church/school), CM04-AA (at the adult community center), CM05-AA (at BASF formerly COGNIS), CM06-AA (at Oreland Volunteer Fire Department (VFD)), and CM07-AA (at Ambler Warehouse east of Asbestos Pile parcel). Note that location CM07-AA was modified on July 7, 2011 due to work on the warehouse where the sampling pump had previously been placed. Subsequently, the sample location and

the nomenclature were changed to CM07B-AA (at guardrail on sidewalk near Ambler Warehouse east of Asbestos Pile parcel) to reflect the difference in location. All samples collected were analyzed for asbestos by TEM ISO 10312.

One sample, CM01-AA-HD12 (September 2011) with a concentration of 0.001174 s/cc exceeded the PCME screening level of 0.001 s/cc asbestos fibers. Detection of asbestos fibers ranged from less than 0.00038 s/cc to 0.001174 s/cc. Asbestos analytical data from ambient air sampling are presented on **Table 3-7**.

3.9 Personal and Perimeter Air Samples

During intrusive site work (subsurface drilling) at the Park, Asbestos Pile and Reservoir parcels, air samples were collected from personal air sampling pumps and at the perimeter of the drilling activities and screened against the OSHA standards for asbestos. Note that these data were not used to determine the need for personal protective equipment requirements for site workers, because all personnel working within the intrusive work zones were required to wear respirators in accordance with the Final SMP.

3.9.1 Personal Air Samples

Personal air samples were analyzed using the phase contrast microscopy (PCM) National Institute for Occupational Health (NIOSH) 7400 method. Personal air limits are set based on OSHA standard 29 CFR 1926.1101. No personal air samples exceeded the 30 minute PCM concentration (greater than 1.0 fiber/cc). The 8-hour time weighted average (TWA) PCM concentration from one sample exceeded the standard (greater than 0.1 fibers/cc). That sample was collected during the second day of drilling at Asbestos Pile parcel location GT-07 (APGT07-PE-TWA02) and had a concentration of 0.15 fibers/cc. **Table 3-8** presents the personal exposure sample results.

3.9.2 Perimeter Air Samples

Perimeter air samples, collected daily during intrusive activities, were analyzed using the NIOSH 7400 method. Per the SMP, if more than 2 asbestos fibers were detected in perimeter air samples, engineering controls were to be used during subsequent intrusive activities. Samples collected the first two days of intrusive activities at each parcel were submitted for analysis, and samples collected on subsequent days were archived. In total, eight days of perimeter air samples were submitted for analysis including two extra samples collected while drilling at the top of the Asbestos Pile parcel where ACM was visible. Results ranged from less than 0.005 fibers/cc to less than 0.026 fibers/cc. No perimeter air samples exceeded the 2 asbestos fibers “trigger” for engineering controls. **Table 3-9** presents the perimeter air monitoring results.

3.10 Groundwater Occurrence and Potentiometric Surface

The water levels in piezometers and monitoring wells measured in January, April, June, September, and October 2011 are tabulated in **Table 3-10**. Generally, the shallow groundwater is found in the fractured upper bedrock, with discontinuous occurrences in the overburden material in the Park parcel, near Wissahickon Creek, and in the Asbestos Pile parcel. Groundwater level elevations from the shallow fractured bedrock monitoring wells and stream gauges were contoured to illustrate the horizontal gradient in the shallow bedrock (see the potentiometric surface maps in **Figures 2-6 to 2-10)**. The water level data from two piezometers (GT-06 and GT-07) installed in the Asbestos Pile parcel are contoured with the shallow bedrock data. These data were included in the contouring to recognize that groundwater is mounded in this area and potentially increases the elevation head in the underlying shallow bedrock groundwater. The groundwater elevations in the overburden piezometers are posted on the potentiometric maps for comparison to other water levels.

The horizontal groundwater gradient in the shallow bedrock is from north to south across the Park parcel, which suggests discharge to Wissahickon Creek. A local gradient also suggests a component of Site groundwater may be discharging to Rose Valley Creek. Although a lack of potentiometric data is recognized in the north central part of the Park parcel, the water levels at the available points suggest groundwater discharge to these two surface water bodies. This gradient pattern is typical in the near-creek settings of the region. The shallow bedrock groundwater, if its potentiometric surface is above the elevation of the surface water bodies, typically flows toward, and emerges, at these low-lying discharge points. In addition to horizontal movement, the shallow groundwater is expected to flow upward toward these discharge points.

Although an upward vertical gradient is typical and expected in the shallow bedrock at the creeks, the surface water in the reservoir is higher than the surrounding water table, and, therefore, a surcharge of water is placed on the saturated zone at this surface water body. This additional pressure head is inferred to create a downward vertical gradient beneath the reservoir, but upward vertical gradients at discharge locations would still be expected. Where the overburden and/or bedrock has a high horizontal to vertical anisotropy ratio, surface water would be expected to follow the pressure gradient from the reservoir into the overburden and bedrock with less downward and more horizontal transmission of subsurface flow.

In addition to this atypical downward vertical gradient due to the reservoir, shallow bedrock groundwater at the southeast side of the Site does not appear to discharge to the nearby creek (Tannery Run), because the water level in this creek is above the groundwater level measured in nearby MW-06.

Lastly, in addition to vertical gradients within the shallow bedrock, the vertical gradient between the overburden and the shallow bedrock groundwater is measurable at one location. The location is in the Park parcel at bedrock well MW-02 and overburden piezometer PKPZ-02. At this location, the vertical hydraulic gradient between these two units is slightly downward. However, downward flow is expected to be slowed, or prohibited, by the clays, silts, and silty and clayey sands that are found immediately above the bedrock. Rather than downward, flow in the overburden is more likely to be horizontal toward Wissahickon Creek, the regional discharge location.

Cross Section A-A' (**Figure 3-3**), which runs from the northwestern corner to the southeastern corner of the Site, depicts the relationships between the overburden groundwater, ACM waste material, bedrock groundwater, and surface water. Note that the potentiometric surface shown on the cross section is that of the shallow bedrock aquifer, and water levels noted from saturated material in the borings at the time of drilling are also shown. The sporadic occurrences of groundwater in the overburden (e.g., water encountered at PKSB-40 but not at PKSB-27 and PKSB-42) suggest this water is discontinuous. However, arguably, the water surface may be irregular and occur at depths beneath the borings where groundwater was not encountered. The overburden groundwater is found both within and below the waste material. On the Park parcel, overburden groundwater was found within the waste at PKSB-42, and mounded groundwater in the Asbestos Pile parcel is also within the waste. However, at PKSB-49, for example, the groundwater table was encountered below the waste material.

Perched groundwater was encountered in some borings on the Asbestos Pile parcel. At APSB-10 located 170 feet off of the cross section line, wet waste is found above dry silty sand. According to bedrock depths recorded in MW-03 and MW-04, located on the west and east sides of the reservoir, the reservoir does not appear to have a bedrock bottom (**Figure 3-3**).

3.11 Quality Control Summary

In general, all soil, groundwater, and air samples were collected in accordance with procedures specified in the SMP. Deviations from the SMP were described in Section 2.5. Quality control samples were collected and tracked as part of the Phase 2 field investigation and will be discussed in detail in the OU-1 Remedial Investigation Report. All data quality objective (DQO)-definitive data collected during Phase 2 was validated by EPA Region 3 Environmental Services Assistance Team (ESAT) using EPA CLP data validation procedures. The inorganic analytical data validation was performed according to Region 3 Modifications to the National Functional Guidelines for Inorganic Data Review, Level IM2. The organic analytical data validation was performed according to Region 3 Modifications *to the National Functional Guidelines for Low Concentration Organic Data Review, Level M3. Definitions for the* qualifier flags used by ESAT to qualify the data are provided as footnotes on the referenced tables. A full discussion of validation results will be included in the OU-1 RI Report.

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Section 4

Recommendations for Additional Field Investigation

Based upon the results from the Phase 2 Field Investigation as described in this report and summarized in **Table ES-1**, CDM Smith recommends that EPA include the following activities in future fieldwork:

- Additional sampling of the existing groundwater monitoring wells at the Site to evaluate seasonal fluctuation of contaminants;
- Installation of one staff gauge in the breech dam in Wissahickon Creek, one staff gauge in Rose Valley and Tannery run near confluence with Wissahickon Creek, and collection of additional rounds of water elevation data to evaluate the hydraulic connection of surface water to groundwater;
- Collection of background soil samples for SVOCs, PCB/pesticides, and metals to provide background organic and inorganic concentrations for the risk assessment;
- Installation and sampling of at least one upgradient monitoring well to provide background data for the HHRA and water level data in the northern part of the Park Parcel; and
- Performance of a topographical and boundary extent survey of the Site to document existing (post-Removal Program) conditions for use as a base map in the RI report.

In addition, CDM Smith recommends that two assessments of the reservoir and its operation be performed: 1) a visual survey of the embankment and the reservoir to identify operating features and 2) an assessment of the safety features to identify potential deficiencies in the current condition of the reservoir that may contribute to mis-operation or failure of the system and threaten the health and safety of downstream populated areas and infrastructure.

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Section 5
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FIGURES

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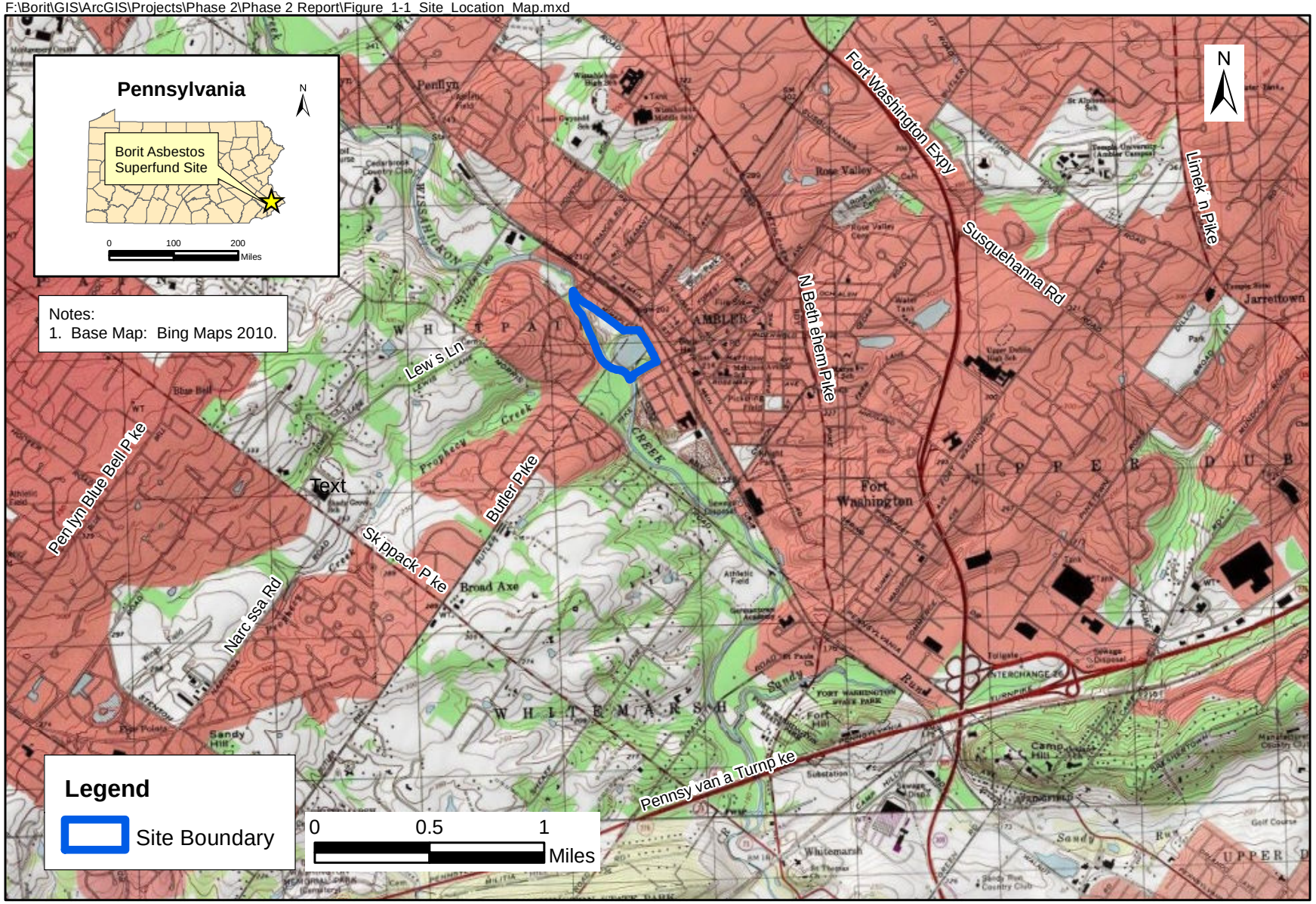


CDM Smith

BoRit Asbestos Superfund Site, OU-1
Ambler, Pennsylvania

Figure ES-1
Site Map

F:\Borit\GIS\ArcGIS\Projects\Phase 2\Phase 2 Report\Figure_1-1_Site_Location_Map.mxd



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BoRit Asbestos Superfund Site, OU1
Ambler, Pennsylvania

Figure 1-1
Site Location Map

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BoRit Asbestos Superfund Site, OU-1
Ambler, Pennsylvania

Figure 1-2
Visual Survey for ACM

N W E S

0 500 1,000 2,000 Feet

F:\Borit\GIS\ArcGIS\Projects\Phase 2\Phase 2 Report\CAG Revisions\Figure 2-1 Park Sampling Locs rev.mxd

Notes:
1. Media types designated by sample name and label color:
   (a) ABS = Activity-Based Samples (Red)
   (b) ABSS = Surface Soil 30-point Composite Sample (Green)
   (c) SB/SS = Surface Soil Grab Sample (Brown)
   (d) MW##-SB = Sub-surface Soil Grab Sample (Black) [Asbestos only]
   (e) MW = Groundwater Sample (Blue)
2. Location designated by sample preface:
   (a) CK = Streambank Cap
   (b) PK = Park Parcel
   (c) KP = Kid's Park
3. Digital orthoimagery source: Bing Maps 2010.

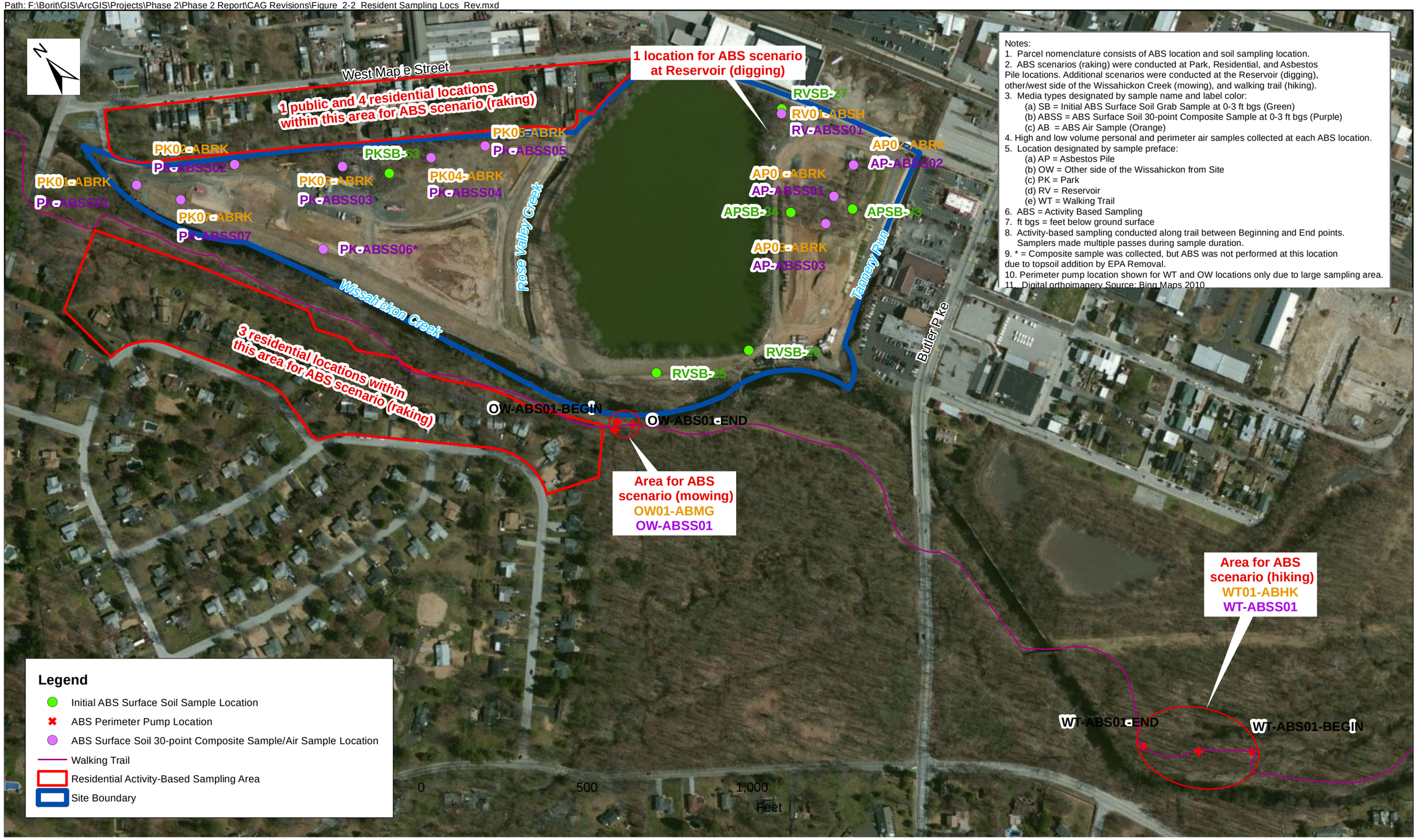


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BoRit Asbestos Superfund Site, OU1
Ambler, Pennsylvania

Figure 2-1
Park Parcel and Kid's Park
Soil Sampling Locations - Phase 2

Path: F:\Borit\GIS\ArcGIS\Projects\Phase 2\Phase 2 Report\CAG Revisions\Figure_2-2_Resident Sampling Locs_Rev.mxd



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BoRit Asbestos Superfund Site, OU-1
Ambler, Pennsylvania

Figure 2-2
ABS Sample Locations

F:\Borit\GIS\ArcGIS\Projects\Phase 2\Phase 2 Report\Figure_2-3_Pile Sampling Locs.mxd



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BoRit Asbestos Superfund Site, OU-1
Ambler, Pennsylvania

Figure 2-3
Asbestos Pile
Sampling Locations - Phase 2

F:\Borit\GIS\ArcGIS\Projects\Phase 2\Phase 2 Report\Figure_2-4_Reservoir Sampling Locs.mxd



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BoRit Asbestos Superfund Site, OU1
Ambler, Pennsylvania

Figure 2-4
Reservoir Sampling Locations - Phase 2

F:\Borit\GIS\ArcGIS\Projects\Phase 2\Phase 2 Report\CAG Revisions\Figure_2-5_Geotech_Piezometer_MW_Locs.mxd



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BoRit Asbestos Superfund Site, OU1
Ambler, Pennsylvania

Figure 2-5
Stream Gauge, Geotechnical, Piezometer, and Monitoring Well Locations

F:\Borit\GIS\ArcGIS\Projects\Phase 2\Phase 2 Report\CAG Revisions\Figure_2-6_Potentiometric_Jan2011_Revised.mxd

Notes:
1. Groundwater and surface water elevations (ft amsl) are posted adjacent to their corresponding measuring points.
2. Groundwater levels collected on January 13, 2011.
3. The vertical datum is NAVD88.
4. ft amsl - feet above mean sea level
5. Contour interval is 1 foot.
6. Digital orthoimagery source: Bing Maps 2010.
7. NM = Not measured

West Maple Street

SG-1 178.42

MW-1 179.84

177.64

SG-3 185.93

MW-3 177.43

PKPZ-01 176.26

MW-2 175.25

PKPZ-03 176.1

PKPZ-02 175.78

MW-6 184.14

SG-2 187.19

GT-6 188.13

GT-7 188.12

MW-4 182.13

GT-8 NM

MW-5 172.02

APPZ-01 171.6

APPZ-02 172.68

APPZ-03 173.72

SG-4 168.0

Butler Pike

Legend

- Monitoring Well
- Piezometer
- Geotechnical Piezometer
- Stream Gauge
- Potentiometric Contour
- Inferred Potentiometric Contour
- Site Boundary

Groundwater level elevations from the bedrock wells and the stream gauges are contoured to illustrate the horizontal gradient in the shallow bedrock. The water level elevations in overburden wells GT-06 and GT-07 are included in the contouring scheme to recognize that groundwater is mounded in this area and potentially increases the elevation head in the underlying shallow bedrock groundwater. Groundwater elevations from the overburden are posted for comparison to the other water levels.

0 250 500 Feet

CDM Smith

BoRit Asbestos Superfund Site, OU-1
Ambler, Pennsylvania

Figure 2-6
Potentiometric Surface Map
January 2011

F:\Borit\GIS\ArcGIS\Projects\Phase 2\Phase 2 Report\CAG Revisions\Figure_2-7_Potentiometric_Apr2011.mxd

Notes:
1. Groundwater and surface water elevations (ft amsl) are posted adjacent to their corresponding measuring points.
2. Groundwater levels collected on April 14, 2011.
3. The vertical datum is NAVD88.
4. ft amsl - feet above mean sea level
5. Contour interval is 1 foot.
6. Digital orthoimagery source: Delaware Valley Regional Planning Commission (DVRPC). 2005.
7. NM = Not measured

West Maple Street

SG-5 178.94
SG-4 177.89
SG-3 186.20
SG-2 186.64
SG-1 168.52
MW-1 181.47
MW-2 176.51
MW-3 178.67
MW-4 183.41
MW-5 172.57
MW-6 185.85
PKPZ-01 176.89
PKPZ-02 176.94
PKPZ-03 Dry
GT-6 188.69
GT-7 188.77
APPZ-01 172.04
APPZ-02 172.74
APPZ-03 173.9
NM

Butler Pike

Legend

- Monitoring Well
- Piezometer
- Geotechnical Piezometer
- Stream Gauge
- Potentiometric Contour
- Inferred Potentiometric Contour
- Site Boundary

Groundwater level elevations from the bedrock wells and the stream gauges are contoured to illustrate the horizontal gradient in the shallow bedrock. The water level elevations in overburden wells GT-06 and GT-07 are included in the contouring scheme to recognize that groundwater is mounded in this area and potentially increases the elevation head in the underlying shallow bedrock groundwater. Groundwater elevations from the overburden are posted for comparison to the other water levels.

0 250 500 Feet

CDM Smith

BoRit Asbestos Superfund Site, OU-1
Ambler, Pennsylvania

Figure 2-7
Potentiometric Surface Map
April 2011

F:\Borit\GIS\ArcGIS\Projects\Phase 2\Phase 2 Report\CAG Revisions\Figure_2-8_Potentiometric_Jun2011.mxd

Notes:
1. Groundwater and surface water elevations (ft amsl) are posted adjacent to their corresponding measuring points.
2. Groundwater levels collected on June 27, 2011.
3. The vertical datum is NAVD88.
4. ft amsl - feet above mean sea level
5. Contour interval is 1 foot.
6. Digital orthoimagery source: Bing Maps 2010.
7. NM = Not measured

West Maple Street

Butler Pike

SG-5 178.5
MW-1 179.84
SG-4 177.83
SG-3 185.68
MW-3 177.74
PKPZ-01 176.37
MW-2 175.36
PKPZ-03 176.63
PKPZ-02 175.96
MW-4 181.95
MW-6 184.64
SG-2 186.92
GT-6 188.47
GT-7 188.72
GT-8 Removed
MW-5 171.34
APPZ-01 172.58
APPZ-03 171.04
SG-1 167.94

Legend

- Monitoring Well
- Piezometer
- Geotechnical Piezometer
- Stream Gauge
- Potentiometric Contour
- Inferred Potentiometric Contour
- Site Boundary

Groundwater level elevations from the bedrock wells and the stream gauges are contoured to illustrate the horizontal gradient in the shallow bedrock. The water level elevations in overburden wells GT-06 and GT-07 are included in the contouring scheme to recognize that groundwater is mounded in this area and potentially increases the elevation head in the underlying shallow bedrock groundwater. Groundwater elevations from the overburden are posted for comparison to the other water levels.

0 250 500 Feet

CDM Smith

BoRit Asbestos Superfund Site, OU-1
Ambler, Pennsylvania

Figure 2-8
Potentiometric Surface Map
June 2011

F:\Borit\GIS\ArcGIS\Projects\Phase 2\Phase 2 Report\CAG Revisions\Figure_2-9_Potentiometric_Sept2011.mxd

Notes:
1. Groundwater and surface water elevations (ft amsl) are posted adjacent to their corresponding measuring points.
2. Groundwater levels collected on September 13, 2011.
3. The vertical datum is NAVD88.
4. ft amsl - feet above mean sea level
5. Contour interval is 1 foot.
6. Digital orthoimagery source: Bing Maps 2010.
7. NM = Not measured

West Maple Street

Butler Pike

SG-5 178.93

MW-1 183.11

SG-4 178.03

MW-6 183.82

SG-2 187.62

GT-6 190.26

GT-7 190.26

MW-2 NM

GT-8 Removed

SG-3 186.78

MW-3 178.91

PKPZ-01 179.71

MW-4 176.83

PKPZ-01 177.91

PKPZ-02 177.29

MW-5 172.17

APPZ-01 Removed

APPZ-01 Removed

APPZ-01 Removed

SG-1 168.04

Legend

- Monitoring Well
- Piezometer
- Geotechnical Piezometer
- Stream Gauge
- Potentiometric Contour
- Inferred Potentiometric Contour
- Site Boundary

Groundwater level elevations from the bedrock wells and the stream gauges are contoured to illustrate the horizontal gradient in the shallow bedrock. The water level elevations in overburden wells GT-06 and GT-07 are included in the contouring scheme to recognize that groundwater is mounded in this area and potentially increases the elevation head in the underlying shallow bedrock groundwater. Groundwater elevations from the overburden are posted for comparison to the other water levels.

0 250 500 Feet

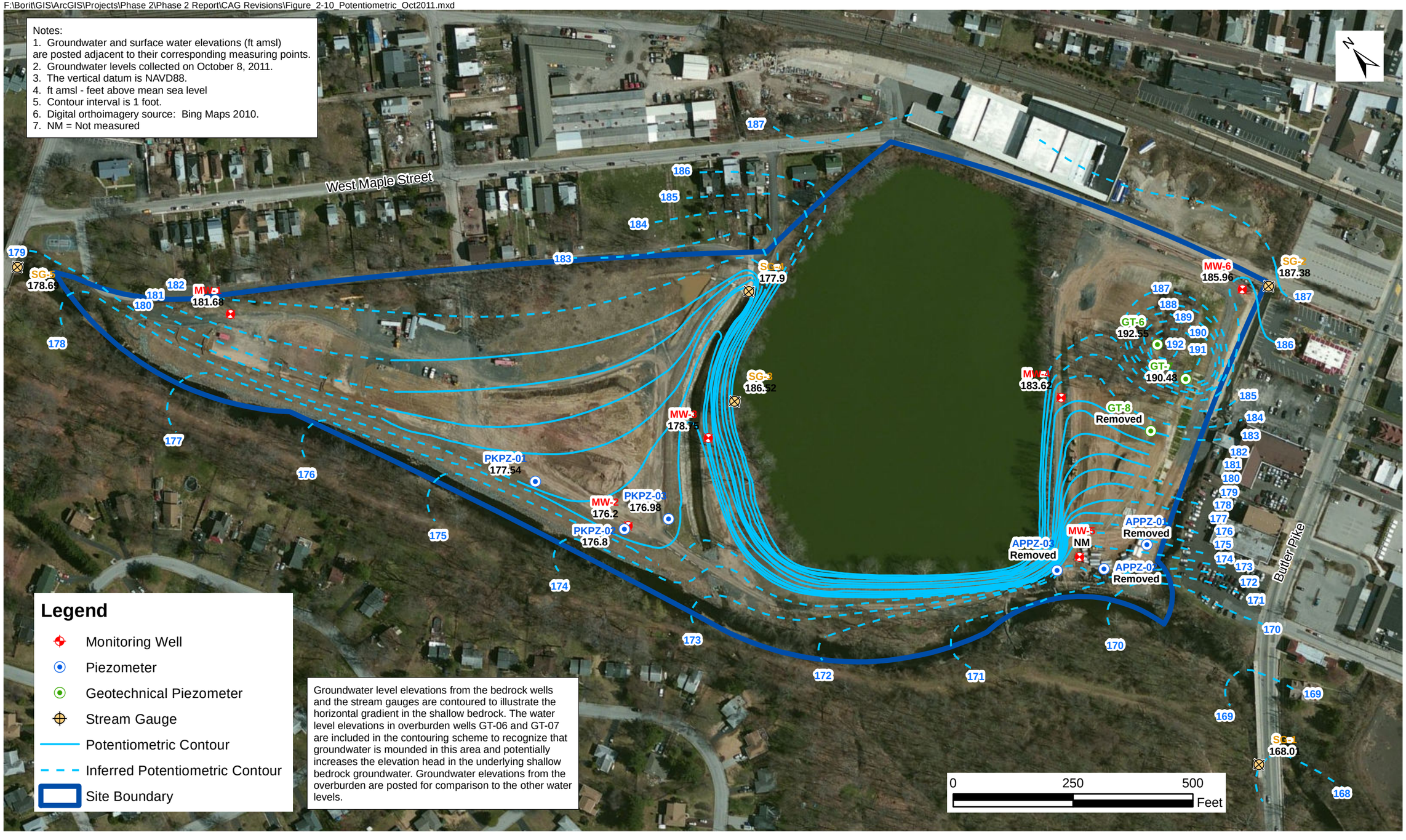
CDM Smith

BoRit Asbestos Superfund Site, OU-1
Ambler, Pennsylvania

Figure 2-9
Potentiometric Surface Map
September 2011

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Notes:
1. Groundwater and surface water elevations (ft amsl) are posted adjacent to their corresponding measuring points.
2. Groundwater levels collected on October 8, 2011.
3. The vertical datum is NAVD88.
4. ft amsl - feet above mean sea level
5. Contour interval is 1 foot.
6. Digital orthoimagery source: Bing Maps 2010.
7. NM = Not measured



Legend

- Monitoring Well
- Piezometer
- Geotechnical Piezometer
- Stream Gauge
- Potentiometric Contour
- Inferred Potentiometric Contour
- Site Boundary

Groundwater level elevations from the bedrock wells and the stream gauges are contoured to illustrate the horizontal gradient in the shallow bedrock. The water level elevations in overburden wells GT-06 and GT-07 are included in the contouring scheme to recognize that groundwater is mounded in this area and potentially increases the elevation head in the underlying shallow bedrock groundwater. Groundwater elevations from the overburden are posted for comparison to the other water levels.

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BoRit Asbestos Superfund Site, OU-1
Ambler, Pennsylvania

Figure 2-10
Potentiometric Surface Map
October 2011

Path: F:\Borit\GIS\ArcGIS\Projects\Phase 2\Phase 2 Report\CAG Revisions\Figure_2-11_Ambient_Air_Monitoring_Locations.mxd

Notes:
1. Media types designated by sample name and label color:
(a) AA = Ambient Air (Purple)
2. Location designated by sample prefix:
(a) CM = Commerical Property
3. CM06-AA = Background location.
4. Boundary lines are estimated.
5. Digital orthoimagery source: Bing Maps 2010.

CM04-AA
(Adult Community Center)

Ambler

CM05-AA
(Cognis)

CM03-AA
(Church/School)

CM07-AA
(Ambler Warehouse)

West Maple Street

CM07B-AA
(Guardrail in front of vacant lot)

Rose Valley Creek

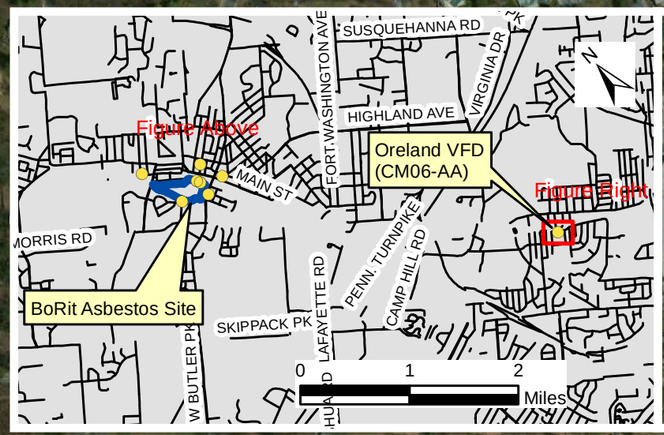
Tannery Run

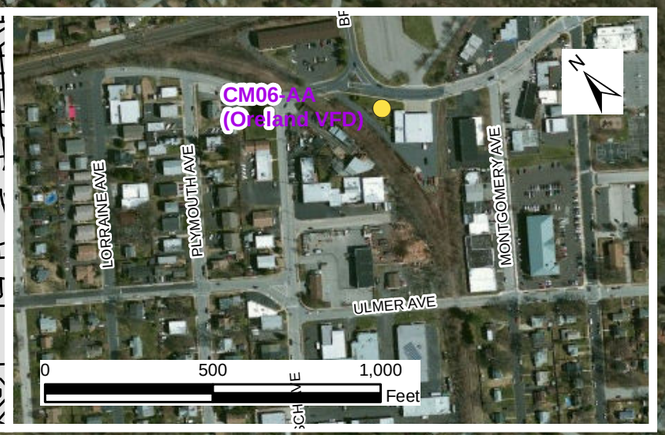
Butler Pike

CM02-AA
(Post Office Employee Parking Lot)

CM01-AA
(End of Easement)

Wissahickon Creek





0 500 1,000
Feet

Legend

- Ambient Air Sampling Location
- Site Boundary

CDM Smith

BoRit Asbestos Superfund Site, OU1
Ambler, Pennsylvania

Figure 2-11
Ambient Air Monitoring Locations

F:\Borit\GIS\ArcGIS\Projects\Phase 2\Phase 2 Report\Figure 3-1 Park Asbestos Exceed Soil.mxd

Notes:
1. Media types designated by sample name and label color:
   (a) ABSS = Surface Soil 30-point Composite Sample (Green)
   (b) SB/SS = Surface Soil Grab Sample (Brown)
   (c) MW##-SB = Sub-surface Soil Grab Sample (Black)
2. Location designated by sample preface:
   (a) CK = Streambank Cap
   (b) PK = Park
3. Digital orthoimagery source: Bing Maps 2010.

PKSS-01		
	RSL	PKSS-01
Asbestos	**(%)**	
Asbestos Fibers (Chrysotile)	1	**1.2**

PKSB-06		
	RSL	PKSB-06
	(%)	
Asbestos Fibers (Chrysotile)	1	**1.5**

PKSB-08		
	RSL	PKSB-08
Asbestos	**(%)**	
Asbestos Fibers (Chrysotile)	1	**1.1**

West Maple Street

PKSS-01
PKSS-01-ABSS02
PKMW01A-SB
PKSB-06
PKSB-06-ABSS03
PKSB-08
PKSB-08-ABSS04
PKSS-02
PKSB-12
PKSB-10
PKSB-10-ABSS05
CKSB-07
CKSB-07-ABSS01
CKSS-01
CKSS-01-ABSS07
CKSS-05
PKSB-29
PKSB-30
PKSB-30-ABSS06
CKSS-02
Rose Valley Creek
CKSS-04
PKMW02-SB
Wissahickon Creek
CKSS-03

Legend
Asbestos Sampling Location

0 250 500
Feet

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BoRit Asbestos Superfund Site, OU1
Ambler, Pennsylvania

Figure 3-1
Asbestos Exceeding Screening Levels in Park Surface Soil, Subsurface Soil

F:\Borit\GIS\ArcGIS\Projects\Phase 2\Phase 2 Report\CAG Revisions\Figure_3-2_XS Location Map.mxd

Notes:
1. Digital orthoimagery source: Bing Maps 2010.

West Maple Street
Maple Avenue
Rose Valley Creek
Wissahickon Creek
Tannery Run
Butler Pike

A
A'
MW-01A
MW-03
MW-04
MW-05
MW-06
SG-02
SG-03
SG-04
PKSB-01
PKSB-02
PKSB-03
PKSB-04
PKSB-05
PKSB-06
PKSB-07
PKSB-08
PKSB-09
PKSB-10
PKSB-11
PKSB-12
PKSB-13
PKSB-14
PKSB-15
PKSB-16
PKSB-17
PKSB-18
PKSB-19
PKSB-20
PKSB-21
PKSB-22
PKSB-23
PKSB-24
PKSB-25
PKSB-26
PKSB-27
PKSB-28
PKSB-29
PKSB-30
PKSB-31
PKSB-32
PKSB-33
PKSB-34
PKSB-35
PKSB-36
PKSB-37
PKSB-38
PKSB-39
PKSB-40
PKSB-41
PKSB-42
PKSB-43
PKSB-44
PKSB-45
PKSB-46
PKSB-47
PKSB-48
PKSB-49
PKSB-50
PKSB-51
PKSB-52
RVSB-01
RVSB-02
RVSB-03
RVSB-04
RVSB-05
RVSB-06
RVSB-07
RVSB-08
RVSB-09
RVSB-10
RVSB-11
RVSB-12
RVSB-13
RVSB-14
RVSB-15
RVSB-16
RVSB-17
RVSB-18
RVSB-19
RVSB-20
RVSB-21
RVSB-22
RVSB-23
RVSB-24
RVSB-25
RVSB-26
RVSB-27
APSB-01
APSB-02
APSB-03
APSB-04
APSB-05
APSB-06
APSB-07
APSB-08
APSB-09
APSB-10
APSB-11
APSB-12
APSB-13
APSB-14
APSB-15
APSB-16
APSB-17
APSB-18
APSB-19
APSB-20
APSB-21
APSB-22
APSB-23
APSB-24
APSB-25
APSB-26
APSB-27
APSB-28
APSB-29
APSB-30
APSB-31
APSB-32
APSB-33
APSB-34
GT-01
GT-02
GT-03
GT-04
GT-05
GT-06
GT-07
GT-08
PKPZ-01
PKPZ-02
PKPZ-03
APPZ-01
APPZ-02
APPZ-03
GKSB-01

Legend
- Soil Boring
- Monitoring Well
- Geotechnical Boring
- Piezometer
- Stream Gauge

CDM Smith

BoRit Asbestos Superfund Site, OU-1
Ambler, Pennsylvania

Figure 3-2
Cross Section Location Map

Northwest **A** — **A'** **Southeast**

Elevation (feet above mean sea level)

Distance Along Baseline (ft)

PKSB-41 PKSB-52 PKSB-01 MW-01 PKSB-23 PKSB-26 PKSB-27 PKSB-40 PKSB-42 PKPZ-01 PKSB-49 MW-02 PKSB-46 Rose Valley Creek MW-03 Reservoir MW-04 APSB-17 GT-06 APSB-07 Tannery Run MW-06 SG-2

LEGEND:

- Cement Seal
- Bentonite Seal
- Filter Pack
- Well Screen
- Bulk ACM debri
- Apparent Asbestos Process Waste
- Bulk ACM debris mixed with soil
- Fill (made ground)
- USCS Low Plasticity Clay
- USCS Low Plasticity Silty Clay
- USCS Clayey Sand
- USCS Silt
- USCS Silty Sand
- USCS Poorly-graded Sand
- Bedrock
- No recovery
- GROUND SURFACE
- RESERVOIR BOTTOM
- POTENTIOMETRIC SURFACE APRIL 2011
- BASE OF ACM-CONTAINING FILL
- BEDROCK SURFACE
- STATIC WATER LEVEL, November 2010 except GT-06 measured January 2011

Notes:
Topography is based on EPA START survey dated June 2, 2008. Subsequent elevation changes (e.g. remedial excavation within asbestos pile) are not reflected in the cross section.

The potentiometric surface developed for the April 2011 monitoring event is represented in profile along the cross-section baseline.
The elevations of the base of fill and bedrock surface were modeled to generate a surface for each unit across the Site. These surfaces are also represented in profile along the baseline of the cross section.

CDM Smith

BoRit Asbestos Superfund Site, OU1
Ambler, Pennsylvania

Figure 3-3
Cross Section A-A'

BORIT_CROSS_SECTION - STANDARD_ENVIRONMENTAL_PROJECT.GDT - 07/01/11 14:25 - F:\GIN\PROJECTS\BORIT\BORIT_ASBESTOS.GPJ

TABLES

Table ES-1
Exceedances Summary
BoRit Asbestos Superfund Site, OU-1
Phase 2 Remedial Investigation

Sample Matrix	Parcel or Area	VOC Exceedance	SVOC Exceedance	Pesticide/PCB Exceedance	Dioxin/Furan Exceedance	Inorganic Exceedance	Asbestos Exceedance
Soil	Park	NA	NA	NA	NA	NA	ü
	Asbestos Pile	NA	ü		ü	ü	ü
	Kid's Park	NA	NA	NA	NA	NA	
	Reservoir	NA	NA	NA	NA	NA	ü
	Residential	NA	NA	NA	NA	NA	
	Other Side of Wissahickon	NA	NA	NA	NA	NA	
	Walking Trails	NA	NA	NA	NA	NA	
Groundwater	Park	ü	ü		NA	ü	
	Asbestos Pile		ü		NA	ü	
	Reservoir		ü		NA	ü	
Seep	Reservoir		ü		NA	ü	
Air - ABS	Park	NA	NA	NA	NA	NA	ü
	Asbestos Pile	NA	NA	NA	NA	NA	ü
	Reservoir	NA	NA	NA	NA	NA	
	Residential	NA	NA	NA	NA	NA	
	Walking Trails	NA	NA	NA	NA	NA	
Air - Ambient	Off Site	NA	NA	NA	NA	NA	

Notes:
ü = At least one compound from this group exceeded the associated screening value in at least one sample.
blank cell = No compound from this group exceeded the associated RSL in any sample.
NA = not analyzed
RSL = Regional Screening Level
PCB = polychlorinated biphenyl
PCME = phase contrast microscopy equivalent
s/cc = structures per cubic centimeter
SVOC = semi-volatile organic compound
VOC = volatile organic compound
VOC, SVOC, Pesticide/PCB, dioxin/furan, and inorganic results were screened against May 2012 Regional Screening Levels.
Asbestos results in groundwater and seep were screened against the Maximum Contaminant Level (May 2009).
Asbestos results in air ABS results were screened against the residential screening value (0.04 structures/cc) for PCME provided by EPA Work Assignment Manager in an email dated 10/27/2011.
Asbestos results in ambient air were screened against the screening value of 0.001 structures/cc asbestos (PCME) which was provided by EPA Region 3 in an email dated May 15, 2012.
Asbestos results in soil were screened against the value provided in the Framework for Investigating Asbestos-Contaminated Superfund Sites (September 2008).

Table 1-1
Phase 2 Field Planning Guide
BoRit Asbestos Superfund Site, OU-1
Phase 2 Remedial Investigation

Question Number[1]	Investigative Question	Existing Information	Data Gaps	Phase 2 Investigative Activities
Park				
4	Has shallow groundwater been impacted beneath the Park Area?	• Phase 1 groundwater data from grab samples within boreholes and piezometers installed during Phase 1	• Groundwater flow direction/gradient • Groundwater depth • Groundwater aquifer(s)	• **PHASE 2** • Install 2 monitoring wells in Phase 2 at the Park. Monitoring wells will be cased off through the waste layer and left as an open hole in bedrock, unless open hole is greater than 20 feet long. Collect soil sample for asbestos by polarized light microscopy (PLM) at the native layer. • Survey piezometers and monitoring wells, and collect water levels to determine groundwater flow direction. • Develop and collect groundwater samples using low flow techniques for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs)/Pesticides, metals, and asbestos by transmission electron microscopy (TEM).
5	Are additional data necessary to perform the HHRA for the Park Area?	• Phase 1 asbestos and chemical data • Activity-based sampling (ABS) conducted in 2006 and 2007: raking and grass cutting, walking, and soil sampling • Maintenance ABS scenario (raking). This ABS scenario showed an asbestos level of 0.076 fibers/mm^2 • Modeled risk from asbestos was sufficient to score	• Additional ABS to evaluate the air exposure pathway from asbestos • May need to collect additional chemical data and evaluate metal anomalies • Collect soil to be analyzed for asbestos at property extent, specifically at areas where steep slopes could have	• **PHASE 2** • Depending on discussions with EPA after review of the Phase 1 Data Summary Report, may add additional samples for non-asbestos containing materials (ACM) contamination found at the Site. • Analyze 3 stationary passive air samples for asbestos by TEM and particulates (1 upwind, 2 downwind) each day during ABS (approximately 21 samples at the Park). • Collect 6 surface soil samples (0-3”) for asbestos within the composite area that had asbestos levels >12% in the cover waste interface (PKSB-06, 08, 10, 12, , 29, 40), collect 5 surface soil samples (0-3”) for asbestos along the Wissahickon and Rose Valley stream bank cap to check if ABS needs to be performed in these areas. Total 11 soil samples by PLM. • Collect 1 grab surface soil sample (0-3”) for asbestos and percent moisture at each of the planned 7 ABS locations prior to performing ABS activities. Total 7 for PLM and % moisture. • Conduct ABS for raking activity at 7 locations. Analyze 2 activity-

Table 1-1
Phase 2 Field Planning Guide
BoRit Asbestos Superfund Site, OU-1
Phase 2 Remedial Investigation

		the Site for placement on the NPL	surface water runoff exiting the Site	based air samples (high or low volume adult and high volume child) for each of the 7 planned ABS locations, total 14 by TEM. Low volume cassette only analyzed if high volume cassette is compromised. Child cassette worn on ABS actor's waist. Analytical sensitivity for all TEM ISO 10312 air sampling is 0.0004 S/cc. • Plan 4 ABS locations in the Park along border with Maple Street in areas not yet addressed by Removal: 1 in each of the 2 composite areas that had levels > 12% in the cover waste interface, and 2 other locations based on visible ACM (will be 4 total, 2 on each side of the access road from Oak Street). • Plan 1 ABS location in the floodplain area in the northern corner by CKFP-07 • Take 2 additional ABS locations in the streambank cap along the Wissahickon and Rose Valley if PLM samples taken during Phase 2 have detectable levels of asbestos (if no asbestos detected during PLM analysis will do 1 ABS scenario in Removal's work area in new cover). Proposed ABS locations are subject to change depending on availability. Total to scope is 7. • Collect GPS points at all ABS locations. • **Note: Added per conference calls on March 30 and April 6 with EPA and a Site visit with EPA on April 28, 2010.** • Grab two surface soil samples (0-3") for asbestos where surface water runoff is believed to exit the Site. • **Note: Added per EPA WAM email June 21 and based on call from EPA WAM on June 3.** • **Note: Analytical sensitivity for asbestos air samples analyzed by TEM ISO 10312 method based on call with EPA on July 28.** • **AFTER PHASE 2** • Prepare a Baseline Human Health Risk Assessment Report.

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6	Are additional data necessary to perform the screening level ecological risk assessment for the Park Area?	• None	• Determine whether there are burrowing animals at the site • Determine ecological risks and exposure pathways	• **PHASE 1 (not yet completed)** • Perform an ecological site walk over (habitat survey) to observe what species inhabit or visit the Site. • **Note: This will be performed during the growing season.** • **AFTER PHASE 2** • Perform a SLERA using available data.
38	Can existing Site subsurface conditions provide enough stability to perform potential remedial action activities (e.g., capping, excavation, treatment, etc.)?	• None	• Geo-environmental data to support FS evaluation of potential remedial alternatives	• **PHASE 2 (still under review by CDM Smith, may change)** • Drill 3 test borings to depths ranging from approximately 15 to 30 feet below the ground surface. Borings will be drilled with continuous standard penetration tests (SPTs). Borings will be drilled at the locations which appear to be critical with respect to potential remedial action activities. Borings will be located in the field and their ground surface elevations obtained by a surveyor. • Laboratory testing may include moisture content, grain size analysis, Atterberg Limits, which collectively are called Classification Tests, specific gravity tests, consolidation tests, and shear strength tests. Preliminarily it is anticipated that 6 Classification Tests, 2 specific gravity tests, 2 consolidation tests, and 2 shear strength tests will be performed. These tests will help evaluate settlement and slope stability at the Park for the FS.

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Asbestos Pile				
7	What is the extent of ACM Waste in the cover and waste layers of the Asbestos Pile?	• Phase 1 asbestos data • An electromagnetic survey was conducted (Gilmore Report); CDM Smith will reevaluate the use of this report after Phase 1 has been completed to determine if the existing report is sufficient or if a new survey needs to be conducted	• Aerial and vertical extent of ACM waste	• **Will Evaluate Need After Phase 1** • Perform an electrical resistivity survey to determine the lateral extent and thickness of the Asbestos Pile and associated ACM waste layer(s). • **Task not yet completed.** • **Phase 2** • Grab one surface soil sample (0-3") for asbestos where surface water runoff is believed to exit the Site. • **Note: Added per EPA WAM email June 21 and based on call from EPA WAM on June 3.**
11	Has shallow groundwater been impacted beneath the Asbestos Pile?	• Phase 1 groundwater data from grab samples within boreholes and piezometers	• Groundwater flow direction/gradient • Groundwater depth • Groundwater aquifer(s)	• **PHASE 2** • Install 2 monitoring wells in Phase 2 at the Asbestos Pile. Monitoring wells will be cased off through the waste layer and left as open holes in bedrock, unless open hole is greater than 20 feet long. Collect soil sample for asbestos by PLM at the top of the native layer. • Survey piezometers and monitoring wells, and collect water levels to determine groundwater flow direction. • Develop and collect groundwater samples using low flow techniques for VOCs, SVOCs, PCBs/Pesticides, metals, and asbestos by TEM.
12	Are additional data necessary to perform the HHRA for the Asbestos	• Some ABS has been conducted such as a raking maintenance scenario • Phase 1 soil	• Additional activity-based samples to evaluate the air exposure pathway	• **PHASE 2** • Depending on discussions with EPA after review of the Phase 1 Data Summary Report, may add additional samples for chemical contamination found at the Site. • Analyze 3 stationary passive air samples for asbestos by TEM and particulates (1 upwind, 2 downwind) each day during activity-

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	Pile?	chemical data	• May need to collect additional chemical data and evaluate metal anomalies • Collect soil to be analyzed for asbestos at property extent, specifically at areas where steep slopes could have surface water runoff exiting the Site	based sampling (ABS) (approximately 12 samples at the Asbestos Pile). • Collect 1 grab surface soil sample (0-3") for asbestos and percent moisture at each of the 4 planned ABS locations prior to performing ABS activities. Total 4 for PLM and % moisture. • Conduct ABS for raking activity at 4 locations. Analyze 2 activity-based air samples (high or low volume adult and high volume child) per ABS location, total 8 by TEM. Low volume cassette only analyzed if high volume cassette is compromised. Child cassette worn on ABS actor's waist. Analytical sensitivity for all TEM ISO 10312 air sampling is 0.0004 S/cc. • 4 ABS locations: 1 in Former Fire Training area, 1 along fence line with Maple Street, 1 on top of Pile at APSB-34, and 1 in shingles area near APPZ-03A. Proposed locations are subject to change depending on availability. Total to scope is 4. • Collect GPS points at all ABS locations. • **Note: Added per conference calls on March 30 and April 6 with EPA and a Site visit with EPA on April 28, 2010.** • **Note: Analytical sensitivity for asbestos air samples analyzed by TEM ISO 10312 method based on call with EPA on July 28.** • **AFTER PHASE 2** • Prepare a Baseline Human Health Risk Assessment Report.
13	Are additional data necessary to perform the ecological risk assessment For the Asbestos Pile?	• Chemical data collected during Phase 1 activities	• Determine if there are burrowing animals in the Asbestos Pile • Determine ecological risks and exposure pathways	• **PHASE 1 (not yet completed)** • Perform an ecological site walk over (habitat survey) to observe what species inhabit or visit the Site. • **Note: This will be performed during the growing season.** • **AFTER PHASE 2** • Perform a SLERA using available data.
39	Can existing Site subsurface conditions provide	• None	• Geo-environmental data to support FS evaluation of	• **PHASE 2 (still under review by CDM Smith, may change)** • Drill 6 test borings to depths ranging from approximately 20 to 50 feet below the ground surface. Borings will be drilled with

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	enough stability to perform potential remedial action activities (e.g., capping, excavation, treatment, etc.) and to support potential future Site uses?		potential remedial alternatives and potential future uses	continuous SPTs. Borings will be drilled at the locations of which appear to be critical with respect to potential remedial action activities. Borings will be located in the field and their ground surface elevations obtained by a surveyor. • Laboratory testing may include moisture content, grain size analysis, Atterberg Limits, which collectively are called Classification Tests, specific gravity tests, consolidation tests, and shear strength tests. Preliminarily it is anticipated that 14 to 20 Classification Tests, 4 to 6 specific gravity tests, 4 to 6 consolidation tests, and 4 to 6 shear strength tests will be performed. These tests will help evaluate settlement and slope stability at the Asbestos Pile for the FS.
40	Has the soil been impacted with dioxins during the fire training activities?	• No dioxin analyses were performed during Phase 1	• Dioxin sampling within the former fire training area	• **PHASE 2** • Collect 5 samples for dioxins (0-3") in the former fire training area. Samples will be collected in the flat area on both sides of the access road (3 on one side, 2 on the other). • **Note: Added per conversations with EPA on March 24, 2010 and confirmed in an email from CDM Smith on March 25, 2010.**
41	Is the visible slag impacting soil?	• None • Slag was noted for the first time during the Phase 1 field investigation	• Metals, SVOCs, asbestos, and dioxins sampling on visible slag	• **PHASE 2** • Collect 1 to 2 samples of visible slag at the Pile and analyze for metals, SVOCs, asbestos, and dioxins. **Note: Added per conversations with EPA on March 24, 2010 and confirmed in an email from CDM Smith on March 25, 2010. Asbestos sampling added on per a conversation with EPA on June 16, 2010**

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Reservoir				
15	Are there risks to ecological receptors at the Reservoir?	• Reservoir area used as a waterfowl preserve • EPA on-scene coordinator (OSC) noted that the Reservoir is being stocked with fish for the waterfowl • EPA Biological Techinical Assistance Group (BTAG) stated that asbestos fibers have been shown to be toxic to some fish	• Confirm presence of ecological receptors in Reservoir • Confirm type of waterfowl observed at the Wissahickon Waterfowl Preserve • Confirm type of fish being stocked in the Reservoir	• **PHASE 1 (not yet completed)** • Perform an ecological site walk over (habitat survey) to observe what species inhabit or visit the Site. • Talk with the Wissahickon Waterfowl Preserve to determine what waterfowl or other species have been observed at the Reservoir and what fish are used to stock the Reservoir. **This task is currently being performed.** • **Note: This will be performed during the growing season.** • **AFTER PHASE 2** • Perform a SLERA using available data.
19	How does the Reservoir fill and drain?	• Anecdotal reports indicate that it may drain through a pipe located near the former dam into Wissahickon Creek • Seep was observed on the western side of the Reservoir near Wissahickon Creek	• Reservoir construction data • Contaminant levels in seep	• **PHASE 1** • Perform file search for background information concerning the construction of the Reservoir. Agencies to contact: Dams and Waterways, Pennsylvania Department of Environmental Protection (PADEP), County, and EPA (Ambler Asbestos Site File). **This task is currently being performed.** • **PHASE 2** • Sample the seep observed during Phase 1 field investigation for Asbestos by TEM, VOCs, SVOCs, metals, PCBs, and pesticides. • **Note: Added per an email from EPA on May 28, 2010.**

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20	Is the Reservoir hydraulically connected to the other surface water (streams) or to shallow groundwater?	• None	• Piezometric data from Reservoir, groundwater, and streams	• **PHASE 2** • Install staff gauges in the Reservoir, upstream and downstream in Wissahickon Creek, and upstream in Rose Valley Creek and Tannery Run • Survey piezometers in groundwater table. Collect water level data quarterly and immediately following major storm events.
21	If the Reservoir is hydraulically connected to the shallow groundwater, has the shallow groundwater quality been impacted?	• Phase 1 surface water data from Reservoir	• Hydraulic connectivity data • Groundwater quality data	• **PHASE 2** • Evaluate Reservoir water and sediment quality data (using data collected during Phase 1). • Install and survey staff gauges in streams and Reservoir and piezometers in water table aquifer (see investigative question #20). • Install 2 monitoring wells at the Reservoir adjacent to the Reservoir berm, one along the access road between the Asbestos Pile and Reservoir and one within the floodplain closest to Rose Valley Creek. Monitoring wells will be cased off through the waste layer and left as an open hole in bedrock, unless open hole is greater than 20 feet long. Collect soil sample for asbestos by PLM at the native layer. • Survey piezometers and monitoring wells, and collect water levels to determine groundwater flow direction. • Develop and collect groundwater samples using low flow techniques for VOCs, SVOCs, PCBs/Pesticides, metals, and asbestos by TEM.
22	Are additional data necessary to perform the HHRA for the Reservoir?	Phase 1 chemical and asbestos data collected in Reservoir sediments, surface water and soil	• Additional activity-based samples to evaluate the air exposure pathway associated with	• **PHASE 2** • Depending on discussions with EPA after review of the Phase 1 Data Summary Report, may add additional samples for chemical contamination found in the Reservoir sediments, surface water, or soils. • Analyze 3 stationary passive air samples for asbestos by TEM and

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			Reservoir berm soils • May need to collect additional chemical data	particulates (1 upwind, 2 downwind) each day during ABS (approximately 3 samples at the Reservoir). • Collect 1 grab surface soil sample (0-3") for asbestos and percent moisture at the ABS location prior to performing ABS activities. Total 1 for PLM and % moisture. • Conduct ABS at 1 location for long handle shovel activity. Analyze 2 activity-based air samples (high or low volume adult and high volume child) for the ABS location, total 2 by TEM. Low volume cassette only analyzed if high volume cassette is compromised. Child cassette worn on ABS actor's waist. Analytical sensitivity for all TEM ISO 10312 air sampling is 0.0004 S/cc. • 1 ABS location: One ABS location near RVSB-18. Total to scope is 1. • Collect GPS points at the ABS location. • **Note: Added per conference calls on March 30 and April 6 with EPA and a Site visit with EPA on April 28, 2010.** • **Note: Analytical sensitivity for asbestos air samples analyzed by TEM ISO 10312 method based on call with EPA on July 28.** • Grab one surface soil sample (0-3") for asbestos where surface water runoff is believed to exit the Site. • **Note: Added per EPA WAM email June 21 and based on call from EPA WAM on June 3.** • **AFTER PHASE 2** • Prepare a Baseline Human Health Risk Assessment Report.
Creeks (Wissahickon, Rose Valley and Tannery Run)				
25	What is the risk to ecological receptors from the creeks?	• None	• Confirm presence of ecological receptors in creeks	• **PHASE 1 (not yet completed)** • Perform an ecological site walk over (habitat survey) to observe what species inhabit or visit the Site. • **Note: This will be performed during the growing season.** • **AFTER PHASE 2** • Perform a SLERA using available data.

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30	What are the risks to human health from the creeks? Is there an exposure from wading or fishing?	• Phase 1 chemical and asbestos data collected in Creek surface water and sediment	• Analytical data for assessing human health risk of asbestos in air	• **PHASE 2** • Discuss Phase 1 data with EPA to determine if additional sample collection is required for a HHRA. • Analyze 3 stationary passive air samples for asbestos by TEM and particulates (1 upwind, 2 downwind) each day during ABS (approximately 6 samples within the downstream floodplain). • Collect 1 grab surface soil sample (0-3") for asbestos and percent moisture at each of the planned 2 ABS locations prior to performing ABS activities. Total 2 for PLM and % moisture. • Conduct ABS for a hiking activity (downstream of Butler Pike) and a mowing activity (near OWSB-02). Analyze 2 activity-based air samples (high or low volume adult and high volume child) per ABS location, total 4 by TEM. Low volume cassette only analyzed if high volume cassette is compromised. Child cassette worn on ABS actor's waist. Analytical sensitivity for all TEM ISO 10312 air sampling is 0.0004 S/cc. • 2 ABS locations: 1 downstream of Butler Pike within the walking trail and rocky floodplain and 1 just downstream of OWSB-02 on the other side of Wissahickon Creek in the walking trail. Total to scope is 2. • Collect GPS points at both ABS locations. • **Note: Added per conference calls on March 30 and April 6 with EPA and a Site visit with EPA on April 28, 2010.** • **Note: Analytical sensitivity for asbestos air samples analyzed by TEM ISO 10312 method based on call with EPA on July 28.** • Determine extent of ACM debris washed downstream from the Site. • **Note: Added per a telephone call with EPA on June 3, 2010.** • **AFTER PHASE 2** • Prepare a Baseline Human Health Risk Assessment Report (Phase 2).

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Other				
35	Have there been any impacts to soil, sediment, surface water or shallow groundwater at any of the three areas?	• Phase 1 investigation data and any subsequent data collected for the RI/FS	• Reports	• **AFTER PHASE 2** • Prepare Draft and Final Remedial Investigation Reports.
36	What are the potential cleanup alternatives and estimated costs based on the findings of the RI?	• None	• Reports	• **AFTER PHASE 2** • Prepare Draft and Final Feasibility Study reports.
37	Community Involvement	• NA	• NA	• **ONGOING** • Provide community involvement support for 5 meetings which may include: preparation of poster boards and other materials, CDM attendance at meetings in Ambler, PA, and meeting minutes. • Continue to update spreadsheet containing information provided by various CAG members. Provide to EPA RPM monthly.
42	Has asbestos migrated offsite to exteriors at neighboring residences? What are the risks to human health within residential yards performing day-to-day activities?	• None	• Activity-based sampling to evaluate the air exposure pathway for day-to-day residential activities in residential yards	• **PHASE 2** • Prepare factsheet for residents. • If requested by EPA, prepare Access Agreements for residential ABS sampling. At this time, EPA expects to perform this activity. • Analyze 3 stationary passive air samples for asbestos by TEM and particulates (1 upwind, 2 downwind) each day during ABS (approximately 24 samples). • Collect 1 grab surface soil sample (0-3”) for asbestos and percent moisture at each ABS location prior to performing ABS activities. Total 8 for PLM and % moisture. • Perform PLM in woodchip and/or soil samples (whichever exists) beneath swings at kids park (**prior to Phase 2**) and then EPA will decide if ABS is appropriate (note depth of wood chips and if soil beneath has visible ACM). Total of 2 PLM samples. • Conduct ABS for raking activities. Analyze 2 activity-based air

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				samples (high or low volume adult and high volume child) per ABS location, total 16 by TEM. Low volume cassette only analyzed if high volume cassette is compromised. Child cassette worn on ABS actor's waist. Analytical sensitivity for all TEM ISO 10312 air sampling is 0.0004 S/cc. • Plan 3 Residential ABS locations along Mercer Hill Rd and Betsy Lane, 5 residential ABS locations along Maple Street. Total to scope is 8. • All residential locations are subject to change and will vary depending on access acquired by EPA. • Collect GPS points at all ABS locations. • **Note: Added per conference calls on March 30 and April 6 with EPA and a Site visit with EPA on April 28, 2010.** • **Note: Analytical sensitivity for asbestos air samples analyzed by TEM ISO 10312 method based on call with EPA on July 28.**
43	Is asbestos in ambient air in adjacent neighboring communities?	• Some historical air monitoring was performed in community in 2006 and 2007 prior to Removal performing work • Air monitoring in community during Removal's intrusive work	• Evaluation of ambient air in neighboring community after Removal started intrusive work at the Site	• Analyze ambient air in neighboring communities for 5 months. Each month will consist of 3 separate 24 hour sampling events. Assume 7 stationary locations similar to those locations used by Removal for air monitoring in 2006 and 2007, plus one across Maple Street from the Asbestos Pile. EPA expects three one day sampling events to occur in August, three one-day sampling events to occur in September, three one day sampling events to occur in October and the other six one day sampling events will be held in reserve. • **Note: Added per a telephone call from EPA on May 6, 2010. Scope for ambient air sampling finalized during call with EPA on July 28. Analytical sensitivity to be used for ambient air program will be 0.0004 S/cc. Will run two cassettes off of each air pump using a manifold, only one sample will be analyzed. The second air cassette will be archived unless the first cassette is compromised, at which time the second cassette will be submitted for analysis.**

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44	Is analytical data being managed in EPA's EQuIS Database?	• Phase 1 data are being managed in an Access database currently maintained by CDM	• Data in EQuIS for EPA's ease in future storage and management	• Move all Phase 1 and Phase 2 analytical data from Access to an EQuIS database to facilitate future transfer to EPA's EQuIS database. • **Note: Added per a telephone call from Stacie Pratt on May 6, 2010.**
45	What are the analyte levels for inorganics in background soil for this area?	• None	• Inorganic background concentrations	• **AFTER PHASE 2** • Collect soil samples for inorganics from background locations chosen by EPA. • **Note: Added per recommendations from the Phase 1 Data Evaluation Report and subsequent conversations with EPA WAM.**

Notes:

1) Question numbers omitted in this table were completed during the Phase 1 investigation.

Table 2-1
Groundwater Sampling Summary
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Field Activity	Area	Location	Screen Interval (ft msl)	Sample Name	Sample Date	Analyses
Groundwater Sampling	Park	MW-01 MW-01A	45 - 53	PKMW01-1011	11/10/2010	VOCs, SVOCs, PCBs, Pest, Inorganics, Asbestos by TEM
			118.6 - 128.6	PKMW01A-1011	11/15/2010	VOCs, SVOCs, PCBs, Pest, Inorganics, Asbestos by TEM
		MW-02	133.5 - 143.5	PKMW02-1011	11/9/2010	VOCs, SVOCs, PCBs, Pest, Inorganics, Asbestos by TEM
	Reservoir	MW-03	128.7 - 138.7	RVMW03-1011	11/8/2010	VOCs, SVOCs, PCBs, Pest, Inorganics, Asbestos by TEM
		MW-04	95.8 - 115.8	RVMW04-1011	11/9/2010	VOCs, SVOCs, PCBs, Pest, Inorganics, Asbestos by TEM
	Asbestos Pile	MW-05	127 - 137	APMW05-1011	11/9/2010	VOCs, SVOCs, PCBs, Pest, Inorganics, Asbestos by TEM
				APMW-05D-1011	11/9/2010	VOCs, SVOCs, PCBs, Pest, Inorganics, Asbestos by TEM
		MW-06	142.1 - 152.1	APMW06-1011	11/10/2010	VOCs, SVOCs, PCBs, Pest, Inorganics, Asbestos by TEM
Seep Sampling	Reservoir	RV-SPSW-01	N/A	RV-SPSW-01	10/12/2010	VOCs, SVOCs, PCBs, Pest, Inorganics, Asbestos by TEM
				RV-SPSWD-01	10/12/2010	VOCs, SVOCs, PCBs, Pest, Inorganics, Asbestos by TEM

Notes:

1) MW-01 was drilled deeper at the same location and MW-01A was installed

2) Results for MW-01 will not be used in the human health risk assessment due to potential grout contamination in sample.

ft msl = feet above mean sea level

MW = monitoring well

N/A = not applicable

PCB = polychlorinated biphenyl

SVOC = semi-volatile organic compound

TEM = transmission electron microscopy

VOC = volatile organic compound

Table 2-3
Geotechnical Boring, Soil Boring, Monitoring Well and Piezometer Installation Summary
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Location	Well ID	Total Depth (feet bgs)	Top of Concrete Pad (ft msl)	Cement/ Bentonite Grout (ft msl)	Bentonite Seal (ft msl)	Sand Pack (ft msl)	Top of Screen (ft msl)	Bottom of Screen (ft msl)	Screen Length (ft)	Screen Details	Outer Riser (ft msl)	Inner Riser (ft msl)
Park	MW-01A	73	191.6	191.6 - 136.6	136.6 - 131.6	131.6 - 118.6	128.6	118.6	10	0.010 slot PVC	193.9 - 166.6	193.6 - 128.6
	MW-02	63	196.5	196.5 - 147.5	147.5 - 145.5	145.5 - 133.5	143.5	133.5	10	0.010 slot PVC	198.4 - 160.5	198.1 - 143.5
	GT-1	20	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	GT-2	26	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	GT-3	28	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Reservoir	MW-03	53	181.7	181.7 - 142.7	142.7 - 140.7	140.7 - 128.7	138.7	128.7	10	0.010 slot PVC	183.7 - 157.7	183.7 - 138.7
	MW--04	100	195.8	195.8 - 119.8	119.8 - 117.8	117.8 - 95.8	115.8	95.8	10	0.010 slot PVC	194.8 - 151.8	195.45 - 115.8
Asbestos Pile	MW-05	64	191	191 - 141	141 - 139	139 - 127	137	127	10	0.010 slot PVC	193.2 - 152	192.8 - 137
	MW-06	53	195.1	195.1 - 156.1	156.1 - 154.1	154.1 - 142.1	152.1	142.1	10	0.010 slot PVC	197.3 - 167.1	197 - 152.1
	GT-04	40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	GT-05	14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	GT-06	40	220.1	220.1 - 194.1	194.1 - 192.1	192.1 - 180.1	190.1	180.1	10	0.010 slot PVC	222.01 - 217.01	221.9 - 194.1
	GT-07	24	208.6	208.6 - 198.6	198.6 - 196.6	196.6 - 184.6	194.6	184.6	10	0.010 slot PVC	210.94 - 205.94	210.6 - 198.6
	GT-08	30	212.9	212.9 - 194.9	194.9 - 192.9	192.9 - 182.9	192.9	182.9	10	0.010 slot PVC	215.33 - 210.33	215.2 - 194.9
	GT-09	30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
1) MW-01 was drilled deeper at the same location and MW-01A was installed
2) Well construction logs are included in Appendix B
bgs = below ground surface
ft msl = feet above mean sea level
GT = geotechnical
MW = monitoring well
N/A = geotechnical borings that were not converted to monitoring wells

Table 2-4
ABS Air and Soil Sampling Summary
BoRit Asbestos Superfund Site, OU-1
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Field Activity	Location	Air Samples	Sample Date	Analyses	Soil Samples	Sample Date	Analyses	Interval
Activity-Based Sampling	PK-ABS01/ CKSB-07	PK01-ABRK01-H	7/18/2011	ISO 10312	PK-ABSS01-A	10/19/2010	SVOCs, Pest/PCBs, Metals, Dioxins/Furans, Asbestos by PLM	0-3"
		PK01-ABRK03-CH		ISO 10312				
		PK01-PA01-H		ISO 10312				
		PK01-PA02-H		ISO 10312				
		PK01-PA03-H		ISO 10312				
	PK-ABS02/ PKSS-01	PK02-ABRK01-H	7/11/2011	ISO 10312	PKSS-01	8/17/2010	Asbestos by PLM	0-3"
		PK02-ABRK03-CH		ISO 10312				
		PK02-PA01-H		ISO 10312	PK-ABSS02-A	10/19/2010	Asbestos by PLM	0-3"
		PK02-PA02-H		ISO 10312				
		PK02-PA03-H		ISO 10312				
	PK-ABS03/ PKSB-06	PK03-ABRK01-H	7/18/2011	ISO 10312	PKSB-06	8/17/2010	Asbestos by PLM	0-3"
		PK03-ABRK03-CH		ISO 10312				
		PK03-PA01-H		ISO 10312	PK-ABSS03-A	10/19/2010	Asbestos by PLM	0-3"
		PK03-PA02-H		ISO 10312				
		PK03-PA03-H		ISO 10312				
	PK-ABS04/ PKSB-08	PK04-ABRK01-H	7/19/2011	ISO 10312	PKSB-08	8/17/2010	Asbestos by PLM	0-3"
		PK04-ABRK03-CH		ISO 10312				
		PK04-PA01-H		ISO 10312	PK-ABSS04-A	10/19/2010	Asbestos by PLM	0-3"
		PK04-PA02-H		ISO 10312				
		PK04-PA03-H		ISO 10312				
	PK-ABS05/ PKSB-10	PK05-ABRK01-H	7/19/2011	ISO 10312	PKSB-10	8/17/2010	Asbestos by PLM	0-3"
		PK05-ABRK02-H		ISO 10312				
		PK05-PA01-H		ISO 10312	PK-ABSS05-A	10/18/2010	Asbestos by PLM	0-3"
		PK05-PA02-H		ISO 10312				
		PK05-PA03-H		ISO 10312				
	PK-ABS07/ CKSS-01	PK07-ABRK01-H	7/18/2011	ISO 10312	CKSS-01	8/17/2010	SVOCs, Pest/PCBs, Metals, Dioxins/Furans, Asbestos by PLM	0-3"
		PK07-ABRK03-CH		ISO 10312				
		PK07-PA01-H		ISO 10312	PK-ABSS07-A	10/19/2010	Asbestos by PLM	0-3"
		PK07-PA02-H		ISO 10312				
		PK07-PA03-H		ISO 10312				
	RV-ABS01	RV01-ABSH01-H	7/15/2011	ISO 10312	RV-ABSS01-A	7/15/2011	Asbestos by PLM	0-3"
		RV01-ABSH03-CH		ISO 10312				
		RV01-PA01-H		ISO 10312				
		RV01-PA02-H		ISO 10312				
		RV01-PA03-H		ISO 10312				
	AP-ABS01	AP01-ABRK01-H	7/6/2011	ISO 10312	AP-ABSS01-A	7/6/2011	Asbestos by PLM	0-3"
		AP01-ABRK03-CH		ISO 10312				
		AP01-PA01-H		ISO 10312				
		AP01-PA02-H		ISO 10312				
		AP01-PA03-H		ISO 10312				
	AP-ABS02	AP02-ABRK01-H	7/11/2011	ISO 10312	AP-ABSS02-A	7/11/2011	Asbestos by PLM	0-3"
		AP02-ABRK03-CH		ISO 10312				
		AP02-PA01-H		ISO 10312				
		AP02-PA02-H		ISO 10312				
		AP02-PA03-H		ISO 10312				
	AP-ABS03	AP03-ABRK01-H	7/11/2011	ISO 10312	AP-ABSS03-A	7/11/2011	Asbestos by PLM	0-3"
		AP03-ABRK03-CH		ISO 10312				
		AP03-PA01-H		ISO 10312				
		AP03-PA02-H		ISO 10312				
		AP03-PA03-H		ISO 10312				
	RS-ABS01	RS01-ABRK01-H	7/13/2011	ISO 10312	RS01-ABSS-A	10/13/2010	Asbestos by PLM	0-3"
		RS01-ABRK01-CH		ISO 10312				
		RS01-PA01-H		ISO 10312				
		RS01-PA02-H		ISO 10312				
		RS01-PA03-H		ISO 10312				
	RS-ABS02	RS02-ABRK01-H	7/12/2011	ISO 10312	RS02-ABSS-A	10/13/2010	Asbestos by PLM	0-3"
		RS02-ABRK01-CH		ISO 10312				
		RS02-PA01-H		ISO 10312				
		RS02-PA02-H		ISO 10312				
		RS02-PA03-H		ISO 10312				
	RS-ABS03	RS03-ABRK01-H	7/13/2011	ISO 10312	RS03-ABSS-A	10/13/2010	Asbestos by PLM	0-3"
		RS03-ABRK01-CH		ISO 10312				
		RS03-PA01-H		ISO 10312				
		RS03-PA02-H		ISO 10312				
		RS03-PA03-H		ISO 10312				

Table 2-4
ABS Air and Soil Sampling Summary
BoRit Asbestos Superfund Site, OU-1
Phase 2 Remedial Investigation

Field Activity	Location	Air Samples	Sample Date	Analyses	Soil Samples	Sample Date	Analyses	Interval
Activity-Based Sampling	RS-ABS04	RS04-ABRK01-H	7/12/2011	ISO 10312	RS04-ABSS-A	10/13/2010	Asbestos by PLM	0-3"
		RS04-ABRK01-CH		ISO 10312				
		RS04-PA01-H		ISO 10312				
		RS04-PA02-H		ISO 10312				
		RS04-PA03-H		ISO 10312				
	RS-ABS05	RS05-ABRK01-H	7/12/2011	ISO 10312	RS05-ABSS-A	10/13/2010	Asbestos by PLM	0-3"
		RS05-ABRK01-CH		ISO 10312				
		RS05-PA01-H		ISO 10312				
		RS05-PA02-H		ISO 10312				
		RS05-PA03-H		ISO 10312				
	RS-ABS06	RS06-ABRK01-H	7/14/2011	ISO 10312	RS06-ABSS-A	10/13/2010	Asbestos by PLM	0-3"
		RS06-ABRK01-CH		ISO 10312				
		RS06-PA01-H		ISO 10312				
		RS06-PA02-H		ISO 10312				
		RS06-PA03-H		ISO 10312				
	RS-ABS07	RS07-ABRK01-H	7/14/2011	ISO 10312	RS07-ABSS2-A	7/14/2011	Asbestos by PLM	0-3"
		RS07-ABRK01-CH		ISO 10312				
		RS07-PA01-H		ISO 10312				
		RS07-PA02-H		ISO 10312				
		RS07-PA03-H		ISO 10312				
	RS-ABS08	RS08-ABRK01-H	7/14/2011	ISO 10312	RS08-ABSS-A	10/13/2010	Asbestos by PLM	0-3"
		RS08-ABRK01-CH		ISO 10312				
		RS08-PA01-H		ISO 10312				
		RS08-PA02-H		ISO 10312				
		RS08-PA03-H		ISO 10312				
	OW-ABS01	OW01-ABMG01-H	7/15/2011	ISO 10312	OW-ABSS01-A	7/15/2011	Asbestos by PLM	0-3"
		OW01-ABMG03-CH		ISO 10312				
		OW01-PA01-H		ISO 10312				
		OW01-PA02-H		ISO 10312				
		OW01-PA03-H		ISO 10312				
	WT-ABS01	WT01-ABHK01-H	7/13/2011	ISO 10312	WT-ABSS01-A	7/13/2011	Asbestos by PLM	0-3"
		WT01-ABHK03-CH		ISO 10312				
		WT01-PA01-H		ISO 10312				
		WT01-PA02-H		ISO 10312				
		WT01-PA03-H		ISO 10312				

Notes:
AP = Asbestos Pile parcel
CH = child high volume
H = adult high volume
HK = hiking
MG = mowing
N/A = samples of this media were not collected for this location
OW = other side of Wissahickon
PA = perimeter air
PK = Park parcel
PLM = polarized light microscopy
RS = residential property
RK = raking
RV = Reservoir parcel
SH = shoveling
WT = Walking Trail

Table 2-5
Ambent Air Sampling Summary
BoRit Asbestos Superfund Site, OU-1
Phase 2 Remedial Investigation

Field Activity	Location	Air Samples	Sample Date	Analyses
Ambient Air Sampling	Location 1 - End of easement	CM01-AA-HD1	11/14/2010	ISO 10312 PCME
	Location 2 - Post office employee parking lot	CM02-AA-HD1	11/14/2010	ISO 10312 PCME
	Location 3 - Church/school	CM03-AA-HD1	11/14/2010	ISO 10312 PCME
	Location 4 - Adult community center	CM04-AA-HD1	11/14/2010	ISO 10312 PCME
	Location 5 - Cognis	CM05-AA-HD1	11/14/2010	ISO 10312 PCME
	Location 6 - Oreland VFD	CM06-AA-HD1	11/14/2010	ISO 10312 PCME
	Location 7 - Ambler Warehouse	CM07-AA-HD1	11/14/2010	ISO 10312 PCME
	Location 1 - End of easement	CM01-AA-HD2	12/15/2010	ISO 10312 PCME
	Location 2 - Post office employee parking lot	CM02-AA-HD2	12/15/2010	ISO 10312 PCME
	Location 3 - Church/school	CM03-AA-HD2	12/15/2010	ISO 10312 PCME
	Location 4 - Adult community center	CM04-AA-HD2	12/15/2010	ISO 10312 PCME
	Location 5 - Cognis	CM05-AA-HD2	12/15/2010	ISO 10312 PCME
	Location 6 - Oreland VFD	CM06-AA-HD2	12/15/2010	ISO 10312 PCME
	Location 7 - Ambler Warehouse	CM07-AA-HD2	12/15/2010	ISO 10312 PCME
	Location 1 - End of easement	CM01-AA-HD3	1/15/2011	ISO 10312 PCME
	Location 2 - Post office employee parking lot	CM02-AA-HD3	1/15/2011	ISO 10312 PCME
	Location 3 - Church/school	CM03-AA-HD3	1/15/2011	ISO 10312 PCME
	Location 4 - Adult community center	CM04-AA-HD3	1/15/2011	ISO 10312 PCME
	Location 5 - Cognis	CM05-AA-HD3	1/15/2011	ISO 10312 PCME
	Location 6 - Oreland VFD	CM06-AA-HD3	1/15/2011	ISO 10312 PCME
	Location 7 - Ambler Warehouse	CM07-AA-HD3	1/15/2011	ISO 10312 PCME
	Location 1 - End of easement	CM01-AA-HD4	2/15/2011	ISO 10312 PCME
	Location 2 - Post office employee parking lot	CM02-AA-HD4	2/15/2011	ISO 10312 PCME
	Location 3 - Church/school	CM03-AA-HD4	2/15/2011	ISO 10312 PCME
	Location 4 - Adult community center	CM04-AA-HD4	2/15/2011	ISO 10312 PCME
	Location 5 - Cognis	CM05-AA-HD4	2/15/2011	ISO 10312 PCME
	Location 6 - Oreland VFD	CM06-AA-HD4	2/15/2011	ISO 10312 PCME
	Location 7 - Ambler Warehouse	CM07-AA-HD4	2/15/2011	ISO 10312 PCME
	Location 1 - End of easement	CM01-AA-HD5	3/18/2011	ISO 10312 PCME
	Location 2 - Post office employee parking lot	CM02-AA-HD5	3/18/2011	ISO 10312 PCME
	Location 3 - Church/school	CM03-AA-HD5	3/18/2011	ISO 10312 PCME
	Location 4 - Adult community center	CM04-AA-HD5	3/18/2011	ISO 10312 PCME
	Location 5 - Cognis	CM05-AA-HD5	3/18/2011	ISO 10312 PCME
	Location 6 - Oreland VFD	CM06-AA-HD5	3/18/2011	ISO 10312 PCME
	Location 7 - Ambler Warehouse	CM07-AA-HD5	3/18/2011	ISO 10312 PCME
	Location 1 - End of easement	CM01-AA-HD6	4/27/2011	ISO 10312 PCME
	Location 2 - Post office employee parking lot	CM02-AA-HD6	4/27/2011	ISO 10312 PCME
	Location 3 - Church/school	CM03-AA-HD6	4/27/2011	ISO 10312 PCME
	Location 4 - Adult community center	CM04-AA-HD6	4/27/2011	ISO 10312 PCME
	Location 5 - Cognis	CM05-AA-HD6	4/27/2011	ISO 10312 PCME
	Location 6 - Oreland VFD	CM06-AA-HD6	4/27/2011	ISO 10312 PCME
	Location 7 - Ambler Warehouse	CM07-AA-HD6	4/27/2011	ISO 10312 PCME
	Location 1 - End of easement	CM01-AA-HD7	5/13/2011	ISO 10312 PCME
	Location 2 - Post office employee parking lot	CM02-AA-HD7	5/13/2011	ISO 10312 PCME
	Location 3 - Church/school	CM03-AA-HD7	5/13/2011	ISO 10312 PCME
	Location 4 - Adult community center	CM04-AA-HD7	5/13/2011	ISO 10312 PCME
	Location 5 - Cognis	CM05-AA-HD7	5/13/2011	ISO 10312 PCME
	Location 6 - Oreland VFD	CM06-AA-HD7	5/13/2011	ISO 10312 PCME
	Location 7 - Ambler Warehouse	CM07-AA-HD7	5/13/2011	ISO 10312 PCME
	Location 1 - End of easement	CM01-AA-HD8	6/20/2011	ISO 10312 PCME
	Location 2 - Post office employee parking lot	CM02-AA-HD8	6/20/2011	ISO 10312 PCME
	Location 3 - Church/school	CM03-AA-HD8	6/20/2011	ISO 10312 PCME
	Location 4 - Adult community center	CM04-AA-HD8	6/20/2011	ISO 10312 PCME
	Location 5 - Cognis	CM05-AA-HD8	6/20/2011	ISO 10312 PCME
	Location 6 - Oreland VFD	CM06-AA-HD8	6/20/2011	ISO 10312 PCME
	Location 7 - Ambler Warehouse	CM07-AA-HD8	6/20/2011	ISO 10312 PCME
	Location 1 - End of easement	CM01-AA-HD9	7/21/2011	ISO 10312 PCME
	Location 2 - Post office employee parking lot	CM02-AA-HD9	7/21/2011	ISO 10312 PCME
	Location 3 - Church/school	CM03-AA-HD9	7/21/2011	ISO 10312 PCME
	Location 4 - Adult community center	CM04-AA-HD9	7/21/2011	ISO 10312 PCME
	Location 5 - Cognis	CM05-AA-HD9	7/21/2011	ISO 10312 PCME
	Location 6 - Oreland VFD	CM06-AA-HD9	7/21/2011	ISO 10312 PCME
	Location 7B - Ambler Warehouse	CM07B-AA-HD9	7/21/2011	ISO 10312 PCME

Table 2-5
Ambent Air Sampling Summary
BoRit Asbestos Superfund Site, OU-1
Phase 2 Remedial Investigation

Field Activity	Location	Air Samples	Sample Date	Analyses
Ambient Air Sampling	Location 1 - End of easement	CM01-AA-HD10	8/13/2011	ISO 10312 PCME
	Location 2 - Post office employee parking lot	CM02-AA-HD10	8/13/2011	ISO 10312 PCME
	Location 3 - Church/school	CM03-AA-HD10	8/13/2011	ISO 10312 PCME
	Location 4 - Adult community center	CM04-AA-HD10	8/13/2011	ISO 10312 PCME
	Location 5 - Cognis	CM05-AA-HD10	8/13/2011	ISO 10312 PCME
	Location 6 - Oreland VFD	CM06-AA-HD10	8/13/2011	ISO 10312 PCME
	Location 7B - Ambler Warehouse	CM07B-AA-HD10	8/13/2011	ISO 10312 PCME
	Location 1 - End of easement	CM01-AA-HD11	9/1/2011	ISO 10312 PCME
	Location 2 - Post office employee parking lot	CM02-AA-HD11	9/1/2011	ISO 10312 PCME
	Location 3 - Church/school	CM03-AA-HD11	9/1/2011	ISO 10312 PCME
	Location 4 - Adult community center	CM04-AA-HD11	9/1/2011	ISO 10312 PCME
	Location 5 - Cognis	CM05-AA-HD11	9/1/2011	ISO 10312 PCME
	Location 6 - Oreland VFD	CM06-AA-HD11	9/1/2011	ISO 10312 PCME
	Location 7B - Ambler Warehouse	CM07B-AA-HD11	9/1/2011	ISO 10312 PCME
	Location 1 - End of easement	CM01-AA-HD12	9/13/2011	ISO 10312 PCME
	Location 2 - Post office employee parking lot	CM02-AA-HD12	9/13/2011	ISO 10312 PCME
	Location 3 - Church/school	CM03-AA-HD12	9/13/2011	ISO 10312 PCME
	Location 4 - Adult community center	CM04-AA-HD12	9/13/2011	ISO 10312 PCME
	Location 5 - Cognis	CM05-AA-HD12	9/13/2011	ISO 10312 PCME
	Location 6 - Oreland VFD	CM06-AA-HD12	9/13/2011	ISO 10312 PCME
	Location 7B - Ambler Warehouse	CM07B-AA-HD12	9/13/2011	ISO 10312 PCME
	Location 1 - End of easement	CM01-AA-HD13	10/9/2011	ISO 10312 PCME
	Location 2 - Post office employee parking lot	CM02-AA-HD13	10/9/2011	ISO 10312 PCME
	Location 3 - Church/school	CM03-AA-HD13	10/9/2011	ISO 10312 PCME
	Location 4 - Adult community center	CM04-AA-HD13	10/9/2011	ISO 10312 PCME
	Location 5 - Cognis	CM05-AA-HD13	10/9/2011	ISO 10312 PCME
	Location 6 - Oreland VFD	CM06-AA-HD13	10/9/2011	ISO 10312 PCME
	Location 7B - Ambler Warehouse	CM07B-AA-HD13	10/9/2011	ISO 10312 PCME
	Location 1 - End of easement	CM01-AA-HD14	10/23/2011	ISO 10312 PCME
	Location 2 - Post office employee parking lot	CM02-AA-HD14	10/23/2011	ISO 10312 PCME
	Location 3 - Church/school	CM03-AA-HD14	10/23/2011	ISO 10312 PCME
	Location 4 - Adult community center	CM04-AA-HD14	10/23/2011	ISO 10312 PCME
	Location 5 - Cognis	CM05-AA-HD14	10/23/2011	ISO 10312 PCME
	Location 6 - Oreland VFD	CM06-AA-HD14	10/23/2011	ISO 10312 PCME
	Location 7B - Ambler Warehouse	CM07B-AA-HD14	10/23/2011	ISO 10312 PCME

Notes:
1) Location 7 was modified on 7/21/11 due to work on the warehouse where the pump had previously been placed. After this date, the sample location and sample nomenclature changed to 7B to reflect the difference in location.

AA = ambient Air

HDXX = high volume sample, Day XX

ISO = International Standard Method 10312

PCME = phase contrast microscopy equivalent

VFD = volunteer fire department

Table 3-1
Asbestos Detected in Composite ABS Surface Soil, Sub-Surface Soil, Slag Area Soil, and Park Creek Bank Grab Samples
BoRit Asbestos Superfund Site, OU-1
Phase 2 Remedial Investigation

Compound	SL	Location	AP-ABS01	AP-ABS02	AP-ABS03	APSL-SS01	APSL-SS02	APSL-SS02	CKSS-01	PKSB-06	PKSB-08
		Sample Name	AP-ABSS01-A	AP-ABSS02-A	AP-ABSS03-A	APSL-SS01-C	APSL-SS02-B	APSL-SS02-C	CKSS-01	PKSB-06	PKSB-08
		Collection Date	07/06/11	07/06/11	07/11/11	10/07/10	10/07/10	10/07/10	08/17/10	08/17/10	08/17/10
		Sample Type	Composite	Composite	Composite	Composite	Composite	Composite	Grab	Grab	Grab
Asbestos (%)											
Asbestos Fibers (Chrysotile)	1		**2.2**	**3.5**	**1.3**	0.80	0.20	0.50	0.20	**1.5**	**1.1**

Compound	SL	Location	PKSB-10	PK-SB40	PKSS-01	PKSS-02	RS-04	MW03	RVSS-01	WT-ABS01
		Sample Name	PKSB-10	PKSB-40	PKSS-01	PKSS-02	RS04-ABSS-A	VMW03-SB2_25-2_	RVSS-01	WT-ABSS01-A
		Collection Date	08/17/10	08/17/10	08/17/10	08/17/10	10/13/10	10/22/10	08/17/10	07/13/11
		Sample Type	Grab	Grab	Grab	Grab	Composite	Composite	Grab	Composite
Asbestos (%)										
Asbestos Fibers (Chrysotile)	1		0.70	0.90	**1.2**	0.40	0.60	**1.5**	**1.5**	0.30

Notes:
Only samples with detections are shown in this table.
Bolded cells indicate result exceeds SL for compound.
Grab samples were collected in August 2010 to determine ABS locations.
30 point composite samples were collected across the entire designated sampling area.
AB = Activity based
AP = Asbestos Pile parcel
APSL = Asbestos Pile slag
CK = Creek
PK = Park parcel
RS = Residential
RV = Reservoir parcel
SB = Soil boring
SS = Surface soil
WT = Walking Trail
Screening level for asbestos is 1 percent (USEPA 2008).

Table 3-2
Constituents Detected in Groundwater
BoRit Asbestos Superfund Site, OU-1
Phase 2 Remedial Investigation

Constituent	RSL/ MCL	MW01A		MW02		MW03		MW04		MW05				MW06	
		PKMW01A-1011		PKMW02-1011		RVMW03-1011		RVMW04-1011		APMW05-1011		APMW05D-1011		APMW06-1011	
		11/15/2010		11/9/2010		11/8/2010		11/9/2010		11/9/2010		11/9/2010		11/10/2010	
		Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered
Volatile Organics (ug/L)															
Acetone	1200	9.4 B	NA		NA	--	NA	--	NA	--	NA	--	NA	--	NA
Carbon Tetrachloride	0.39	--	NA	**5.8**	NA	--	NA	--	NA	--	NA	--	NA	--	NA
CFC-11	110	--	NA	30	NA	--	NA	--	NA	--	NA	--	NA	--	NA
Dichloromethane	8.4	13 B	NA	6.6 B	NA	6.3 B	NA	6.7 B	NA	6.8 B	NA	6.6 B	NA	9.6 B	NA
Tetrachloroethene	3.5	--	NA	**22**	NA	--	NA	--	NA	--	NA	--	NA	--	NA
Semivolatile Organics (ug/L)															
Bis(2-Ethylhexyl)phthalate	0.071	--	NA	**55**	NA	--	NA	**3.0 J**	NA	**42**	NA	**26**	NA	**14**	NA
Inorganics (ug/L)															
Aluminum	1600	441	--	--	--	--	--	307	--	--	--	--	--	--	--
Arsenic	0.045	--	--	--	--	--	**7.6 J**	--	--	--	--	--	**5.0 J**	**5.2 J**	--
Barium	290	175 J	175 J	99.0 J	112 J	**525**	**561**	20.9 J	20.4 J	8.1 J	27.4 J	7.1 J	20.8 J	94.0 J	101 J
Cadmium[1]	0.69	--	--	--	--	--	--	--	--	--	**0.71 J**	--	**1.1 J**	--	--
Calcium	NV	60800	58300 J	105000	105000 J	101000	104000 J	115000	92500 J	164000	268000 J	162000	264000 J	116000	113000 J
Chromium[2]	0.031	--	8.3 B	--	2.7 B	--	3.8 B	--	1.7 B	--	--	--	--	2.0 B	5.4 B
Copper	62	3.6 J	1.1 J	1.4 J	0.98 J	3.5 J	3.0 J	0.80 J	--	0.81 J	1.1 J	0.67 J	0.98 J	2.5 J	1.8 J
Cyanide	0.93	3.8 J	NA	--	NA	8.2 J	NA	--	NA	--	NA	--	NA	--	NA
Iron	1100	446	--	55.4 J	--	52.5 J	--	360	147	178	135	175	125	--	--
Lead[3]	15	--	--	--	--	--	3.0 B	--	--	--	--	--	--	--	--
Magnesium	NV	15600	15200	20200	19000	15400	15300	6030	4860 J	8870	10800	8480	10500	16700	16200
Manganese[4]	32	24.3	4.4 J	14.8 J	--	**9190**	**9620**	**95.9**	**86.7**	**157**	**156**	**149**	**121**	**450**	**426**
Mercury	0.063	--	0.08 B	--	--	--	--	--	--	--	0.05 B	--	--	--	0.10 B
Nickel	30	--	--	--	--	8.2 J	--	--	--	--	--	--	--	--	--
Potassium	NV	--	1490 J	2040 J	2150 J	1660 J	2140 J	1770 J	--	1520 J	3120 J	1490 J	2670 J	3460 J	4260 J
Selenium	7.8	--	--	--	--	--	--	--	--	--	**14.3 J**	--	**13.1 J**	--	--
Silver	7.1	--	1.8 B	--	1.2 B	--	1.6 B	--	--	--	2.1 B	--	1.2 B	1.7 B	2.7 B
Sodium	NV	14400 J	13500	24100 J	22900	34100 J	34400	1120000 J	13400	20100 J	38500	19900 J	37200	42300 J	40600
Thallium	0.016	7.4 B	--	7.8 B	6.7 B	11.7 B	9.1 B	7.9 B	--	8.5 B	3.7 B	7.3 B	3.7 B	7.9 B	3.9 B
Vanadium	7.8	--	--	**10.6 J**	--	--	--	--	--	--	--	--	--	--	--
Zinc	470	4.7 J	9.1 J	--	4.6 J	5.8 J	9.5 J	4.5 J	--	--	--	--	--	14.1 J	10.0 J
Asbestos (MFL)															
Fibers	7	--	--	--	--	--	--	0.51	--	--	--	--	--	--	--

Notes:
Only detected compounds are shown.
Bolded cells indicate result exceeds RSL for compound.
-- indicates compound was not detected.
AP = Asbestos Pile parcel
MW = Monitoring well
NV = No screening value is available.
NA = Not analyzed
ug/L = micrograms per liter
MFL = million fibers per liter
PK = Park parcel
R = Rejected
RV = Reservoir parcel
SP = Seep
SW = Surface water
B = Analyte not detected substantially above the level reported in laboratory or field blanks.
J = Analyte present. Reported value may not be accurate or precise.
RSL = Regional Screening Level (EPA Region 3 Risk Based Concentration Values for Residential Tapwater (May 2012)) (for organic and inorganic results)
MCL = maximum contaminant level (May 2009) (for asbestos results)
1. No RSL available for this compound; cadmium (water) RSL used as surrogate.
2. No RSL available for this compound; chromium (VI) used as surrogate.
3. No RSL available for this compound; lead maximum contaminant level used as surrogate (May 2009).
4. No RSL available for this compound; manganese (non-diet) RSL used as surrogate.

Table 3-3
Constituents Detected in Seep Water
BoRit Asbestos Superfund Site, OU-1
Phase 2 Remedial Investigation

Constituent	RSL/MCL	RV-SPSW01 RV-SPSW-01 10/12/2010 Unfiltered	RV-SPSW01 RV-SPSWD-01 10/12/2010 Unfiltered
Volatile Organics (ug/L)			
Acetone	1200	6.3 J	6.5 J
CFC-11	110	--	--
Semivolatile Organics (ug/L)			
Bis(2-Ethylhexyl)phthalate	0.071	--	**44 B**
Inorganics (ug/L)			
Aluminum	1600	554	690
Barium	290	65.5 J	67.8 J
Calcium	NV	35000	35900
Copper	62	2.4 B	2.5 B
Iron	1100	708	1070
Magnesium	NV	6930	7610
Manganese[1]	32	**52.9**	**59.5**
Potassium	NV	7820	8090
Silver	7.1	10 R	10 R
Sodium	NV	13800	14300
Thallium	0.016	6.3 B	7.3 B
Zinc	470	10.4 J	11.6 J
Asbestos (MFL)			
Fibers	7	5.1	NA

Notes:
Only detected compounds are shown.
Bolded cells indicate result exceeds RSL for compound.
-- indicates compound was not detected.
NV = No screening value is available.
NA = Not analyzed
ug/L = micrograms per liter
MFL = million fibers per liter
R = Rejected
RV = Reservoir parcel
SP = Seep
SW = Surface water
B = Analyte not detected substantially above the level reported in laboratory or field blanks.
J = Analyte present. Reported value may not be accurate or precise.
MCL = maximum contaminant level (May 2009) (for asbestos results)
RSL = Regional Screening Level (EPA Region 3 Risk Based Concentration Values for Residential Tapwater (May 2012)) (for organic and inorganic results)
1. No RSL available for this compound; manganese (non-diet) RSL used as surrogate.

Table 3-4
ABS Air Asbestos Results
BoRit Asbestos Superfund Site, OU-1
Phase 2 Remedial Investigation

Binning category	Residential Screening Value	AP-ABS01				
		AP01-ABRK01-CH	AP01-ABRK01-L	AP01-PA02-L	AP01-PA01-H	AP01-PA03-H
PCME (s/cc)	0.04	**0.044**	**0.058**	**0.041**	0.016	0.032
Total TEM-ISO (s/cc)	NV	0.52	4.4	1.5	0.27	0.48

Binning category	Residential Screening Value	AP-ABS02				
		AP02-ABRK01-CH*	AP02-ABRK01-H	AP02-PA01-H	AP02-PA02-H	AP02-PA03-H
PCME (s/cc)	0.04	**0.04**	**0.1**	0	0.023	0.03
Total TEM-ISO (s/cc)	NV	5.9	1.2	1.6	1.5	2

Binning category	Residential Screening Value	AP-ABS03				
		AP03-ABRK01-CH	AP03-ABRK01-H	AP03-PA01-H	AP03-PA02-H	AP03-PA03-H
PCME (s/cc)	0.04	**0.065**	**0.13**	0.014	0.019	0.00077
Total TEM-ISO (s/cc)	NV	1.3	1.6	0.46	0.66	0.048

Binning category	Residential Screening Value	RS-ABS01				
		RS01-ABRK01-CL	RS01-ABRK01-H	RS01-PA01-H	RS01-PA02-H	RS01-PA03-H
PCME (s/cc)	0.04	0	0	0.0004	0	0
Total TEM-ISO (s/cc)	NV	0	0.0008	0.004	0.0008	0.0012

Binning category	Residential Screening Value	RS-ABS02				
		RS02-ABRK01-CH	RS02-ABRK01-H	RS02-PA01-H	RS02-PA02-H	RS02-PA03-H
PCME (s/cc)	0.04	0	0.0012	0	0	0
Total TEM-ISO (s/cc)	NV	0.0072	0.004	0.0004	0	0

Binning category	Residential Screening Value	RS-ABS03				
		RS03-ABRK01-CH*	RS03-ABRK01-H*	RS03-PA01-H	RS03-PA02-L	RS03-PA03-L
PCME (s/cc)	0.04	0	0	0.0094	0.039	0.018
Total TEM-ISO (s/cc)	NV	4	3.2	0.14	0.51	0.51

Binning category	Residential Screening Value	RS-ABS04				
		RS04-ABRK01-CH	RS04-ABRK01-L	RS04-PA01-H	RS04-PA02-H	RS04-PA03-H
PCME (s/cc)	0.04	0.0094	0.0075	0.0004	0.0004	0
Total TEM-ISO (s/cc)	NV	0.062	0.078	0.0012	0.0016	0.0004

Binning category	Residential Screening Value	RS-ABS05				
		RS05-ABRK01-CH	RS05-ABRK01-H	RS05-PA01-H	RS05-PA02-H	RS05-PA03-H
PCME (s/cc)	0.04	0.0015	0.00073	0	0	0.0004
Total TEM-ISO (s/cc)	NV	0.034	0.0077	0	0	0.0048

Binning category	Residential Screening Value	RS-ABS06				
		RS06-ABRK01-CH*	RS06-ABRK01-L	RS06-PA01-H	RS06-PA02-H	RS06-PA03-L
PCME (s/cc)	0.04	0.0004	0	0	0	0.0004
Total TEM-ISO (s/cc)	NV	0.008	0.0004	0.008	0.0044	0.01

Binning category	Residential Screening Value	RS-ABS07				
		RS07-ABRK01-CH	RS07-ABRK01-H	RS07-PA01-H	RS07-PA02-H	RS07-PA03-H
PCME (s/cc)	0.04	0	0	0.0004	0.0004	0
Total TEM-ISO (s/cc)	NV	0.0004	0.0004	0.0008	0.0044	0

Binning category	Residential Screening Value	RS-ABS08				
		RS08-ABRK01-CH	RS08-ABRK01-H	RS08-PA01-H	RS08-PA02-H	RS08-PA03-H
PCME (s/cc)	0.04	0	0	0	0	0
Total TEM-ISO (s/cc)	NV	0	0	0	0	0

Binning category	Residential Screening Value	OW-ABS01				
		OW01-ABMG01-CH	OW01-ABMG01-L	OW01-PA01-H	OW01-PA02-H	OW01-PA03-H
PCME (s/cc)	0.04	0.0008	0	0	0	0
Total TEM-ISO (s/cc)	NV	0.008	0	0.0072	0.0014	0.0008

Binning category	Residential Screening Value	PK-ABS01				
		PK01-ABRK01-CH	PK01-ABRK01-H*	PK01-PA01-H	PK01-PA02-L	PK01-PA03-H
PCME (s/cc)	0.04	**0.04**	**0.16**	0.013	**0.14**	0.01
Total TEM-ISO (s/cc)	NV	0.72	1.6	0.17	0.89	0.11

Table 3-4
ABS Air Asbestos Results
BoRit Asbestos Superfund Site, OU-1
Phase 2 Remedial Investigation

Binning category	Residential Screening Value	PK-ABS02				
		PK02-ABRK01-CH	PK02-ABRK01-H	PK02-PA01-H	PK02-PA02-H	PK02-PA03-H
PCME (s/cc)	0.04	**0.074**	0.01	0.00065	0	0
Total TEM-ISO (s/cc)	NV	0.31	0.12	0.073	0.023	0.0028

Binning category	Residential Screening Value	PK-ABS03				
		PK03-ABRK01-CL	PK03-ABRK01-H	PK03-PA01-H	PK03-PA02-L	PK03-PA03-L
PCME (s/cc)	0.04	**0.086**	0.024	**0.072**	**0.09**	**0.17**
Total TEM-ISO (s/cc)	NV	1.2	1.3	0.38	2	1.6

Binning category	Residential Screening Value	PK-ABS04				
		PK04-ABRK01-CH*	PK04-ABRK01-H*	PK04-PA01-H	PK04-PA02-L	PK04-PA03-H
PCME (s/cc)	0.04	**0.057**	0.033	0	0.019	0.0077
Total TEM-ISO (s/cc)	NV	1.6	0.6	0.46	1.3	1.1

Binning category	Residential Screening Value	PK-ABS05				
		PK05-ABRK01-CH*	PK05-ABRK01-H*	PK05-PA01-H	PK05-PA02-L	PK05-PA03-L
PCME (s/cc)	0.04	**0.2**	**0.46**	**0.056**	**0.05**	0.016
Total TEM-ISO (s/cc)	NV	16	9.3	0.71	0.76	0.9

Binning category	Residential Screening Value	PK-ABS07				
		PK07-ABRK01-CH*	PK07-ABRK01-L	PK07-PA01-H	PK07-PA02-H	PK07-PA03-H
PCME (s/cc)	0.04	**0.044**	0.0012	0.0004	0	0
Total TEM-ISO (s/cc)	NV	0.82	0.0052	0.0028	0.0004	0

Binning category	Residential Screening Value	RV-ABS01				
		RV01-ABSH01-CH	RV01-ABSH01-H	RV01-PA01-H	RV01-PA02-H	RV01-PA03-H
PCME (s/cc)	0.04	0	0	0	0	0
Total TEM-ISO (s/cc)	NV	0	0	0.00079	0.0012	0.00039

Binning category	Residential Screening Value	WT-ABS01				
		WT01-ABHK01-CH	WT01-ABHK01-H	WT01-PA01-H	WT01-PA02-H	WT01-PA03-L
PCME (s/cc)	0.04	0	0	0	0.0052	0
Total TEM-ISO (s/cc)	NV	0.0048	0	0	0.14	0

Sample nomenclature examples:

AP01-ABRK01-CH = asbestos pile, location 1 – ABS, raking scenario, 1st attempt – child high volume

AP01-PA01-H = asbestos pile, location 1 – perimeter air location 1 – high volume

PK02-ABRK01-H = park, location 2 – ABS, raking scenario, 1st attempt – adult high volume

RS04-ABRK01-L = residential, location 4 – ABS, raking scenario, 1st attempt – adult low volume

WT01-PA03-L = walking trail, location 1 - perimeter air location 3 - low volume

RV01-ABSH01-CH = reservoir, location 1 - ABS, shovelling scenario, 1st attempt - child high volume

OW01-ABMG01-L = other side of the Wissahickon, location 1 - ABS, mowing scenario, 1st attempt - adult low volume

Notes:

Bolded cells indicate result exceeds screening value.

Residential screening value provided by EPA Work Assignment Manager in an email dated 10/27/2011

NV = No screening value is available

*Sample was prepared for analysis using the indirect method. Indirect preparation has the potential to bias the resulting air concentrations for these samples, due to the disaggregation of complex asbestos structures.

s/cc = structures per cubic centimeter

-- = result not presented in laboratory EDD

PCME = phase contrast microscopy equivalent

TEM - ISO = Transmission Electron Microscopy International Standard Method 10312

Table 3-5
Organic Compounds Detected in Transformer Area, Fire Training Area, and Slag Area Soil
BoRit Asbestos Superfund Site, OU-1
Phase 2 Remedial Investigation

Compound	RSL	APFT-SS01	APFT-SS01	APFT-SS01	APFT-SS01	APFT-SS02	APFT-SS02	APFT-SS02	APFT-SS03	APFT-SS03	APFT-SS03	APFT-SS04	APFT-SS04	APFT-SS04
		APFT-SS01-A	APFT-SS01-B	APFT-SS01-C	APFT-SS01D-A	APFT-SS02-A	APFT-SS02-B	APFT-SS02-C	APFT-SS03-A	APFT-SS03-B	APFT-SS03-C	APFT-SS04-A	APFT-SS04-B	APFT-SS04-C
		10/07/10	10/07/10	10/07/10	10/07/10	10/07/10	10/07/10	10/07/10	10/07/10	10/07/10	10/07/10	10/07/10	10/07/10	10/07/10
Semivolatile Organics (ug/kg)														
1,2-Benzphenanthracene	15000	2900	1200	4100	1700	440	730	14000	1200	2800	9100	1200	1800	800
2-Methylnaphthalene	23000	--	--	--	--	69 J	--	280	--	--	380	--	--	--
Acenaphthene	340000	--	--	190 J	100 J	--	--	1400	--	290	2000	--	120 J	--
Acenaphthylene[1]	340000	140 J	--	--	100 J	--	--	100 J	--	--	320	--	--	--
Acetophenone	780000	--	--	--	--	460	84 J	--	--	--	--	--	--	--
Anthracene	1700000	500	190 J	1100	430	110 J	94 J	4800	190 J	1200	6200	240	460	230
Benzaldehyde	780000	--	--	--	--	490	92 J	--	--	--	--	--	--	--
Benzo(a)anthracene	150	**2700**	**1300**	**4300**	**1700**	**370**	**540**	**15000**	**1200**	**3100**	**9600**	**1200**	**1900**	**810**
Benzo(a)pyrene	15	**2900**	**1200**	**4000**	**1600**	**370**	**520**	**13000**	**1300**	**3000**	**7100**	**1500**	**1900**	**770**
Benzo(b)fluoranthene	150	**3200**	**1300**	**3100**	**1500**	**350**	**560**	**10000**	**1300**	**3100**	**6100**	**1500**	**2000**	**810**
Benzo(g,h,i)perylene[2]	170000	1600	870	2800	1000	280	380	8200	900	1900	3900	1000	1200	520
Benzo(k)fluoranthene	1500	**2600**	980	**3300**	**1600**	320	400	**11000**	870	**2000**	**6500**	960	1400	540
Bis(2-ethylhexyl)phthalate	35000	4400					**280000**	5500						
Carbazole	NV	380	83 J	140 J	250	--	--	440	--	460	1600	93 J	170 J	--
Dibenzo(a,h)anthracene	15	**670**	**330**	**1100**	**430**	**130 J**	**170 J**	**2700**	**370**	**850**	**2100**	**480**	**580**	**220**
Dibenzofuran	7800	--	--	120 J	94 J	--	--	1300	--	220	1800	--	91 J	--
Di-n-butylphthalate	610000	--	--	--	--	--	--	--	--	260	--	--	--	--
Fluoranthene	230000	5000	1800	8600	2800	770	990	38000	2300	7200	25000	2400	4100	1600
Fluorene	230000	150 J	78 J	140 J	180 J	--	--	1800	--	540	4200	--	180 J	94 J
Indeno(1,2,3-cd)pyrene	150	**1800**	**910**	**3000**	**1000**	**280**	**370**	**8000**	**960**	**2000**	**4000**	**1100**	**1300**	**520**
Naphthalene	3600	--	--	--	--	--	--	240	--	--	210	--	--	--
Phenanthrene[2]	170000	1900	640	3500	1700	430	460	21000	790	4800	21000	880	2000	730
Phenol	1800000	--	--	--	--	--	220	--	--	--	--	--	--	--
Pyrene	170000	4900	1800	6300	3000	570	660	26000	1600	5100	14000	1600	2700	1100
Pesticides and PCBs (ug/kg)														
4,4'-DDT	1700	--	1.4 J	--	--	3.0 J	1.1 J	1.0 J	3.1 J	--	--	--	1.9 J	1.7 J
Aroclor-1016	390	--	12 J	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1254	110	14 J	10 J	--	16 J	31 J	11 J	--	32 J	--	--	11 J	28 J	--
Aroclor-1260	220	11 J	10 J	--	12 J	23 J	13 J	--	21 J	--	19 J	8.3 J	21 J	22 J
Dioxins and Furans (ng/kg)[3]														
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	NV	904	333	77.50	973	261	143.00	110	504	412	637	372	415	214
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	NV	20.90	5.73 J	1.59 J	23.00	3.51 J	2.16 J	1.92 J	3.98 J	2.55 J	4.55 J	3.20 J	3.45 J	2.18 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	NV	36.90	11.40	2.86 J	40.10	9.34	4.51 J	3.69 J	14.80	11.10	18.30	9.92	12.40	6.09
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	NV	45.30	21.10 J	4.22 J	66.50	9.97	6.05 J	4.56 J	11.40	7.57	9.27 J	8.39	10.80 J	4.19 J
1,2,3,7,8-pentachlorodibenzofuran	NV	1.72 J	1.55 J	0.50 B	1.67 J	2.22 J	1.24 J	1.05 B	1.23 J	0.78 J	0.94 B	0.68 J	0.94 B	0.86 B
1,2,3,7,8-pentachlorodibenzo-p-dioxin	NV	12.50	3.97 J	1.07 J	13.30	2.82 J	1.53 J	1.70 J	1.71 J	1.18 J	2.02 J	1.45 J	2.14 J	1.16 J
12346789-OCDD	NV	9910	7940	3020	10500	4340	2470	2100.00	7710	7130	8410	6840	7360	8190
12346789-OCDF	NV	245	116	20.40	273	100	58.20	54.50	561	528	987	335	446	181
1234678-HpCDF	NV	147	65.40	16.00	156.00	52.30	26.20	26.00	127	105	208	83.00	86.50	40.60
1234789-HpCDF	NV	7.59	3.29 J	0.76 J	8.23	3.42 J	--	2.20 J	8.13	6.65	13.40	5.65	6.32	2.71 J
123478-HxCDF	NV	9.94	4.76 J	--	10.60	7.55	4.01 J	4.13 J	4.44 J	3.44 J	6.32 J	3.44 J	4.79 J	2.54 J
123678-HxCDF	NV	11.30	3.85 J	1.45 J	11.40	4.06 J	1.93 J	2.45 J	3.53 J	2.56 J	5.90	2.65 J	3.78 J	1.92 J
123789-HxCDF	NV	0.27 J	--	--	0.24 J	0.29 J	--	0.46 J	0.15 J	0.17 J	--	--	--	--
2,3,7,8-tetrachlorodibenzofuran	NV	3.23 J	1.70 J	0.82 J	2.54	3.84 J	1.56 J	3.04 J	1.01	0.99 J	1.26 J	1.05	1.46 J	0.93 J
234678-HxCDF	NV	7.75	5.80	1.13 J	13.60	4.84 J	2.78 J	4.19 J	5.08	4.03 J	3.75 J	4.11 J	4.92 J	1.60 J
23478-PeCDF	NV	3.21 J	1.93 J	0.80 J	2.80 J	3.22 J	1.52 J	2.36 J	1.08 J	0.93 J	1.24 J	0.98 J	1.44 J	0.89 J
2378-TCDD	4.5	1.84	--	0.32 J	0.56 J	1.05 J	0.67 J	2.05 J	0.27 J	0.22 J	0.72 J	0.28 J	0.86 J	0.57 J
Total TEQ	4.5	**42.55**	**16.46**	**4.69**	**46.15**	**13.74**	**7.44**	**8.93**	**15.65**	**12.48**	**19.45**	**12.08**	**15.01**	**9.03**

Notes:

Only detected compounds are shown in this table.
Bolded cells indicate result exceeds RSL for compound.
-- indicates compound was not detected.
-A = soil sample collected 0-3"
-B = soil sample collected 0-6"
-C = soil sample collected 6-24"
AP = Asbestos Pile parcel
APFT = Asbestos pile fire training
APSL = Asbestos pile slag
APTF = Asbestos pile transformer
CK = Creek
FT = Fire training
NV = no screening value is available.
PK = Park parcel
PCB = polychlorinated biphenyl
ng/kg = nanograms per kilogram
RV = Reservoir parcel
SS = Surface soil
ug/kg = micrograms per kilogram
J = Analyte present. Reported value may not be accurate or precise.
RSL = Regional Screening Level (EPA Region 3 Risk Based Concentration Values for Residential Soil (May 2012))
1. No RSL available for this compound; acenaphthene RSL used as surrogate.
2. No RSL available for this compound; pyrene RSL used as surrogate.
3. Values shown are actual analytical results and have not been converted to a TEQ value based on it's TEF. Total TEQ is the sum of the coverted values
TEQ = Toxic equivalents quotient
TEF = Toxic equivalency factor

CDM Smith

Table 3-5
Organic Compounds Detected in Transformer Area, Fire Training Area, and Slag Area Soil
BoRit Asbestos Superfund Site, OU-1
Phase 2 Remedial Investigation

Compound	RSL	APFT-SS05	APFT-SS05	APFT-SS05	APSL-SS01	APSL-SS01-B	APSL-SS01	APSL-SS02	APSL-SS02	APSL-SS02	APTF01	APTF02
		APFT-SS05-A	APFT-SS05-B	APFT-SS05-C	APSL-SS01-A	APSL-SS01-B	APSL-SS01-C	APSL-SS02-A	APSL-SS02-B	APSL-SS02-C	APTF01-SS	APTF02-SS
		10/07/10	10/07/10	10/07/10	10/07/10	10/07/10	10/07/10	10/07/10	10/07/10	10/07/10	1/14/2010	1/14/2010
Semivolatile Organics (ug/kg)												
1,2-Benzphenanthracene	15000	690	660	500	140 J	250	560	260	--	170 J	NA	NA
2-Methylnaphthalene	31000	--	--	--	--	--	--	--	--	--	NA	NA
Acenaphthene	340000	--	--	--	--	--	--	--	--	--	NA	NA
Acenaphthylene	NV	--	--	--	--	--	--	--	--	--	NA	NA
Acetophenone	780000	--	--	--	--	--	--	--	--	--	NA	NA
Anthracene	1700000	110 J	180 J	110 J	--	--	72 J	--	--	--	NA	NA
Benzaldehyde	780000	--	--	--	--	--	--	--	--	--	NA	NA
Benzo(a)anthracene	150	**680**	**690**	**490**	120 J	**220**	**480**	**220**	--	**160 J**	NA	NA
Benzo(a)pyrene	15	**760**	**670**	**500**	**130 J**	**250**	**560**	**230**	--	**170 J**	NA	NA
Benzo(b)fluoranthene	150	**780**	**690**	**510**	**150 J**	**260**	**450**	**210**	--	130 J	NA	NA
Benzo(g,h,i)perylene[1]	170000	480	400	310	79 J	140 J	450	170 J	--	140 J	NA	NA
Benzo(k)fluoranthene	1500	530	450	340	110 J	170 J	490	180 J	--	150 J	NA	NA
Bis(2-ethylhexyl)phthalate	35000								--	--	NA	NA
Carbazole	NV	--	--	--	--	--	--	--	--	--	NA	NA
Dibenzo(a,h)anthracene	15	**240**	**200**	**140 J**	--	--	**150 J**	**63 J**	--	--	NA	NA
Dibenzofuran	7800	--	--	--	--	--	--	--	--	--	NA	NA
Di-n-butylphthalate	610000	--	--	--	--	--	--	--	--	--	NA	NA
Fluoranthene	230000	1200	1400	1000	180 J	370	740	390	110 J	360	NA	NA
Fluorene	230000	--	--	--	--	--	--	--	--	--	NA	NA
Indeno(1,2,3-cd)pyrene	150	**530**	**450**	**330**	84 J	**160 J**	**400**	140 J	--	110 J	NA	NA
Naphthalene	3600	--	--	--	--	--	--	--	--	--	NA	NA
Phenanthrene[1]	170000	400	660	460	--	150 J	250	210	--	210	NA	NA
Phenol	1800000	--	--	--	--	--	--	--	--	--	NA	NA
Pyrene	170000	880	980	680	140 J	290	650	360	120 J	300	NA	NA
Pesticides and PCBs (ug/kg)												
4,4'-DDT	1700	--	2.1 J	--	--	--	--	--	--	--	NA	NA
Aroclor-1016	390	--	2.6 J	--	--	--	--	--	--	--	--	--
Aroclor-1254	110	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1260	220	--	12 J	--	--	--	--	--	--	--	14 J	**370**
Dioxins and Furans (ng/kg)[3]												
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	NV	430	941.00	198	53.30	240	52.80	116	97	346	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	NV	2.56 J	4.39 J	2.00 J	0.74 J	2.97 J	--	0.64 J	0.69 J	--	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	NV	11.80	26.00	5.87	1.49 J	3.93 J	--	1.89 J	3.12 J	6.54	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	NV	8.06	8.86 J	6.02 J	2.25 J	8.70 J	2.24 J	2.33 J	3.09 J	15.50 J	NA	NA
1,2,3,7,8-pentachlorodibenzofuran	NV	0.48 J	--	0.72 B	0.25 J	--	0.25 B	0.36 J	0.42 J	--	NA	NA
1,2,3,7,8-pentachlorodibenzo-p-dioxin	NV	1.16 J	1.47 J	1.06 J	0.42 J	1.60 J	0.51 J	0.38 J	0.45 J	0.96 J	NA	NA
12346789-OCDD	NV	7220	13000	4040	2590	14000	4110	23800	14500	12900	NA	NA
12346789-OCDF	NV	605	2010	237	19.00	19.50	15.40	13.30	33.50	24.10 J	NA	NA
1234678-HpCDF	NV	131.00	311	51.90	9.59	6.66	6.70	44.30	100	67.40	NA	NA
1234789-HpCDF	NV	7.89	20.10	3.16 J	0.62 J	--	--	0.61 J	0.96 J	--	NA	NA
123478-HxCDF	NV	3.23 J	7.98	2.50 J	0.89 J	1.03 J	1.10 J	1.46 J	2.61 J	3.27 J	NA	NA
123678-HxCDF	NV	2.59 J	4.98 J	1.99 J	0.61 J	--	0.68 J	1.07 J	1.97 J	--	NA	NA
123789-HxCDF	NV	--	--	--	--	--	--	0.05 J	--	--	NA	NA
2,3,7,8-tetrachlorodibenzofuran	NV	0.85 J	0.55 J	0.75 J	0.62 J	0.73 J	0.57 J	0.51 J	0.75 J	0.55 J	NA	NA
234678-HxCDF	NV	4.23 J	3.05 J	3.17 J	0.92 J	0.59 J	1.01 J	1.57 J	2.70 J	2.79 J	NA	NA
23478-PeCDF	NV	0.66 J	--	0.96 J	0.43 J	--	--	0.49 J	0.80 J	0.93 J	NA	NA
2378-TCDD	4.5	0.56 J	1.50 J	--	--	0.41 J	--	--	0.37 J	--	NA	NA
Total TEQ	4.5	**13.30**	**25.78**	**7.39**	2.73	**10.48**	2.90	**10.24**	**8.91**	**12.12**	NA	NA

Notes:

Only detected compounds are shown in this table.
Bolded cells indicate result exceeds RSL for compound.
-- indicates compound was not detected.
-A = soil sample collected 0-3"
-B = soil sample collected 0-6"
-C = soil sample collected 6-24"
AP = Asbestos Pile parcel
APFT = Asbestos pile fire training
APSL = Asbestos pile slag
APTF = Asbestos pile transformer
CK = Creek
FT = Fire training
NV = no screening value is available.
PK = Park parcel
PCB = polychlorinated biphenyl
ng/kg = nanograms per kilogram
RV = Reservoir parcel
SS = Surface soil
ug/kg = micrograms per kilogram
J = Analyte present. Reported value may not be accurate or precise.
RSL = Regional Screening Level (EPA Region 3 Risk Based Concentration Values for Residential Soil (May 2012))
TEQ = Toxic equivalents quotient
TEF = Toxic equivalency factor
1. No RSL available for this compound; pyrene RSL used as surrogate.
2. No RSL available for this compound; acenaphthene RSL used as surrogate.
3. Values shown are actual analytical results and have not been converted to a TEQ value based on it's TEF. Total TEQ is the sum of the coverted values

CDM Smith

Table 3-6
Inorganic Compounds Detected in Slag Area Soil
BoRit Asbestos Superfund Site, OU-1
Phase 2 Remedial Investigation

Compound	RSL	APSL-SS01 APSL-SS01-A 10/07/10	APSL-SS01-B APSL-SS01-B 10/07/10	APSL-SS01 APSL-SS01-C 10/07/10	APSL-SS01 APSL-SS01D-A 10/07/10	APSL-SS02 APSL-SS02-A 10/07/10	APSL-SS02 APSL-SS02-B 10/07/10	APSL-SS02 APSL-SS02-C 10/07/10
Inorganics (mg/kg)								
Aluminum	7700	**15400**	**19200**	**22600**	**15600**	**20900**	**17500**	**18200**
Antimony	3.1	1.9 J	1.5 J	1.7 J	1.9 J	2.4 J	2.1 J	2.4 J
Arsenic	0.39	**4.6**	**3.7**	**3.5**	**2.7**	**5.2**	**5.9**	**6.4**
Barium	1500	112	88.5	103	111	91.6	97.0	108
Beryllium	16	0.98	0.64	0.71	1.1	0.53 J	0.43 J	0.69
Cadmium[1]	7	0.31 J	0.32 J	0.27 J	0.42 J	0.21 J	0.25 J	0.28 J
Calcium	NV	24900	6850	18700	35200	2930	2720	13800
Chromium[2]	0.29	**37.2 K**	**22.3 K**	**25.7 K**	**37.6 K**	**29.3 K**	**26.5 K**	**29.8 K**
Chromium[3]	12,000	37.2 K	22.3 K	25.7 K	37.6 K	29.3 K	26.5 K	29.8 K
Copper	310	36.0	20.3	23.1	30.4	21.2	26.3	25.2
Iron	5500	**26400 J**	**17700**	**15700**	**27300 J**	**25000 J**	**24000 J**	**28400 J**
Lead	400	--	--	17.5 L	--	--	--	--
Magnesium	NV	12600	3930	5210	17300	4030	3730	5220
Manganese[4]	180	**659 J**	**430 J**	**364 J**	**656 J**	**341 J**	**385 J**	**336 J**
Nickel	150	31.5	18.2	28.0	33.5	24.3	24.9	32.9
Potassium	NV	4640	1440	1530	5860	2150	2120	2420
Sodium	NV	220 J	--	196 J	290 J	--	--	--
Thallium	0.078	**3.1**	--	--	--	--	--	--
Vanadium	39	38.6	25.8	23.2	38.0	38.0	32.4	36.6
Zinc	2300	122	366	117	176	226	110	86.8

Notes:
Only detected compounds are shown in this table.
Bolded cells indicate result exceeds RSL for compound.
-- indicates compound was not detected.
AP = Asbestos Pile parcel
APSL = Asbestos Pile slag
mg/kg = milligrams per kilogram
RSL = Regional Screening Level (EPA Region 3 Risk Based Concentration Values for Residential Soil (May 2012))
NV = no screening value is available.
1. No RSL available for this compound; cadmium (diet) RSL used as surrogate.
2. No RSL available for this compound; chromium (VI) RSL used as surrogate.
3. RSL value for Chromium+3
4. No RSL available for this compound; manganese (non-diet) RSL used as surrogate.

-A = soil sample collected 0-3"
-B = soil sample collected 0-6"
-C = soil sample collected 6-24"

Data Qualifiers:
J = Analyte present. Reported value may not be accurate or precise.
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

Table 3-7
Total Asbestos Detected in Ambient Air
BoRit Asbestos Superfund Site, OU-1
Phase 2 Remedial Investigation

Sample Name	Sample Date	PCME (s/cc)	Total TEM-ISO (s/cc)
CM01-AA-HD9	7/21/11	0	0.00077
CM01-AA-HD12	9/13/11	**0.0012**	0.014
CM02-AA-HD7	5/13/11	0	0.002
CM02-AA-HD10	8/12/11	0	0.00077
CM02-AA-HD14	10/23/11	0	0.0008
CM03-AA-HD5	3/18/11	0	0.00077
CM03-AA-HD9	7/21/11	0	0.0019
CM03-AA-HD10	8/13/11	0	0.0026
CM03-AA-HD13	10/9/11	0	0.00037
CM04-AA-HD9	7/21/11	0	0.0019
CM04-AA-HD10	8/13/11	0.00075	0.0034
CM05-AA-HD13	10/9/11	0	0.00038
CM07-AA-HD5	3/18/11	0	0.0004
CM07-AA-HD8	6/20/11	0	0.0026
CM07B-AA-HD10	8/13/11	0.00079	0.024
CM07B-AA-HD11	9/1/11	0	0.00079
CM07B-AA-HD13	10/9/11	0	0.0026

Notes:
Only samples with detected asbestos are shown in this table.
A screening level for ambient air of 0.001 structures/cc asbestos (PCME) was provided by EPA Region 3 in an e-mail dated May 15, 2012.
Bolded results indicate value exceeded the screening level.
AA-HDXX = Ambient air-High volume, Day XX
PCME = phase contract microscopy equivalents
TEM - ISO = Transmission Electron Micrscopy International Standard Method 10312
s/cc = structures per cubic centimeter

Table 3-8
Personal Exposure Results During Drilling
BoRit Asbestos Superfund Site, OU-1
Phase 2 Remedial Investigation

Location	Sample Name	Sample Date	Activity	Result
GT-04	APGT04-PE-TWA01	11/8/10	8 Hour TWA	0.017
GT-05	APGT05-PE-EXC01	11/8/10	30 Min Excursion	<0.039
GT-06	APGT06-PE-TWA01	11/10/10	8 Hour TWA	0.023
GT-07	APGT07-PE-EXC02	11/10/10	30 Min Excursion	<0.040
GT-07	APGT07-PE-TWA01	11/9/10	8 Hour TWA	0.038
GT-07	APGT07-PE-TWA02	11/10/10	8 Hour TWA	**0.15**
GT-08	APGT08-PE-TWA01	11/9/10	8 Hour TWA	<0.009
GT-09	APGT09-PE-EXC01	11/9/10	30 Min Excursion	<0.039
GT-09	APGT09-PE-TWA01	11/9/10	8 Hour TWA	<0.023
MW01	PKMW01-PE-EXC01	10/20/10	30 Min Excursion	<0.044
MW01	PKMW01-PE-EXC02	10/21/10	30 Min Excursion	<0.044
MW01	PKMW01-PE-TWA01	10/20/10	8 Hour TWA	<0.028
MW01	PKMW01-PE-TWA02	10/21/10	8 Hour TWA	<0.013
MW01	PKMW01-PE-TWA03	10/26/10	8 Hour TWA	NR
MW01	PKMW01-PE-TWA04-1	11/11/10	8 Hour TWA	<0.007
MW01	PKMW01-PE-TWA04-2	11/11/10	8 Hour TWA	<0.015
MW02	PKMW02-PE-EXC02	10/22/10	30 Min Excursion	<0.044
MW02	PKMW02-PE-EXC04	10/26/10	8 Hour TWA	<0.044
MW02	PKMW02-PE-TWA01	10/21/10	8 Hour TWA	<0.015
MW02	PKMW02-PE-TWA02	10/22/10	8 Hour TWA	<0.009
MW02	PKMW02-PE-TWA03	10/25/10	8 Hour TWA	<0.022
MW02	PKMW02-PE-TWA04	10/26/10	30 Min Excursion	<0.014
MW03	PKMW03-PE-EXC02	10/25/10	30 Min Excursion	<0.044
MW03	PKMW03-PE-TWA01	10/22/10	8 Hour TWA	0.051
MW03	PKMW03-PE-TWA02	10/25/10	8 Hour TWA	<0.013
MW03	RVMW03-PE-EXC03	10/28/10	30 Min Excursion	<0.044
MW03	RVMW03-PE-TWA03	10/28/10	8 Hour TWA	<0.019
MW04	APMW04-PE-EXC02	11/1/10	30 Min Excursion	<0.044
MW04	APMW04-PE-TWA01	10/27/10	8 Hour TWA	<0.009
MW04	APMW04-PE-TWA02	11/1/10	8 Hour TWA	NR
MW04	PKMW04-PE-EXC04	11/11/10	30 Min Excursion	<0.039
MW04	RVMW04-PE-EXC03	11/2/10	30 Min Excursion	<0.034
MW04	RVMW04-PE-TWA03	11/2/10	8 Hour TWA	<0.006
MW05	APMW05-PE-EXC01	10/27/10	30 Min Excursion	<0.044
MW05	APMW05-PE-EXC03	10/29/10	30 Min Excursion	<0.044
MW05	APMW05-PE-TWA01	10/27/10	8 Hour TWA	<0.019
MW05	APMW05-PE-TWA02	10/28/10	8 Hour TWA	NR
MW05	APMW05-PE-TWA03	10/29/10	8 Hour TWA	<0.010
MW06	APMW06-PE-EXC03	11/3/10	30 Min Excursion	<0.044
MW06	APMW06-PE-TWA01	11/1/10	8 Hour TWA	<0.014
MW06	APMW06-PE-TWA02	11/2/10	8 Hour TWA	<0.011
MW06	APMW06-PE-TWA03	11/3/10	8 Hour TWA	<0.021

Table 3-8
Personal Exposure Results During Drilling
BoRit Asbestos Superfund Site, OU-1
Phase 2 Remedial Investigation

Notes:
All values are reported in fibers/cc.
Bolded cells indicate result exceeds PEL.
Personal air samples were collected during drilling activities.
Air sample collected at MW-04 (PKMW04-PE-EXC04) was mislabeled in the field. It should have been labeled RVMW04-PE-EXC04.
AP = Asbestos Pile parcel
Exc = excursion
GT = geotechnical boring
Min = minute
MW = Monitoring well
NR = No result. Sample was considered overloaded and was not reanalyzed.
OSHA PEL = 0.1 fibers/cc
OSHA STEL = 1.0 fibers/cc
PE = Personal air during drilling
PK = Park parcel
PEL = Permissible Exposure Limit
RV = Reservoir parcel
STEL = Short Term Exposure Limit
TWA = Time Weighted Average

Table 3-9
Perimeter Air Monitoring Results During Drilling
BoRit Asbestos Superfund Site, OU-1
Phase 2 Remedial Investigation

Location	Sample Name	Sample Date	Result
GT-06	APGT06-PA-HED1	11/10/10	<0.005
GT-06	APGT06-PA-HND1	11/10/10	<0.005
GT-06	APGT06-PA-HSD1	11/10/10	<0.005
GT-06	APGT06-PA-HWD1	11/10/10	<0.005
GT-07	APGT07-PA-HED1	11/9/10	<0.014
GT-07	APGT07-PA-HED2	11/10/10	<0.014
GT-07	APGT07-PA-HND1	11/9/10	<0.015
GT-07	APGT07-PA-HND2	11/10/10	<0.014
GT-07	APGT07-PA-HSD1	11/9/10	<0.014
GT-07	APGT07-PA-HSD2	11/10/10	<0.014
GT-07	APGT07-PA-HWD1	11/9/10	<0.013
GT-07	APGT07-PA-HWD2	11/10/10	<0.014
MW01	PKMW01-PA-HED1	10/20/10	<0.010
MW01	PKMW01-PA-HND1	10/20/10	<0.010
MW01	PKMW01-PA-HSD1	10/20/10	<0.011
MW01	PKMW01-PA-HWD1	10/20/10	<0.009
MW02	PKMW02-PA-HED1	10/21/10	<0.010
MW02	PKMW02-PA-HND1	10/21/10	<0.009
MW02	PKMW02-PA-HSD1	10/21/10	<0.009
MW02	PKMW02-PA-HWD1	10/21/10	<0.009
MW03	RVMW03-PA-HED1	10/22/10	<0.026
MW03	RVMW03-PA-HED2	10/25/10	<0.006
MW03	RVMW03-PA-HND1	10/22/10	<0.026
MW03	RVMW03-PA-HND2	10/25/10	<0.006
MW03	RVMW03-PA-HSD1	10/22/10	<0.026
MW03	RVMW03-PA-HSD2	10/25/10	<0.006
MW03	RVMW03-PA-HWD1	10/22/10	<0.023
MW03	RVMW03-PA-HWD2	10/25/10	<0.006
MW05	APMW05-PA-HED1	10/27/10	<0.009
MW05	APMW05-PA-HED2	10/28/10	<0.008
MW05	APMW05-PA-HND1	10/27/10	<0.009
MW05	APMW05-PA-HND2	10/28/10	<0.008
MW05	APMW05-PA-HSD1	10/27/10	<0.009
MW05	APMW05-PA-HSD2	10/28/10	0.009
MW05	APMW05-PA-HWD1	10/27/10	<0.009
MW05	APMW05-PA-HWD2	10/28/10	<0.008

Notes:
Perimeter air samples were collected during drilling activities, immediately adjacent to the drilling area.
All values are reported in fibers per cubic centimeter (f/cc).
AP - Asbestos Pile parcel
GT = geotechnical boring
HEDI = high volume, east direction, day 1
MW = Monitoring well
OSHA PEL = 0.1 fibers/cc
OSHA STEL = 1.0 fibers/cc
OSHA = Occupational Safety and Health Administration
PA = perimeter air during drilling
PEL = Permissible Exposure Limit
PK = Park parcel
RV = Reservoir parcel
STEL = Short Term Exposure Limit

Table 3-10
Water Level Elevation Data
BoRit Asbestos Superfund Site, OU-1
Ambler, Pennsylvania

Name	Type	Elevation of TOC (ft msl)	Elevation of TIC (ft msl)	January 13, 2011		April 14, 2011		June 27, 2011		September 13, 2011		October 8, 2011	
				DTW (ft btic)	Water Level Elevation	DTW (ft btic)	Water Level Elevation (ft msl)	DTW (ft btic)	Water Level Elevation (ft msl)	DTW (ft btic)	Water Level Elevation (ft msl)	DTW (ft btic)	Water Level Elevation (ft msl)
MW-1	Monitoring Well	193.89	193.55	13.71	179.84	12.08	181.47	13.71	179.84	10.44	183.11	11.87	181.68
MW-2	Monitoring Well	198.36	198.06	22.81	175.25	21.55	176.51	22.70	175.36	21.23	176.83	21.86	176.20
MW-3	Monitoring Well	183.72	183.27	5.84	177.43	4.60	178.67	5.53	177.74	4.36	178.91	4.52	178.75
MW-4	Monitoring Well	195.79	195.44	13.31	182.13	12.01	183.43	13.49	181.95	NM	NM	11.82	183.62
MW-5	Monitoring Well	193.16	192.81	20.79	172.02	20.24	172.57	21.47	171.34	20.64	172.17	NM	NM
MW-6	Monitoring Well	197.31	196.95	12.81	184.14	11.10	185.85	12.31	184.64	13.13	183.82	10.99	185.96
PKPZ-01	Piezometer	199.14	198.50	22.24	176.26	21.61	176.89	22.13	176.37	18.79	179.71	20.96	177.54
PKPZ-02	Piezometer	199.67	199.45	23.67	175.78	22.51	176.94	23.49	175.96	22.16	177.29	22.65	176.80
PKPZ-03	Piezometer	199.26	199.12	23.02	176.10	Dry	Dry	22.49	176.63	21.21	177.91	22.14	176.98
APPZ-03	Piezometer	191.88	191.79	20.19	171.60	19.75	172.04	20.75	171.04	Removed	Removed	Removed	Removed
APPZ-02	Piezometer	189.89	189.70	17.02	172.68	16.96	172.74	17.12	172.58	Removed	Removed	Removed	Removed
APPZ-01	Piezometer	189.68	189.48	15.76	173.72	15.51	173.97	NM	NM	Removed	Removed	Removed	Removed
GT-8	Piezometer	215.34	215.20	NM	NM	NM	NM	NM	NM	Removed	Removed	Removed	Removed
GT-6	Piezometer	222.00	221.86	33.73	188.13	33.17	188.69	33.39	188.47	31.60	190.26	29.31	192.55
GT-7	Piezometer	210.97	210.58	22.46	188.12	21.81	188.77	21.86	188.72	20.32	190.26	20.10	190.48
SG-5	Staff Gauge	178.54	n/a	-0.12	178.42	0.40	178.94	-0.04	178.50	0.39	178.93	0.15	178.69
SG-4	Staff Gauge	177.89	n/a	-0.25	177.64	0.00	177.89	-0.06	177.83	0.14	178.03	0.01	177.90
SG-3	Staff Gauge	185.68	n/a	0.30	185.98	0.52	186.20	0.00	185.68	1.10	186.78	0.84	186.52
SG-2	Staff Gauge	186.62	n/a	0.57	187.19	0.02	186.64	0.30	186.92	1.00	187.62	0.76	187.38
SG-1	Staff Gauge	167.98	n/a	0.08	168.06	0.54	168.52	-0.04	167.94	0.06	168.04	0.03	168.01

Notes:
ft btic = feet below top of inner casing
ft msl = ft above mean sea level, in North American Vertical Datum 1988 (NAVD88)
TOC = top of outer casing. For staff gauges, elevation refers to gauge bottom.
TIC = Top of inner casing
n/a = not applicable
NM = not measured
Rainfall information gathered from Dresher, PA weather station KPAAMBLE2 and MAR075. Rainfall for the two days prior to the April 14, 2011 event was 0.89 inches.
Rainfall for the two days prior to the September 13, 2011 event was 0.31 inches; however, total rainfall since September 5, 2011 to September 12, 2011 was 9.25 inches.
Other events had zero rainfall for the two days prior to the event.
Removed = Well has been abondoned

Appendix A

Utility Clearance Report

Delta Geophysics

MW-1 - No ConFlict

MW-2- No ConFlict

MW3- No ConFlict

MW4- Possible Trench Detected W/ GPR. Trench travels Parrallel To Roadway Approx 2 Ft From well Location. Marked with Pink Paint

MW-5- No ConFlict

MW-6- No ConFlict

GT-1. Shallow metallic debris detected near boring Location. Marked onsite with Pink Flags & Paint.

GT-2. No ConFlict

GT-3- No ConFlict

GT-4- No ConFlict

GT-5- No ConFlict

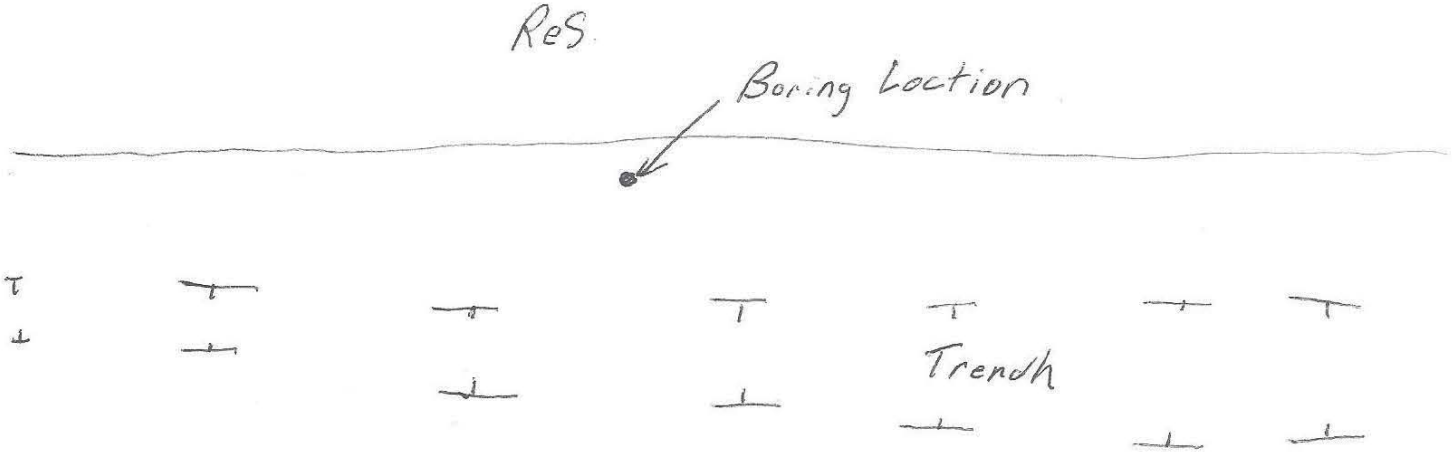
GT-6- No ConFlict

GT-7- No ConFlict

GT-8- No ConFlict. Could not use GPR

GT-9- No ConFlict

MW-4

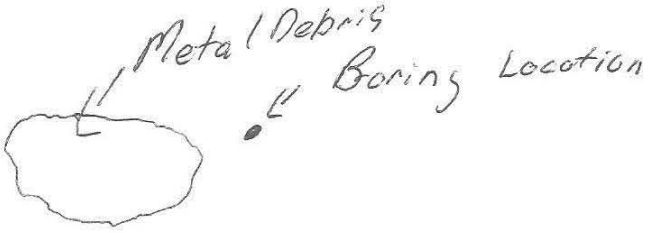


Roadway

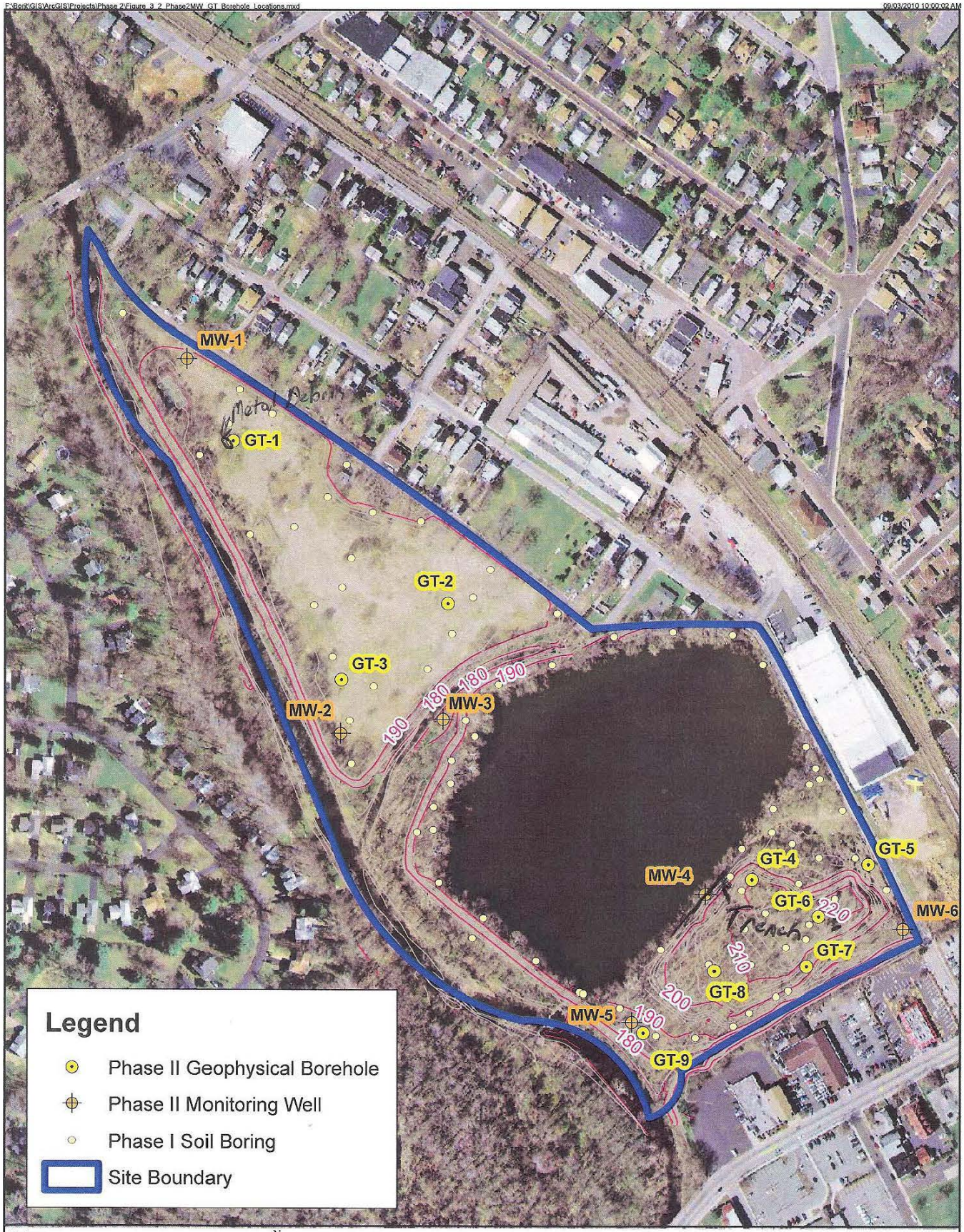
Asbestos

Pile

GT-1



F:\Borit\GIS\ArcGIS\Projects\Phase 2\Figure_3_2_Phase2MW_GT_Borehole_Locations.mxd 09/03/2010 10:00:02 AM



Notes:
1) Elevations are measured in feet above mean sea level (ft amsl)
2) Boundary lines are estimated
3) Source: Delaware Valley Regional Planning Commission (2005)

N W E S

BoRit Asbestos Superfund Site, OU-1
Ambler, Pennsylvania

0 250 500 1,000 Feet

Figure 3-2
Phase 2 Monitoring Well and Geophysical Borehole Locations

CDM

Appendix B

Preliminary Geotechnical Engineering Evaluation

Appendix B
Geotechnical Report

1.0 Geotechnical Evaluation Purpose and Scope

The purpose of this preliminary geotechnical evaluation is to summarize subsurface conditions encountered in the Park and Asbestos Pile Parcels of the BoRit Asbestos Superfund Site shown on **Figure 1** encountered during the Phase 2 investigation. Subsurface data collected as part of the Phase 1 investigation was also reviewed and considered as part of this geotechnical evaluation. These activities were conducted for the purpose of preliminarily assessing geotechnical considerations, including potential slope stability and settlement should potential remedial approaches be conducted. Specifically, the preliminary geotechnical evaluation includes the following components:

- Review available site subsurface geotechnical information, geological literature, site history, and related documents;
- Conduct a limited subsurface exploration program consisting of nine test borings to evaluate subsurface conditions and obtain soil samples for geotechnical laboratory testing;
- Review of geotechnical laboratory test results for select samples to assist with classification and estimation of the engineering characteristics of the soil and waste encountered;
- Estimate the volume of waste present at the Park and Asbestos Pile parcels; and
- Perform preliminary engineering analyses to evaluate geotechnical considerations including slope stability and settlement associated with several potential remediation approaches.

2.0 Existing Site Conditions

2.1 Park Parcel

During the Phase 2 investigation (fall 2010), the approximately 11-acre Park Parcel was relatively flat, with existing site grades ranging from about elevation (El.) 182 to El. 196. The ground surface sloped at approximately 2 percent (%) in all directions from a high point near the center of the site. At the high point the ground surface was about six feet higher in elevation than the adjacent street level (approximately El. 190) along the north east side of the parcel. The east and south limits of the parcel (Wissahickon Creek and Rose Valley Creek, respectively), sloped down at approximately 2 horizontal to 1 vertical (2H: 1 V). The 100-year flood plain along Wissihickon Creek was at approximate El. 182. The Park Parcel was triangular in shape and was roughly 500 feet in width at its widest point and was approximately 1500 feet in length from end to end. The EPA Removal contractor has not completed activities at the Park Parcel as of January 2012 which will change the elevations at the Site after remaining trees are cleared and a soil cover is placed at the surface.

2.2 Asbestos Pile Parcel

The Asbestos Pile Parcel is located south east of the Park Parcel and the Reservoir Parcel and occupies an area of approximately 2.5 acres. The Asbestos Pile Parcel is bordered to the south by Tannery Run and to the east by Wissahickon Creek. During the Phase 2 investigation (fall 2010), topography at the Asbestos Pile Parcel ranged

from about El. 188 to El. 220. The topography of the Asbestos Pile rose up to approximately 30 feet above the surrounding ground surface to El. 220 at the eastern limit of the Asbestos Pile. Based on a site survey conducted in 2008, the Asbestos Pile side slopes were inclined as steep as approximately 1.5H: 1V. The balance of the parcel was relatively flat. The exceptions are the eastern and southern borders limits which sloped down at 2H: 1V toward Wissahickon Creek and Tannery Run, respectively. Since the fall of 2010, the EPA Removal contractor have completed removing the remaining trees on the Asbestos Pile and placed a soil cover at the surface; therefore, changing the elevations at the Site.

3.0 Site Geology

The Triassic bedrock of the Newark Basin underlies the region. The oldest unit of the basin, the Stockton Formation, ranges from 1,000 to 5,000 feet in thickness and is approximately 3,000 feet thick near the Site. The formation is characterized by light-colored, coarse-grained, arkosic sandstone and conglomerate; red to brown fine-grained siliceous sandstone; and red shale. Lenses of silty and sandy red shale are interbedded with the sandstone. The Stockton Formation outcrops in an east-northeast trending band approximately five miles wide in the Ambler area. Bedding strikes northeast and dips to the northwest at 10 to 20 degrees. Bedding planes commonly show ripple marks, mud cracks, raindrop impressions, cross bedding, and pinch and swell structures. The Formation is extensively faulted and is cut by at least two sets of vertical joints.

Weathering of the Stockton Formation generally results in deposits of sandy clay loams of varying thicknesses that form an undulating topography of moderately low relief. Valleys are typically eroded into the softer sandstone beds while uplands are more commonly underlain by arkosic beds. Due to the proximity of creeks to the Site, it is anticipated that bedrock underlies alluvial soils at the Park and Asbestos Pile parcels. Natural soils at the site consist of Bowmansville-Knauers silt loam which is recent alluvium derived from sandstone and shale, according to on-line soil resource data collected from the United States Department of Agriculture Natural Resources Conservation Service.

4.0 Site and Subsurface Conditions

4.1 2010 Geotechnical Investigations

In November 2010, a Phase 2 geotechnical investigation was performed consisting of nine geotechnical test borings drilled by Uni-Tech Drilling Co., Inc. of Franklinville, New Jersey using a truck-mounted drill rig. Test borings were drilled with hollow stem augers to depths ranging from 14 to 40 feet below the existing ground surface. Split-spoon sampling was conducted during hollow stem auger drilling continuously in general accordance with ASTM D1586 (2-inch-diameter sampler driven 24 inches by blows from a 140-pound hammer falling freely for a 30-inch drop). The number of blows required to drive the sampler each 6-inch increment was recorded and the Standard Penetration Resistance (N-value) was determined as the sum of the blows over the middle two 6-inch increments of the drive. Test borings were generally terminated upon reaching refusal with the exception of GT-05 which was terminated at a depth of 14-feet. Split-spoon refusal was defined as less than 6 inches of penetration for 50 blows from a 140-pound hammer. When a refusal condition was encountered, the number of blows with the corresponding depth of penetration was recorded.

Relatively undisturbed sampling of fine-grained (cohesive) soils was conducted at selected locations using a standard Shelby tube sampler and in general accordance with ASTM D1587. A total of five Shelby tube samples were collected. The Shelby tube samples were trimmed and both ends of the tube samples were sealed with plastic caps, tape and wax for subsequent review and laboratory testing.

All soil samples were visually classified in general accordance with the modified Burmister classification system by a CDM Smith representative. Samples were stored in jars and sealed plastic bags according to various geotechnical and analytical test requirements and shipped to the laboratory contracted by EPA for geotechnical analysis. Select samples procured during the investigation were also submitted for environmental testing. Details of the environmental testing and analytical findings are found in the Phase 2 Data Evaluation Report, to which this memorandum is an appendix.

Groundwater levels at the test boring locations were estimated from the condition of the samples and by the observed water levels within the borehole at the time of drilling.

Drilling spoils were either placed back in the boring or drummed at the time of drilling. The drums were labeled with the associated boring numbers and depths, and transported to and stored at the on-site environmental containment and decontamination area for subsequent testing and disposal. Upon completion of drilling, all test boring locations were backfilled with drill cuttings mixed with cement-bentonite grout.

The test boring locations were marked in the field and subsequently surveyed to obtain their location and elevation. Boring locations and pertinent site features are shown on the attached **Figures 2A** and **2B**. Test boring logs, prepared by CDM Smith, are included in **Appendix B** and are summarized on **Table 2.**

4.2 Geotechnical Laboratory Testing

Geotechnical laboratory tests were performed on select split spoon samples and Shelby tube samples obtained from the test borings as follows:

- Twenty grain size analyses were performed in accordance with ASTM D422;
- Twenty Atterberg limit tests were performed in accordance with ASTM D4318;
- Twenty moisture content tests were performed in accordance with ASTM D2216;
- Nine specific gravity tests were performed in accordance with ASTM D854;
- Five consolidation tests were performed in accordance with ASTM D2435; and
- Five consolidated undrained shear tests were performed in accordance with ASTM D4767.

The purpose of these tests was to assist with soil classification and for use in preliminary engineering analyses. Laboratory testing results are summarized in **Table 3**. Laboratory test data are included in **Attachment C**.

4.3 Subsurface Soil Conditions

Subsurface conditions described in this section are based upon review of existing Phase 1 subsurface information and Phase 2 test borings conducted as part of this investigation. The subsurface materials encountered at the site typically consisted of silty, gravelly fill underlain by asbestos containing material (ACM) mixed with soil, light process waste (LPW), and alluvial soils. Fill or topsoil was encountered at the surface of a majority of the test boring locations. In general, the fill, ACM, and LPW horizons were not layered consistently. For example, at some locations layers of fill were encountered within ACM layers. As such, there were not clearly separated strata of waste and fill. Soil samples collected during drilling were generally moist to wet. Subsurface conditions at each parcel based on the 2010 test borings are summarized below.

4.3.1 Park Parcel

Three geotechnical borings (GT-01 through GT-03) were drilled at the Park Parcel in 2010. The geotechnical boring locations are shown on **Figure 2**. Descriptions of the subsurface conditions at each location are described below.

Four feet of fill was encountered at the top of GT-01 and consisted of sandy, silty clay and sandy gravel. The SPT N-values in the fill horizon in this boring were 14 and 6 blows per foot (bpf). Fill 4 to 12 feet thick was encountered at depths of 12 feet and 20 feet in Test Borings GT-02 and GT-03, respectively.

ACM was present at all Phase 2 boring locations in the Park parcel based on visual observations. ACM was encountered near the surface beneath a thin layer of topsoil at Phase 2 boring locations GT-02 and GT-03. The ACM layers ranged from 4 to 20 feet thick and consist of a mixture of fibrous, granular asbestos and fine grained soils. SPT N-values in the ACM ranged from 2 to 78 bpf with an average of 16.

Two feet of LPW were observed at a depth of 8 feet in test boring GT-01. The LPW consisted of moist, soft, white, material with the consistency of toothpaste. There were some fluffy inclusions observed within the paste. The SPT N-value in the LPW was 4 bpf.

Alluvial soils were not encountered in the borings drilled in the Park Parcel. Sandstone was encountered in the tip of the split-spoon sampler upon achieving refusal in test borings GT-01 and GT-02 at respective depths of 18.8 and 24.8 feet bgs.

4.3.2 Asbestos Pile Parcel

Six geotechnical borings (GT-04 through GT-09) were drilled at the Asbestos Pile Parcel in 2010. The geotechnical boring locations are shown on **Figure 2**. Descriptions of the subsurface conditions at each location are described below.

At the Asbestos Pile Parcel, fill was encountered at the surface of all boring locations. The fill layer varies from about 2 to 6 feet thick and consists of mixtures of silt, clay and sand. SPT N-values in the Asbestos Pile Parcel fill ranged from 2 to more than 50 bpf. Six feet of Fill was encountered at a depth of 22 feet in test boring GT-09.

ACM was present at the Asbestos Pile Parcel at borings GT-05, GT-07, and GT-09 based on visual observations. The ACM layers range in thickness from 2 to 10 feet. ACM was encountered at depths of 6 and 12 feet bgs in test boring GT-05, 2 and 16 feet bgs at test Boring GT-07, and 4 and 12 feet bgs at test boring GT-09. The thickness of the ACM ranged from 2 to 10 feet, with the thickest layer encountered at a depth of 12 feet in test boring GT-09. The ACM was consistent with the makeup of the ACM sampled at the Park Parcel. SPT N-values in the ACM ranged from 0 to 12 bpf with an average of 6 bpf.

LPW was observed in all borings at the Asbestos Pile Parcel. The LPW was encountered at depths ranging from 2 to 8 feet bgs and had similar consistency to the LPW sampled at the Park Parcel. The LPW ranged in thickness from 2 to 36 feet. SPT N-values ranged from 0 to over 50 bpf with an average of 5 bpf. In general, the 50 bpf N-values were not representative of the material encountered and were apparently due to the presence of debris present within the horizon sampled. The LPW was generally very soft to soft.

Alluvial soils were encountered in borings GT-04, GT-06, and GT-09 based on observation of the samples obtained. Alluvial soils consisted of very dense fine sand and medium stiff clayey silt. Alluvial soils sampled

ranged from 2 to 4 feet thick. Split-spoon refusal was achieved in all of the borings encountering alluvium. Sandstone was encountered in the split-spoons at the bottom of borings GT-4, GT-6, GT-8, and GT-9.

A summary of the subsurface strata encountered at the test boring locations is presented in **Table 2**.

5.0 Estimated Waste Volumes

CDM completed an analysis to estimate the total volume of ACM plus LPW (waste) at the Park and Asbestos Pile Parcels, excluding fill material where encountered above the top of the waste. The waste volumes were estimated using AutoCAD Civil 3D software, the 2008 site survey of existing topography completed by Ludgate Engineering Corporation, and the Phase 1 and 2 boring data. Boring data were utilized to estimate horizons for the top and bottom of waste, and a subsequent estimate of the waste thickness. In general, the bottom of the waste was estimated to extend to about 30-feet below existing site grades, this does not account for waste above ground surface at the Asbestos Pile parcel. The depth of fill overlying the waste, where present, was not included in waste volume estimates. The depth from the existing ground surface to the top of the waste horizon and the estimated waste thicknesses utilized in the volume analysis are summarized in **Table 4**. The horizontal limit of waste was estimated to correspond to the horizontal extent of where Phase 1 and Phase 2 borings were drilled. Cross-sections used to develop the model, depicting only Phase 2 boring data, used for earth work quantity analysis are shown on **Figure 3**.

As previously discussed, ACM and LPW horizons were not layered uniformly, and there was not clear separation between layers of fill material (soil and debris) that was encountered within the overall waste horizon. As such, the volume estimated consider the upper and lower elevation of observed waste and fill materials present within the waste horizon.

The topographic survey used as the basis for waste volume estimates appears to have been completed prior to the Phase 2 field investigation and the ongoing EPA Removal Program site activities. As a result the 2008 survey does not appear to be representative of the site topography at the time of the Phase 2 investigation. As previously discussed, the elevation at the test boring location was obtained. Although interpolation was used to correct topographic differences between the survey and site conditions observed during the 2010 Phase 2 geotechnical investigation, the estimated waste volumes will need to be validated when the site topographic survey has been updated to reflect site conditions upon completion of Removal Program activities.

The results of the waste horizon volume estimates are as follows:

Park Parcel = 195,000 cubic yards (CY)

Asbestos Pile Parcel = 125,000 CY

6.0 Geotechnical Evaluation of Potential Remediation Approaches

6.1 Potential Remediation Approaches

Several potential remediation approaches identified based upon discussions with EPA were evaluated for geotechnical considerations. These potential remediation approaches include excavation and disposal, in-situ treatment, placement of a cap, and ex-situ treatment. General descriptions of these potential remediation approaches follow:

1. Excavate and Dispose – Under this approach, the waste would be excavated and removed by conventional earth moving methods, loaded into trucks, and transferred to permitted off-site treatment or disposal facilities. Some pretreatment of the waste may be necessary prior to removal in order to meet transport or disposal requirements. Upon completion of removal activities, the excavation area would be re-graded or filled in with inert fill obtained from an off-site source, and the site restored or redeveloped for other uses.

2. In-situ Treatment (Solidification/Stabilization) – Solidification/Stabilization (S/S) reduces the mobility of hazardous substances or contaminants through physical and chemical means. S/S seeks to trap or immobilize contaminants within their host medium such as soil. A common approach to S/S of subsurface waste is by the injection of cementitious material via use of auger injection systems. Upon completion the site surface could be re-graded and restored or redeveloped.

3. Placement of a Cap – Utilization of a cap would involve installation of an engineered barrier on the surface of the waste to reduce exposure and reduce or prevent surface runoff potential. Cap systems also reduce the potential for vertical infiltration of water into the underlying waste. The cap system would generally include a surface that can support vegetation and or be used for other purposes.

4. Ex-situ Treatment – Ex-situ treatment is a variation of the S/S process. In this approach the waste would be excavated, processed on-site to effect solidification or stabilization, and replaced on the site. This approach would require multiple construction steps in terms of excavation, staging, processing, stockpiling of processed waste, and replacement of the treated waste. As such, this approach typically would also require a sizeable area for staging the work when compared to other approaches. The site could subsequently be reclaimed as described for the other potential remediation approaches.

6.2 Common Parcel Considerations

There are several physical site considerations pertinent to the evaluations that are common to both Parcels including:

- Site access would be via Wissahickon Ambler Alley or Maple Street;
- Surface water from the parcels drains to Wissahickon Creek;
- Limited space would be available for construction staging;
- Parcels are bordered by residential areas;
- Local roadways may be of insufficient capacity to accommodate heavy truck traffic necessary for equipment mobilization and construction material delivery; and
- Monitoring and control of airborne asbestos fiber emissions would be required.

6.3 Implementation Considerations of Potential Remediation Approaches

Each of the four potential remediation approaches discussed above was considered in relation to the Park and Asbestos Pile Parcels.

6.3.1 *Park Parcel*

Excavate and Dispose- Initial construction activities would include installation of erosion and sedimentation control (E&S) measures such as silt fence. Storm water management features would also be constructed within the approximate 11-acre area to control surface water run-off entering Rose Valley Creek or Wissahickon Creek. Upon installation of E&S control and storm water management features, it is anticipated that all of the waste would be excavated with hydraulic excavators and loaded into tri-axle dump trucks. It is anticipated that excavations up to 30-feet deep below existing site grades would be required based on the anticipated waste depth. Temporary excavation slopes would need to be laid back or be structurally supported to create safe access and stable temporary slopes. In particular, temporary excavation support structures may be needed along Wissahickon Ambler Alley depending on waste extent in that area. This approach would expose workers to the waste during excavation and handling. It is anticipated that controls would be designed to manage airborne emissions during construction to protect workers and the local community. Controls may include but not be limited to limiting the area of waste exposed, covering the waste, and/or keeping the waste wet in conjunction with air monitoring. It is anticipated that the excavated waste would then be hauled for disposal to an approved landfill. It is estimated that approximately 195,000 CY of waste would be excavated and disposed of. Once the waste was removed, the site would be restored. This may include importing excavated material to re-establish pre-construction site grades, grading of the site, a sufficient thickness of topsoil to support vegetation, and placement of seed and plantings. Placement of imported engineered fill to re-establish pre-construction site grades is anticipated to result in limited future ground surface settlement, compared to potential ground surface settlement if the waste were to remain in place. Since the site is presently relatively flat with the exception of the stream banks, future slope stability issues within the parcel are not anticipated. Reconstruction of the stream banks with engineered fill is anticipated to result in more stable banks than the existing banks if properly designed and constructed.

In-situ treatment- Prior to in-situ treatment activities, it is anticipated that E&S and storm water management measures would need to be in place similar to the Excavate and Dispose approach. Site disturbance for this approach would be anticipated to be limited to grading to create accessible work areas and positive site storm water drainage. Because less site disturbance is anticipated, there would be reduced potential for surface water run-off to enter Rose Valley Creek and Wissahickon Creek compared to the Excavate and Dispose approach. During the remediation process, augering or soil mixing type equipment would be utilized to penetrate the anticipated depth of waste to 30-feet below the surrounding existing ground surface. The augering equipment would be utilized to inject material, such as cement and water that would be mixed with the waste to its full horizontal and vertical extent to solidify it to reduce its mobility and toxicity. Details relative to the characteristics of the treated waste would need to be determined based on further study. However, it is possible that this treatment may result in densification of the waste. This approach would significantly limit exposure to the waste during construction, because it would not be necessary to uncover or expose the waste. Exposure to waste would be anticipated to be limited to residue on the construction equipment after mixing and the material brought to the surface during mixing operations. Upon completion of waste solidification, the site would be restored by grading, placement of a sufficient thickness of topsoil to support vegetation and possibly preclude root penetration into the waste, and placement of seed and plantings. In-situ waste treatment is anticipated to result in limited future ground surface settlement compared to potential ground surface settlement if the waste were to remain untreated. Future slope stability issues within the parcel are not anticipated if the site is re-graded to be relatively flat. Treatment of the stream banks via in-situ remediation is anticipated to result in more stable slopes than untreated banks if properly designed and constructed.

Placement of a cap- E&S and storm water measures similar to those required for in-situ treatment would be installed prior to initiation of cap construction. Site grading would be necessary to accommodate the cap system. The cap system may be about 30-inches thick and could include a 12-inch thick low permeability clay barrier placed close to the waste covered by common fill, as necessary, to address positive site drainage. It is anticipated that the cap material would need to be imported from an off -site source. Slightly more earth disturbance is anticipated for this approach compared to the in-situ treatment approach in order to accommodate the cap system. It is estimated that cap material would need to be imported from off-site. This approach would result in reduced potential for waste containing runoff to leave the site, because only limited disturbance of near surface waste would occur. Accordingly, exposure to waste during construction is anticipated to be limited. Upon completion of cap installation, the site would be restored by placement of a sufficient thickness of topsoil to support vegetation and possibly preclude root penetration into the waste, and placement of seed and plantings. In addition, it is anticipated that annual monitoring would be required. Monitoring may include but not be limited to evaluating if burrowing animals were present that could damage the integrity of the cap system or if ground surface erosion is occurring that is damaging the cap. Placement of a cap would need to consider site grading to accommodate potential future settlement of the waste. This may include grading a vertical camber on the ground surface. Future slope stability issues within the parcel are not anticipated if the site is re-graded to be relatively flat. It is anticipated that reconstruction of the stream banks, or other measures such as modifying the geometry of the banks by placing an engineered fill buttress to flatten the overall bank slope, is anticipated to be necessary to improve slope stability.

Ex-situ treatment- E&S and storm water measures similar to those required for excavation and disposal would be installed prior to initiation of ex-situ remediation activities. Staging areas would also need to be developed to accommodate waste stockpiling, processing, and treated waste stockpiling. This approach would require the most space to accommodate construction activities compared to the other approaches. Due to the limited site area and construction steps involved, areas of the site would likely need to be remediated sequentially in order to accommodate space limitations. Upon installation of erosion and sediment control and storm water management features and preparation of staging areas, waste would be excavated with hydraulic excavators and stockpiled. In a separate operation, stockpiled waste would be loaded into processing equipment where it would be mixed with cementitious material or other products to stabilize the waste. Upon completion of processing, the material would be stockpiled for subsequent replacement on the site. It is anticipated that the treated waste would have improved engineering characteristics after treatment, placement, and compaction, when compared to the in-situ waste. Since excavations up to 30-feet deep are anticipated, temporary excavation slopes or structures similar to those required for the Excavate and Dispose approach would be needed. It is anticipated that controls to manage airborne emissions similar to those described for the excavation and replacement option would also be needed. Once the waste was processed, the site would be restored in a similar manner to the Excavate and Dispose approach. Placement of compacted treated waste to re-establish pre-construction site grades is anticipated to result in limited future ground surface settlement, compared to potential ground surface settlement if the waste were to remain in place. Since the site is presently relatively flat with the exception of the stream banks, future slope stability issues within the parcel are not anticipated if the site is similarly re-graded. Reconstruction of the stream banks with compacted treated waste are anticipated to be more stable than banks containing waste if properly designed and constructed.

6.3.2 Asbestos Pile Parcel

Excavate and Dispose- Initial construction activities would include installation of E&S measures and storm water control features within the approximate 2.5-acre area to control surface water run-off entering Tannery Run or Wissahickon Creek. Upon installation of erosion and sediment control and storm water management features, it

is anticipated that all of the waste would be excavated and removed. Waste up to 30-feet deep below the existing site grades as well as waste above ground surface at the Asbestos Pile would be excavated with hydraulic excavators and loaded into tri-axle dump trucks. Temporary slopes for excavations below surrounding site grades would need to be laid back, be excavated in multiple stages, or be structurally supported to create safe access. Structural temporary excavation supports may be needed in areas where deeper excavations are to occur due to the limited size of the work area and due to the proximity of adjacent structures such as roads. During excavation of the pile which was estimated to be about 25-feet above ground surface at the time of the Phase 2 investigation, it is anticipated that existing slopes would need to be flattened in order to provide adequate stability for construction equipment. This approach would expose workers to the waste during excavation and handling. It is likely that airborne emission controls would need to be implemented as previously described. The excavated waste would then be hauled for disposal to an approved landfill. It is estimated that approximately 125,000 CY of waste would be excavated and disposed of. Once the waste was removed, the site would be restored. It is anticipated that this may include importing material, placed as a compacted engineered fill, to fill in the excavation left by waste removal, re-establishment of the approximate pre-construction site grades surrounding the actual pile, grading of the site to promote positive storm water drainage, placement of a sufficient thickness of topsoil to support vegetation, and placement of seed and plantings. Placement of imported engineered fill to re-establish pre-construction site grades is anticipated to result in limited future ground surface settlement, compared to potential ground surface settlement if the waste were to remain in place. It is anticipated that the site grade after waste removal would be relatively flat. As such, future slope stability issues within the parcel are not anticipated. Reconstruction of the stream banks with engineered fill are anticipated to be more stable than banks containing waste if properly designed and constructed.

In-situ treatment- Prior to in-situ treatment activities, it is anticipated that E&S and storm water management measures would need to be in place similar to the Excavate and Dispose approach. Site disturbance for this remediation approach would be limited to grading to create accessible work areas and positive site drainage. However, Asbestos Pile slopes are relatively steep. Significant grading and reducing the pile height may be necessary to create stable slopes that are safe for construction activities. Due to the grading activities, there may be increased potential for run-off to enter Tannery Run and Wissahickon Creek. During the remediation process, augering or soil mixing type equipment would be utilized to penetrate the waste as previously described for the Park Parcel. The augering equipment would be utilized to inject material, such as cement and water that would be mixed with the waste to its full horizontal and vertical extent to solidify it to reduce its mobility and toxicity. Details relative to the characteristics of the treated waste would need to be determined based on further study. However it is possible that this treatment may result in densification of the waste and improvement of its engineering characteristics. Although significant grading is anticipated, this approach would likely result in less exposure to the waste during construction than for the Excavate and Dispose approach for this parcel, because the entire volume of waste would not be directly handled. Upon completion of waste solidification, the site would be restored by grading. Due to the anticipated grading as previously discussed, it is anticipated that the overall height of the pile after treatment would be less than at present. Although additional study is required to evaluate this treatment approach, it is anticipated that the resulting site grading would create a relatively flat plateau with gentle side slopes. After grading, placement of a sufficient thickness of topsoil to support vegetation and possibly preclude root penetration into the waste, and placement of seed and plantings would be completed. In-situ waste treatment is anticipated to result in limited future ground surface settlement, compared to potential ground surface settlement if the waste were to remain untreated. Future slope stability issues within the parcel are not anticipated if the site is re-graded to reduce the pile height and flatten the pile side slopes. Treatment of the stream banks via in-situ remediation are anticipated to be more stable than untreated banks containing waste if properly designed and constructed.

Placement of a cap- E&S and storm water measures similar to those previously described for this site would be installed prior to the start of cap system construction. Again, site grading would be necessary to flatten slopes to accommodate construction equipment, and to ensure that the cap system would be stable with respect to slope stability as discussed for the previous treatment approaches for this parcel. Depending on the amount the slope is flattened, the cap may need to incorporate geogrids to ensure future cap and pile stability. It is estimated that a significant amount of of cap material would need to be imported for the 2.5-acre site. This approach would result in a temporary increased potential for run-off to leave the site during construction due to the significant anticipated grading. Exposure to waste during construction would be anticipated to be less than the Excavate and Dispose approach, because all of the waste would not be handled during construction. Upon completion of cap installation, the site would be restored by placement of a sufficient thickness of topsoil to support vegetation and possibly preclude root penetration into the waste, and placement of seed and plantings. In addition, it is anticipated that annual monitoring would be required. Monitoring may include but not be limited to evaluating if burrowing animals were present that could damage the integrity of the cap system or if ground surface erosion is occurring that is damaging the cap. Placement of a cap would need to consider site grading to accommodate potential future settlement of the waste. This may include grading a vertical camber on the ground surface. Future slope stability issues within the parcel are not anticipated if the cap system is properly designed and constructed. It is anticipated that reconstruction of the stream banks, or other measures such as modifying the geometry of the banks by placing an engineered fill buttress to flatten the overall bank slope, are anticipated to be necessary in conjunction with cap installation to improve slope stability.

Ex-situ treatment- E&S and storm water measures similar to those required for the Excavation and Disposal approach would be installed prior to initiation of ex-situ remediation activities. Staging areas would also need to be developed to accommodate waste stockpiling, processing, and treated waste stockpiling. Due to the size of this site, staging for ex-situ remediation would be anticipated to be difficult, because 125,000 CY of waste would need to be processed on the 2.5-acre site. The waste would be excavated as previously described for the Excavate and Dispose approach, and be processed as previously described for the Park Parcel. Creating stable excavations up to 30-feet deep below existing site grades by using flat slopes or temporary excavation support systems would be challenging in the small area available. Significant site grading would be necessary to flatten slopes to accommodate construction equipment on the pile, and to ensure that temporary excavation slopes are stable during construction as discussed for the previous treatment approaches for this parcel. It is anticipated that small areas would need to be processed in a sequenced approach which would take longer than for a comparable waste volume at a larger site. Once the waste was processed, the site would be restored in a similar manner to the Excavate and Replace approach.

Attachments:
Figure 1 – Site Map
Figure 2 – Boring Location Plan
Figure 3 – Cross-Sections
Table 1 – Summary of Subsurface Conditions – Previous Explorations
Table 2 – Summary of Subsurface Conditions – Phase 2 Explorations
Table 3 – Summary of Geotechnical Index Test Results
Table 4 – Summary of Subsurface Waste Depths
Attachment A – Geotechnical Boring Logs
Attachment B - Geotechnical Laboratory Test Results

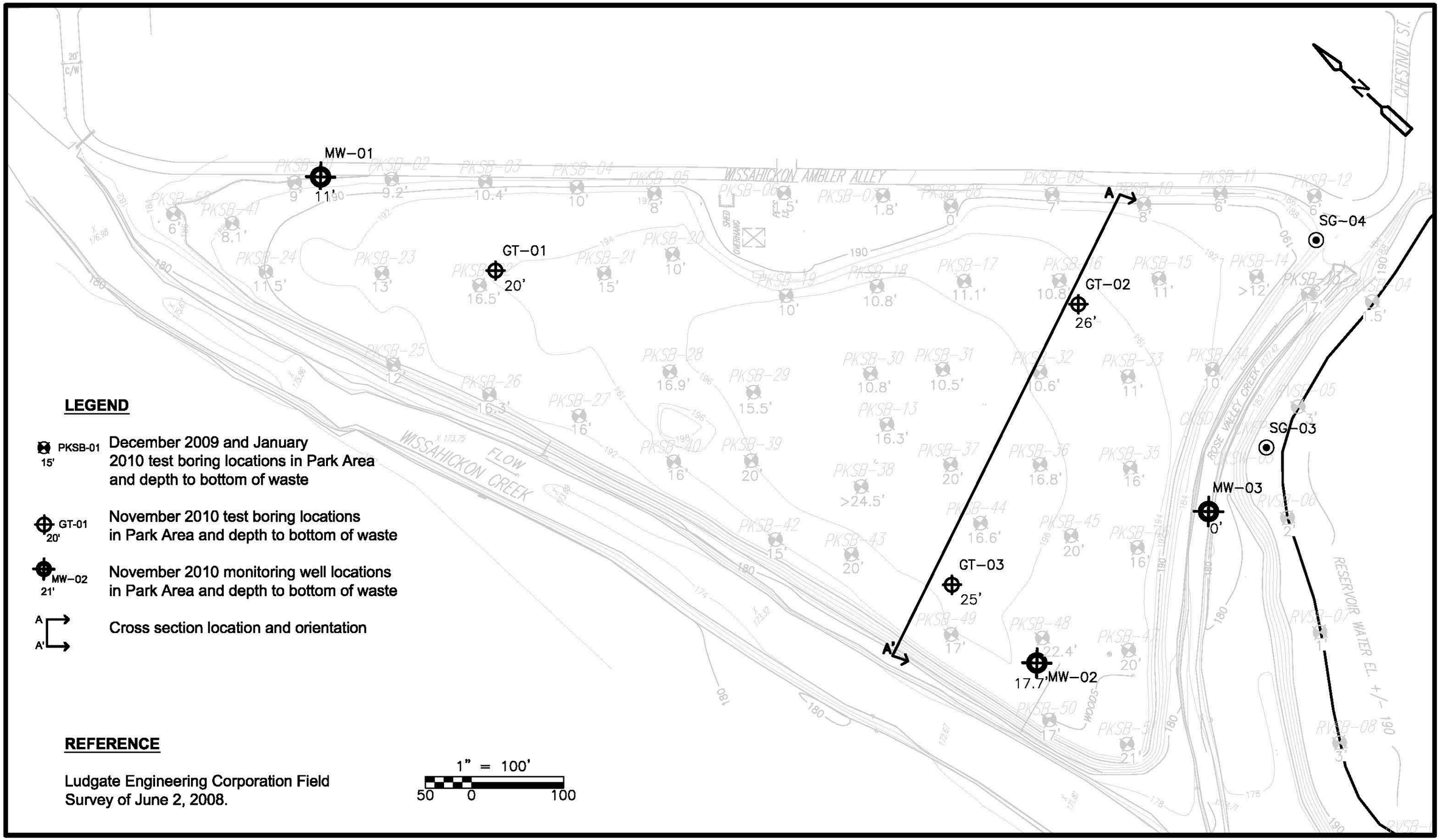
Figures



CDM

BoRit Asbestos Superfund Site, OU-1
Ambler, Pennsylvania

Figure 1
Site Map



CDM
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BoRit Asbestos Superfund Site, OU-2
Ambler, Pennsylvania

Figure 2A
PARK PARCEL SUBSURFACE INVESTIGATION LOCATION PLAN

LEGEND

- PKSB-01 / 15' — December 2009 and January 2010 test boring locations in Pile and Reservoir Area and depth to bottom of waste
- GT-01 / 20' — November 2010 test boring locations in Pile and Reservoir Area and depth to bottom of waste
- MW-02 / 21' — November 2010 monitoring well locations in Pile and Reservoir Area and depth to bottom of waste
- B / B' — Cross section location and orientation

N

SG-04
SG-03
SG-02
MW-03
MW-04
MW-05
MW-06
GT-04 35.5'
GT-05 >12'
GT-06 37.5'
GT-07 >24'
GT-08 >30'
GT-09 20'
B
B'
C
C'
RESERVOIR WATER EL. +/- 190
CHESTNUT ST.
MAPLE STREET
BUTLER PIKE
TANNERY RUN
WISSAHICKON CREEK
BOTTOM OF PILE

REFERENCE

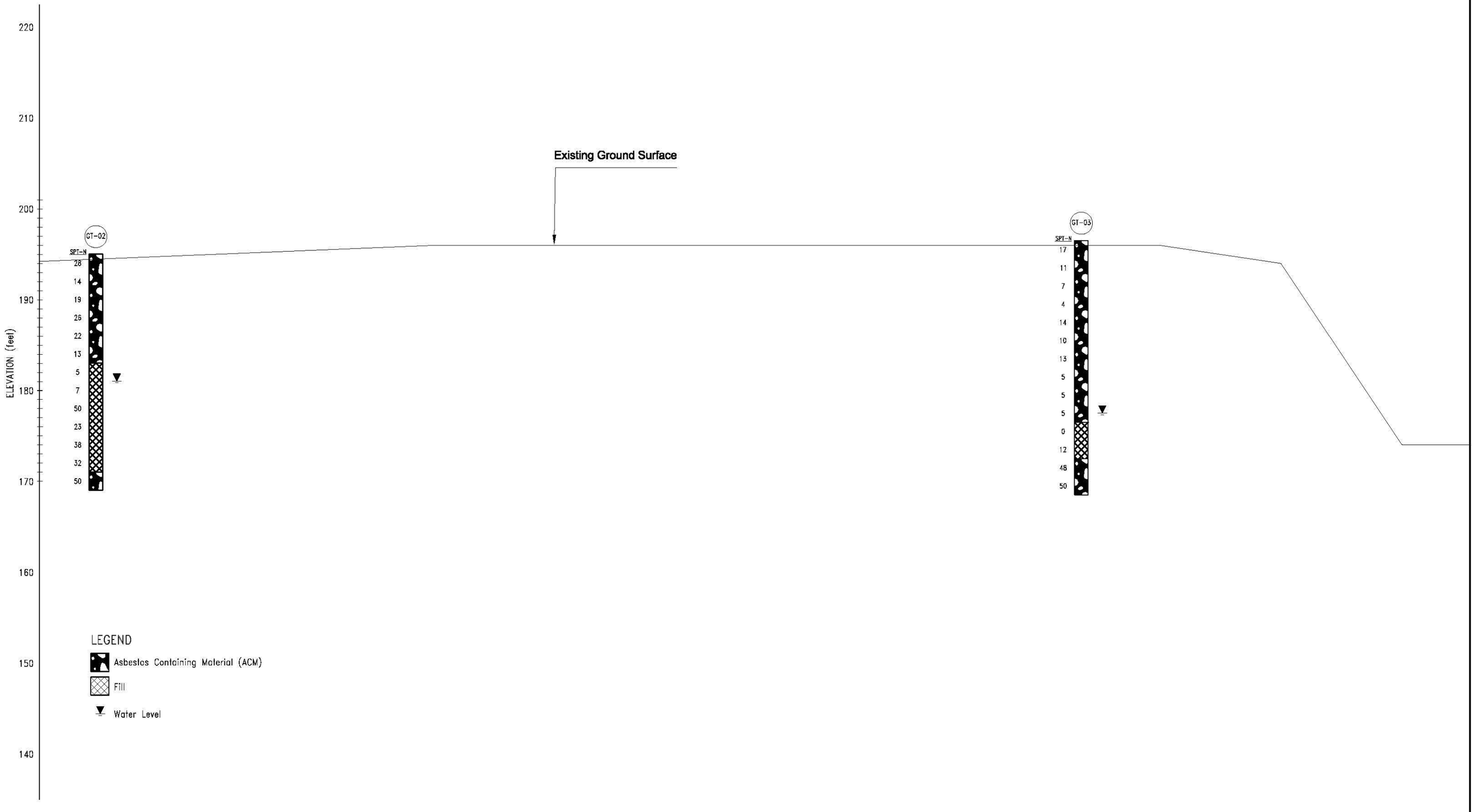
Ludgate Engineering Corporation Field Survey of June 2, 2008.

1" = 110'
55 0 110

CDM
consulting • engineering • construction • operations

BoRit Asbestos Superfund Site, OU-2
Ambler, Pennsylvania

Figure 2B
PILE PARCEL SUBSURFACE INVESTIGATION LOCATION PLAN



BOSTON BEER BORIT.GPJ - 12/15/10

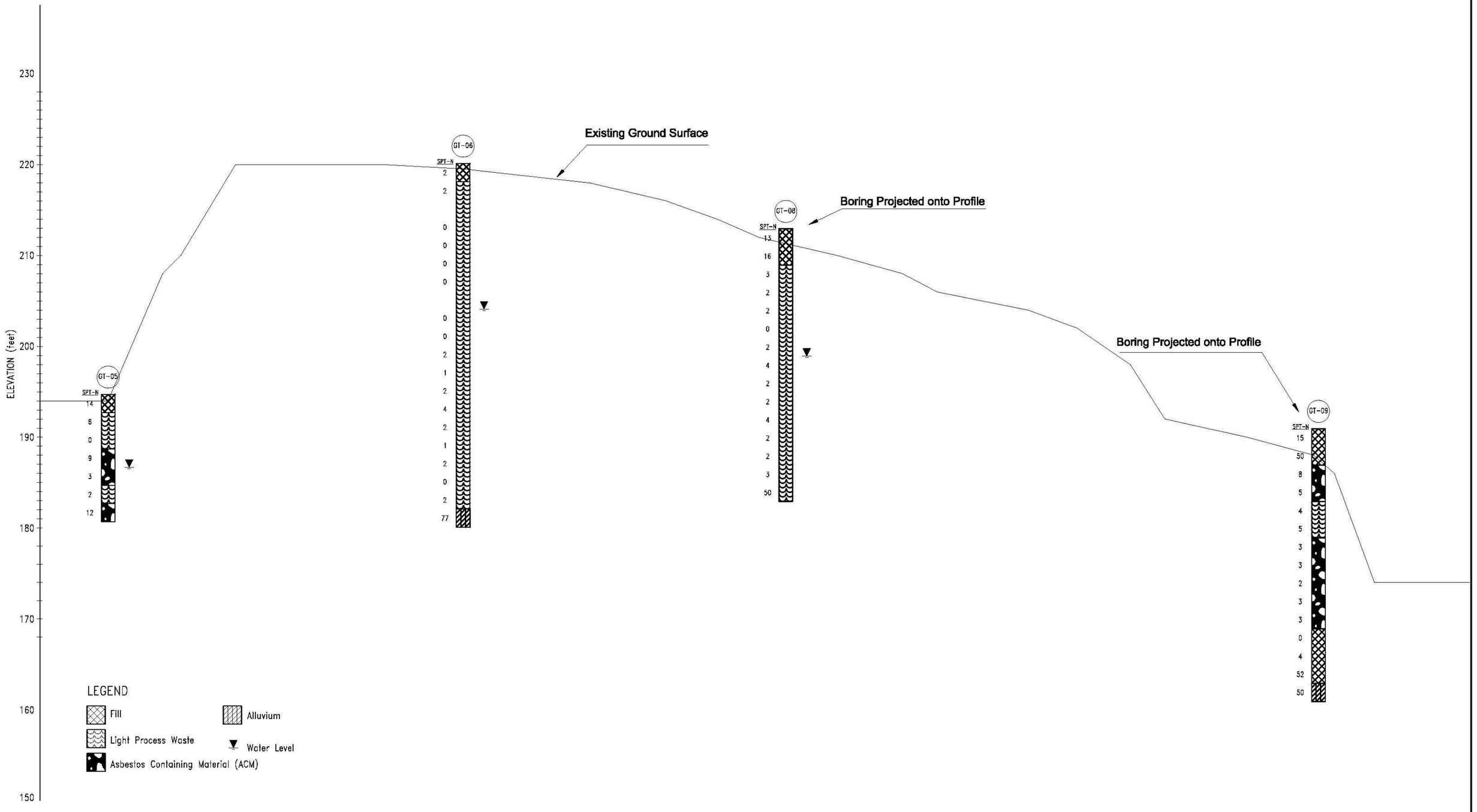
CDM
Camp Dresser & McKee

15 0 30
Horizontal Scale (ft.)

5 0 10
Vertical Scale (ft.)

BoRit Asbestos Superfund Site, OU-2
Ambler, Pennsylvania

Figure 3A
CROSS SECTION A-A'



CDM
Camp Dresser & McKee

25 0 50
Horizontal Scale (ft.)

5 0 10
Vertical Scale (ft.)

BoRit Asbestos Superfund Site, OU-2
Ambler, Pennsylvania

Figure 3B
CROSS SECTION B-B'

BOSTON BEER BORIT.GPJ - 12/15/10

LEGEND

- Fill
- Light Process Waste (LPW)
- Alluvium
- Asbestos Containing Material (ACM)
- Water Level

ELEVATION (feet)

240
230
220
210
200
190
180
170
160

Existing Ground Surface

Borings Projected onto Profile

Tannery Run

GT-04

SPT-N: 12, 16, 4, 3, 2, 0, 1, 2, 2, 2, 2, 0, 0, 0, 12, 50, 12, 65, 50

GT-06

SPT-N: 2, 2, 0, 0, 0, 0, 0, 0, 2, 1, 2, 4, 2, 1, 2, 0, 2, 77

GT-07

SPT-N: 5, 4, 8, 6, 6, 2, 2, 7, 0, 59

15 0 30
Horizontal Scale (ft.)

5 0 10
Vertical Scale (ft.)

CDM
Camp Dresser & McKee

BoRit Asbestos Superfund Site, OU-2
Ambler, PA

Figure 3C
CROSS SECTION C-C'

BOSTON BEER BORIT.GPJ - 12/15/10

Tables

BoRit Asbestos
Superfund Site
Ambler, PA

Table 1
Summary of Subsurface Conditons
Previous Explorations

Point ID	Approximate Ground Surface El.	Total Exploration Depth (ft)	Strata Thickness (ft)			
			Topsoil/ Fill	ACM	LPW	Native
APPZ-02	188	25	-	16.8	-	8.2
APPZ-03	188.5	28	0.4	19.6	-	8
APPZ-03A	192	25	-	5.4	-	19.6
APPZ-29	180	20	-	15	1	4
APSB-01	194	20	8	-	-	12
APSB-02	194	12	5.3	0.5	-	6.2
APSB-03	195	12	5	7.0	-	
APSB-04	194	8	4	-	-	8
APSB-05	194	13.3	1	4.4	-	7.9
APSB-06	192	12	4	4.0	-	4
APSB-07	206	30	-	24.2	-	5.8
APSB-08	220	45	-	40.6	-	4.4
APSB-09	194	15	0.3	9.7	-	5
APSB-10	195	18.5	0.2	15.3	-	3
APSB-11	194	15	5.6	5.2	-	4.2
APSB-12	200	18.4	0.3	15.5	-	2.6
APSB-13	219	40	-	36.0	1	3
APSB-14	200	11	0.5	3.5	5	2
APSB-15	199	25	-	21.5	-	3.5
APSB-16	216	33	6	25.0	-	2
APSB-17	216.5	41.6	-	36.7	-	4.9
APSB-18	197	15	5	0.9	-	9.1
APSB-19	195	16	12	-	-	4
APSB-20	213	34.5	15	13.0	-	9.5
APSB-21	211	28.8	-	26.0	-	2.8
APSB-22	199	18.8	-	15.8	-	3
APSB-23	206.5	24	15	8.0	-	1
APSB-24	194	20	10	5.0	-	5
APSB-25	200	25	15	3.0	-	7
APSB-26	189	10	-	5.4	-	4.6
APSB-27	189	20	-	17.0	-	3
APSB-28	189.5	25	1	20.0	-	4
APSB-30	199	4	0.5	3.5	-	-
APSB-31	197	4	0.5	3.0	-	0.5
APSB-32	193	4	1	2.0	-	1
CKFP-01A	170	1	-	-	-	1
CKFP-01B	170	1.5	-	-	-	1.5
CKFP-01C	170	1.5	-	-	-	1.5
CKFP-01D	170	2	-	-	-	2
CKFP-01E	170	1	-	-	-	1
CKFP-02A	174	2	1	1.0	-	-
CKFP-02B	174	2	0.7	1.3	-	-
CKFP-02C	174	2	1.5	0.5	-	-
CKFP-02D	174	2	1	1.0	-	-
CKFP-02E	174	2	1	1.0	-	-
CKFP-03A	175	2	-	-	-	2
CKFP-03B	174.5	2	-	-	-	2
CKFP-03C	174.5	2	-	-	-	2
CKFP-03D	175.5	2	-	-	-	2
CKFP-03E	173	2	-	-	-	2
CKFP-04A	175	2	1.5	0.5	-	-
CKFP-04B	174.5	1.2	-	-	-	1.2
CKFP-04C	175	2	-	1.0	-	1
CKFP-04D	175.5	2	-	-	-	2
CKFP-04E	175.5	2	-	-	-	2
CKFP-05A	178	2	-	-	-	2
CKFP-05B	178	2	-	-	-	2
CKFP-05C	178	2	-	-	-	2

BoRit Asbestos
Superfund Site
Ambler, PA

Table 1
Summary of Subsurface Conditons
Previous Explorations

Point ID	Approximate Ground Surface El.	Total Exploration Depth (ft)	Strata Thickness (ft)			
			Topsoil/ Fill	ACM	LPW	Native
CKFP-05D	178	2	-	-	-	2
CKFP-05E	178	1	-	-	-	1
CKFP-06A	180	2	2	-	-	-
CKFP-06B	180	2	2	-	-	-
CKFP-06C	180	2	2	-	-	-
CKFP-06D	180	2	2	-	-	-
CKFP-06E	180	2	2	-	-	-
CKFP-07A	183	1.5	-	-	-	1.5
CKFP-07B	183	2	-	-	-	2
CKFP-07C	183	2	-	-	-	2
CKFP-07D	183	2	-	-	-	2
CKFP-07E	183	2	-	-	-	2
CKFP-08A	174	1	-	-	-	1
CKFP-08B	174	2	-	-	-	2
CKFP-08C	174	2	-	-	-	2
CKFP-08D	174	1	-	-	-	1
CKFP-08E	174	1.2	-	-	-	1.2
CKSB-01	180.5	4	0.5	3.5		-
PKPZ-01	195	28.5	2.7	17.3	-	8.5
PKPZ-02	195	27	2.5	17.7	-	6.8
PKPZ-03	194.5	25	1	19.0	-	5
PKSB-01	188	10	1.3	7.7	-	5
PKSB-02	191	12	0.6	8.6	-	2.8
PKSB-03	192.5	20	0.7	14.3	-	5
PKSB-04	192.5	15	0.4	9.6	-	5
PKSB-05	195	15	0.8	9.2	-	5
PKSB-06	190	10	-	1.5	-	9.5
PKSB-07	189	10	0.1	1.7	-	8.3
PKSB-08	190	10	1.8	-	-	8.2
PKSB-09	193	15	0.2	7.0	-	7.8
PKSB-10	192.5	16	0.5	8.0	-	7.5
PKSB-11	190.5	12	0.5	7.5	-	4
PKSB-12	188	12	0.2	6.3	-	5.5
PKSB-13	196	25	0.7	16.3	-	8
PKSB-14	192	12	0.3	11.7	-	-
PKSB-15	193.5	16	0.3	11.7	-	4
PKSB-16	195	20	0.4	11.0	-	8.6
PKSB-17	196	20	0.4	11.8	-	7.8
PKSB-18	196	17.5	0.5	12.0	-	5
PKSB-19	195	15	1	13.0	-	1
PKSB-20	195	20	0.5	9.5	-	10
PKSB-21	194.5	18	0.5	14.5	-	8
PKSB-22	194	19	0.5	16.0	-	2.5
PKSB-23	192.5	16	3.5	9.5	-	3
PKSB-24	191	15	11.5	-	-	3.5
PKSB-25	191	20	1	11.0	-	8
PKSB-26	192.5	18	0.5	11.3	-	1.7
PKSB-27	193	17	1	15.0	-	1
PKSB-28	195	20	1	15.9	-	3.1
PKSB-29	196	20	1	14.5	-	4.5
PKSB-30	196	20	0.3	11.9	-	7.8
PKSB-31	196	17	1	9.5	-	6.5
PKSB-32	195.5	20	0.3	10.3	-	9.4
PKSB-33	194.5	20	1	11.0	-	9
PKSB-34	192.5	20	1	11.5	-	7.5
PKSB-35	195	20	1	15.0	-	4
PKSB-36	196	25	0.4	16.4	-	8.2
PKSB-37	196	25	1	19.0	-	5
PKSB-38	196	24.5	1	23.5	-	-

BoRit Asbestos
Superfund Site
Ambler, PA

Table 1
Summary of Subsurface Conditons
Previous Explorations

Point ID	Approximate Ground Surface El.	Total Exploration Depth (ft)	Strata Thickness (ft)			
			Topsoil/ Fill	ACM	LPW	Native
PKSB-39	196	24	1	19.0	-	4
PKSB-40	194	25	1	15.0	-	9
PKSB-41	187	10	1.5	6.6	-	1.9
PKSB-42	194.5	20	1	14.0	-	5
PKSB-43	194.5	23	-	20.0	-	3
PKSB-44	196	25	0.2	16.4	-	8.4
PKSB-45	195.5	30	2.4	17.6	-	10
PKSB-46	194	20	1	15.0	-	4
PKSB-47	194	24	1	19.0	-	4
PKSB-48	195	30	1.7	20.7	-	7.6
PKSB-49	196	25	0.8	16.2	-	8
PKSB-50	195	25	0.7	16.3	-	8
PKSB-51	194.5	25	5	16.0	-	4
PKSB-52	185.5	10	0.6	5.4	-	4
RVSB-01	192	4	0.5		-	3.5
RVSB-02	190	4	1.5	1.5	-	1
RVSB-03	190	4	0.5	1.5	-	2
RVSB-04	190	4	1	0.5	-	2.5
RVSB-05	190	4	1	2.0	-	1
RVSB-06	190	3.5	1	1.0	-	1.5
RVSB-07	190	4	0.5	0.5	-	3
RVSB-08	190	4	-	3.0	-	1
RVSB-09	190	2	1	1.0	-	-
RVSB-10	190	4	1	2.0	-	1
RVSB-11	190	4	0.5	0.5	-	3
RVSB-12	190	4	4	-	-	-
RVSB-13	193	10	0.3	3.2	-	6.5
RVSB-14	194	20	6.1	9.8	-	4
RVSB-15	194	15	0.5	4.5	-	10
RVSB-16	194	15	2	-	-	13
RVSB-17	194	15	5.8	1.4	-	7.8
RVSB-18	192	12	5	-	-	7
RVSB-19	192	4	-	-	-	4
RVSB-20	192	4	-	-	-	4
RVSB-21	188	3.5	3	0.5	-	-
RVSB-22	190	3	1	2.0	-	-
RVSB-23	190	3	2.5	0.5	-	-
RVSB-24	190	3	2	1.0	-	-

Abbreviations:

-	Not encountered
ACM	Asbestos-Containing Material
LPW	Light Process Waste

BoRit Asbestos
Superfund Site
Ambler, PA

Table 2
Summary of Subsurface Conditions - Phase 2 Explorations

Test Boring No.	Location	Groundsurface El. (ft)[1]	Total Exploration Depth (ft)	Overburden Strata Thickness				Estimated Top of Waste El.	Estimated Bottom of Waste El.	Depth to Groundwater (ft)	Estimated Groundwater El. (ft)
				Fill	ACM	LPW	Alluvium				
GT-1	Park	194.2	20	4	14[3]	2	-	190.2	174.2	16.0	178.2
GT-2	Park	195.1	26	12	14[4]	-	-	195	169	14.0	181.1
GT-3	Park	196.5	28	4	>24[5]	-	-	197	168.5	18.0	178.5
GT-4	Asbestos Pile	208.3	40	6	-	30	>4	202	172	16.0	192.3
GT-5	Asbestos Pile	194.7	14	2	6[6]	6[7]		193	181	8.0	186.7
GT-6	Asbestos Pile	220.1	40	2	-	36	2	218	182	16.0	204.1
GT-7	Asbestos Pile	208.6	24	2	8[8]	14[9]	-	207	185	22	186.6
GT-8	Asbestos Pile	212.9	30	4	-	26	-	209	183	14.0	198.9
GT-9	Asbestos Pile	190.9	30	10[10]	14[11]	4	2	187	169	22.0	168.9

Notes:

1. Test boring locations surveyed by
2. NE = Not Encountered
3. 4 feet of ACM above LPW, 10 feet of ACM below LPW.
4. 12 feet of ACM above FILL, 2 feet of ACM below FILL.
5. 20 feet of ACM above FILL, 4 feet of ACM below FILL.
6. 4 feet of ACM below first LPW layer, 2 feet of ACM below the second LPW layer.
7. 4 feet of LPW below FILL, 2 feet of LPW below the first ACM layer.
8. 2 feet of ACM below FILL, 6 feet of ACM below LPW.
9. 12 feet of LPW below first ACM layer, 2 feet of LPW below second ACM layer.
10. 4 feet of FILL above the first ACM layer, 6 feet of FILL above ALLUVIUM.
11. 4 feet of ACM above LPW. 10 feet of ACM below LPW.

Abbreviations:

- - Not encountered
- > Indicates strata not fully penetrated
- ACM Asbestos-Containing Material
- LPW Light Process Waste

BoRit Asbestos Superfund Site
Ambler, Pennsylvania

Table 3
Summary of Geotechnical Index Test Results

Test Boring No.	Sample Depth (ft)	Strata	Moisture Content (%)	Grain Size Analysis [1]			Specific Gravity	Atterberg Limits [2]			USCS Classification [3]	Consolidation Compression Index[4]	Strength Parameters[5]	
				Gravel (%)	Sand (%)	Fines (%)		LL (%)	PL (%)	PI (%)			c' (psi)	Φ' (degrees)
							Samples							
*GT-01/GT-03	0-2	Clayey Fill	31.2	49.0	21.4	29.6	-	46	31	15	SM	-	-	-
*GT-01/GT-03	2-4/8-10	Gravelly Fill	36.6	72.8	16.6	10.6	-	NV	NP	NP	GP-GM	-	-	-
GT-02	0-2/4-8	ACM	45.3	54.5	32.3	13.2	2.44	93	72	21	GM	-	-	-
GT-02	2-4/8-12	ACM	34.8	61.1	30.4	7.9	2.63	NV	NP	NP	SP-SM	-	-	-
GT-03	2-6	ACM	46.7	22.3	56.4	21.3	-	NV	NP	NP	SM	-	-	-
GT-03	20-22	Clayey Fill	30.7	0.0	19.2	80.8	-	33	23	10	CL	-	-	-
GT-04	10-12	LPW	207.0	18.0	29.5	52.5	2.65	61	48	13	MH	1.08	3.1	41.3
GT-04	30-34	LPW	29.3	6.4	45.7	47.9	-	29	20	9	CL	-	-	-
GT-04	32-40	Alluvium	13.1	5.6	64.6	29.8	-	23	21	2	SM	-	-	-
GT-05	4-8	ACM/LPW	125.0	21.6	47.5	30.9	2.24	90	88	2	SM	-	-	-
GT-05	12-14	ACM	21.7	4.0	37.6	58.4	-	26	19	7	CL-ML	-	-	-
GT-06	4-6	LPW	116.6	19.2	41.7	39.1	2.52	112	78	34	MH	1.09	4.98	30.5
GT-06	14-16	LPW	132.9	34.6	20.3	45.1	2.65	110	69	41	SM	1.03	1.25	44.9
GT-06	37-40	Alluvium	27.1	20.5	62.8	16.7	-	NV	NP	NP	SM	-	-	-
GT-07	10-12	LPW	132.0	43.5	18.8	37.7	2.56	127	76	51	MH	1.05	1.99	37.4
GT-07	20-22	ACM	217.9	28.1	34.0	37.9	2.50	129	83	46	MH	3.12	0.322	30.9
GT-09	20-24	ACM/Silt	24.5	64.4	28.8	6.8	-	NV	NP	NP	SW-SM	-	-	-
GT-09	20-25	ACM	24.2	71.7	22.4	5.9	-	NV	NP	NP	GP-GM	-	-	-
GT-09	20-26	Clay	28.2	18.7	28.7	52.6	-	32	24	8	ML	-	-	-
GT-09	20-27	Clay/Silt	16.0	26.2	21.9	51.9	2.61	36	26	10	ML	-	-	-

Notes:

1 Grain size analysis performed in accordance with ASTM D422.
2 Atterberg Limit tests were performed in accordance with ASTM D4318.
3 USCS classifications were performed in accordance with ASTM D2488 and are based on the results of Atterberg limit tests.
4 Consolidation tests were performed in accordance with ASTM 2435.
5 Consolidated Undrained Shear Tests were performed in accordance with ASTM D4767.

Abbreviations:

MDD Maximum Dry Density, PCF
OMC Optimum Moisture Content, %
ML Silt, low plasticity
CL-ML Sandy Silty Clay
- testing not requested

BoRit Asbestos
Superfund Site
Ambler, PA

Table 4
Summary of Subsurface Waste Depths

Test Boring No.	Ground Surface El. (ft)[1]	Total Exploration Depth (ft)	Depth to Estimated Top of Waste (ft)	Depth to Estimated Bottom of Waste (ft)	Top of Waste Elevation BGS	Bottom of Waste Elevation BGS	Total Waste Thickness (ft)
APPZ-02	188	25	0	16.8	188	171.2	16.8
APPZ-03	188.5	28	0.4	20	188.1	168.5	19.6
APPZ-03A	192	25	0	5.4	192	186.6	5.4
APPZ-29	180	20	0	16	180	164	16.0
APSB-01	194	20	NE	NE	NE	NE	0.0
APSB-02	194	12	5.3	5.8	188.7	188.2	0.5
APSB-03	195	12	5	>12	190	NE	>7
APSB-04	194	8	NE	NE	NE	NE	0.0
APSB-05	194	13.3	1	5.4	193	188.6	4.4
APSB-06	192	12	4	8	188	184	4.0
APSB-07	206	30	0	24.2	206	181.8	24.2
APSB-08	220	45	0	40.6	220	179.4	40.6
APSB-09	194	15	0.3	10	193.7	184	9.7
APSB-10	195	18.5	0.2	15.5	194.8	179.5	15.3
APSB-11	194	15	5.6	10.8	188.4	183.2	5.2
APSB-12	200	18.4	0.3	15.8	199.7	184.2	15.5
APSB-13	219	40	0	37	219	182	37.0
APSB-14	200	11	0.5	9	199.5	191	8.5
APSB-15	199	25	0	21.5	199	177.5	21.5
APSB-16	216	33	6	31	210	185	25.0
APSB-17	216.5	41.6	0	36.7	216.5	179.8	36.7
APSB-18	197	15	5	5.9	192	191.1	0.9
APSB-19	195	16	NE	NE	NE	NE	0.0
APSB-20	213	34.5	15	28	198	185	13.0
APSB-21	211	28.8	0	26	211	185	26.0
APSB-22	199	18.8	0	15.8	199	183.2	15.8
APSB-23	206.5	24	15	23	191.5	183.5	8.0
APSB-24	194	20	10	12.2	184	181.8	2.2
APSB-25	200	25	15	18	185	182	3.0
APSB-26	189	10	0	5.4	189	183.6	5.4
APSB-27	189	20	0	17	189	172	17.0
APSB-28	189.5	25	1	21	188.5	168.5	20.0
APSB-30	199	4	0.5	>4	198.5	NE	>3.5
APSB-31	197	4	0.5	3.5	196.5	193.5	3.0
APSB-32	193	4	1	3	192	190	2.0
CKSB-01	180.5	4	0	>4	180.5	NE	>4
GT-01	194.2	20	6	20	188.2	174.2	14.0
GT-02	195.05	26	0.5	26	194.55	169.05	25.5
GT-03	196.53	28	0	25	196.53	171.53	25.0
GT-04	208.27	40	6	35.5	202.27	172.77	29.5
GT-05	194.69	14	2	>14	192.69	NE	>12
GT-06	220.09	40	2	37.5	218.09	182.59	35.5
GT-07	208.63	24	2	>24	206.63	NE	>22
GT-08	212.91	30	4.3	>30	208.61	NE	>25.7
GT-09	190.92	30	4	20	186.92	170.92	16.0
MW-01	191.59	53	1	11	190.59	180.59	10.0
MW-02	196.48	63	2	21	194.48	175.48	19.0
MW-03	181.7	53	NE	NE	NE	NE	0.0
MW-04	195.79	100	2	14	193.79	181.79	12.0
MW-05	190.99	64	2	18.3	188.99	172.69	16.3

BoRit Asbestos
Superfund Site
Ambler, PA

Table 4
Summary of Subsurface Waste Depths

Test Boring No.	Ground Surface El. (ft)[1]	Total Exploration Depth (ft)	Depth to Estimated Top of Waste (ft)	Depth to Estimated Bottom of Waste (ft)	Top of Waste Elevation BGS	Bottom of Waste Elevation BGS	Total Waste Thickness (ft)
MW-06	195.07	53	2	8	193.07	187.07	6.0
PKPZ-01	195	28.5	2.7	15	192.3	180	12.3
PKPZ-02	195	27	2.5	20.2	192.5	174.8	17.7
PKPZ-03	194.5	25	1	20	193.5	174.5	19.0
PKSB-01	188	10	1.3	9	186.7	179	7.7
PKSB-02	191	12	0.6	9.2	190.4	181.8	8.6
PKSB-03	192.5	20	0.7	10.4	191.8	182.1	9.7
PKSB-04	192.5	15	0.4	10	192.1	182.5	9.6
PKSB-05	195	15	0.8	8	194.2	187	7.2
PKSB-06	190	10	0	1.5	190	188.5	1.5
PKSB-07	189	10	0.1	1.8	188.9	187.2	1.7
PKSB-08	190	10	NE	NE	NE	NE	0.0
PKSB-09	193	15	0.2	7	192.8	186	6.8
PKSB-10	192.5	16	0.5	8	192	184.5	7.5
PKSB-11	190.5	12	0.5	6	190	184.5	5.5
PKSB-12	188	12	0.2	6.5	187.8	181.5	6.3
PKSB-13	196	25	0.7	17	195.3	179	16.3
PKSB-14	192	12	0.3	>12	191.7	NE	>11.7
PKSB-15	193.5	16	0.3	11	193.2	182.5	10.7
PKSB-16	195	20	0.4	10.8	194.6	184.2	10.4
PKSB-17	196	20	0.4	11.1	195.6	184.9	10.7
PKSB-18	196	17.5	0.5	10.8	195.5	185.2	10.3
PKSB-19	195	15	1	10	194	185	9.0
PKSB-20	195	20	0.5	10	194.5	185	9.5
PKSB-21	194.5	18	0.5	15	194	179.5	14.5
PKSB-22	194	19	0.5	16.5	193.5	177.5	16.0
PKSB-23	192.5	16	3.5	13	189	179.5	9.5
PKSB-24	191	15	0	11.5	191	179.5	11.5
PKSB-25	191	20	1	12	190	179	11.0
PKSB-26	192.5	18	5	16.3	187.5	176.2	11.3
PKSB-27	193	17	1	16	192	177	15.0
PKSB-28	195	20	1	16.9	194	178.1	15.9
PKSB-29	196	20	1	15.5	195	180.5	14.5
PKSB-30	196	20	0.3	10.8	195.7	185.2	10.5
PKSB-31	196	17	1	10.5	195	185.5	9.5
PKSB-32	195.5	20	0.3	10.6	195.2	184.9	10.3
PKSB-33	194.5	20	1	11	193.5	183.5	10.0
PKSB-34	192.5	20	1	10	191.5	182.5	9.0
PKSB-35	195	20	1	16	194	179	15.0
PKSB-36	196	25	0.4	16.8	195.6	179.2	16.4
PKSB-37	196	25	1	20	195	176	19.0
PKSB-38	196	24.5	1	>24.5	195	NE	>23.5
PKSB-39	196	24	1	20	195	176	19.0
PKSB-40	194	25	1	16	193	178	15.0
PKSB-41	187	10	1.5	8.1	185.5	178.9	6.6
PKSB-42	194.5	20	1	15	193.5	179.5	14.0
PKSB-43	194.5	23	0	20	194.5	174.5	20.0
PKSB-44	196	25	0.2	16.6	195.8	179.4	16.4
PKSB-45	195.5	30	2.4	20	193.1	175.5	17.6
PKSB-46	194	20	1	16	193	178	15.0

BoRit Asbestos
Superfund Site
Ambler, PA

Table 4
Summary of Subsurface Waste Depths

Test Boring No.	Ground Surface El. (ft)[1]	Total Exploration Depth (ft)	Depth to Estimated Top of Waste (ft)	Depth to Estimated Bottom of Waste (ft)	Top of Waste Elevation BGS	Bottom of Waste Elevation BGS	Total Waste Thickness (ft)
PKSB-47	194	24	1	20	193	174	19.0
PKSB-48	195	30	1.7	22.4	193.3	172.6	20.7
PKSB-49	196	25	0.8	17	195.2	179	16.2
PKSB-50	195	25	0.7	17	194.3	178	16.3
PKSB-51	194.5	25	5	21	189.5	173.5	16.0
PKSB-52	185.5	10	0.6	6	184.9	179.5	5.4
RVSB-01	192	4	NE	NE	NE	NE	0.0
RVSB-02	190	4	1.4	3	188.6	187	1.6
RVSB-03	190	4	0.5	2	189.5	188	1.5
RVSB-04	190	4	1	1.5	189	188.5	0.5
RVSB-05	190	4	1	3	189	187	2.0
RVSB-06	190	3.5	1	2	189	188	1.0
RVSB-07	190	4	0.5	1	189.5	189	0.5
RVSB-08	190	4	0	3	190	187	3.0
RVSB-09	190	2	1	>2	189	NE	>1
RVSB-10	190	4	1	3	189	187	2.0
RVSB-11	190	4	0.5	1	189.5	189	0.5
RVSB-12	190	4	NE	NE	NE	NE	0.0
RVSB-13	193	10	0.3	3.5	192.7	189.5	3.2
RVSB-14	194	20	6.2	6.5	187.8	187.5	0.3
RVSB-15	194	15	0.5	2	193.5	192	1.5
RVSB-16	194	15	NE	NE	NE	NE	0.0
RVSB-17	194	15	5.8	7.2	188.2	186.8	1.4
RVSB-18	192	12	NE	NE	NE	NE	0.0
RVSB-19	192	4	NE	NE	NE	NE	0.0
RVSB-20	192	4	NE	NE	NE	NE	0.0
RVSB-21	188	3.5	3	>3.5	185	NE	>0.5
RVSB-22	190	3	1	>3	189	NE	>2
RVSB-23	190	3	2.5	>3	187.5	NE	>0.5
RVSB-24	190	3	2	>3	188	NE	>1

Note:

1. Elevations of recent borings were estimated based on site survey data.

Abbreviations:

NE	Not encountered
>	Indicates strata not fully penetrated
BGS	Below ground surface

Attachment A
Geotechnical Boring Logs

CAMP DRESSER & McKEE

CDM

Boring Number: GT-01

Client: USEPA
Project Name: BoRit Asbestos Superfund Site
Project Location: Park
Project Number: 62625.029.bas.fiz.mbdb2

Drilling Contractor/Driller: Unitech / Jay Blemings
Surface Elevation (ft.): 194.2
Drilling Method/Casing/Core Barrel Size: HSA / / 3.25
Total Depth (ft.): 20
Hammer Weight/Drop Height/ Spoon Size: 140 lb / in /2 in O.D.
Depth to Initial Water Level (ft): 16
Bore Hole Location:

Depth	Date	Time
16		

N: **310101.1** E: **2672373.775**
Abandonment Method: Cuttings and Grout
Drilling Date: Start: 11/4/2010 **End:** 11/4/2010
Logged By: JAC

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
194.2 0	SS	1	24	2 5 9 9	12			FILL	Wet, medium dense, brown, fine, sandy, silty CLAY, 2" topsoil.	
	SS	2	24	2 5 1 3	7				Moist, loose, light gray, medium, sandy GRAVEL.	
189.2 5	SS	3	24	8 6 3 3	10			ACM	6" of moist, loose, light gray, coarse, sandy GRAVEL, becoming moist, brown, clay-coated GRAVEL.	
	SS	4	24	5 3 3 8	10				Moist, medium stiff, gray, fine, shale-like material, woven patterning.	
	SS	5	24	2 2 2 1	14			LPW	6" moist, loose, gray GRAVEL, then 8" moist, soft, light gray, toothpaste-textured waste.	
184.2 10	SS	6	24	2 1 1 1	10			ACM	3" moist, very soft, brown, silty CLAY, then moist, light gray, shale-like ASBESTOS.	
	SS	7	24	6 3 4 3	14				Moist, loose, light gray, well-graded, gravelly ASBESTOS.	
179.2 15	SS	8	24	7 9 8 7	20				SAA.	
	SS	9	24	7 2 5 6	24				Wet, medium stiff, gray-brown CLAY.	
174.2	SS	10	24	6 50/4	8				Wet, medium dense, gray, well-graded, gravelly ASBESTOS and wet, purple-brown, clayey SANDSTONE in the tip.	

Sample Types

AS - Auger/Grab Sample
CS - California Sampler
BQ - 1.5" Rock Core
NQ - 2" Rock Core
HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
GP - Geoprobe

Consistency vs Blowcount/Foot

Granular (Sand):
V. Loose: 0-4 Dense: 30-50
Loose: 4-10 V. Dense: >50
M. Dense: 10-30

Fine Grained (Clay):
V. Soft: <2 Stiff: 8-15
Soft: 2-4 V. Stiff: 15-30
M. Stiff: 4-8 Hard: >30

Burmister Classification

and 35-50%
some 20-35%
little 10-20%
trace <10%
moisture, density, color

Reviewed by: **Date:** **Boring Number: GT-01**

BL BORIT.GPJ - 4/28/11

CAMP DRESSER & McKEE

CDM

Boring Number: GT-02

Client: USEPA
Project Name: BoRit Asbestos Superfund Site
Project Location: Park
Project Number: 62625.029.bas.fiz.mbdb2

Drilling Contractor/Driller: Unitech / Jay Blemings
Surface Elevation (ft.): 195.05
Drilling Method/Casing/Core Barrel Size: HSA / / 3.25
Total Depth (ft.): 26
Hammer Weight/Drop Height/ Spoon Size: 140 lb / in /2 in O.D.
Depth to Initial Water Level (ft): 14
Bore Hole Location:

Depth	Date	Time
14		

N: **309720.681** E: **2672866.005**
Abandonment Method: Cuttings and Grout
Drilling Date: Start: 11/5/2010 **End:** 11/5/2010
Logged By: JAC

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
195.1 0	SS	1	24	1 8 20 15	18			ACM	6" moist, brown, silty TOPSOIL, then 12" moist, medium dense, gray, coarse, gravelly ASBESTOS.	
	SS	2	24	11 11 3 3	10				Moist, medium dense, gray, fibrous and medium gravelly ASBESTOS.	
190.1 5	SS	3	24	6 8 11 12	20				Moist, medium dense, gray, remoldable, silty, fine gravelly ASBESTOS.	
	SS	4	24	10 13 13 18	18				SAA.	
	SS	5	24	16 12 10 16	15				Moist, medium dense, gray, fibrous, gravelly ASBESTOS, then 3" of brick, gravel, and sand.	
185.1 10	SS	6	24	6 3 10 5	21				SAA, then 9" of brick glass, gravel, and sand.	
	SS	7	24	3 3 2 2	10			FILL	Moist, loose, black, gravelly SAND and silt.	
180.1 15	SS	8	24	WOH WOH 7 8	16				10" wet, very soft, gray CLAY, then moist, medium dense, red SAND, little fines.	
	SS	9	24	8 20 30 30	18				Wet, hard, brown, fine, sandy CLAY, then 10" of moist, hard, red and yellow SAND or brick.	
175.1	SS	10	24	15 8 15 20	15				Wet, hard, brown, fine, sandy CLAY, with interstitial very stiff, red CLAY.	

Sample Types

AS - Auger/Grab Sample
CS - California Sampler
BQ - 1.5" Rock Core
NQ - 2" Rock Core
HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
GP - Geoprobe

Consistency vs Blowcount/Foot

Granular (Sand):
V. Loose: 0-4
Loose: 4-10
M. Dense: 10-30
Dense: 30-50
V. Dense: >50

Fine Grained (Clay):
V. Soft: <2
Soft: 2-4
M. Stiff: 4-8
Stiff: 8-15
V. Stiff: 15-30
Hard: >30

Burmister Classification

and 35-50%
some 20-35%
little 10-20%
trace <10%
moisture, density, color

Reviewed by: **Date:** **Boring Number: GT-02**

BL BORIT.GPJ - 4/28/11

CAMP DRESSER & McKEE

CDM

Boring Number: GT-02

Client: USEPA
Project Location: Park

Project Name: BoRit Asbestos Superfund Site
Project Number: 62625.029.bas.fiz.mbdb2

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
175.1 / 20	SS	11	24	16 18 20 15	15			FILL	Wet, dense, brown, well-graded SAND, some rounded gravel.	
	SS	12	24	12 12 20 23	17				Moist, dense, red-brown, well-graded SAND, becoming very dense, sandy, shale-like rock.	
170.1 / 25	SS	13	24	28 50/4	10			ACM	Wet, hard, brown CLAY and large, gravelly ASBESTOS, with sandstone in the tip.	
165.1 / 30										
160.1 / 35										
155.1 / 40										
150.1 / 45										

BL BORIT.GPJ - 4/28/11

CAMP DRESSER & McKEE

CDM

Boring Number: GT-03

Client: USEPA
Project Name: BoRit Asbestos Superfund Site
Project Location: Park
Project Number: 62625.029.bas.fiz.mbdb2

Drilling Contractor/Driller: Unitech / Jay Blemings
Surface Elevation (ft.): 196.53
Drilling Method/Casing/Core Barrel Size: HSA / / 3.25
Total Depth (ft.): 28
Hammer Weight/Drop Height/ Spoon Size: 140 lb / in /2 in O.D.
Depth to Initial Water Level (ft): 19
Bore Hole Location:
Depth 19 **Date** **Time**
N: **309540.662** E: **2672594.617**
Abandonment Method: Cuttings and Grout
Drilling Date: Start: 11/5/2010 **End:** 11/5/2010
Logged By: JAC

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
196.5 0	SS	1	24	6 8 9 6	13			ACM	2" moist, brown, silty TOPSOIL, then very stiff, gray, fibrous ASBESTOS.	
	SS	2	24	6 6 5 2	6				Moist, stiff, gray, fluffy, fine, gravelly ASBESTOS.	
191.5 5	SS	3	24	3 3 4 2	23				Moist, medium stiff, silty, well-graded, gravelly ASBESTOS, with 3" of fluffy fibers at the tip.	
	SS	4	24	3 2 2 1	4				Moist, soft, brown, silty, fine GRAVEL and ASBESTOS.	
	SS	5	24	10 10 4 4	9				Moist, stiff , brown, fibrous, gravelly ASBESTOS.	
186.5 10	SS	6	24	2 4 6 9	1				Dry, medium dense, light gray, gravelly ASBESTOS, some quartz-like rock.	
	SS	7	24	2 3 10 3	3				Moist, stiff, gray, gravelly ASBESTOS.	
181.5 15	SS	8	24	WOH 2 3 4	14				Moist, medium stiff, light gray, crumbly, fine ASBESTOS, becoming white with some black spots.	
	SS	9	24	2 3 3 4	24				Moist, medium stiff, light gray, fine, gravelly ASBESTOS.	
176.5	SS	10	24	2 3 3 4	24				SAA, then bottom 6" wet, medium dense, dark brown CLAY and gravelly ASBESTOS.	

Sample Types

AS - Auger/Grab Sample
CS - California Sampler
BQ - 1.5" Rock Core
NQ - 2" Rock Core
HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
GP - Geoprobe

Consistency vs Blowcount/Foot

Granular (Sand):
V. Loose: 0-4 Loose: 4-10 M. Dense: 10-30 Dense: 30-50 V. Dense: >50

Fine Grained (Clay):
V. Soft: <2 Soft: 2-4 M. Stiff: 4-8 Stiff: 8-15 V. Stiff: 15-30 Hard: >30

Burmister Classification

and 35-50%
some 20-35%
little 10-20%
trace <10%
moisture, density, color

Reviewed by: **Date:** **Boring Number: GT-03**

BL BORIT.GPJ - 4/28/11

CAMP DRESSER & McKEE

CDM

Boring Number: GT-03

Client: USEPA
Project Location: Park

Project Name: BoRit Asbestos Superfund Site
Project Number: 62625.029.bas.fiz.mbdb2

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
176.5 20	SS	11	24	1 WOH WOH WOH	24			FILL	Wet, very soft, brown CLAY, trace gravel.	
	SS	12	24	WOH WOH 12 14	20				Wet, very stiff, brown CLAY, trace gravel.	
171.5 25	SS	13	24	21 25 23 19	24			ACM	Wet, stiff, white, fluffy, toothpastey waste, then hard, sandy, rocky GRAVEL.	
	SS	14	24	50/3	24				Wet, hard, brown, soupy GRAVEL, little fines.	
166.5 30										
161.5 35										
156.5 40										
151.5 45										

BL BORIT.GPJ - 4/28/11

CAMP DRESSER & McKEE

CDM

Boring Number: GT-04

Client: USEPA
Project Name: BoRit Asbestos Superfund Site
Project Location: Asbestos Pile
Project Number: 62625.029.bas.fiz.mbdb2

Drilling Contractor/Driller: Unitech / Jay Blemings
Surface Elevation (ft.): 208.27
Drilling Method/Casing/Core Barrel Size: HSA / / 3.25
Total Depth (ft.): 40
Hammer Weight/Drop Height/ Spoon Size: 140 lb / in /2 in O.D.
Depth to Initial Water Level (ft): 16
Bore Hole Location:

Depth	Date	Time
16		

N: **309053.966** E: **2673541.445**
Abandonment Method: Cuttings and Grout
Drilling Date: Start: 11/8/2010 **End:** 11/8/2010
Logged By: JAC

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
208.3 0	SS	1	24	3 5 7 5	15			FILL	Moist, stiff, brown, fine, sandy CLAY.	
	SS	2	24	5 8 8 8	11				Moist, very stiff, brown, fine, sandy CLAY, trace brick.	
203.3 5	SS	3	24	2 2 2 1	6				Moist, soft, brown, fine, sandy CLAY, trace brick.	
	SS	4	24	1 1 2 1	4			LPW	Dry, very loose, white, sandy, powdery, light process waste.	
	SS	5	24	1 1 1 2	24				Moist, stiff, white, toothpastey, light process waste.	
198.3 10	ST	6	24		24					Shelby Tube
	SS	7	24	WOH WOH WOH WOH	22				Moist, very soft, white, toothpastey, light process waste.	
193.3 15	SS	8	24	WOH WOH 1 1	3				SAA.	
	SS	9	24	1 1 1 1	21				Wet SAA.	
188.3	SS	10	24	1 1 1 1	24				SAA, bottom 12", black.	Sulfurish Odor

Sample Types

AS - Auger/Grab Sample
CS - California Sampler
BQ - 1.5" Rock Core
NQ - 2" Rock Core
HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
GP - Geoprobe

Consistency vs Blowcount/Foot

Granular (Sand):
V. Loose: 0-4 Dense: 30-50
Loose: 4-10 V. Dense: >50
M. Dense: 10-30

Fine Grained (Clay):
V. Soft: <2 Stiff: 8-15
Soft: 2-4 V. Stiff: 15-30
M. Stiff: 4-8 Hard: >30

Burmister Classification

and 35-50%
some 20-35%
little 10-20%
trace <10%
moisture, density, color

Reviewed by: **Date:** **Boring Number: GT-04**

BL BORIT.GPJ - 4/28/11

CAMP DRESSER & McKEE

CDM

Boring Number: GT-04

Client: USEPA
Project Name: BoRit Asbestos Superfund Site
Project Location: Asbestos Pile
Project Number: 62625.029.bas.fiz.mbdb2

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
188.3 / 20	SS	11	24	1 1 1 1	20			LPW	Moist, very soft, white, sticky, crumbly, toothpastey, light process waste.	
	SS	12	24	1 2 0 0	24				Wet SAA, with white and pink layers.	
183.3 / 25	SS	13	24	WOR 0 0 0	24				Moist, very soft, white, sticky, crumbly, toothpastey, light process waste.	
	SS	14	24	WOR 0 0 0	24				SAA.	
	SS	15	24	WOR 0 0 0	20				SAA.	
178.3 / 30	SS	16	24	WOH WOH 12 14	24				SAA, then 6" of wet, medium dense, brown, fine, sandy CLAY.	
	SS	17	24	7 20 30 38	24				Wet, medium dense, brown, fine, sandy CLAY, then 6" of moist, medium dense, light brown SAND.	
173.3 / 35	SS	18	24	7 7 5 9	24				Wet, stiff, white, toothpastey, light process waste, then 6" moist, medium dense, brown, well-graded SAND.	
	SS	19	24	8 30 35 37	14			ALLUVIUM	Wet, very dense, brown, fine SAND.	
	SS	20	24	38 50/4	12				SAA.	
168.3 / 40										
163.3 / 45										

BL BORIT.GPJ - 4/28/11

CAMP DRESSER & McKEE

CDM

Boring Number: GT-05

Client: USEPA
Project Name: BoRit Asbestos Superfund Site
Project Location: Asbestos Pile
Project Number: 62625.029.bas.fiz.mbdb2

Drilling Contractor/Driller: Unitech / Jay Blemings
Surface Elevation (ft.): 194.69
Drilling Method/Casing/Core Barrel Size: HSA / / 3.25
Total Depth (ft.): 14
Hammer Weight/Drop Height/ Spoon Size: 140 lb / in /2 in O.D.
Depth to Initial Water Level (ft): 8
Bore Hole Location:

Depth	Date	Time
8		

N: **309137.246** E: **2673845.997**
Abandonment Method: Cuttings and Grout
Drilling Date: Start: 11/8/2010 **End:** 11/8/2010
Logged By: JAC

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
194.7 0	SS	1	24	3 7 7 3	18			FILL	Dry, stiff, red-brown SILT, becoming sandy GRAVEL.	
	SS	2	24	3 3 3 3	22			LPW	Moist, medium stiff, white, sticky, toothpastey, light process waste.	
189.7 5	SS	3	24	WOH WOH WOH 5	24				16" moist, very soft, white, toothpastey, light process waste, then 8", dark gray, gravelly ASBESTOS.	
	SS	4	24	3 3 6 6	24			ACM	Moist, loose, dark gray, sticky, fine-grained, sandy ASBESTOS.	
	SS	5	24	1 1 2 2	13				Wet, very loose, black, petroleum-sheen rainbow, coarse GRAVEL.	
184.7 10	SS	6	24	1 1 1 1	23			LPW	Wet, very soft, light pink to dark gray, toothpastey, light process waste.	
	SS	7	24	4 4 8 10	24			ACM	Wet, medium dense, gray, gravelly, coarse, sandy ASBESTOS and CLAY, little fine sand.	
179.7 15										
174.7										

Sample Types

AS - Auger/Grab Sample
CS - California Sampler
BQ - 1.5" Rock Core
NQ - 2" Rock Core
HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
GP - Geoprobe

Consistency vs Blowcount/Foot

Granular (Sand):
V. Loose: 0-4
Loose: 4-10
M. Dense: 10-30
Dense: 30-50
V. Dense: >50

Fine Grained (Clay):
V. Soft: <2
Soft: 2-4
M. Stiff: 4-8
Stiff: 8-15
V. Stiff: 15-30
Hard: >30

Burmister Classification

and 35-50%
some 20-35%
little 10-20%
trace <10%
moisture, density, color

Reviewed by: **Date:** **Boring Number: GT-05**

BL BORIT.GPJ - 4/28/11

CAMP DRESSER & McKEE

CDM

Boring Number: GT-06

Client: USEPA
Project Name: BoRit Asbestos Superfund Site
Project Location: Asbestos Pile
Project Number: 62625.029.bas.fiz.mbdb2

Drilling Contractor/Driller: Unitech / Jay Blemings
Surface Elevation (ft.): 220.09
Drilling Method/Casing/Core Barrel Size: HSA / / 3.25
Total Depth (ft.): 40
Hammer Weight/Drop Height/ Spoon Size: 140 lb / in /2 in O.D.
Depth to Initial Water Level (ft): 16
Bore Hole Location:

Depth	Date	Time
16		

N: **308999.388** E: **2673705.112**
Abandonment Method: Cuttings and Grout
Drilling Date: Start: 11/10/2010 **End:** 11/10/2010
Logged By: JAC

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
220.1										
0	SS	1	24	2 1 1 1	3			FILL	Moist, very soft, brown SILT, little gravel.	
	SS	2	24	1 1 1 1	24			LPW	Moist, very soft, white, toothpastey, light process waste.	
215.1 5	ST	3	24							Shelby Tube
	SS	4	24	WOH 0 0 0	7				Moist, very soft, white, toothpastey, light process waste.	
	SS	5	24	WOH 0 0 0	21				SAA.	
210.1 10	SS	6	24	WOH 0 0 0	24				SAA.	
	SS	7	24	WOH WOH WOH 1	24				SAA.	
205.1 15	ST	8	24							Shelby Tube
	SS	9	24	WOH 0 0 0	20				Wet, very soft, white, toothpastey, light process waste.	
	SS	10	24	WOR 0 0 0	23				SAA.	
200.1										

Sample Types

AS - Auger/Grab Sample
CS - California Sampler
BQ - 1.5" Rock Core
NQ - 2" Rock Core
HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
GP - Geoprobe

Consistency vs Blowcount/Foot

Granular (Sand):
V. Loose: 0-4 Loose: 4-10 M. Dense: 10-30 Dense: 30-50 V. Dense: >50

Fine Grained (Clay):
V. Soft: <2 Soft: 2-4 M. Stiff: 4-8 Stiff: 8-15 V. Stiff: 15-30 Hard: >30

Burmister Classification

and 35-50%
some 20-35%
little 10-20%
trace <10%
moisture, density, color

Reviewed by: **Date:** **Boring Number: GT-06**

BL BORIT.GPJ - 4/28/11

CAMP DRESSER & McKEE

CDM

Boring Number: GT-06

Client: USEPA
Project Name: BoRit Asbestos Superfund Site
Project Location: Asbestos Pile
Project Number: 62625.029.bas.fiz.mbdb2

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
200.1 / 20	SS	11	24	1 1 1 4	24			LPW	SAA.	
	SS	12	24	0 1 0 1	16				SAA.	
195.1 / 25	SS	13	24	1 1 1 1	24				SAA.	
	SS	14	24	1 1 3 2	22				SAA.	
	SS	15	24	1 1 1 1	14				SAA.	
190.1 / 30	SS	16	24	1 1 WOH 1	24				SAA.	
	SS	17	24	1 1 1 1	24				SAA.	
185.1 / 35	SS	18	24	WOH 0 0 0	24				SAA.	
	SS	19	24	WOR 1 1 1	24				SAA, then bottom 5" wet, very soft, brown, silty CLAY, trace gravel.	
180.1 / 40	SS	20	24	21 35 42 50/4	22			ALLUVIUM	Wet, very dense, brown, fine SAND, sandstone in tip.	
175.1 / 45										

CAMP DRESSER & McKEE

CDM

Boring Number: GT-07

Client: USEPA
Project Name: BoRit Asbestos Superfund Site
Project Location: Asbestos Pile
Project Number: 62625.029.bas.fiz.mbdb2

Drilling Contractor/Driller: Unitech / Jay Blemings
Surface Elevation (ft.): 208.63
Drilling Method/Casing/Core Barrel Size: HSA / / 3.25
Total Depth (ft.): 24
Hammer Weight/Drop Height/ Spoon Size: 140 lb / in /2 in O.D.
Depth to Initial Water Level (ft): 18-22
Bore Hole Location:

Depth	Date	Time
18-22		

N: **308906.631** E: **2673704.869**
Abandonment Method: Cuttings and Grout
Drilling Date: Start: 11/9/2010 **End:** 11/9/2010
Logged By: JAC

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
208.6 0	SS	1	24	3 2 3 2	6			FILL	Dry, medium stiff, brown SILT and organic material.	
	SS	2	24	2 2 2 2	4			ACM	Dry, very loose, dark brown, coarse, sandy, gravelly ASBESTOS.	
203.6 5	SS	3	24	5 5 3 5	24			LPW	Moist, medium stiff, white, toothpastey, light process waste.	
	SS	4	24	3 3 3 4	7				SAA.	
	SS	5	24	3 3 3 3	18				SAA.	
198.6 10	ST	6	24		24					Shelby Tube
	SS	7	24	1 1 1 1	24				Moist, very soft, white, toothpastey, light process waste.	
193.6 15	SS	8	24	1 1 1 2	0				No recovery.	
	SS	9	24	2 4 3 2	24			ACM	Moist, stiff, brown CLAY and gravelly ASBESTOS.	
188.6	SS	10	24	WOH 0 0 0	0				No recovery.	

Sample Types

AS - Auger/Grab Sample
CS - California Sampler
BQ - 1.5" Rock Core
NQ - 2" Rock Core
HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
GP - Geoprobe

Consistency vs Blowcount/Foot

Granular (Sand):

V. Loose:	0-4	Dense:	30-50
Loose:	4-10	V. Dense:	>50
M. Dense:	10-30		

Fine Grained (Clay):

V. Soft:	<2	Stiff:	8-15
Soft:	2-4	V. Stiff:	15-30
M. Stiff:	4-8	Hard:	>30

Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by: **Date:** **Boring Number: GT-07**

BL BORIT.GPJ - 4/28/11

CAMP DRESSER & McKEE

CDM

Boring Number: GT-07

Client: USEPA
Project Location: Asbestos Pile

Project Name: BoRit Asbestos Superfund Site
Project Number: 62625.029.bas.fiz.mbdb2

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
188.6 20	ST	11	24		24			ACM	Wet, hard, white, toothpastey, light process waste, then very dense SILT and gravel.	Shelby Tube
	SS	12	24	9 24 35 50/4	22			LPW		
183.6 25										
178.6 30										
173.6 35										
168.6 40										
163.6 45										

BL BORIT.GPJ - 4/28/11

CAMP DRESSER & McKEE

CDM

Boring Number: GT-08

Client: USEPA
Project Name: BoRit Asbestos Superfund Site
Project Location: Asbestos Pile
Project Number: 62625.029.bas.fiz.mbdb2

Drilling Contractor/Driller: Unitech / Jay Blemings
Surface Elevation (ft.): 212.91
Drilling Method/Casing/Core Barrel Size: HSA / / 3.25
Total Depth (ft.): 30
Hammer Weight/Drop Height/ Spoon Size: 140 lb / in /2 in O.D.
Depth to Initial Water Level (ft): 14
Bore Hole Location:

Depth	Date	Time
14		

N: **308870.812** E: **2673579.425**
Abandonment Method: Cuttings and Grout
Drilling Date: Start: 11/9/2010 **End:** 11/9/2010
Logged By: JAC

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
212.9 0	SS	1	24	6 6 7 5	6			FILL	Dry, medium stiff, yellow-red, fine sandy SILT.	
	SS	2	24	8 9 7 5	4				Dry, medium dense, yellow, sandstoney GRAVEL.	
207.9 5	SS	3	24	1 2 1 2	13			LPW	Moist, very loose, yellow, medium GRAVEL, then white, toothpastey waste.	
	SS	4	24	WOH 1 1 1	15				Moist, very soft, white, toothpastey, light process waste.	
	SS	5	24	1 1 1 1	24				SAA.	
202.9 10	SS	6	24	WOH WOH WOH 1	15				SAA.	
	SS	7	24	1 1 1 1	24				SAA.	
197.9 15	SS	8	24	1 2 2 1	24				Wet, soft, white, toothpastey, light process waste.	
	SS	9	24	WOR 1 1 1	24				Wet, very soft, white, toothpastey, light process waste.	
192.9	SS	10	24	1 1 1 1	17				SAA.	

Sample Types

AS - Auger/Grab Sample
CS - California Sampler
BQ - 1.5" Rock Core
NQ - 2" Rock Core
HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
GP - Geoprobe

Consistency vs Blowcount/Foot

Granular (Sand):
V. Loose: 0-4 Loose: 4-10 M. Dense: 10-30 Dense: 30-50 V. Dense: >50

Fine Grained (Clay):
V. Soft: <2 Soft: 2-4 M. Stiff: 4-8 Stiff: 8-15 V. Stiff: 15-30 Hard: >30

Burmister Classification

and 35-50%
some 20-35%
little 10-20%
trace <10%
moisture, density, color

Reviewed by: **Date:** **Boring Number: GT-08**

BL BORIT.GPJ - 4/28/11

CAMP DRESSER & McKEE

CDM

Boring Number: GT-08

Client: USEPA
Project Name: BoRit Asbestos Superfund Site
Project Location: Asbestos Pile
Project Number: 62625.029.bas.fiz.mbdb2

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
192.9 / 20	SS	11	24	2 2 2 1	24			LPW	Wet, soft, white, toothpastey, light process waste.	
	SS	12	24	1 1 1 3	24				Wet, very soft, white, toothpastey, light process waste.	
187.9 / 25	SS	13	24	2 1 1 1	24				SAA.	
	SS	14	24	1 2 1 1	24				Wet, soft, white, toothpastey, light process waste.	
	SS	15	24	50/5	5				SAA, 1" sandstone in tip.	
182.9 / 30										
177.9 / 35										
172.9 / 40										
167.9 / 45										

BL BORIT.GPJ - 4/28/11

CAMP DRESSER & McKEE

CDM

Boring Number: GT-09

Client: USEPA
Project Name: BoRit Asbestos Superfund Site
Project Location: Asbestos Pile
Project Number: 62625.029.bas.fiz.mbdb2

Drilling Contractor/Driller: Unitech / Jay Blemings
Surface Elevation (ft.): 190.92
Drilling Method/Casing/Core Barrel Size: HSA / / 3.25
Total Depth (ft.): 30
Hammer Weight/Drop Height/ Spoon Size: 140 lb / in /2 in O.D.
Depth to Initial Water Level (ft): 20-22
Bore Hole Location:

Depth	Date	Time
20-22		

N: **308754.27** E: **2673300.9**
Abandonment Method: Cuttings and Grout
Drilling Date: Start: 11/9/2010 **End:** 11/9/2010
Logged By: JAC

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
190.9 0	SS	1	24	9 9 6 5	0			FILL	No recovery.	
	SS	2	24	50/2	2				Dry, hard, brown, silty CLAY.	
185.9 5	SS	3	24	12 5 3 3	14			ACM	3" wood chips, then dry, loose, gray, gravelly ASBESTOS, some silt.	
	SS	4	24	2 2 3 3	8				Dry, loose, gray, coarse, gravelly ASBESTOS, some silt.	
	SS	5	24	2 2 2 5	14			LPW	SAA, and 4" moist, soft, white, toothpastey, light process waste.	
180.9 10	SS	6	24	2 2 3 3	2				Moist, soft, white, toothpastey, light process waste.	
	SS	7	24	2 2 1 2	10			ACM	Moist, soft, brown SILT and gravelly ASBESTOS.	
175.9 15	SS	8	24	3 2 1 2	7				SAA.	
	SS	9	24	1 1 1 4	7				SAA.	
170.9	SS	10	24	2 2 1 1	5				SAA.	

Sample Types

AS - Auger/Grab Sample
CS - California Sampler
BQ - 1.5" Rock Core
NQ - 2" Rock Core
HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
GP - Geoprobe

Consistency vs Blowcount/Foot

Granular (Sand):
V. Loose: 0-4
Loose: 4-10
M. Dense: 10-30
Dense: 30-50
V. Dense: >50

Fine Grained (Clay):
V. Soft: <2
Soft: 2-4
M. Stiff: 4-8
Stiff: 8-15
V. Stiff: 15-30
Hard: >30

Burmister Classification

and 35-50%
some 20-35%
little 10-20%
trace <10%
moisture, density, color

Reviewed by: **Date:** **Boring Number: GT-09**

BL BORIT.GPJ - 4/28/11

CAMP DRESSER & McKEE

CDM

Boring Number: GT-09

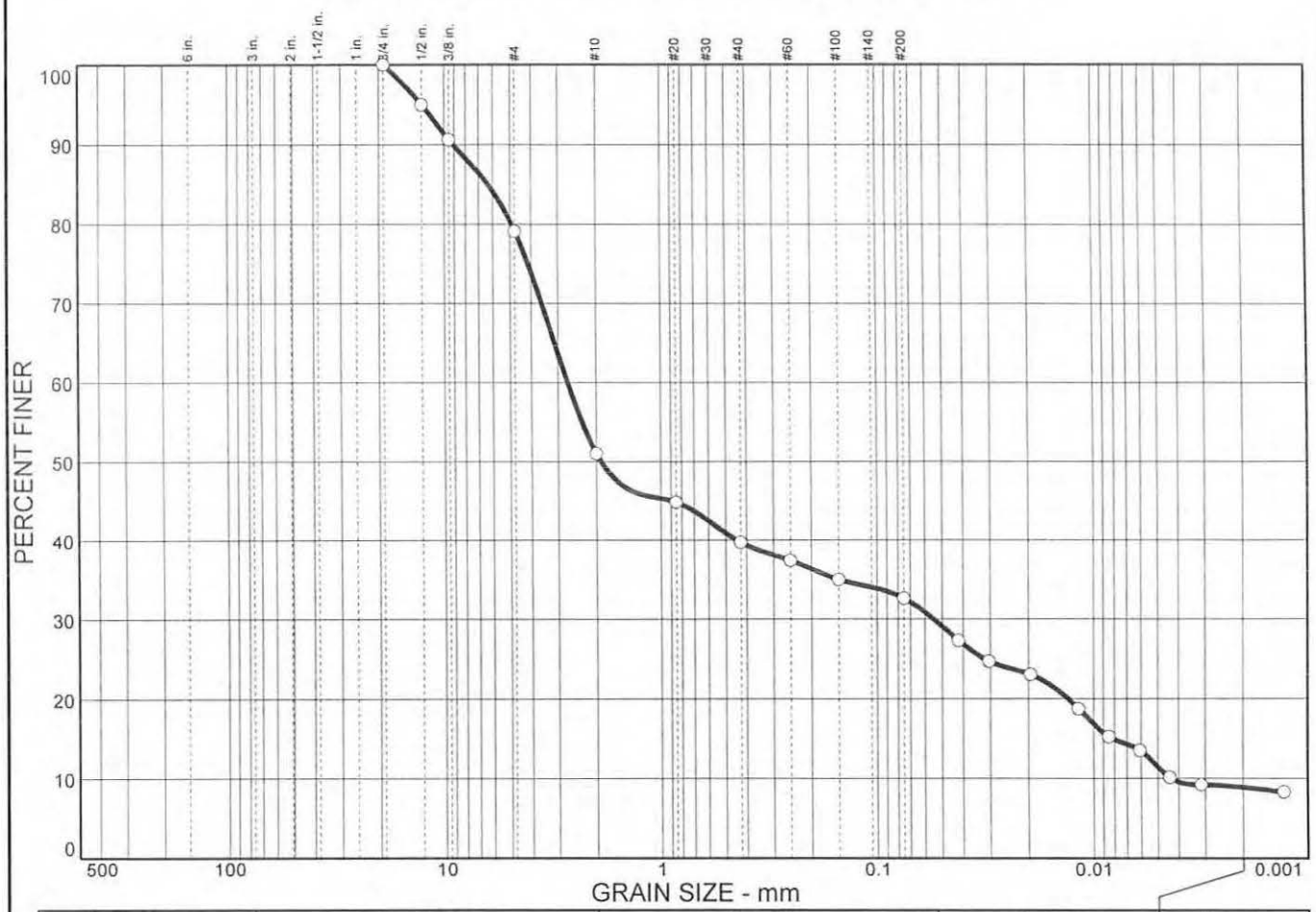
Client: USEPA
Project Location: Asbestos Pile

Project Name: BoRit Asbestos Superfund Site
Project Number: 62625.029.bas.fiz.mbdb2

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	In-Situ Testing (tsf)	Graphic Log	Strata	Material Description	Remarks
170.9 / 20	SS	11	24	3 3 WOH WOH	0			ACM	No recovery.	
	SS	12	24	WOH WOH WOH 4	18			FILL	Wet, very soft, brown, fine, sandy CLAY.	
165.9 / 25	SS	13	24	3 3 1 1	14				Moist, soft, red-brown CLAY.	
	SS	14	24	3 32 20 41	24				Moist, soft, red-brown CLAY, then dry, hard, red SILT.	
160.9 / 30	SS	15	24	5 50/2	12			ALLUVIUM	Moist, medium stiff, clayey SILT, with siltstone in the tip.	
155.9 / 35										
150.9 / 40										
145.9 / 45										

Attachment B
Geotechnical Laboratory Test Results

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	49.0	21.4	20.8	8.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	95.0		
.375 in.	90.6		
#4	79.1		
#10	51.0		
#20	44.8		
#40	39.7		
#60	37.4		
#100	35.0		
#200	32.6		

* (no specification provided)

Material Description

BROWN SOIL CONTAINING ASBESTOS

Atterberg Limits

PL= 31 LL= 46 PI= 15

Coefficients

D_{85}= 6.34 D_{60}= 2.71 D_{50}= 1.90
D_{30}= 0.0550 D_{15}= 0.0082 D_{10}= 0.0044
C_u= 623.99 C_c= 0.26

Classification

USCS= SM AASHTO= A-2-7(1)

Remarks

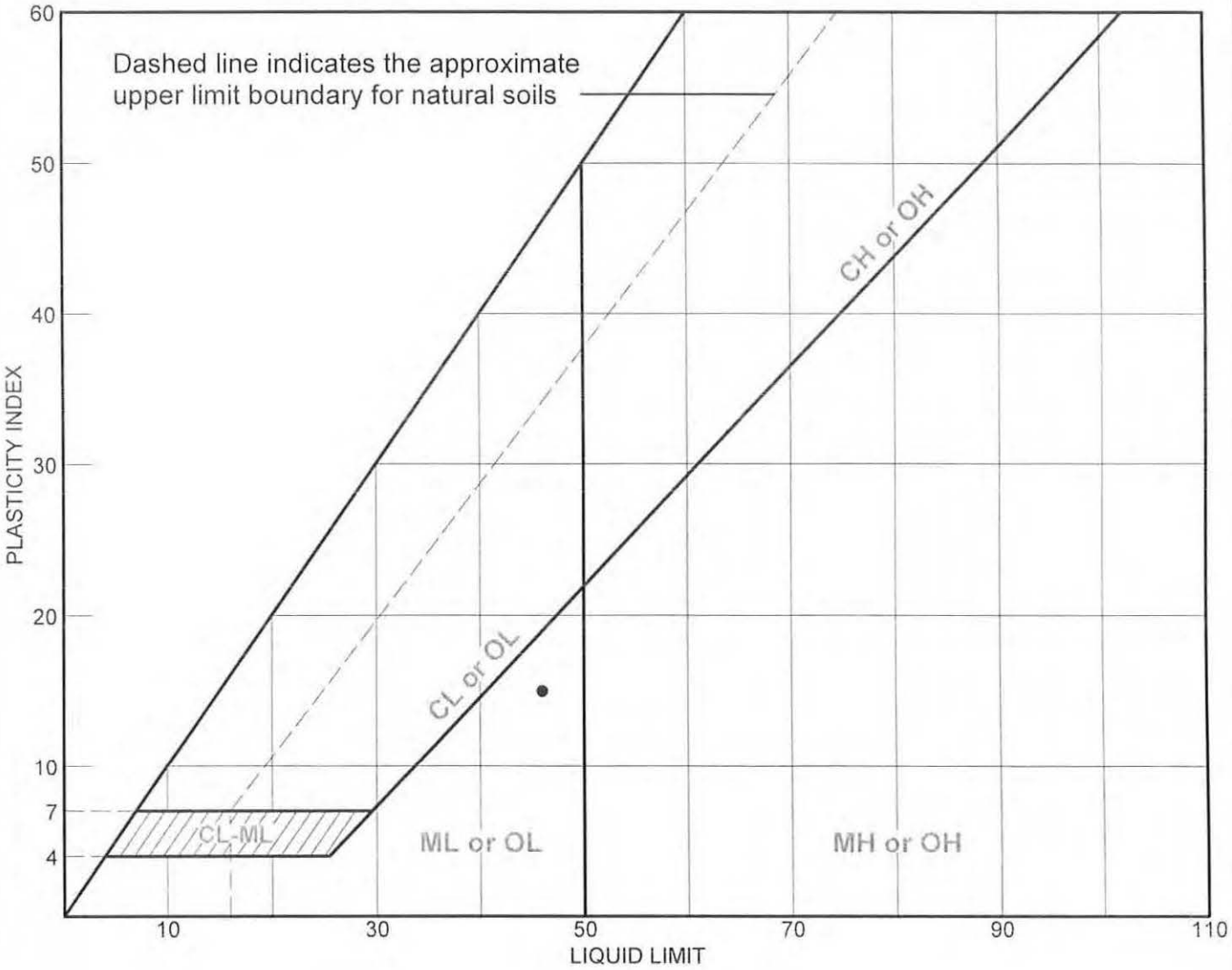
Sample No.: PKGTO103-SB0-2 **Source of Sample:** **Date:** 02.14.11
Location: **Elev./Depth:**

PENNIMAN & BROWNE, INC.

Client: U.S. ENVIRONMENTAL PROTECTION AGENCY
Project: R33523/PKGTO103-SB0-2

Project No: 201100526 **Figure**

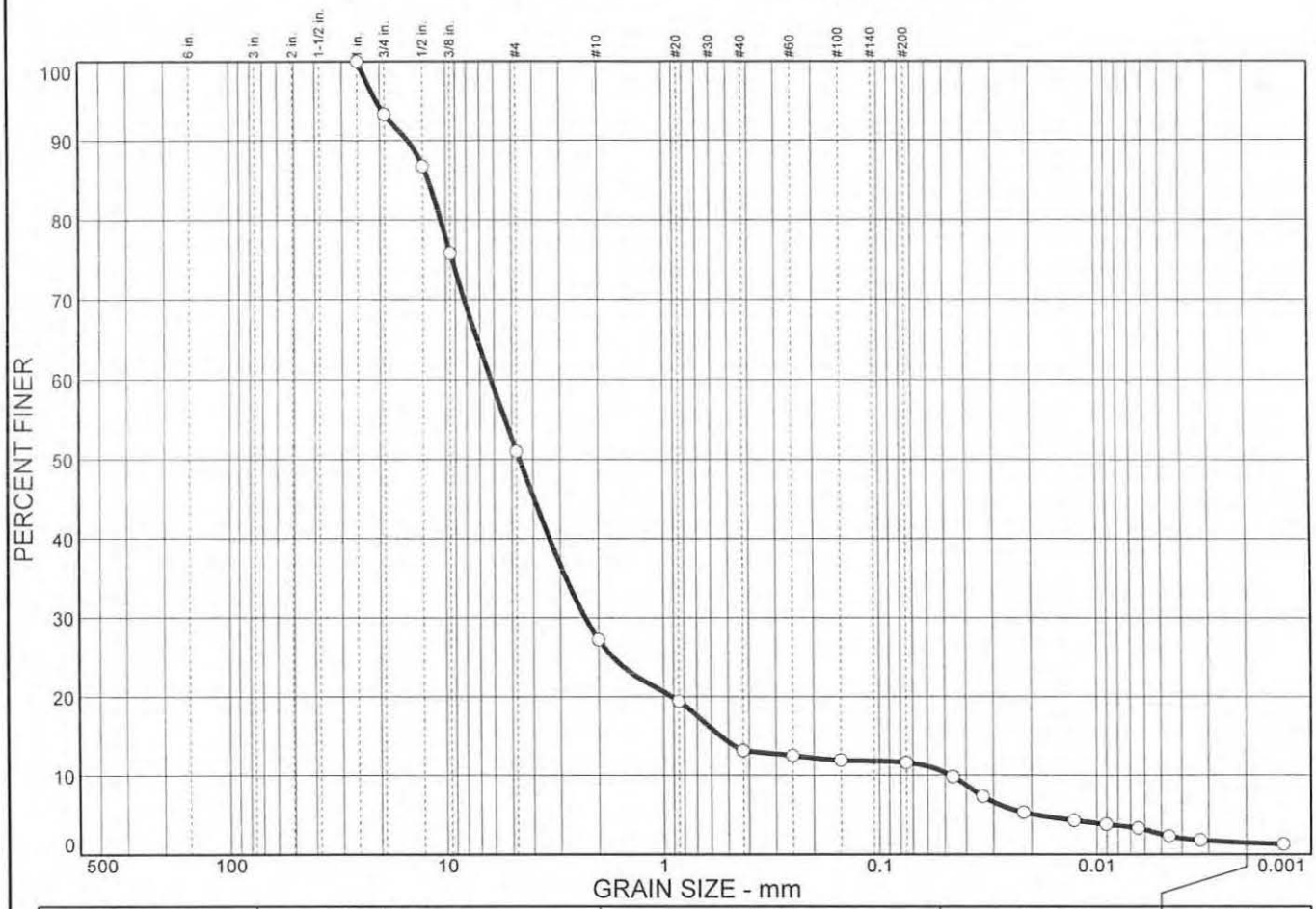
LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●		PKGTO103-		31.2	31	46	15	SM

LIQUID AND PLASTIC LIMITS TEST REPORT **PENNIMAN & BROWNE, INC.**	**Client:** U.S. ENVIRONMENTAL PROTECTION AGENCY **Project:** R33523/PKGTO103-SB0-2 **Project No.:** 201100526 **Figure** 02.14.11

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	72.8	16.6	9.2	1.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	93.3		
.5 in.	86.7		
.375 in.	75.8		
#4	51.0		
#10	27.2		
#20	19.4		
#40	13.1		
#60	12.5		
#100	11.9		
#200	11.6		

* (no specification provided)

Material Description

GRAY SOIL CONTAINING ASBESTOS

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{85}= 12.0 D_{60}= 6.23 D_{50}= 4.61
D_{30}= 2.31 D_{15}= 0.546 D_{10}= 0.0473
C_u= 131.75 C_c= 18.10

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

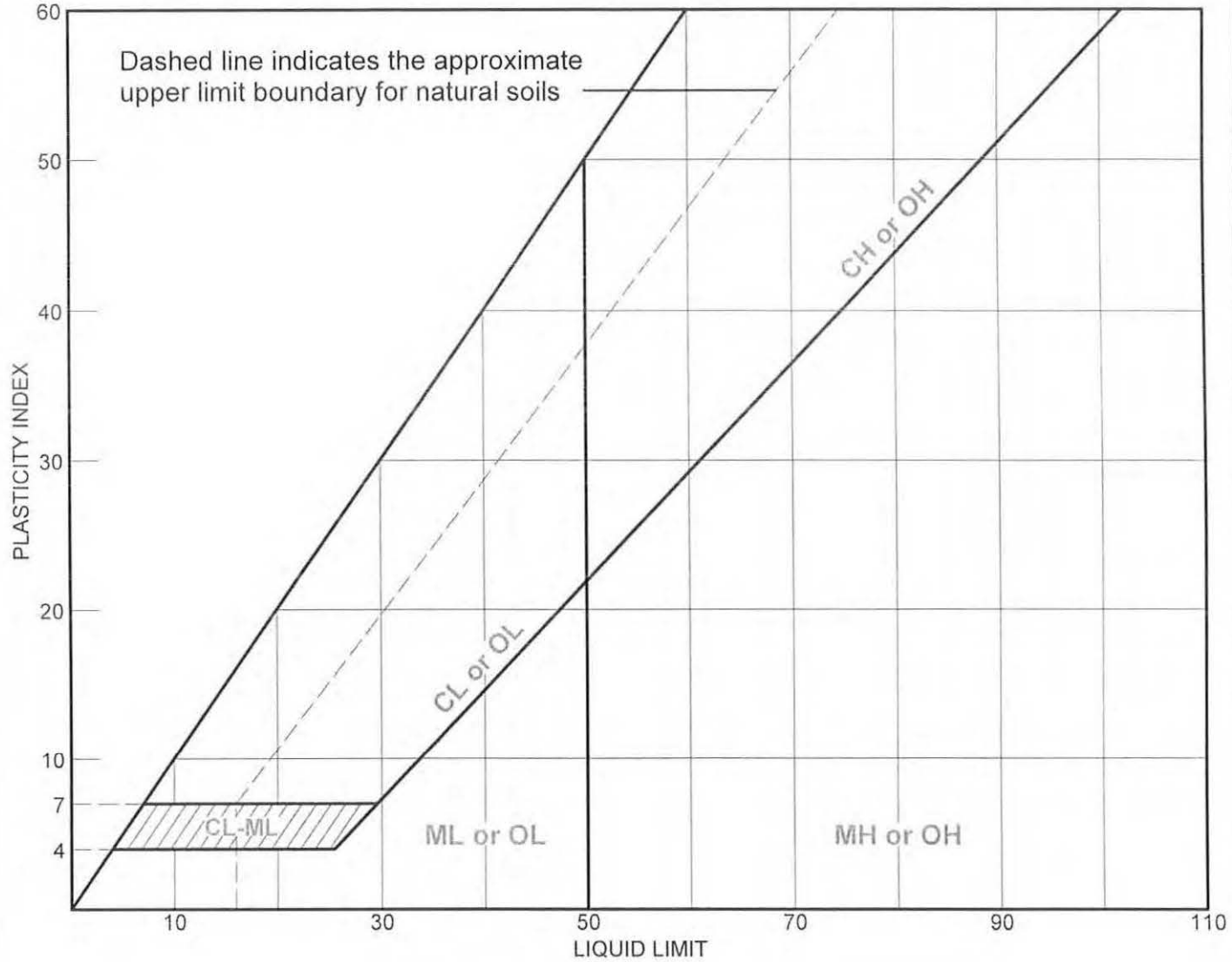
Sample No.: PKGTO103-SB2-10 **Source of Sample:** **Date:** 02.14.11
Location: **Elev./Depth:**

PENNIMAN & BROWNE, INC.

Client: U.S. ENVIRONMENTAL PROTECTION AGENCY
Project: R33523/PKGTO103-SB2-10

Project No: 201100526 **Figure**

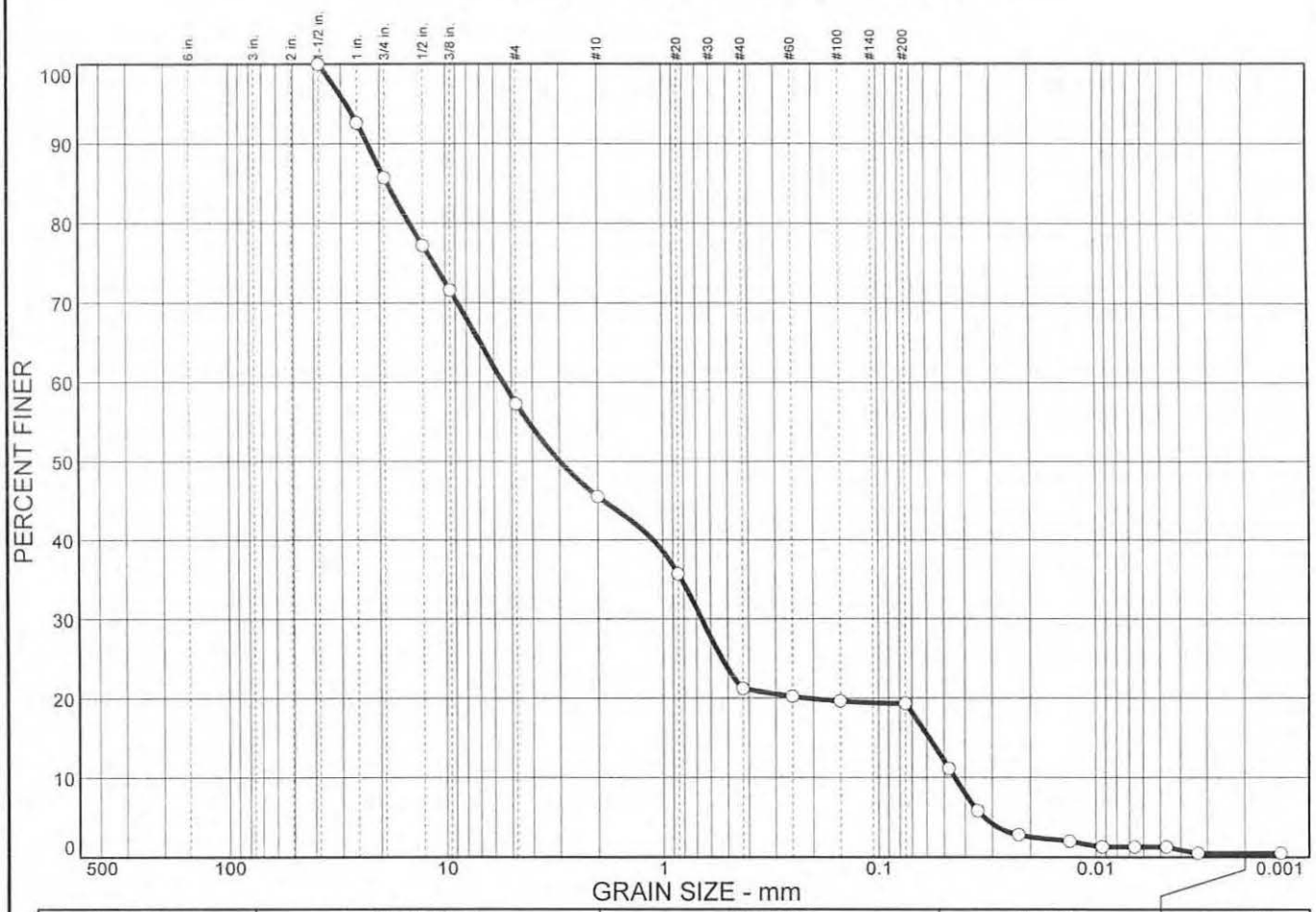
LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●		PKGTO103-		36.6	NP	NV	NP	GP-GM

LIQUID AND PLASTIC LIMITS TEST REPORT **PENNIMAN & BROWNE, INC.**	**Client:** U.S. ENVIRONMENTAL PROTECTION AGENCY **Project:** R33523/PKGTO103-SB2-10 **Project No.:** 201100526 **Figure** 02.14.11

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	54.5	32.3	12.7	0.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5 in.	100.0		
1 in.	92.6		
.75 in.	85.7		
.5 in.	77.2		
.375 in.	71.6		
#4	57.3		
#10	45.5		
#20	35.7		
#40	21.2		
#60	20.2		
#100	19.6		
#200	19.3		

* (no specification provided)

Material Description

GRAY SOIL CONTAINING ASBESTOS

Atterberg Limits

PL= 72 LL= 93 PI= 21

Coefficients

D_{85}= 18.5 D_{60}= 5.46 D_{50}= 3.00
D_{30}= 0.662 D_{15}= 0.0587 D_{10}= 0.0447
C_u= 122.11 C_c= 1.80

Classification

USCS= GM AASHTO= A-2-7(0)

Remarks

SP.GRAVITY-2.442

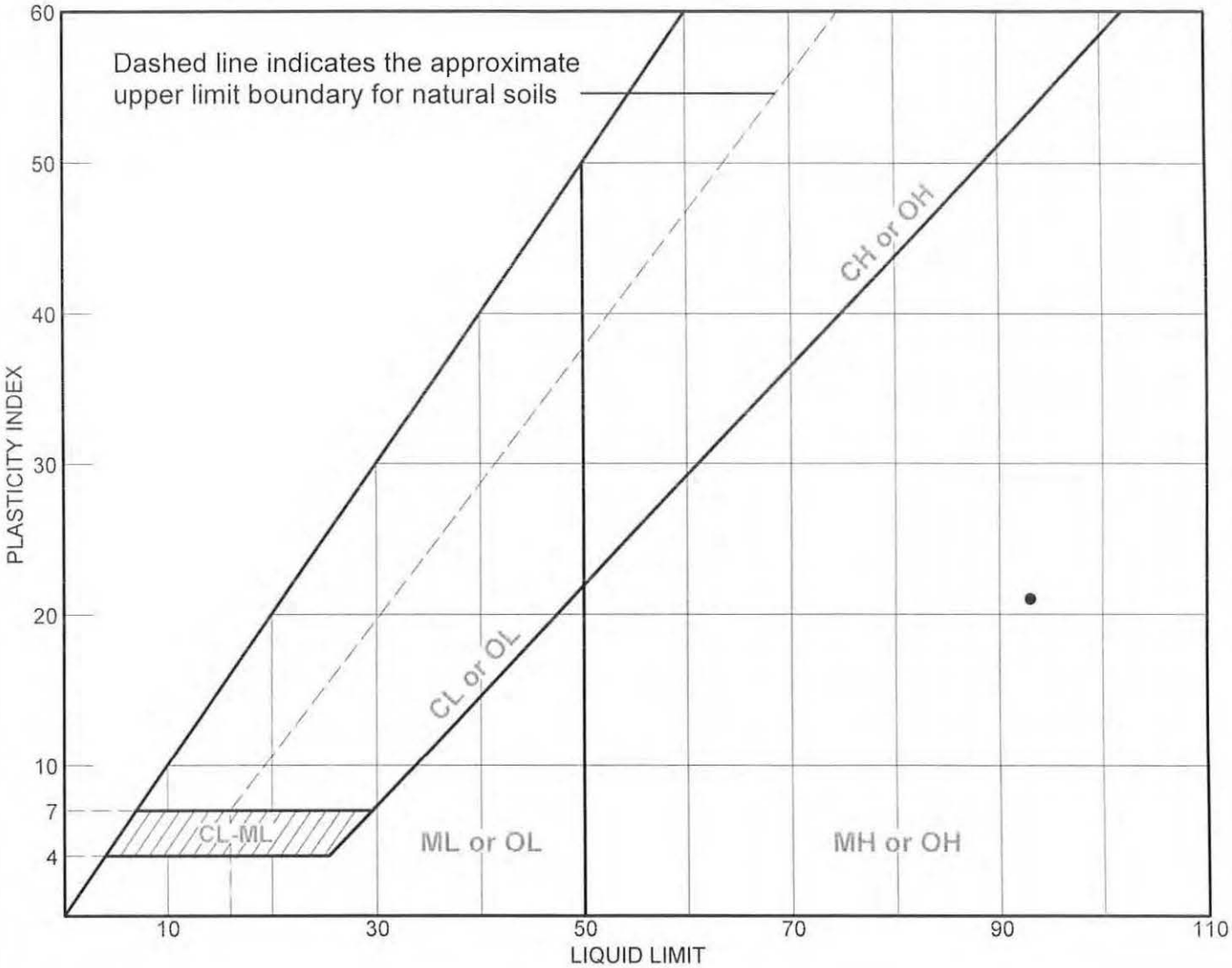
Sample No.: PKGTO2-SB0-8 **Source of Sample:** **Date:** 02.14.11
Location: **Elev./Depth:**

PENNIMAN & BROWNE, INC.

Client: U.S. ENVIRONMENTAL PROTECTION AGENCY
Project: R33523/PKGTO2-SB0-8

Project No: 201100526 **Figure**

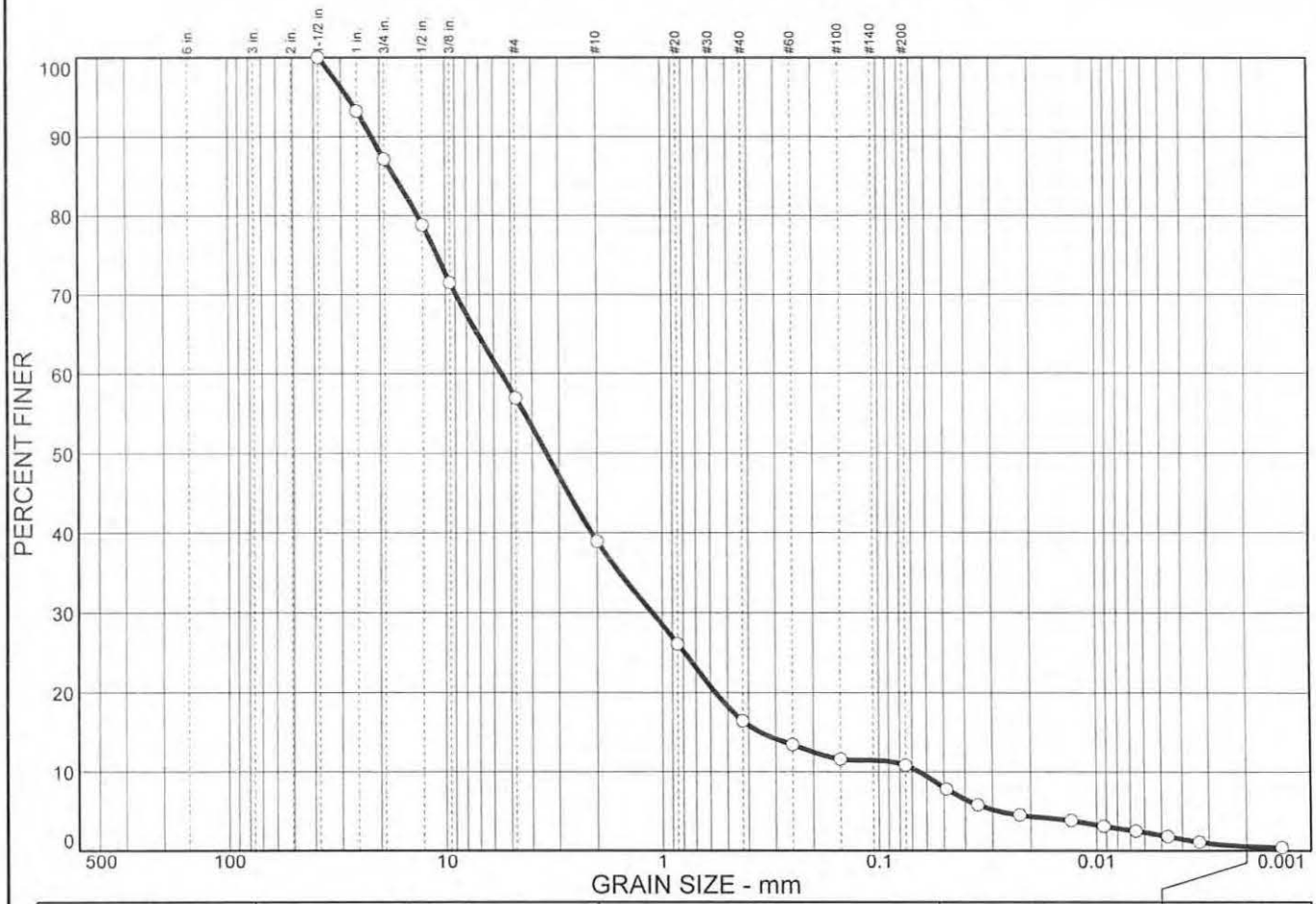
LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●		PKGTO2-		45.3	72	93	21	GM

LIQUID AND PLASTIC LIMITS TEST REPORT **PENNIMAN & BROWNE, INC.**	**Client:** U.S. ENVIRONMENTAL PROTECTION AGENCY **Project:** R33523/PKGTO2-SB0-8 **Project No.:** 201100526 **Figure** 02.14.11

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	61.1	30.4	7.9	0.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5 in.	100.0		
1 in.	93.2		
.75 in.	87.1		
.5 in.	78.8		
.375 in.	71.5		
#4	56.9		
#10	38.9		
#20	26.1		
#40	16.4		
#60	13.4		
#100	11.6		
#200	10.8		

* (no specification provided)

Material Description

GRAY SOIL CONTAINING ASBESTOS

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{85}= 17.2 D_{60}= 5.55 D_{50}= 3.44
D_{30}= 1.12 D_{15}= 0.354 D_{10}= 0.0651
C_u= 85.14 C_c= 3.45

Classification

USCS= SP-SM AASHTO= A-1-a

Remarks

SP.GRAVITY-2.631

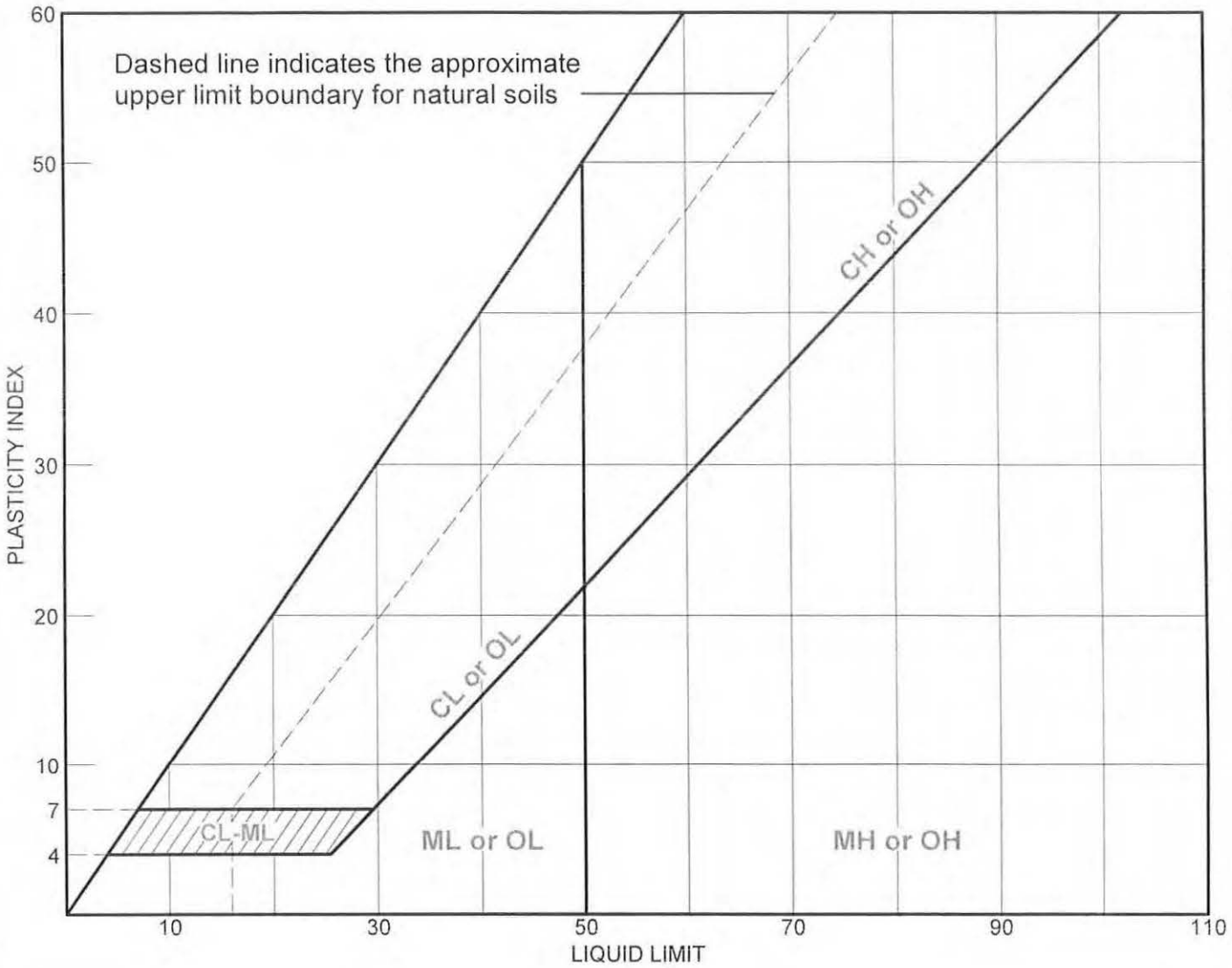
Sample No.: PKGTO2-SB2-12 **Source of Sample:** **Date:** 02.14.11
Location: **Elev./Depth:**

PENNIMAN & BROWNE, INC.

Client: U.S. ENVIRONMENTAL PROTECTION AGENCY
Project: R33523/PKGTO2-SB2-12

Project No: 201100526 **Figure**

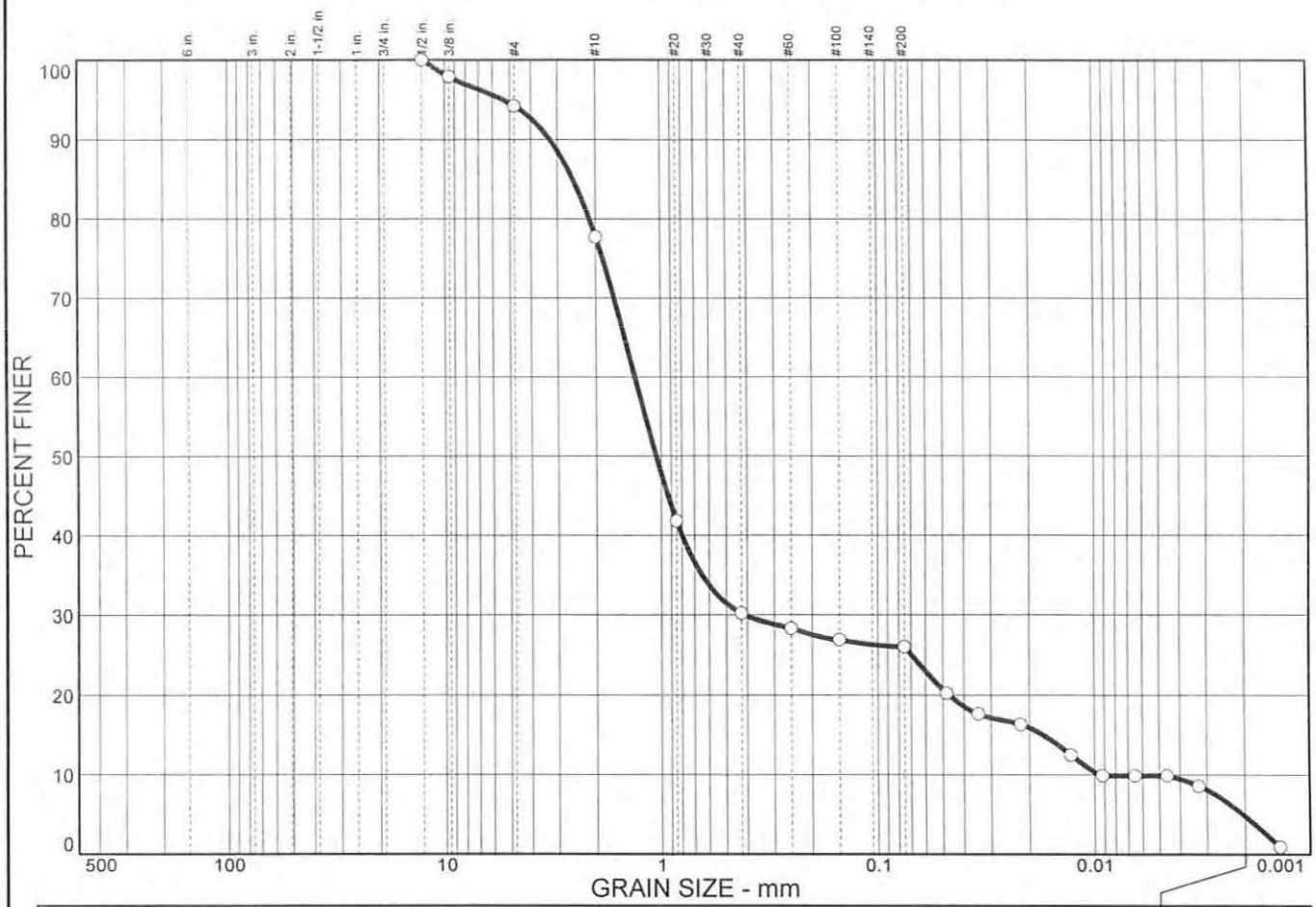
LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●		PKGTO2-		34.8	NP	NV	NP	SP-SM

LIQUID AND PLASTIC LIMITS TEST REPORT **PENNIMAN & BROWNE, INC.**	**Client:** U.S. ENVIRONMENTAL PROTECTION AGENCY **Project:** R33523/PKGTO2-SB2-12 **Project No.:** 201100526 **Figure** 02.14.11

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	22.3	56.4	16.5	4.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	97.9		
#4	94.2		
#10	77.7		
#20	41.8		
#40	30.2		
#60	28.3		
#100	26.9		
#200	26.0		

* (no specification provided)

Material Description

GRAY SOIL CONTAINING ASBESTOS

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{85}= 2.55 D_{60}= 1.32 D_{50}= 1.06
D_{30}= 0.410 D_{15}= 0.0173 D_{10}= 0.0094
C_u= 140.64 C_c= 13.56

Classification

USCS= SM AASHTO= A-1-b

Remarks

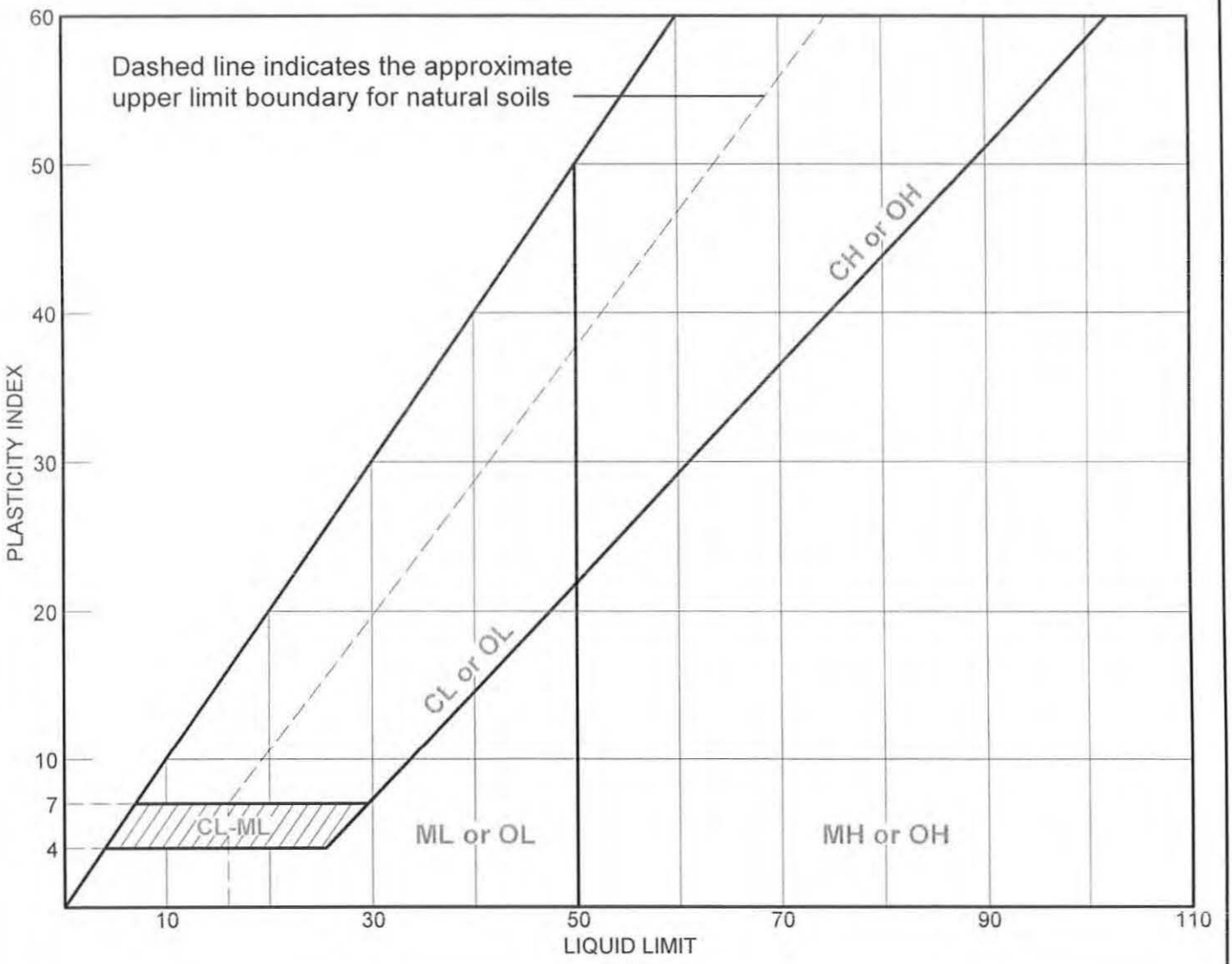
Sample No.: PKGTO3-SB2-6 **Source of Sample:** **Date:** 02.14.11
Location: **Elev./Depth:**

PENNIMAN & BROWNE, INC.

Client: U.S. ENVIRONMENTAL PROTECTION AGENCY
Project: R33523/PKGTO3-SB2-6

Project No: 201100526 **Figure**

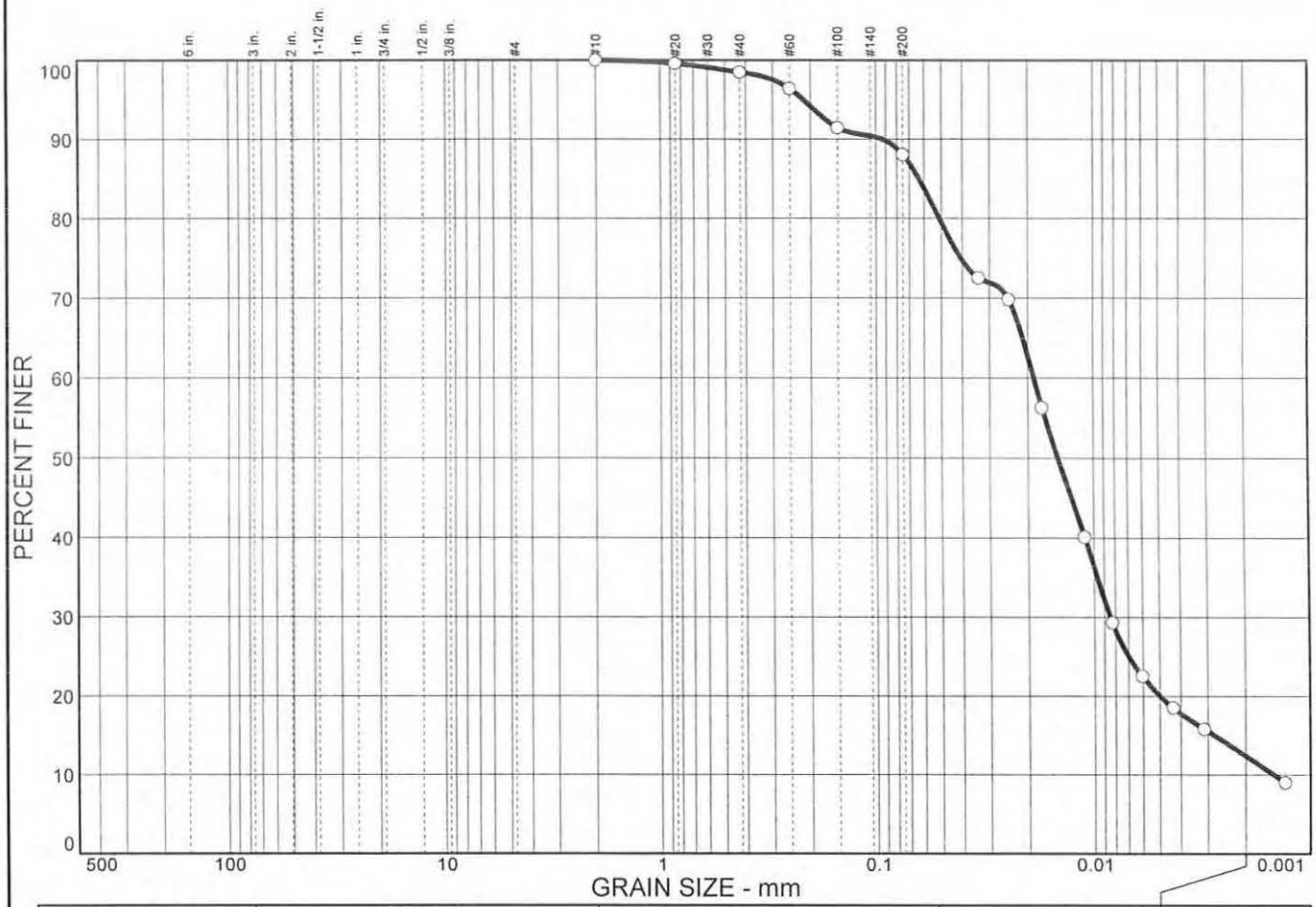
LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●		PKGTO3-		46.7	NP	NV	NP	SM

LIQUID AND PLASTIC LIMITS TEST REPORT **PENNIMAN & BROWNE, INC.**	**Client:** U.S. ENVIRONMENTAL PROTECTION AGENCY **Project:** R33523/PKGTO3-SB2-6 **Project No.:** 201100526 **Figure** 02.14.11

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	19.2	68.4	12.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	99.6		
#40	98.5		
#60	96.4		
#100	91.4		
#200	88.0		

* (no specification provided)

Material Description

BROWN SOIL CONTAINING ASBESTOS

Atterberg Limits

PL= 23 LL= 33 PI= 10

Coefficients

D_{85}= 0.0635 D_{60}= 0.0187 D_{50}= 0.0146
D_{30}= 0.0084 D_{15}= 0.0028 D_{10}= 0.0015
C_u= 12.63 C_c= 2.56

Classification

USCS= CL AASHTO= A-4(9)

Remarks

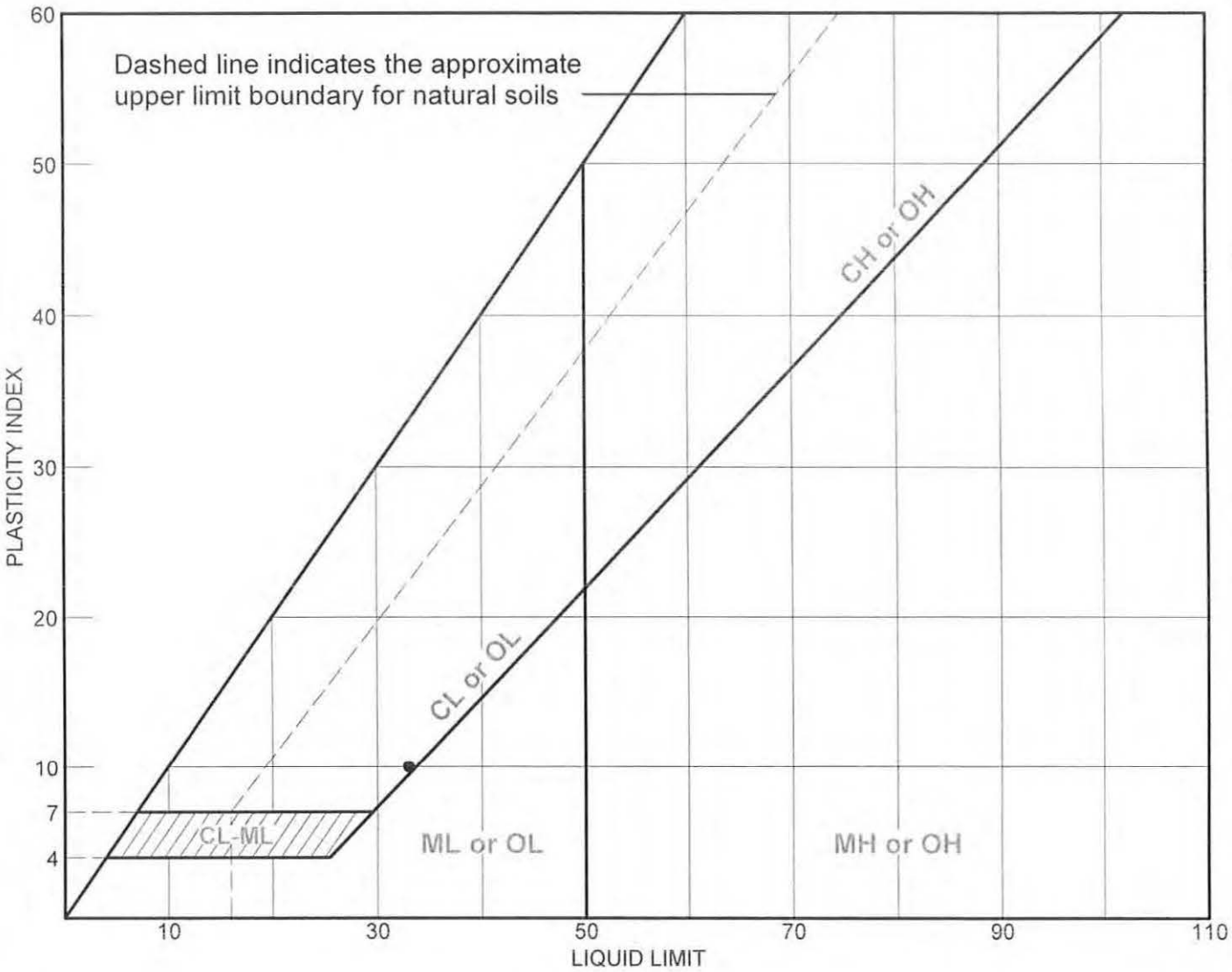
Sample No.: PKGTO3-SB20-22 **Source of Sample:** **Date:** 02.14.11
Location: **Elev./Depth:**

PENNIMAN & BROWNE, INC.

Client: U.S. ENVIRONMENTAL PROTECTION AGENCY
Project: R33523/PKGTO3-SB20-22

Project No: 201100526 **Figure**

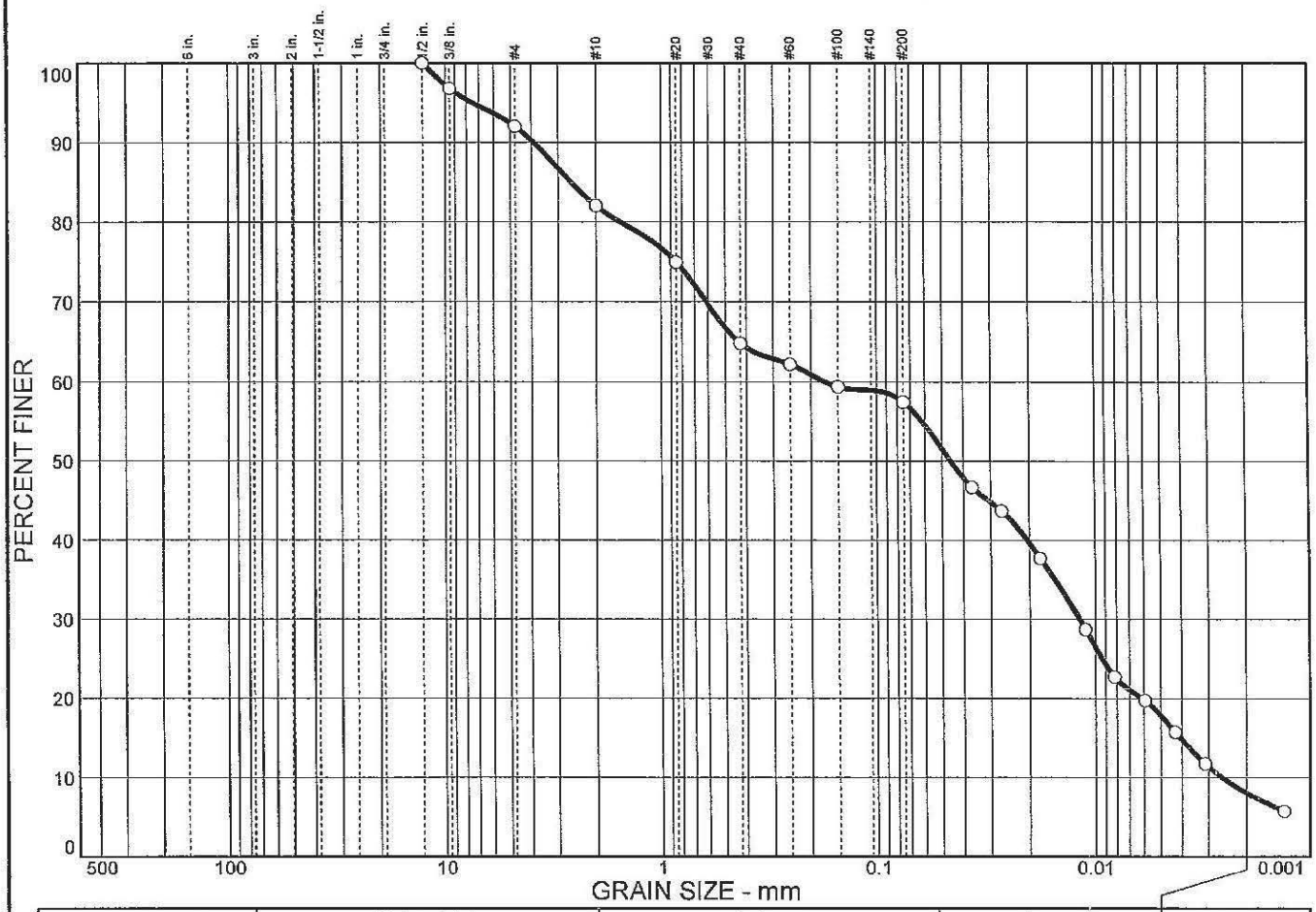
LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●		PKGTO3-		30.7	23	33	10	CL

LIQUID AND PLASTIC LIMITS TEST REPORT **PENNIMAN & BROWNE, INC.**	**Client:** U.S. ENVIRONMENTAL PROTECTION AGENCY **Project:** R33523/PKGTO3-SB20-22 **Project No.:** 201100526 **Figure** 02.14.11

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	18.0	29.5	44.5	8.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	96.8		
#4	92.0		
#10	82.0		
#20	74.9		
#40	64.8		
#60	62.2		
#100	59.4		
#200	57.5		

* (no specification provided)

Material Description

GRAY SOIL CONTAINING ASBESTOS

Atterberg Limits

PL= 48 LL= 61 PI= 13

Coefficients

D_{85}= 2.62 D_{60}= 0.172 D_{50}= 0.0458
D_{30}= 0.0118 D_{15}= 0.0041 D_{10}= 0.0026
C_u= 65.90 C_c= 0.31

Classification

USCS= MH AASHTO= A-7-5(8)

Remarks

SP.GR-2.655

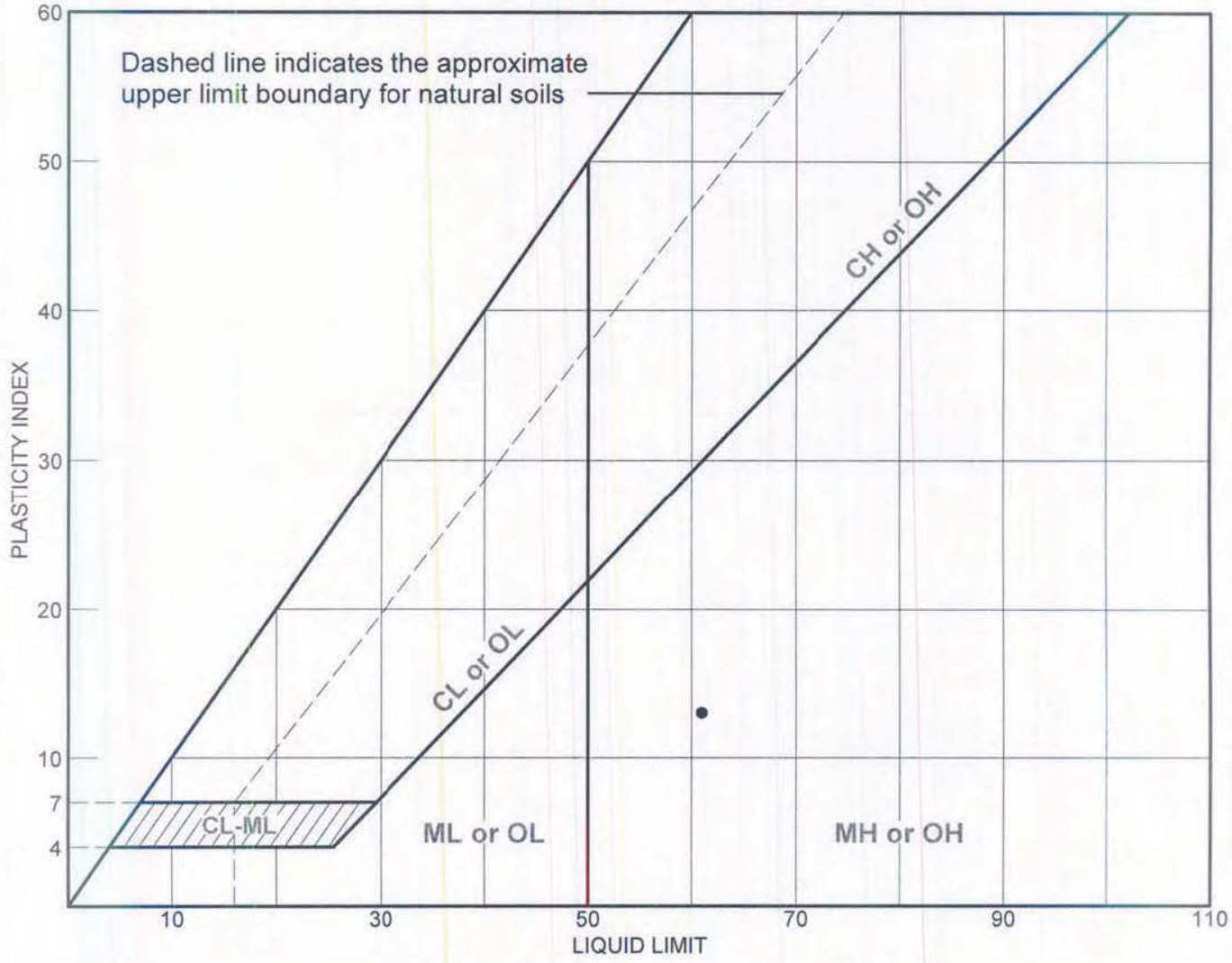
Sample No.: APGTO4-SB10-12 **Source of Sample:** **Date:** 02.17.11
Location: **Elev./Depth:**

PENNIMAN & BROWNE, INC.

Client: U.S. ENVIRONMENTAL PROTECTION AGENCY
Project: R33523/APGTO4-SB10-12

Project No: 201100526 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●		APGTO4-		207	48	61	13	MH

LIQUID AND PLASTIC LIMITS TEST REPORT

PENNIMAN & BROWNE, INC.

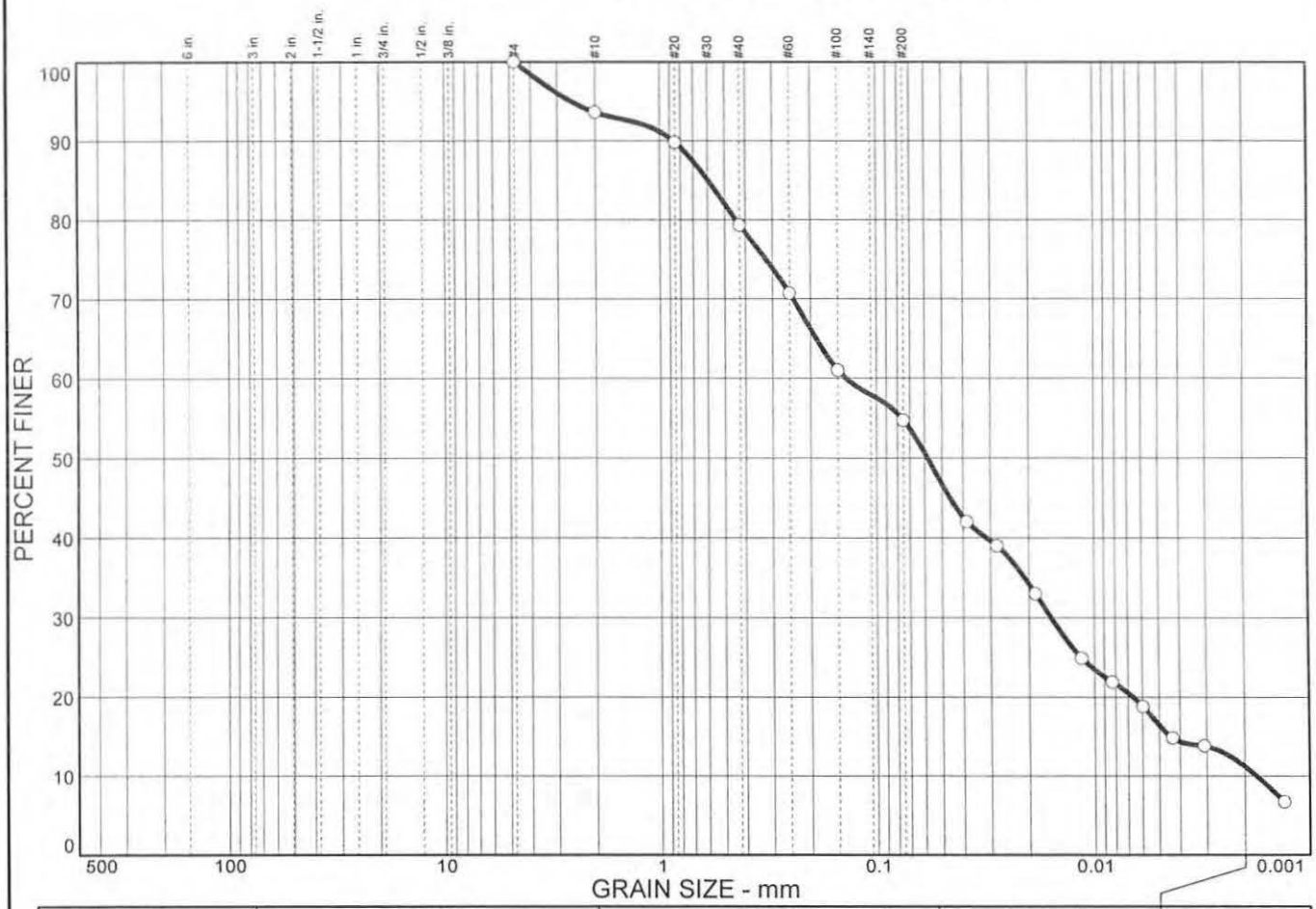
Client: U.S. ENVIRONMENTAL PROTECTION AGENCY

Project: R33523/APGTO4-SB10-12

Project No.: 201100526

Figure 2.17.11

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	6.4	45.7	36.7	11.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	93.6		
#20	89.8		
#40	79.3		
#60	70.7		
#100	61.0		
#200	54.7		

* (no specification provided)

Material Description

BROWN REDDISH SOIL CONTAINING ASBESTOS

Atterberg Limits

PL= 20 LL= 29 PI= 9

Coefficients

D_{85}= 0.599 D_{60}= 0.138 D_{50}= 0.0583
D_{30}= 0.0158 D_{15}= 0.0044 D_{10}= 0.0018
C_u= 77.98 C_c= 1.02

Classification

USCS= CL AASHTO= A-4(2)

Remarks

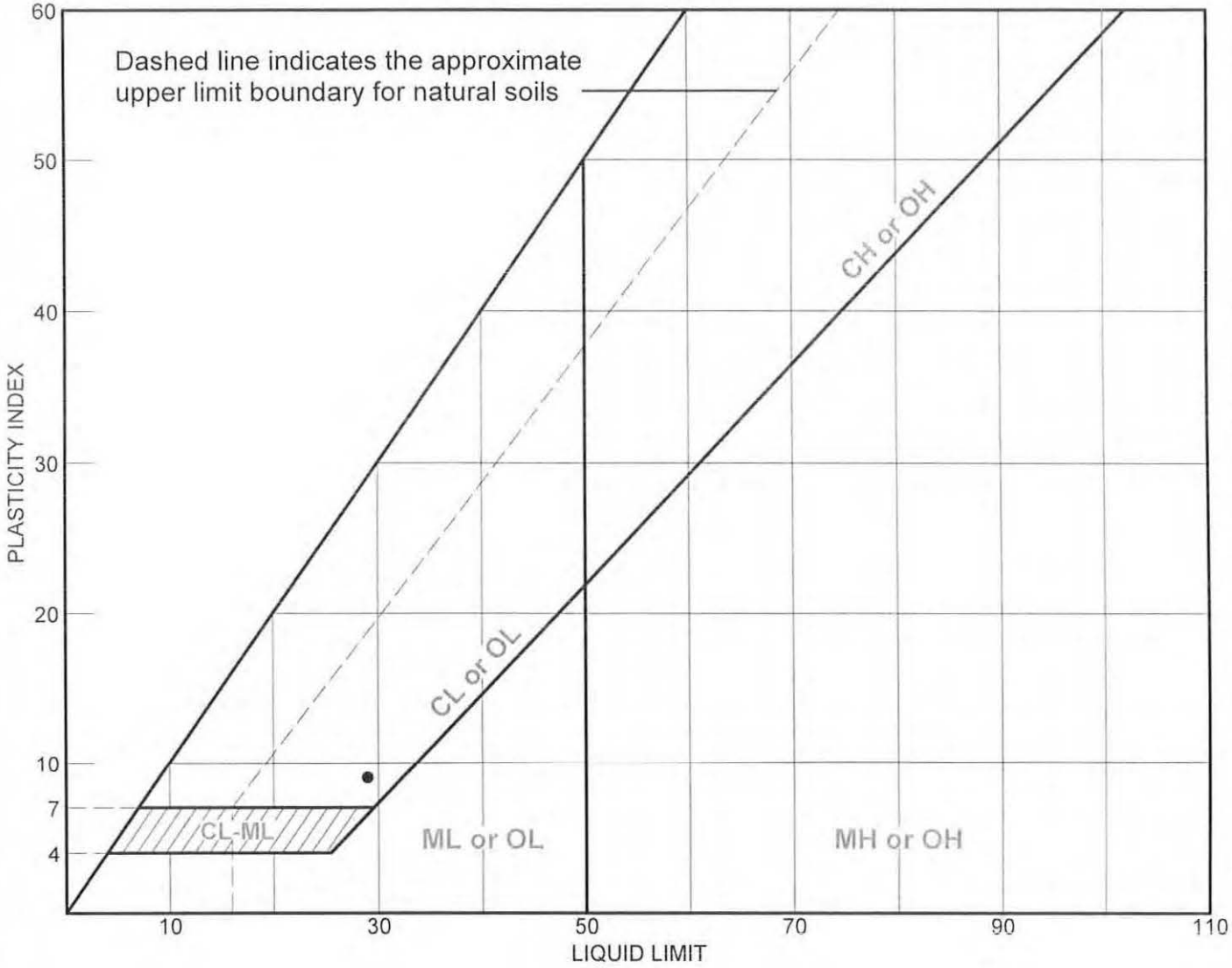
Sample No.: APGTO4-SB30-34 **Source of Sample:** **Date:** 02.14.11
Location: **Elev./Depth:**

PENNIMAN & BROWNE, INC.

Client: U.S. ENVIRONMENTAL PROTECTION AGENCY
Project: R33523/APGTO4-SB30-34

Project No: 201100526 **Figure**

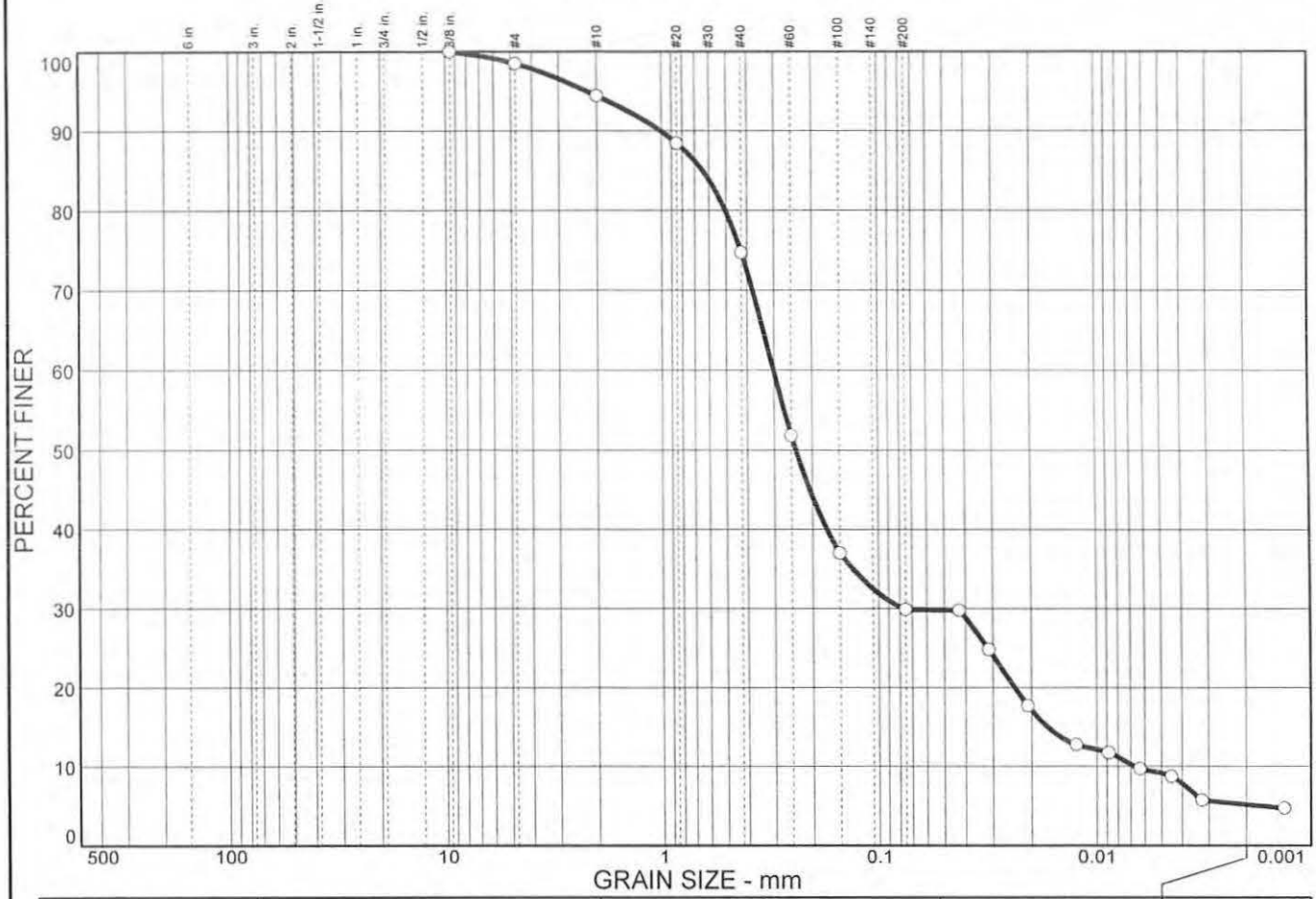
LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●		APGTO4-		29.3	20	29	9	CL

LIQUID AND PLASTIC LIMITS TEST REPORT **PENNIMAN & BROWNE, INC.**	**Client:** U.S. ENVIRONMENTAL PROTECTION AGENCY **Project:** R33523/APGTO4-SB30-34 **Project No.:** 201100526 **Figure** 02.14.11

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	5.6	64.6	24.7	5.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	98.5		
#10	94.4		
#20	88.4		
#40	74.7		
#60	51.8		
#100	37.0		
#200	29.9		

* (no specification provided)

Material Description

BROWN SOIL CONTAINING ASBESTOS

Atterberg Limits

PL= 21 LL= 23 PI= 2

Coefficients

D_{85}= 0.645 D_{60}= 0.302 D_{50}= 0.239
D_{30}= 0.0766 D_{15}= 0.0169 D_{10}= 0.0067
C_u= 45.01 C_c= 2.89

Classification

USCS= SM AASHTO= A-2-4(0)

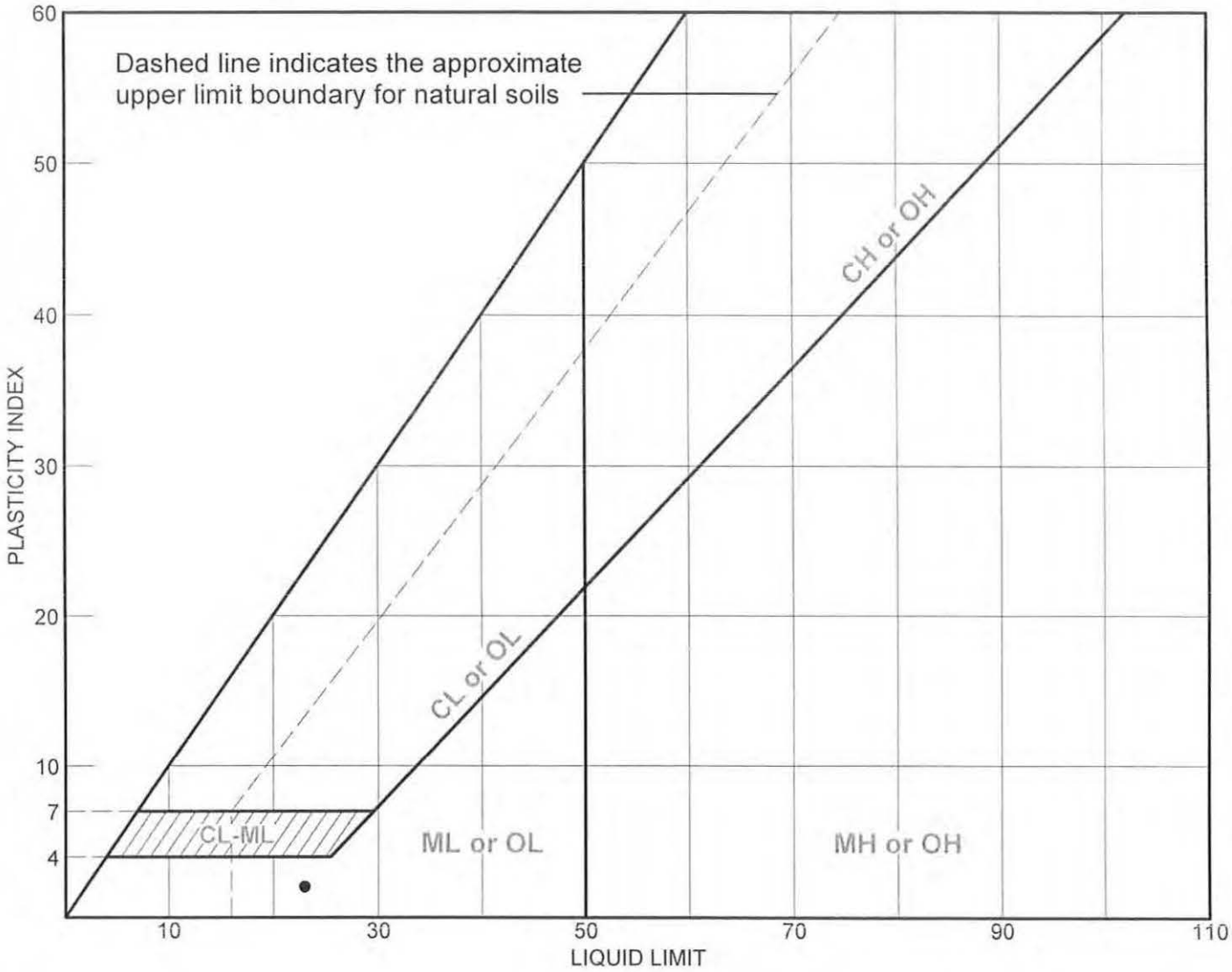
Remarks

Sample No.: APGTO4-SB32-40 **Source of Sample:** **Date:** 02.14.11
Location: **Elev./Depth:**

PENNIMAN & BROWNE, INC.

Client: U.S. ENVIRONMENTAL PROTECTION AGENCY
Project: R33523/APGTO4-SB32-40
Project No: 201100526 **Figure**

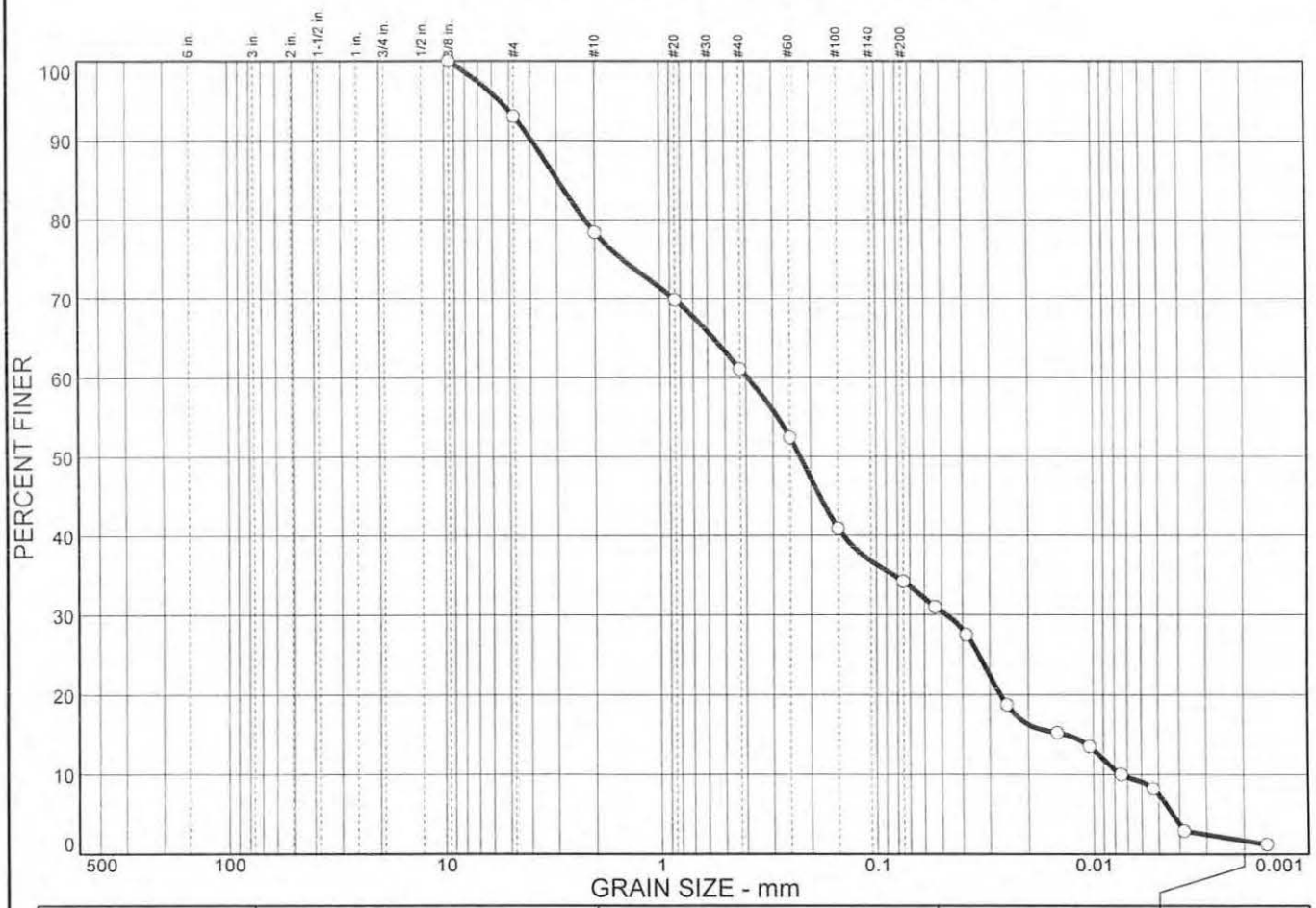
LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●		APGTO4-		13.1	21	23	2	SM

LIQUID AND PLASTIC LIMITS TEST REPORT **PENNIMAN & BROWNE, INC.**	**Client:** U.S. ENVIRONMENTAL PROTECTION AGENCY **Project:** R33523/APGTO4-SB32-40 **Project No.:** 201100526 **Figure** 02.14.11

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	21.6	47.5	29.2	1.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	93.0		
#10	78.4		
#20	69.9		
#40	61.1		
#60	52.4		
#100	40.9		
#200	34.2		

* (no specification provided)

Material Description

BEIGE SOIL CONTAINING ASBESTOS

Atterberg Limits

PL= 88 LL= 90 PI= 2

Coefficients

D_{85}= 2.97 D_{60}= 0.393 D_{50}= 0.225
D_{30}= 0.0477 D_{15}= 0.0136 D_{10}= 0.0074
C_u= 52.73 C_c= 0.78

Classification

USCS= SM AASHTO= A-2-5(0)

Remarks

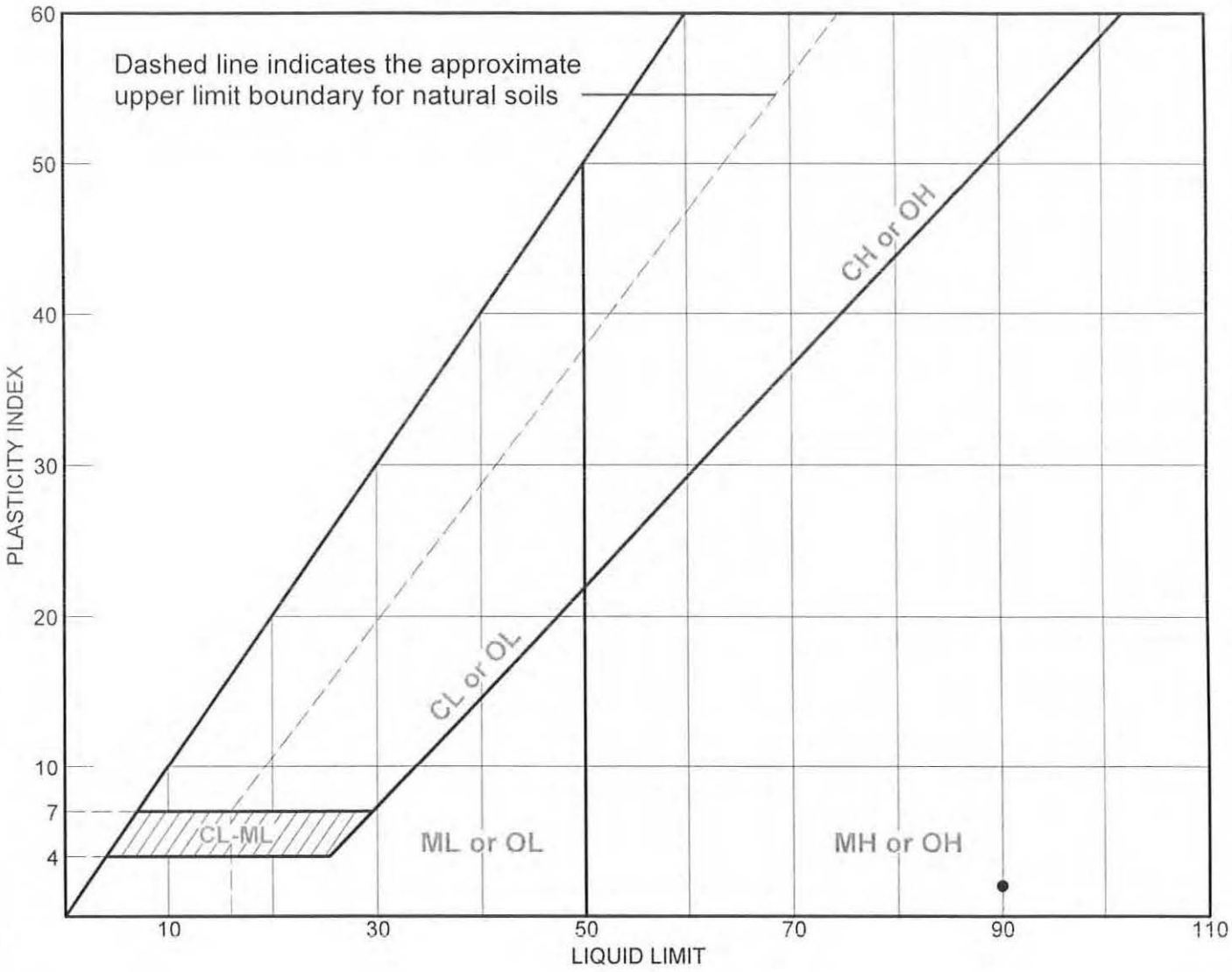
SP.GRAVITY-2.239

Sample No.: APGTO5-SB4-8 **Source of Sample:** **Date:** 02.14.11
Location: **Elev./Depth:**

PENNIMAN & BROWNE, INC.

Client: U.S. ENVIRONMENTAL PROTECTION AGENCY
Project: R33523/APGTO5-SB4-8
Project No: 201100526 **Figure**

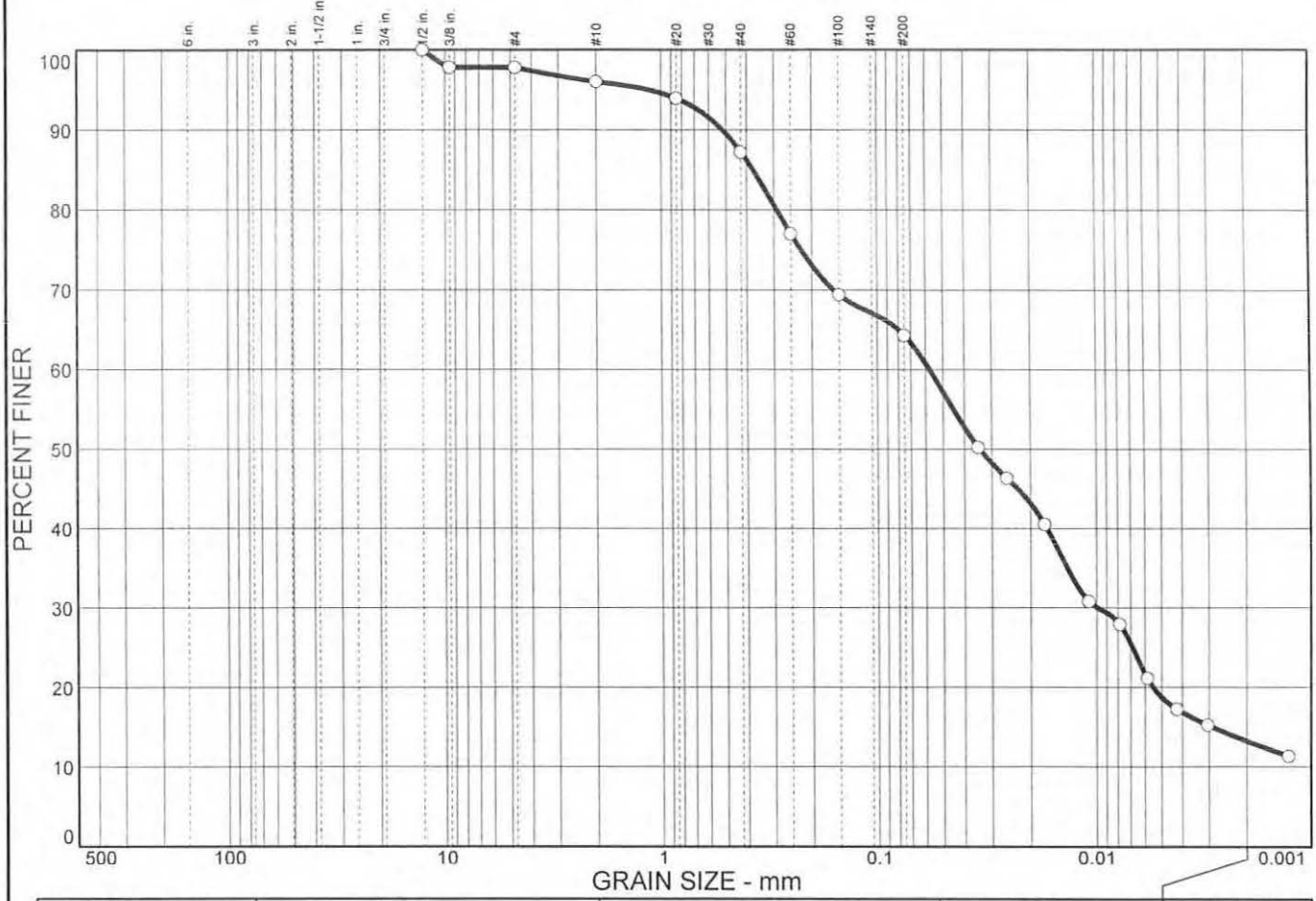
LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●		APGTO5-		125	88	90	2	SM

LIQUID AND PLASTIC LIMITS TEST REPORT **PENNIMAN & BROWNE, INC.**	**Client:** U.S. ENVIRONMENTAL PROTECTION AGENCY **Project:** R33523/APGTO5-SB4-8 **Project No.:** 201100526 **Figure** 02.14.11

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	4.0	37.6	45.2	13.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	97.8		
#4	97.8		
#10	96.0		
#20	93.9		
#40	87.2		
#60	77.0		
#100	69.4		
#200	64.3		

* (no specification provided)

Material Description

BROWN REDDISH SOIL CONTAINING ASBESTOS

Atterberg Limits

PL= 19 LL= 26 PI= 7

Coefficients

D_{85}= 0.375 D_{60}= 0.0576 D_{50}= 0.0341
D_{30}= 0.0099 D_{15}= 0.0029 D_{10}=
C_u= C_c=

Classification

USCS= CL-ML AASHTO= A-4(2)

Remarks

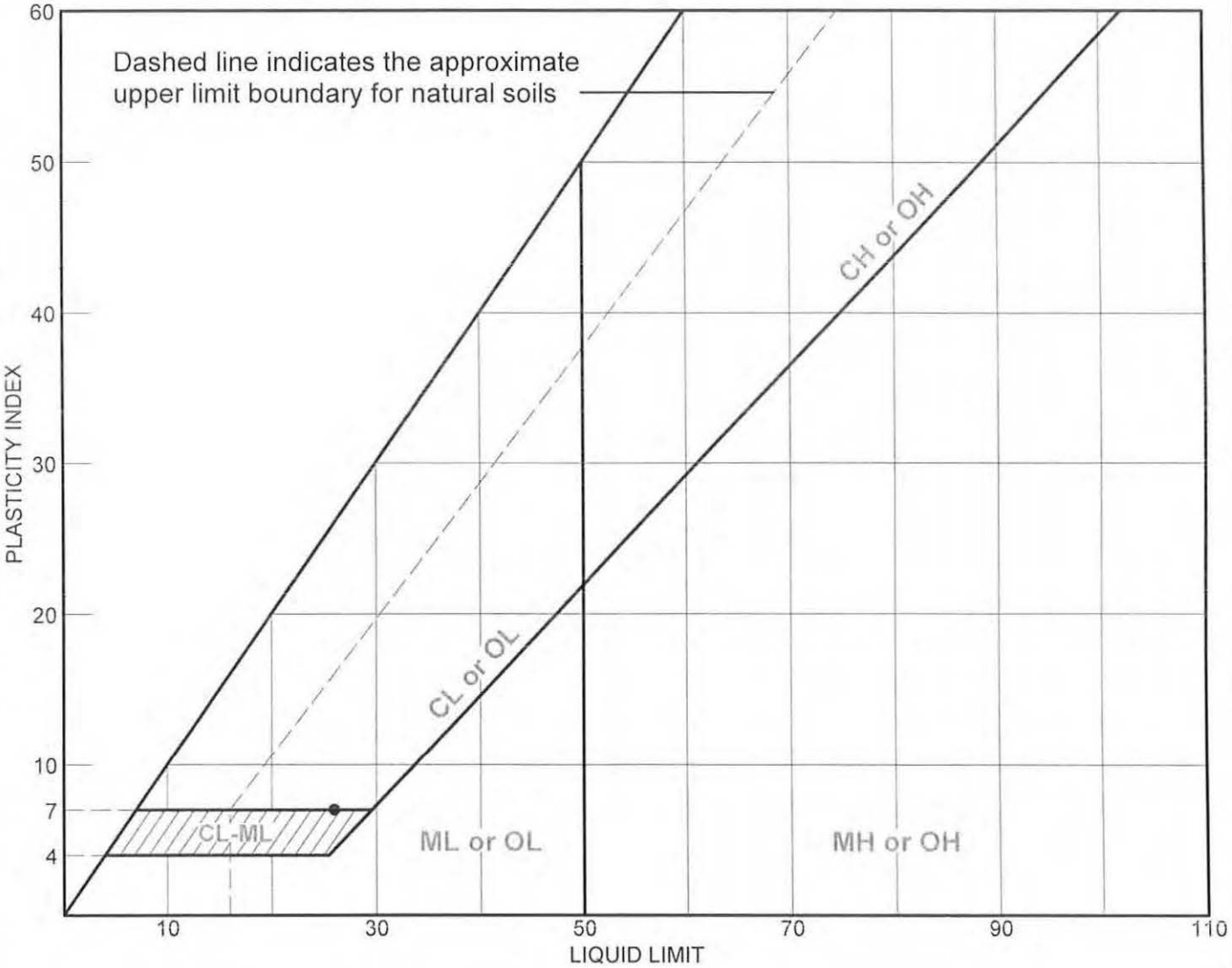
Sample No.: APGTO5-SB12-14 **Source of Sample:** **Date:** 02.14.11
Location: **Elev./Depth:**

PENNIMAN & BROWNE, INC.

Client: U.S. ENVIRONMENTAL PROTECTION AGENCY
Project: R33523/APGTO5-SB12-14

Project No: 201100526 **Figure**

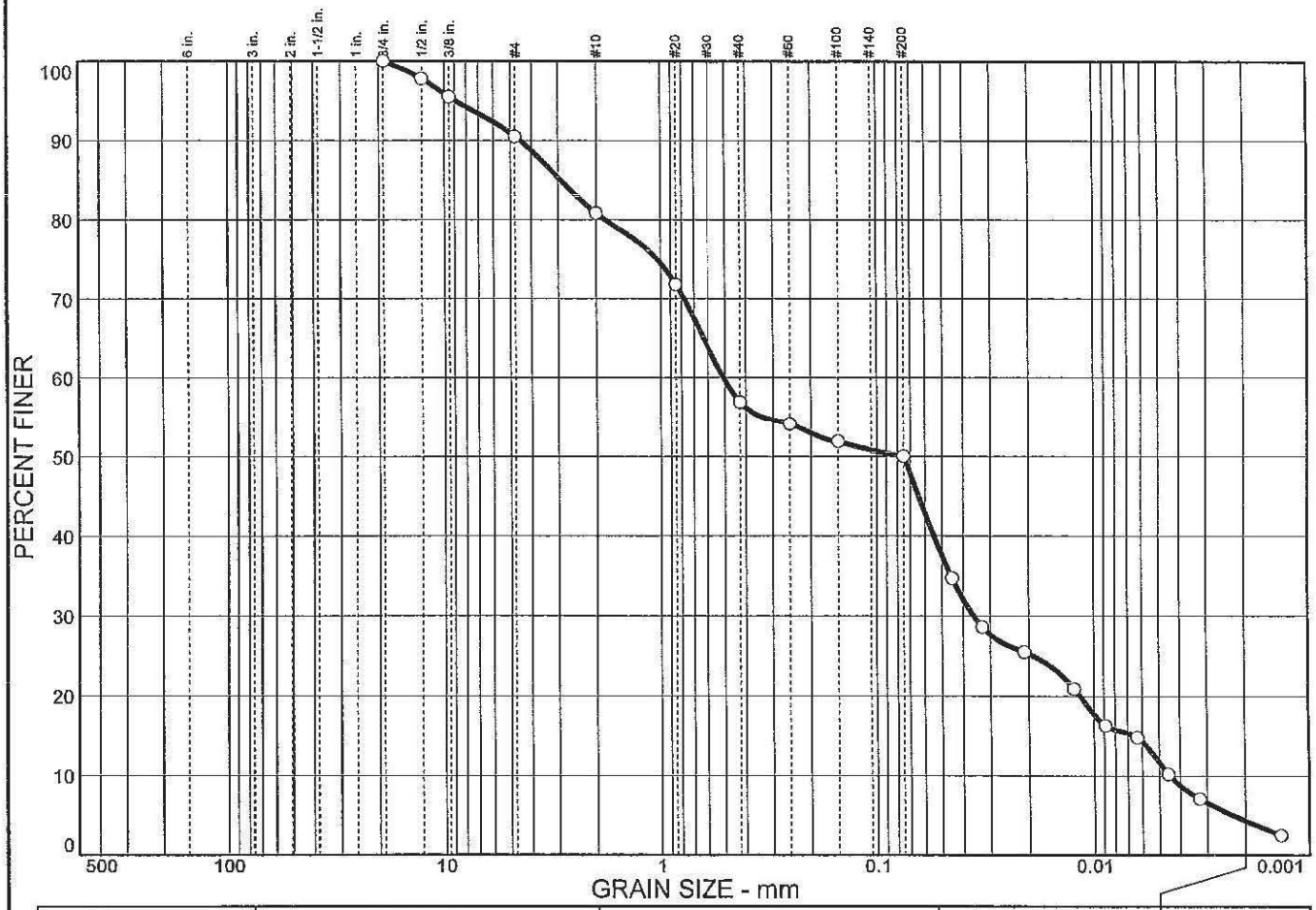
LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●		APGTO5-		21.7	19	26	7	CL-ML

LIQUID AND PLASTIC LIMITS TEST REPORT **PENNIMAN & BROWNE, INC.**	**Client:** U.S. ENVIRONMENTAL PROTECTION AGENCY **Project:** R33523/APGTO5-SB12-14 **Project No.:** 201100526 **Figure** 02.14.11

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	19.2	41.7	34.8	4.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	97.8		
.375 in.	95.5		
#4	90.5		
#10	80.8		
#20	71.8		
#40	56.9		
#60	54.1		
#100	51.9		
#200	50.0		

* (no specification provided)

Material Description

GRAY-BROWN SOIL CONTAINING ASBESTOS

Atterberg Limits

PL= 78 LL= 112 PI= 34

Coefficients

D_{85}= 2.93 D_{60}= 0.508 D_{50}= 0.0750
D_{30}= 0.0359 D_{15}= 0.0065 D_{10}= 0.0045
C_u= 113.59 C_c= 0.57

Classification

USCS= MH AASHTO= A-7-5(17)

Remarks

SP.GR-2.519

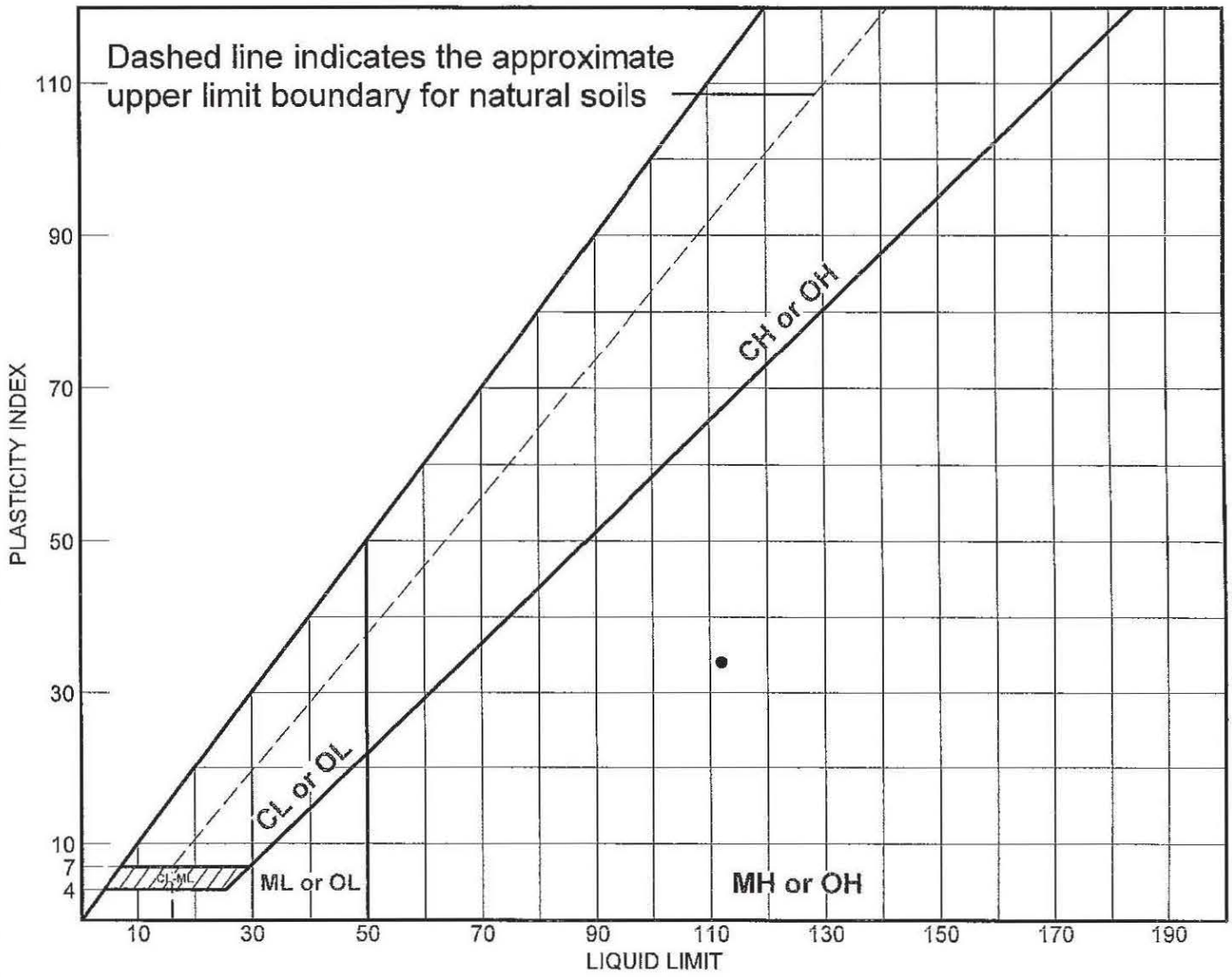
Sample No.: APGTO6-SB4-6 **Source of Sample:** **Date:** 03.11.11
Location: **Elev./Depth:**

PENNIMAN & BROWNE, INC.

Client: U.S. ENVIRONMENTAL PROTECTION AGENCY
Project: R33523/APGTO6-SB4-6

Project No: 201100526 **Figure**

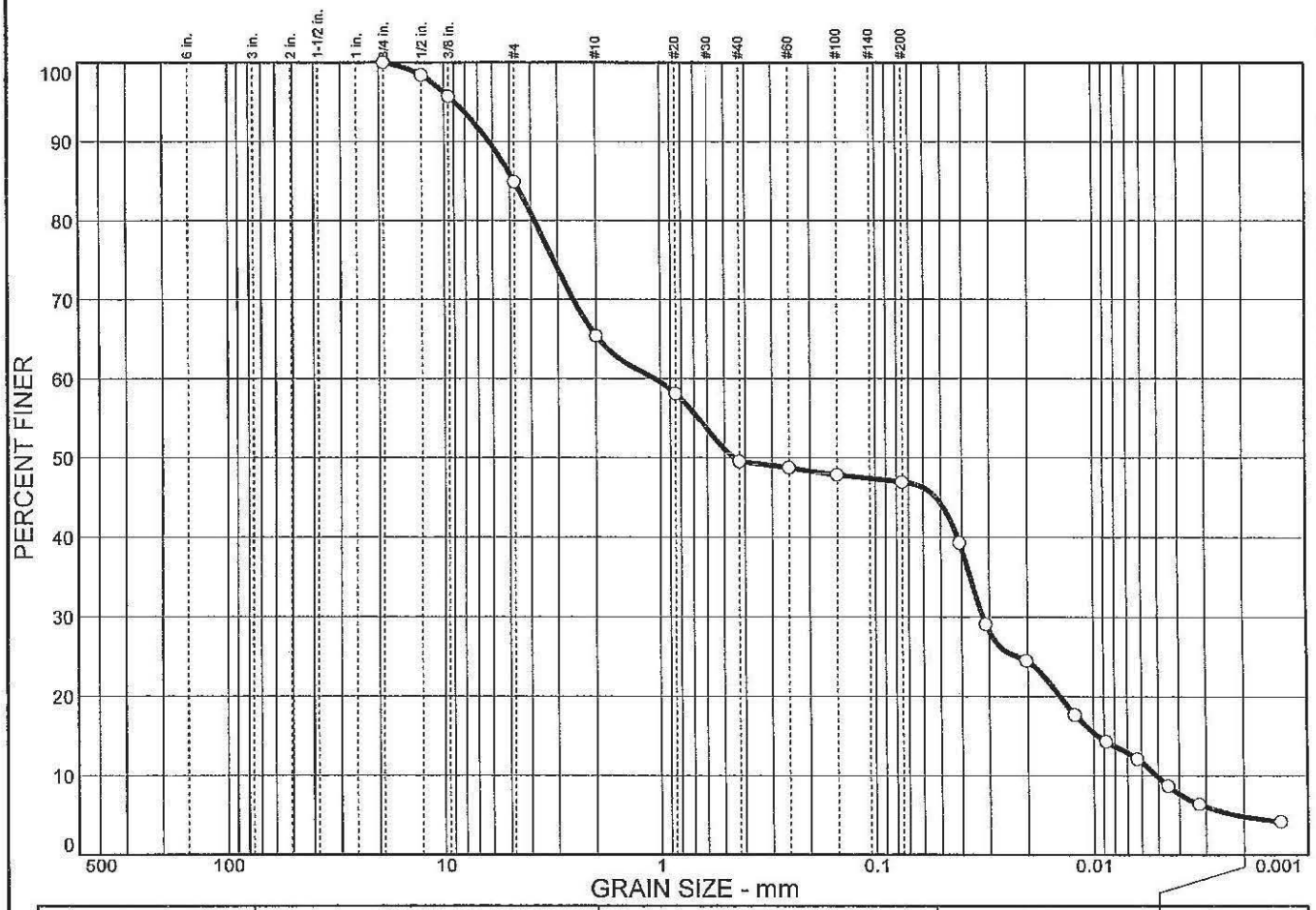
LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●		APGTO6-		116.6	78	112	34	MH

LIQUID AND PLASTIC LIMITS TEST REPORT **PENNIMAN & BROWNE, INC.**	**Client:** U.S. ENVIRONMENTAL PROTECTION AGENCY **Project:** R33523/APGTO6-SB4-6 **Project No.:** 201100526 **Figure** 03.11.11

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	34.6	20.3	40.2	4.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	98.4		
.375 in.	95.7		
#4	84.9		
#10	65.4		
#20	58.1		
#40	49.5		
#60	48.7		
#100	47.8		
#200	46.9		

* (no specification provided)

Material Description

GRAY SOIL CONTAINING ASBESTOS

Atterberg Limits

PL= 69 LL= 110 PI= 41

Coefficients

D_{85}= 4.77 D_{60}= 1.07 D_{50}= 0.452
D_{30}= 0.0320 D_{15}= 0.0096 D_{10}= 0.0051
C_u= 208.61 C_c= 0.19

Classification

USCS= SM AASHTO= A-7-5(17)

Remarks

SP.GR-2.650

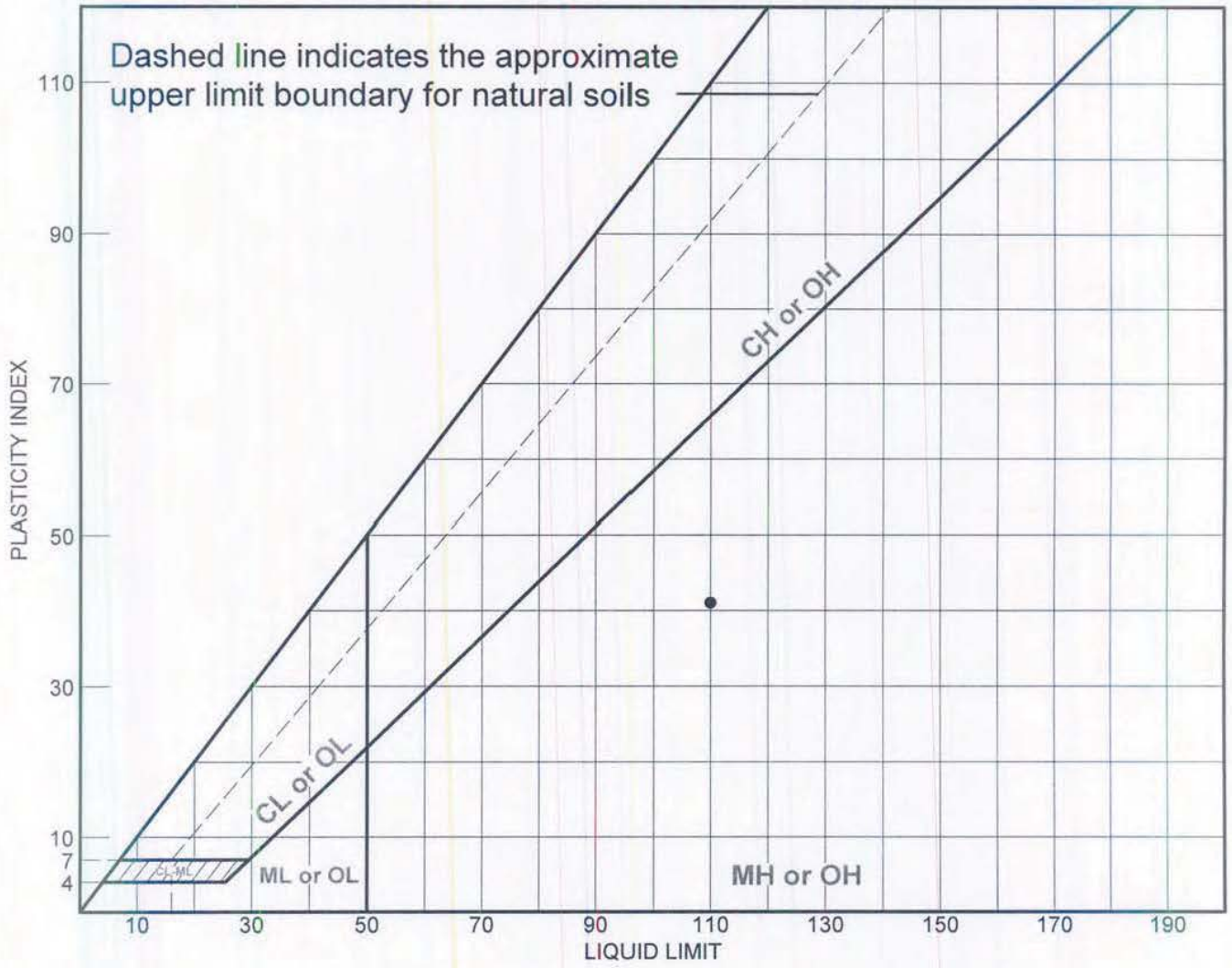
Sample No.: APGTO6-SB14-16 **Source of Sample:** **Date:** 02.17.11
Location: **Elev./Depth:**

PENNIMAN & BROWNE, INC.

Client: U.S. ENVIRONMENTAL PROTECTION AGENCY
Project: R33523/APGTO6-SB14-16

Project No: 201100526 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●		APGTO6-		132.9	69	110	41	SM

LIQUID AND PLASTIC LIMITS TEST REPORT

PENNIMAN & BROWNE, INC.

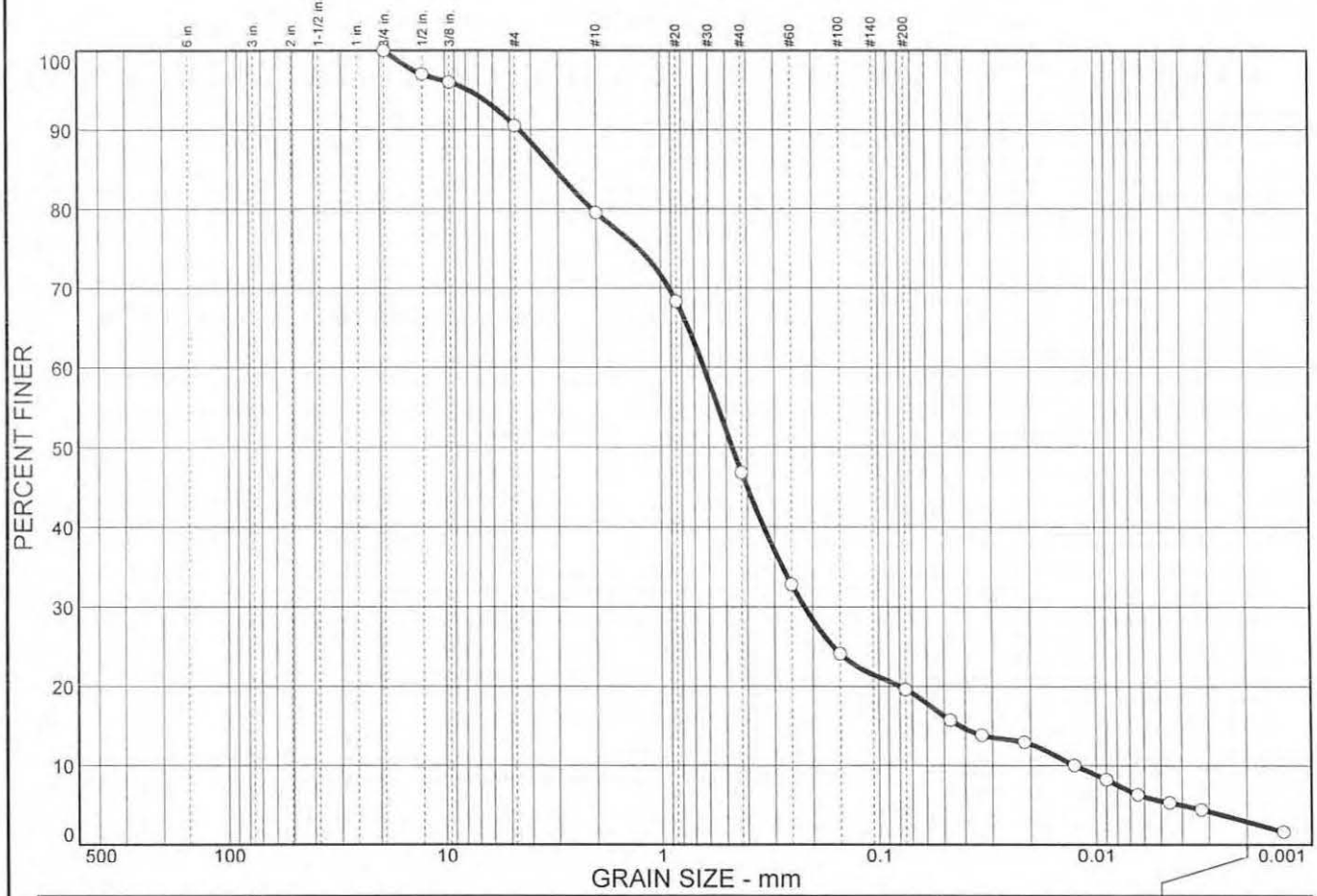
Client: U.S. ENVIRONMENTAL PROTECTION AGENCY

Project: R33523/APGTO6-SB14-16

Project No.: 201100526

Figure 2.17.11

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	20.5	62.8	13.8	2.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	97.0		
.375 in.	96.0		
#4	90.5		
#10	79.5		
#20	68.3		
#40	46.8		
#60	32.8		
#100	24.1		
#200	19.6		

* (no specification provided)

Material Description

CHOCOLATE BROWN SOIL CONTAINING ASBESTOS

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{85}= 3.11 D_{60}= 0.635 D_{50}= 0.469
D_{30}= 0.219 D_{15}= 0.0425 D_{10}= 0.0125
C_u= 50.61 C_c= 6.00

Classification

USCS= AASHTO=

Remarks

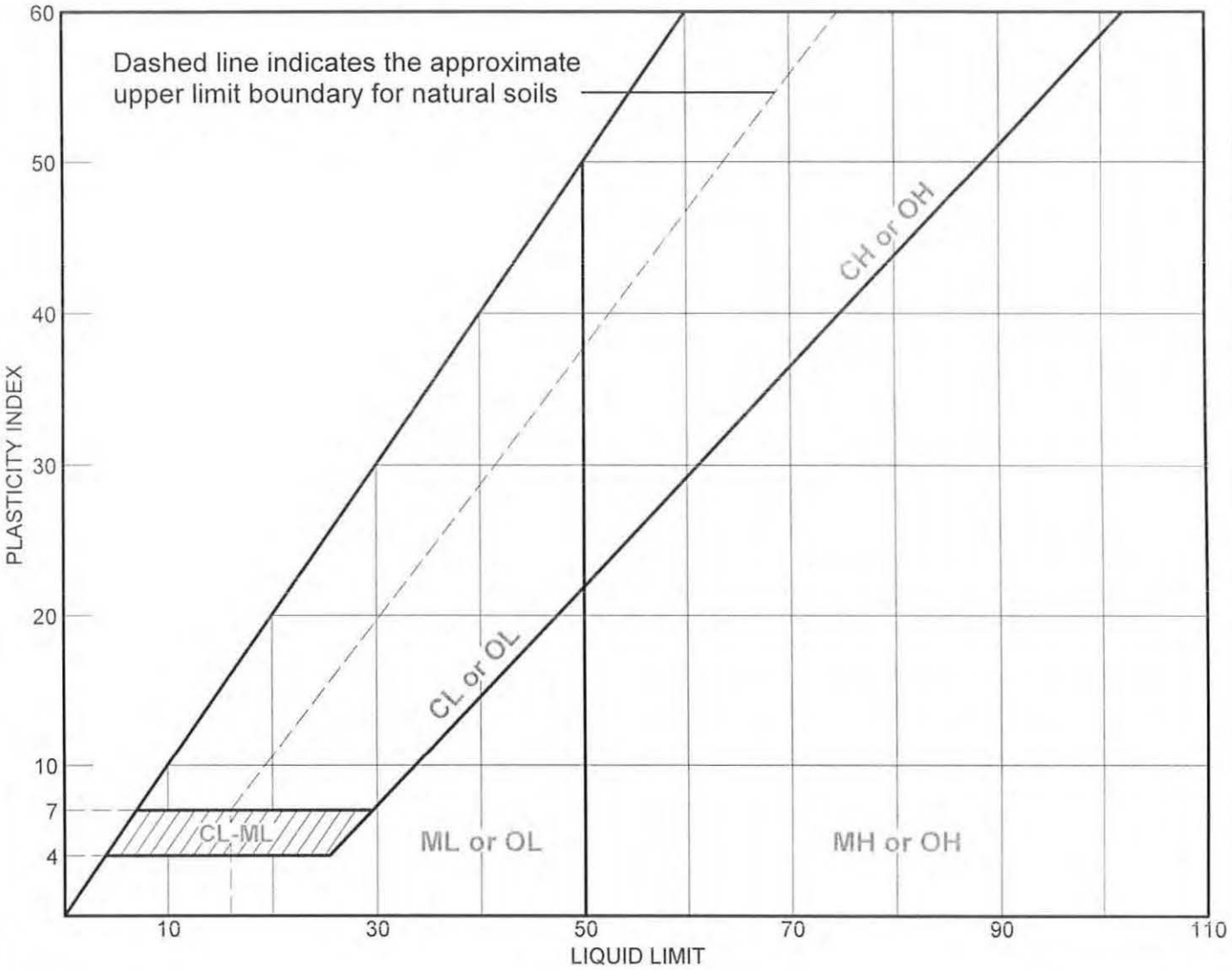
Sample No.: APGTO6-SB37-40 **Source of Sample:** **Date:** 02.14.11
Location: **Elev./Depth:**

PENNIMAN & BROWNE, INC.

Client: U.S. ENVIRONMENTAL PROTECTION AGENCY
Project: R33523/APGTO6-SB37-40

Project No: 201100526 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●		APGTO6-		27.1	NP	NV	NP	

LIQUID AND PLASTIC LIMITS TEST REPORT **PENNIMAN & BROWNE, INC.**	**Client:** U.S. ENVIRONMENTAL PROTECTION AGENCY **Project:** R33523/APGTO6-SB37-40 **Project No.:** 201100526 **Figure** 02.14.11

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	43.5	18.8	36.7	1.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	92.1		
#4	77.9		
#10	56.5		
#20	54.0		
#40	53.1		
#60	52.6		
#100	52.0		
#200	51.5		

* (no specification provided)

Material Description

GRAY SOIL CONTAINING ASBESTOS

Atterberg Limits

PL= 76 LL= 127 PI= 51

Coefficients

D_{85}= 6.76 D_{60}= 2.41 D_{50}= 0.0721
D_{30}= 0.0445 D_{15}= 0.0253 D_{10}= 0.0123
C_u= 195.41 C_c= 0.07

Classification

USCS= MH AASHTO= A-7-5(26)

Remarks

Sp.gr-2.563

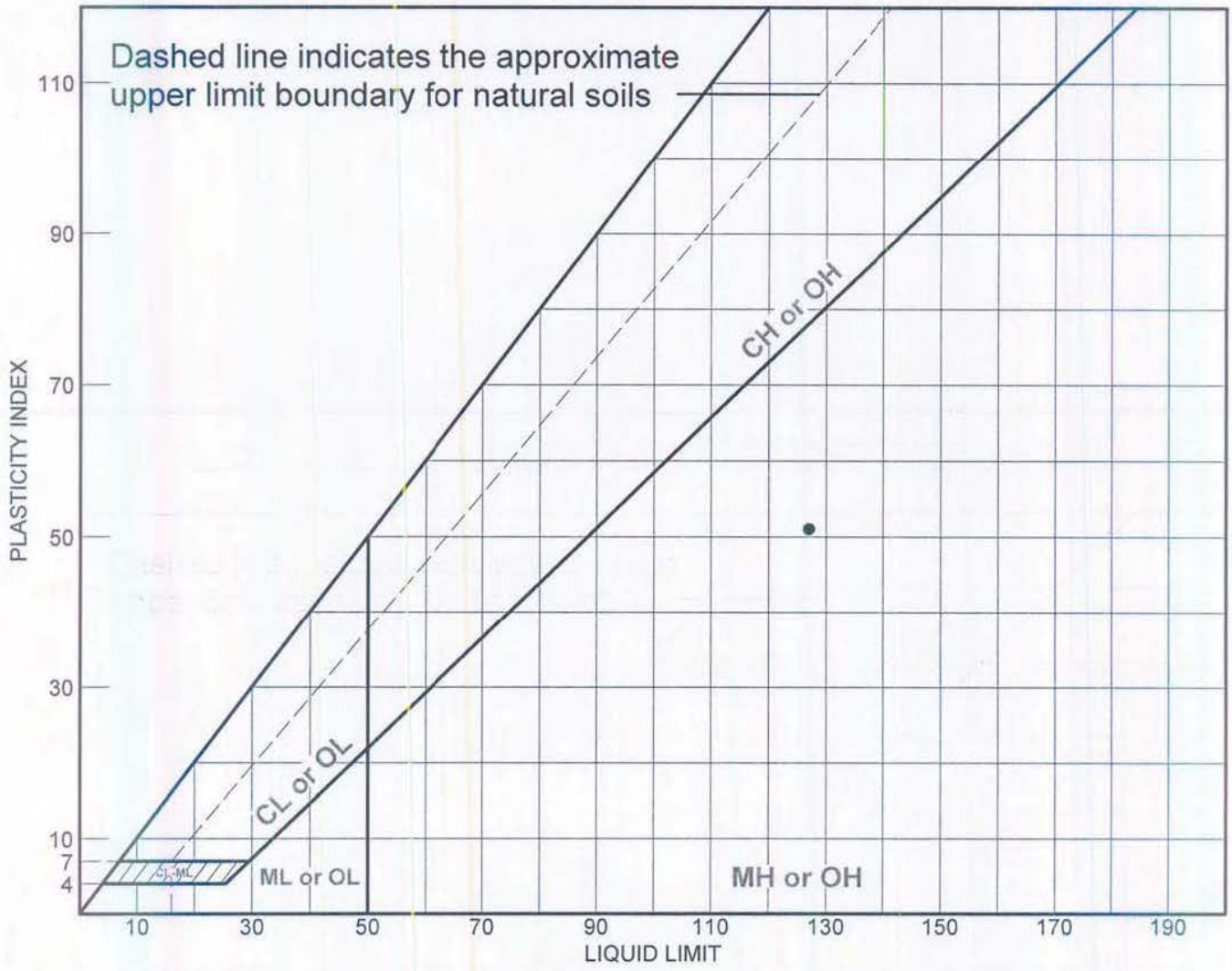
Sample No.: APGTO7-SB10-12 **Source of Sample:** **Date:** 03.22.11
Location: **Elev./Depth:**

PENNIMAN & BROWNE, INC.

Client: U.S. ENVIRONMENTAL PROTECTION AGENCY
Project: R33523/APGTO7-SB10-12

Project No: 201100526 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●		APGTO7-		132	76	127	51	MH

LIQUID AND PLASTIC LIMITS TEST REPORT

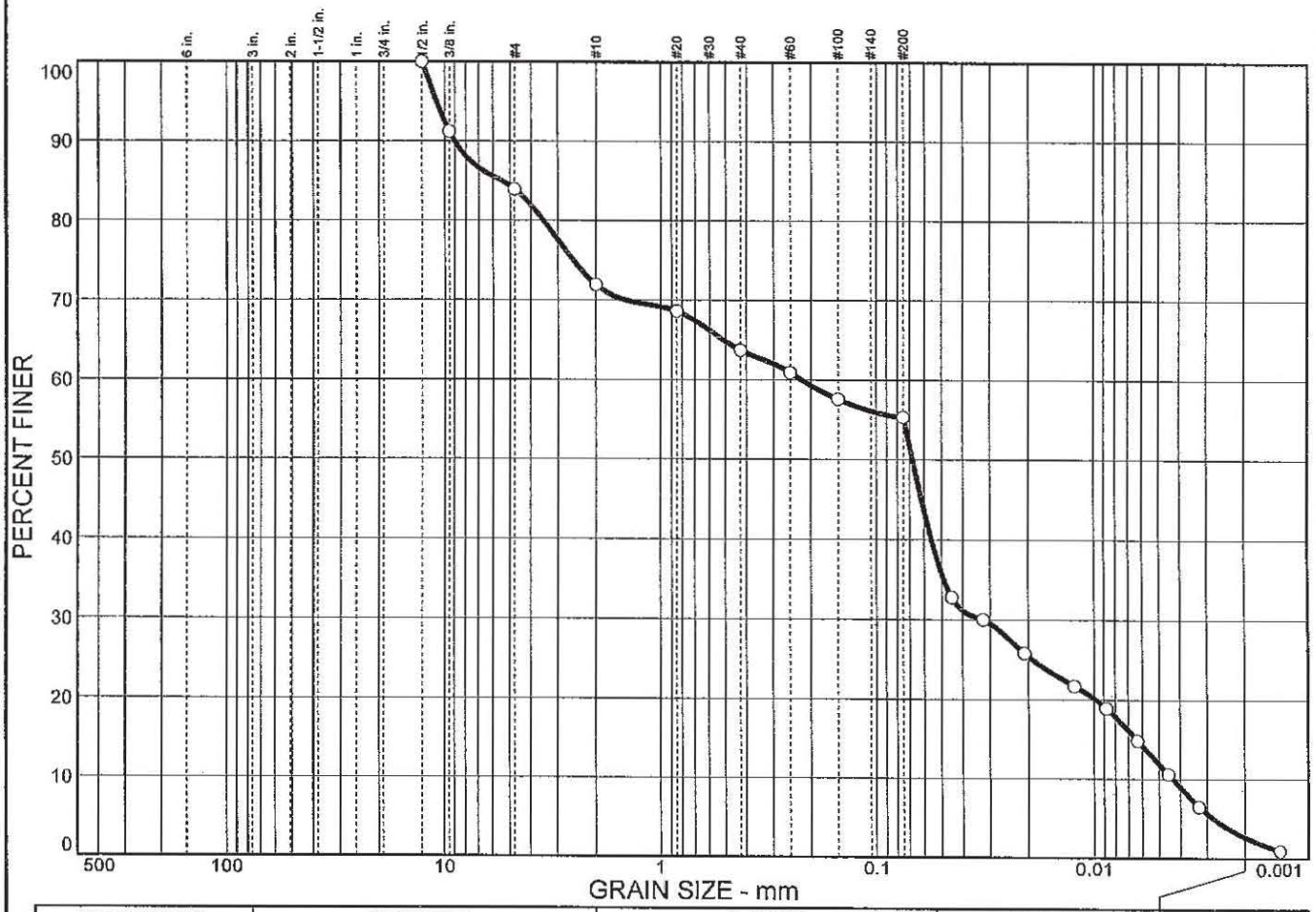
PENNIMAN & BROWNE, INC.

Client: U.S. ENVIRONMENTAL PROTECTION AGENCY

Project: R33523/APGTO7-SB10-12

Project No.: 201100526 **Figure** 3.21.11

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	28.1	34.0	35.2	2.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	91.2		
#4	83.9		
#10	71.9		
#20	68.6		
#40	63.7		
#60	60.9		
#100	57.6		
#200	55.3		

* (no specification provided)

Material Description

GRAY SOIL CONTAINING ASBESTOS

Atterberg Limits

PL= 83 LL= 129 PI= 46

Coefficients

D_{85}= 5.50 D_{60}= 0.222 D_{50}= 0.0682
D_{30}= 0.0322 D_{15}= 0.0064 D_{10}= 0.0043
C_u= 51.14 C_c= 1.08

Classification

USCS= MH AASHTO= A-7-5(27)

Remarks

SP.GR-2.499

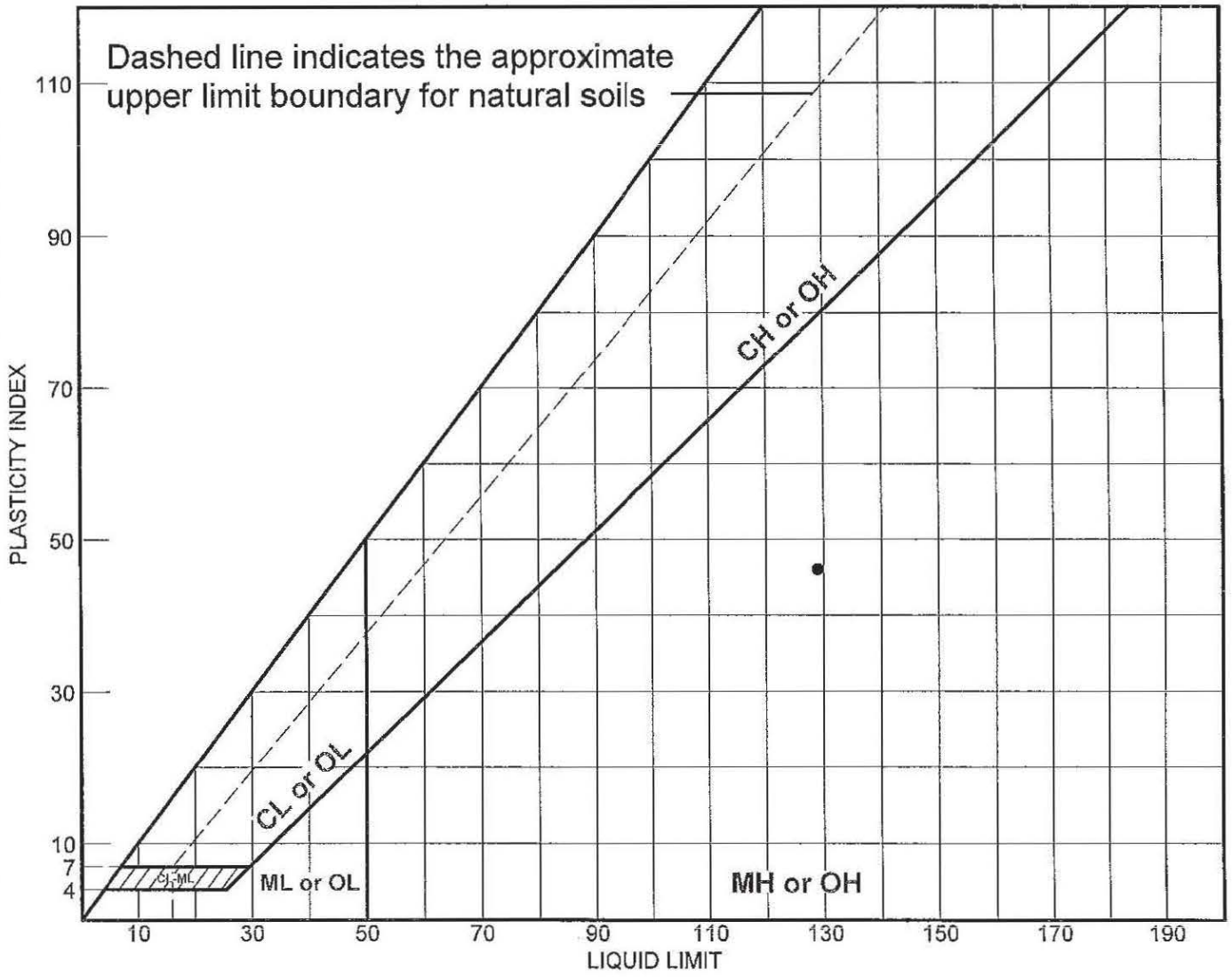
Sample No.: APGTO7-SB20-22 **Source of Sample:** **Date:** 03.11.11
Location: **Elev./Depth:**

PENNIMAN & BROWNE, INC.

Client: U.S. ENVIRONMENTAL PROTECTION AGENCY
Project: R33523/APGTO7-SB20-22

Project No: 201100526 **Figure**

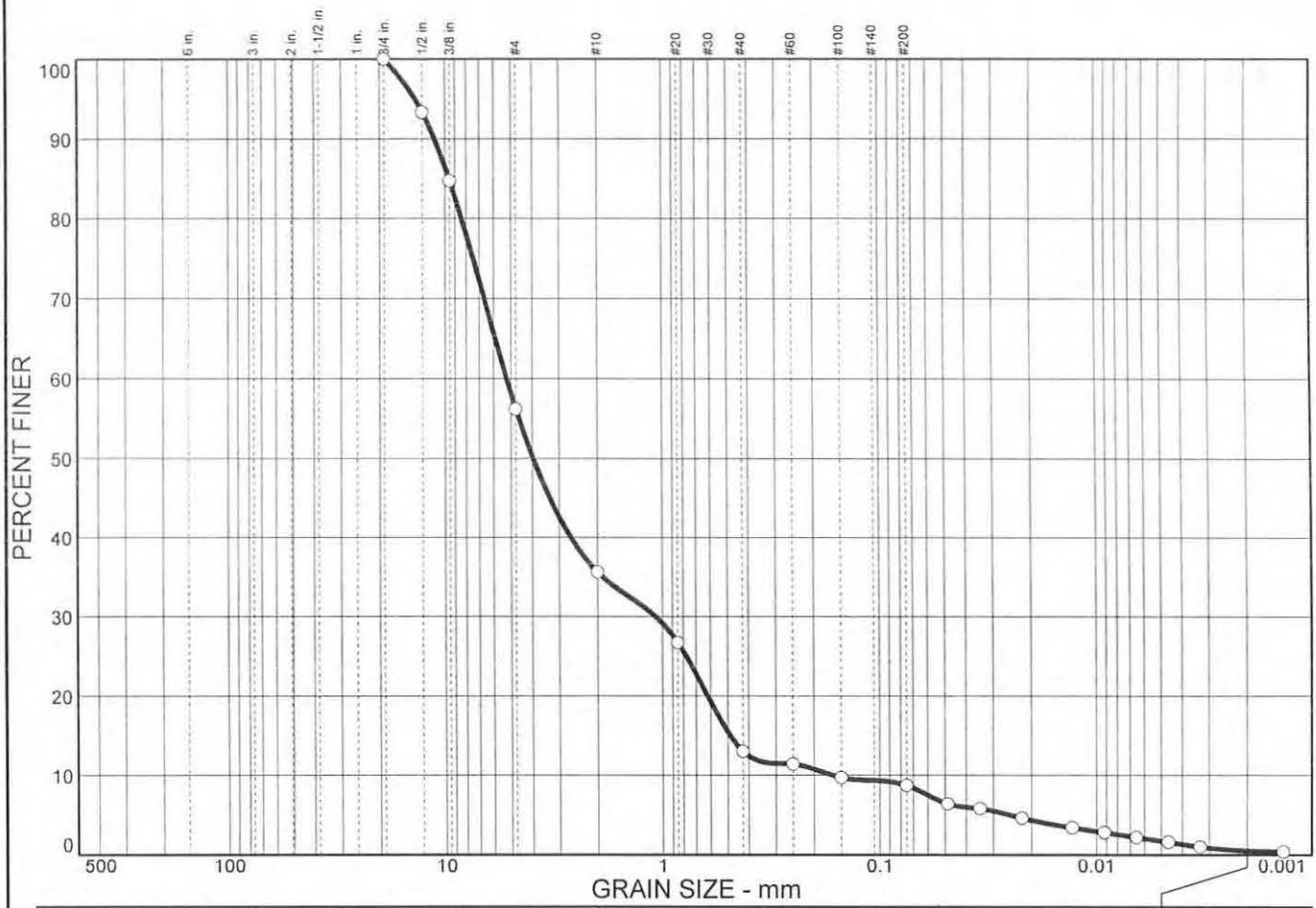
LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●		APGTO7-		217.9	83	129	46	MH

LIQUID AND PLASTIC LIMITS TEST REPORT **PENNIMAN & BROWNE, INC.**	**Client:** U.S. ENVIRONMENTAL PROTECTION AGENCY **Project:** R33523/APGTO7-SB20-22 **Project No.:** 201100526 **Figure** 03.10.11

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	64.4	28.8	6.3	0.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	93.3		
.375 in.	84.7		
#4	56.2		
#10	35.6		
#20	26.7		
#40	13.0		
#60	11.4		
#100	9.7		
#200	8.7		

* (no specification provided)

Material Description

GRAY SOIL CONTAINING ASBESTOS

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{85}= 9.61 D_{60}= 5.24 D_{50}= 3.96
D_{30}= 1.08 D_{15}= 0.487 D_{10}= 0.165
C_u= 31.70 C_c= 1.34

Classification

USCS= SW-SM AASHTO= A-1-a

Remarks

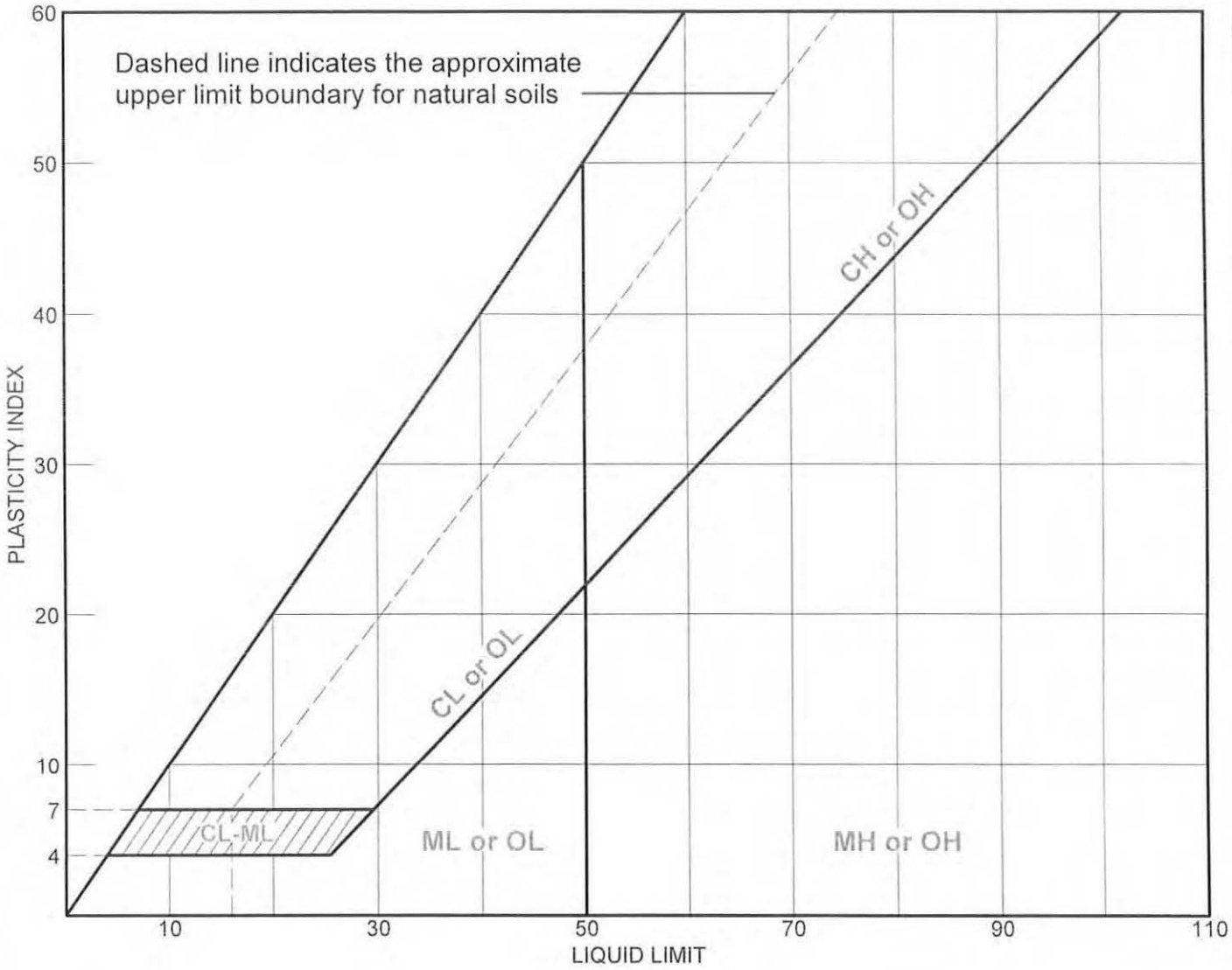
Sample No.: APGTO9-SB4-10 **Source of Sample:** **Date:** 02.14.11
Location: **Elev./Depth:**

PENNIMAN & BROWNE, INC.

Client: U.S. ENVIRONMENTAL PROTECTION AGENCY
Project: R33523/APGTO9-SB4-10

Project No: 201100526 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●		APGTO9-		24.5	NP	NV	NP	SW-SM

LIQUID AND PLASTIC LIMITS TEST REPORT

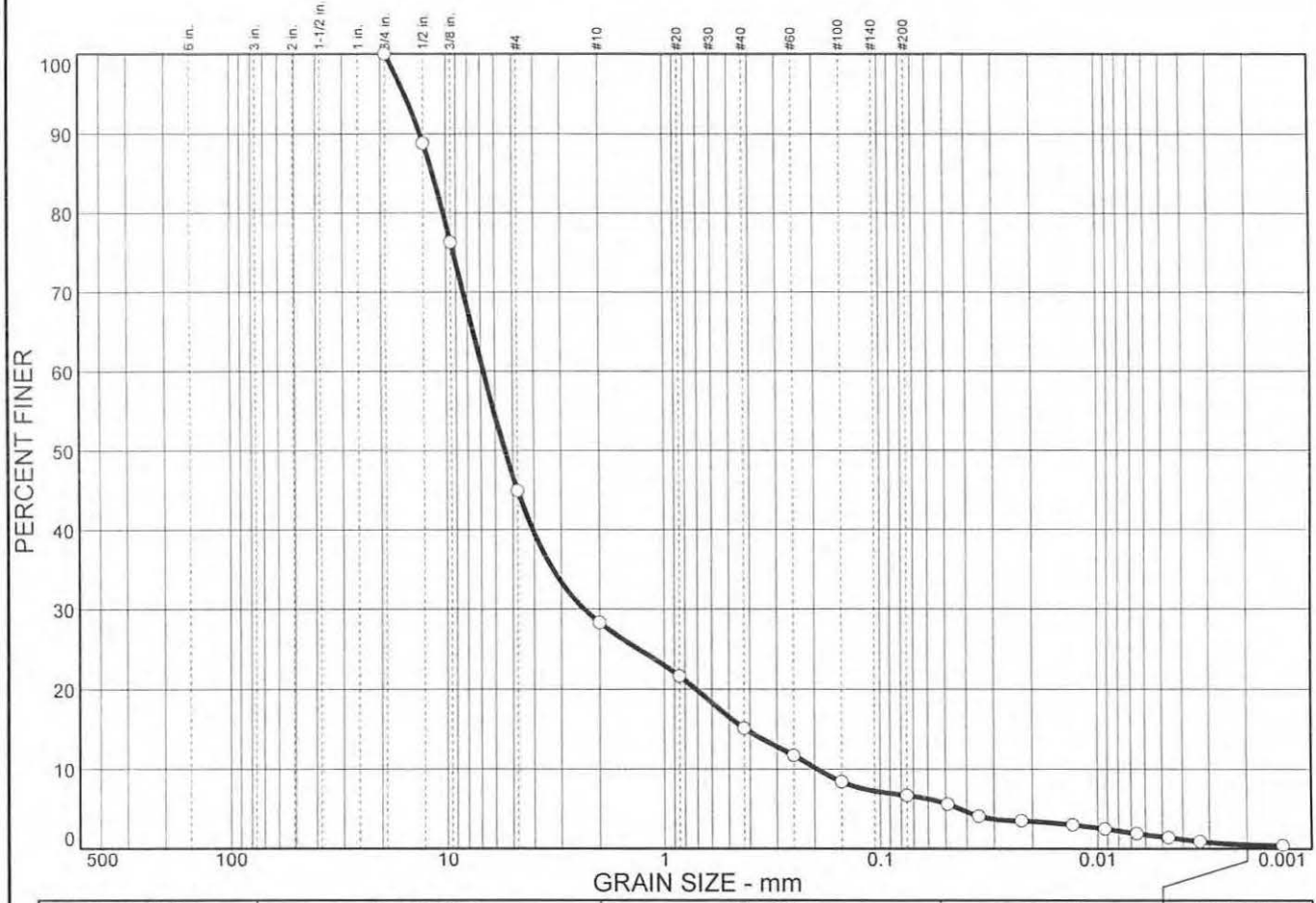
PENNIMAN & BROWNE, INC.

Client: U.S. ENVIRONMENTAL PROTECTION AGENCY

Project: R33523/APGTO9-SB4-10

Project No.: 201100526 **Figure** 02.14.11

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	71.7	22.4	5.4	0.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	88.8		
.375 in.	76.3		
#4	44.9		
#10	28.3		
#20	21.6		
#40	15.1		
#60	11.7		
#100	8.4		
#200	6.7		

* (no specification provided)

Material Description

GRAY SOIL CONTAINING ASBESTOS

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{85}= 11.5 D_{60}= 6.80 D_{50}= 5.43
D_{30}= 2.36 D_{15}= 0.420 D_{10}= 0.195
C_u= 34.88 C_c= 4.20

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

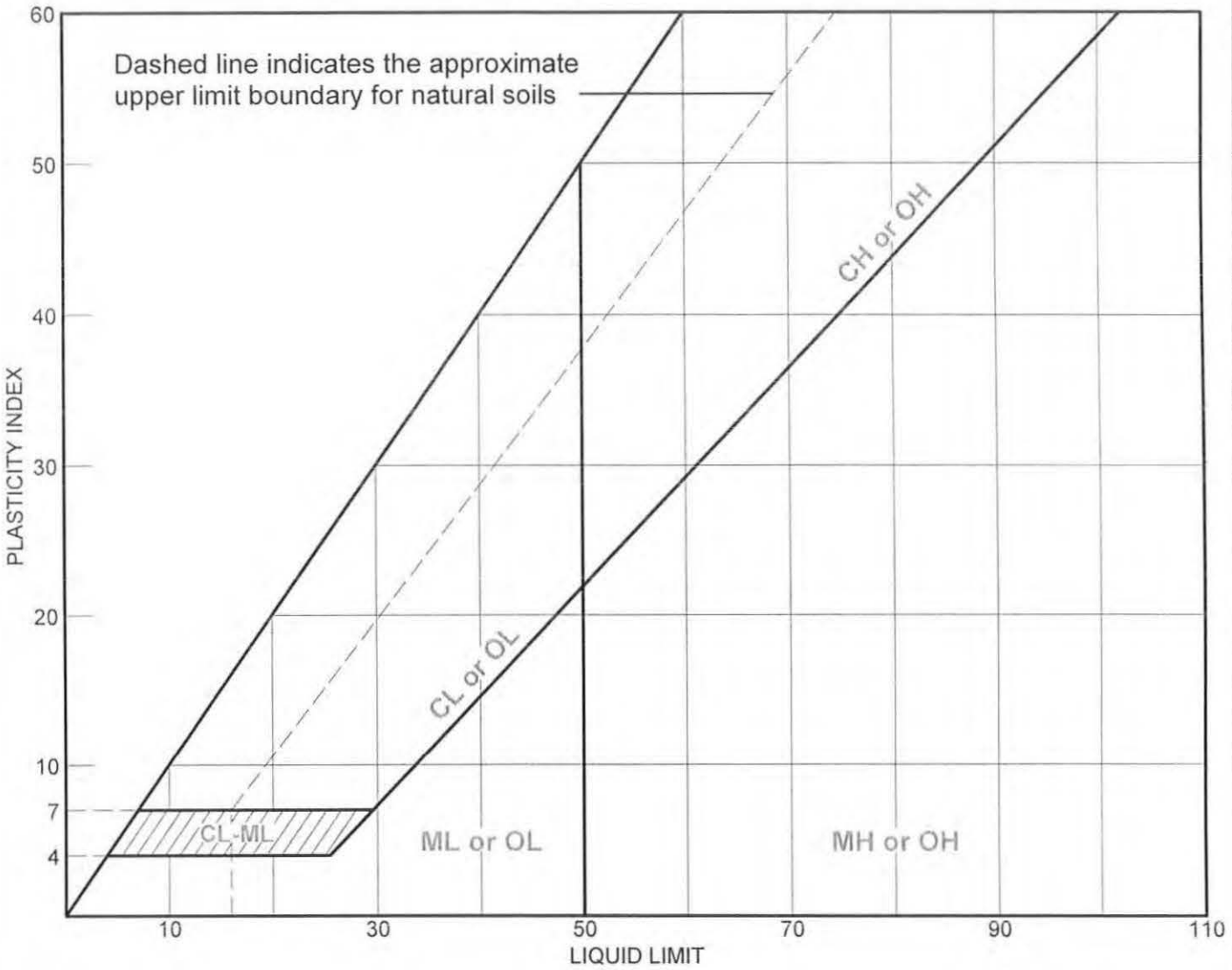
Sample No.: APGTO9-SB12-20 Source of Sample: Date: 02.14.11
Location: Elev./Depth:

PENNIMAN & BROWNE, INC.

Client: U.S. ENVIRONMENTAL PROTECTION AGENCY
Project: R33523/APGTO9-SB12-20

Project No: 201100526 Figure

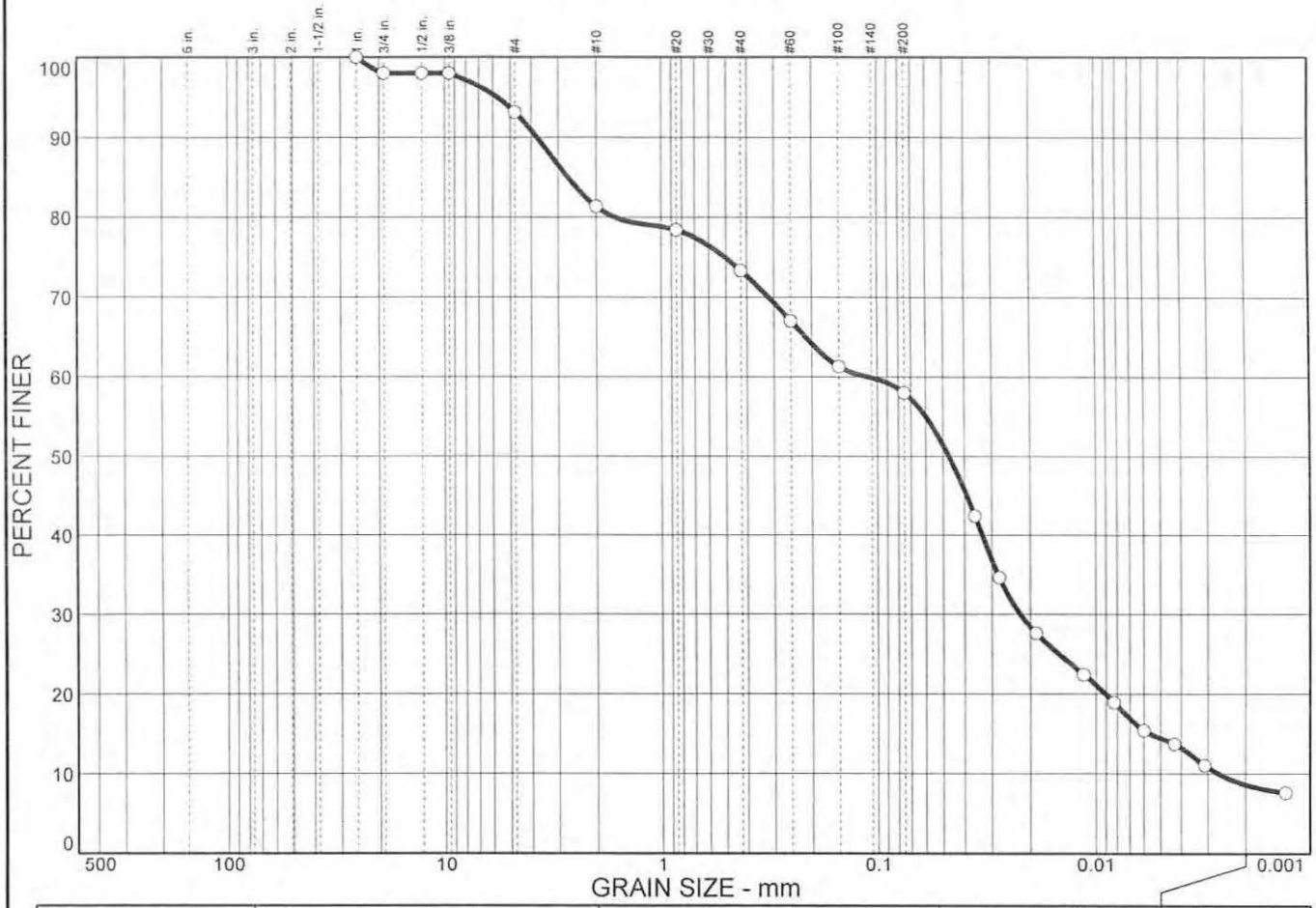
LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●		APGTO9-		24.2	NP	NV	NP	GP-GM

LIQUID AND PLASTIC LIMITS TEST REPORT **PENNIMAN & BROWNE, INC.**	**Client:** U.S. ENVIRONMENTAL PROTECTION AGENCY **Project:** R33523/APGTO9-SB12-20 **Project No.:** 201100526 **Figure** 02.14.11

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	18.7	28.7	44.0	8.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	98.0		
.5 in.	98.0		
.375 in.	98.0		
#4	93.1		
#10	81.3		
#20	78.4		
#40	73.3		
#60	67.0		
#100	61.3		
#200	58.0		

* (no specification provided)

Material Description

CHOCOLATE BROWN SOIL CONTAINING ASBESTOS

Atterberg Limits

PL= 24 LL= 32 PI= 8

Coefficients

D_{85}= 2.71 D_{60}= 0.110 D_{50}= 0.0471
D_{30}= 0.0223 D_{15}= 0.0056 D_{10}= 0.0027
C_u= 40.80 C_c= 1.67

Classification

USCS= ML AASHTO= A-4(3)

Remarks

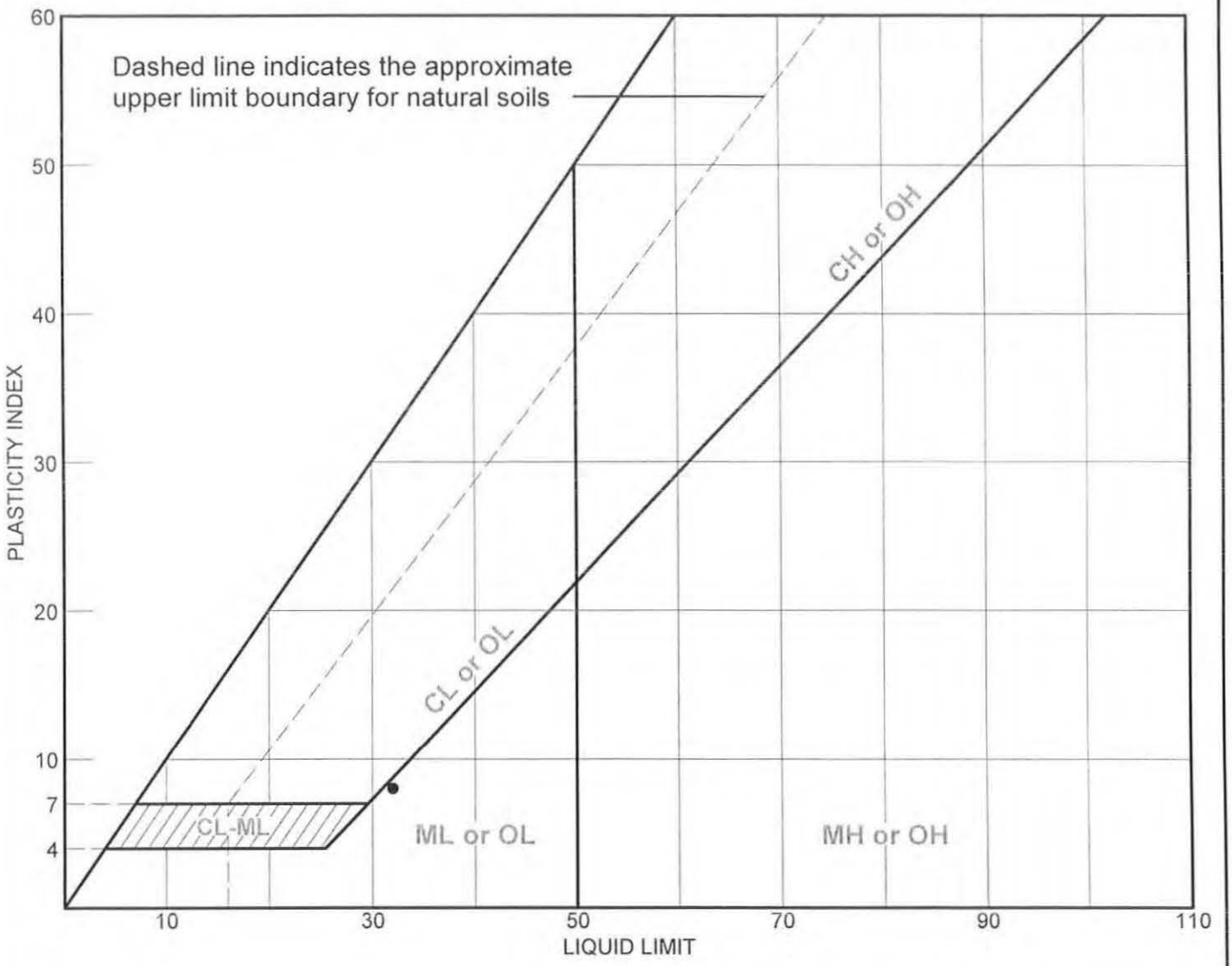
Sample No.: APGTO9-SB22-27 **Source of Sample:** **Date:** 02.14.11
Location: **Elev./Depth:**

PENNIMAN & BROWNE, INC.

Client: U.S. ENVIRONMENTAL PROTECTION AGENCY
Project: R33523/APGTO9-SB22-27

Project No: 201100526 **Figure**

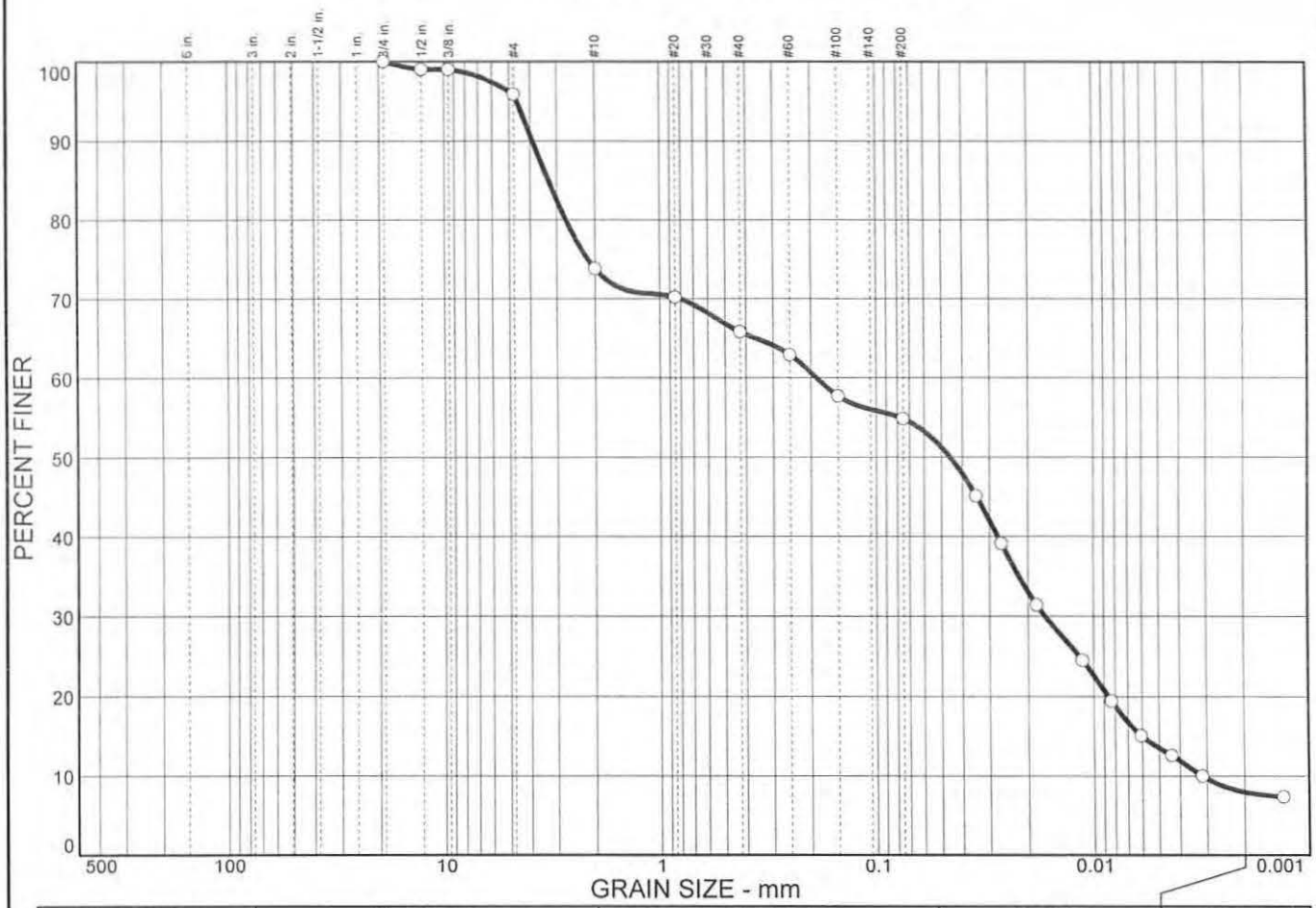
LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●		APGTO9-		28.2	24	32	8	ML

LIQUID AND PLASTIC LIMITS TEST REPORT **PENNIMAN & BROWNE, INC.**	**Client:** U.S. ENVIRONMENTAL PROTECTION AGENCY **Project:** R33523/APGTO9-SB22-27 **Project No.:** 201100526 **Figure** 02.14.11

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	26.2	21.9	43.9	8.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	99.0		
.375 in.	99.0		
#4	95.9		
#10	73.8		
#20	70.2		
#40	65.8		
#60	62.9		
#100	57.7		
#200	54.8		

* (no specification provided)

Material Description

CHOCOLATE BROWN SOIL CONTAINING ASBESTOS

Atterberg Limits

PL= 26 LL= 36 PI= 10

Coefficients

D_{85}= 3.29 D_{60}= 0.189 D_{50}= 0.0458
D_{30}= 0.0167 D_{15}= 0.0060 D_{10}= 0.0032
C_u= 59.87 C_c= 0.47

Classification

USCS= ML AASHTO= A-4(4)

Remarks

SP.GRAVITY-2.608

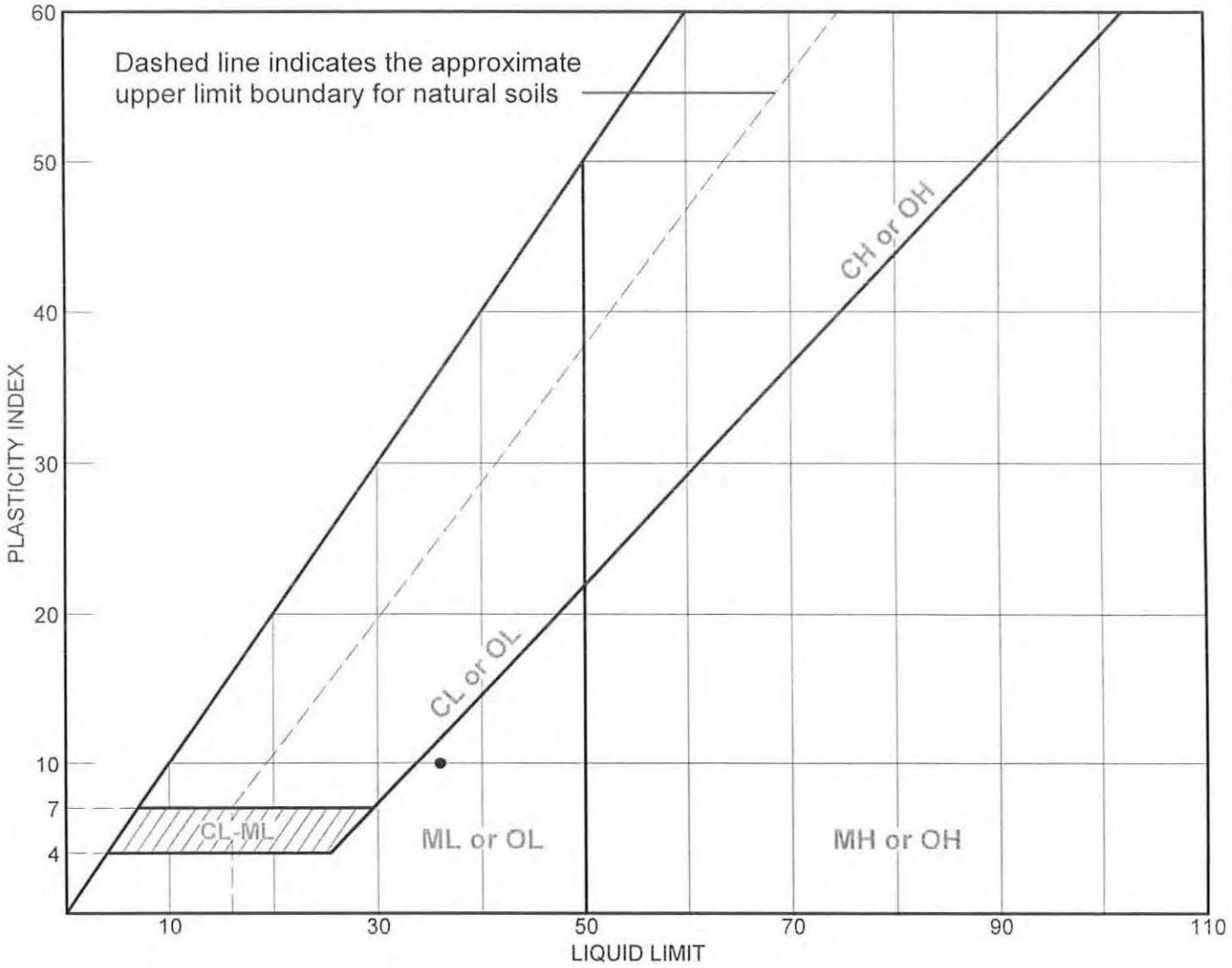
Sample No.: APGTO9-SB26-30 **Source of Sample:** **Date:**
Location: **Elev./Depth:**

PENNIMAN & BROWNE, INC.

Client: U.S. ENVIRONMENTAL PROTECTION AGENCY
Project: R33523/APGTO9-SB26-30

Project No: 201100526 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT

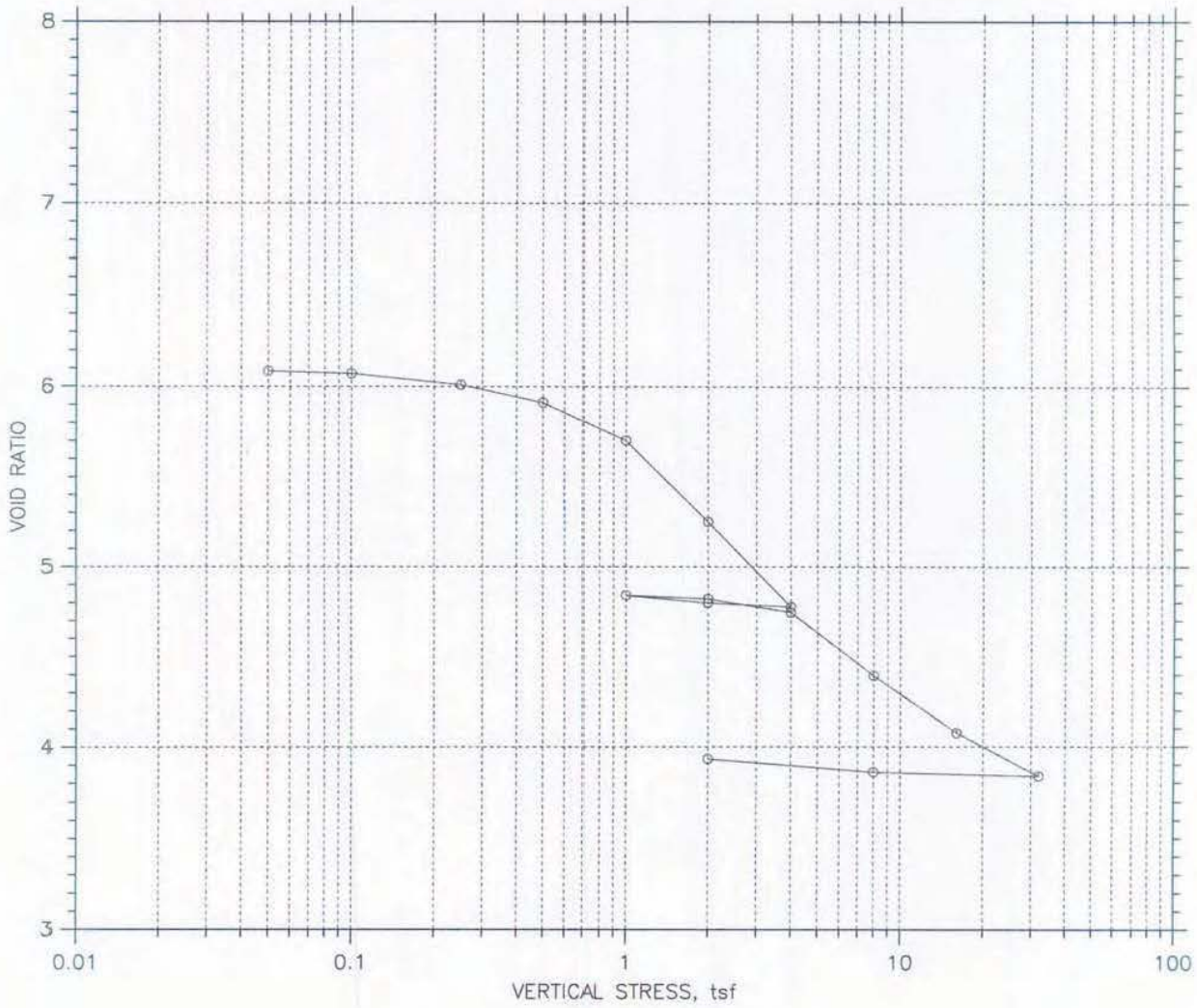


SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●		APGTO9-		16	26	36	10	ML

LIQUID AND PLASTIC LIMITS TEST REPORT **PENNIMAN & BROWNE, INC.**	**Client:** U.S. ENVIRONMENTAL PROTECTION AGENCY **Project:** R33523/APGTO9-SB26-30 **Project No.:** 201100526 **Figure** 02.14.11

CONSOLIDATION TEST DATA

SUMMARY REPORT



					Before Test	After Test
Overburden Pressure: 0.25 tsf				Water Content, %	223.33	93.33
Preconsolidation Pressure: 1 tsf				Dry Unit Weight, pcf	23.28	33.54
Compression Index: 1.08				Saturation, %	96.93	62.89
Diameter: 2.5 in		Height: 1 in		Void Ratio	6.11	3.93
LL: 61	PL: 48	PI: 13	GS: 2.65			

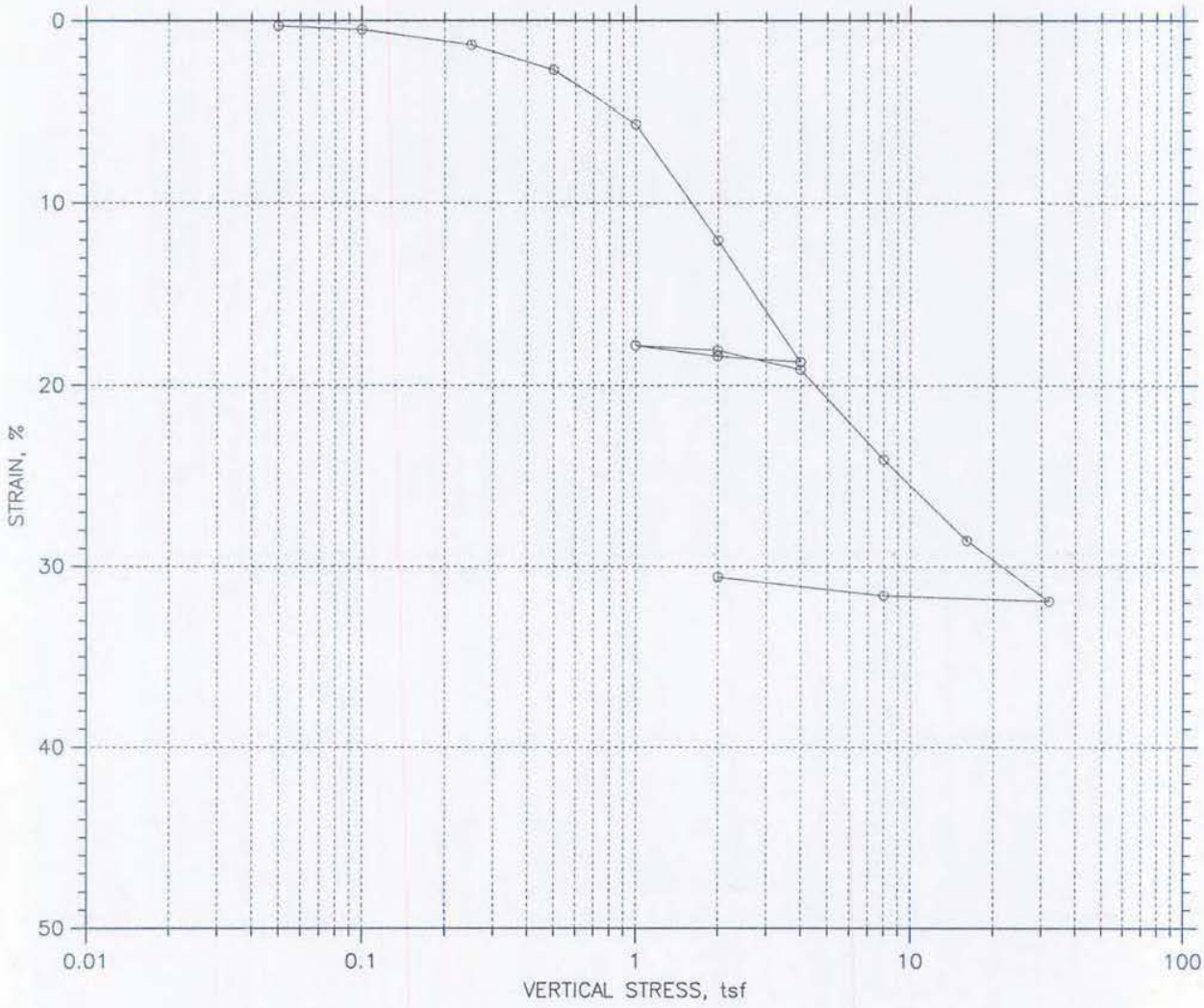
PENNIMAN & BROWNE, INC.

Project: U.S. EPA	Location: APGT04-SB10-12	Project No.: 201100526
Boring No.: SB10-12	Tested By: AS	Checked By:
Sample No.: APGT04	Test Date: 02.17.11	Depth:
Test No.:	Sample Type: ST	Elevation:
Description: GRAY SOIL CONTAINING ASBESTOS		
Remarks:		

Fri, 25-FEB-2011 15:53:12

CONSOLIDATION TEST DATA

SUMMARY REPORT



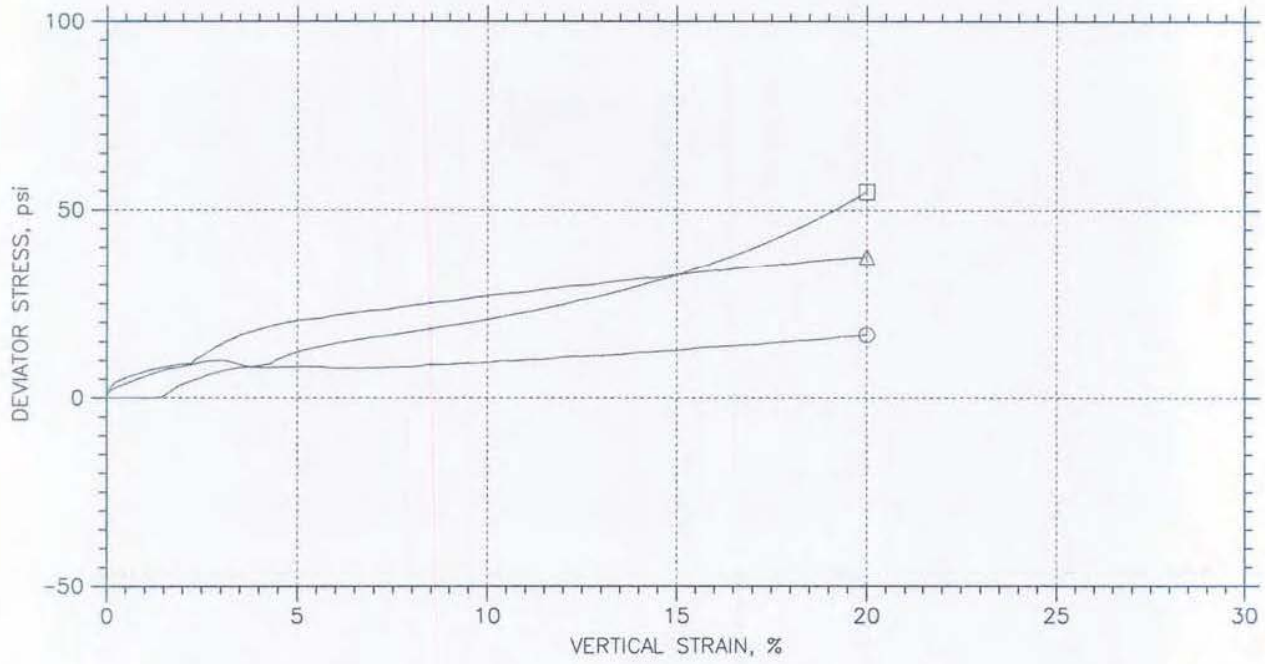
					Before Test	After Test
Overburden Pressure: 0.25 tsf				Water Content, %	223.33	93.33
Preconsolidation Pressure: 1 tsf				Dry Unit Weight, pcf	23.28	33.54
Compression Index: 1.08				Saturation, %	96.90	62.86
Diameter: 2.5 in		Height: 1 in		Void Ratio	6.12	3.94
LL: 61	PL: 48	PI: 13	GS: 2.65			

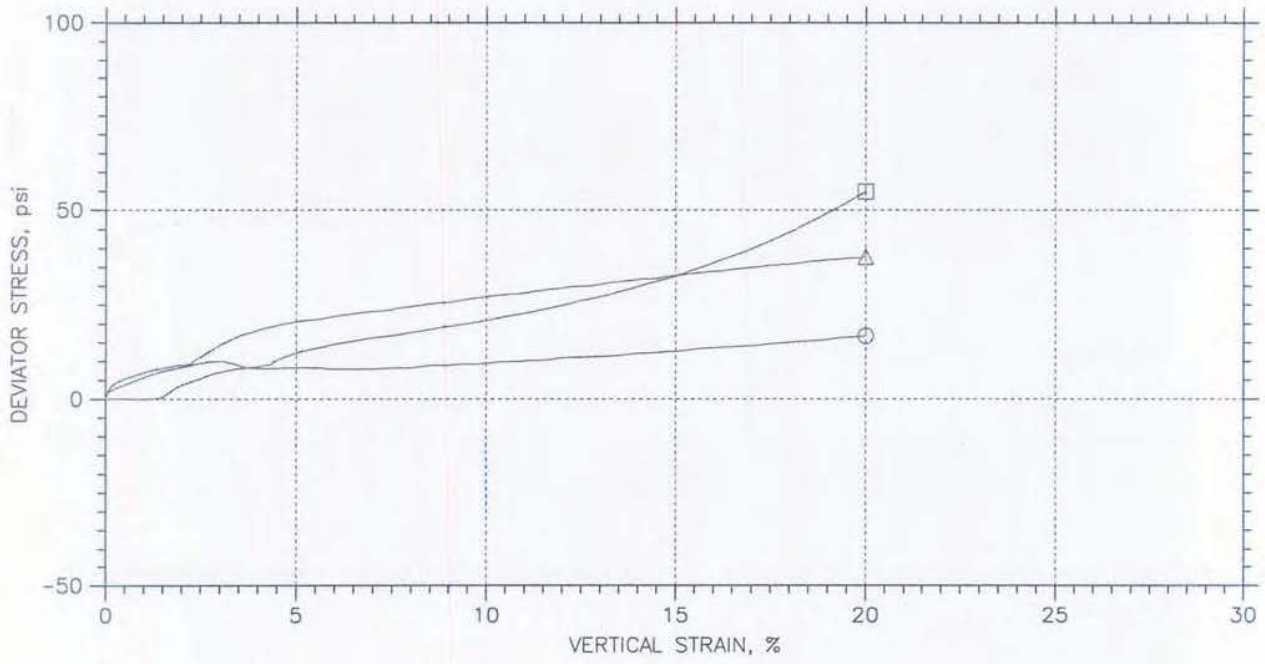
PENNIMAN & BROWNE, INC.

Project: U.S. EPA	Location: APGT04-SB10-12	Project No.: 201100526
Boring No.: SB10-12	Tested By: AS	Checked By:
Sample No.: APGT04	Test Date: 02.17.11	Depth:
Test No.:	Sample Type: ST	Elevation:
Description: GRAY SOIL CONTAINING ASBESTOS		
Remarks:		

Fri, 25-MAR-2011 13:48:01

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





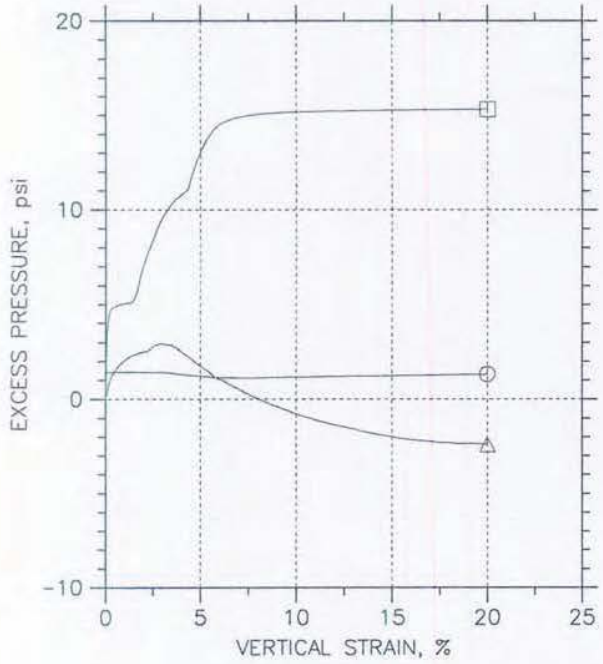
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
○	APGT04	1		AS	02.11.11			201100526-01(1)apgto4-sb10-
△	APGT04	2		AS	02.21.11			201100526-01(2)apgto4-sb10-
□	APGT04	3		AS	02.22.11			201100526-01(3)apgto4-sb10-

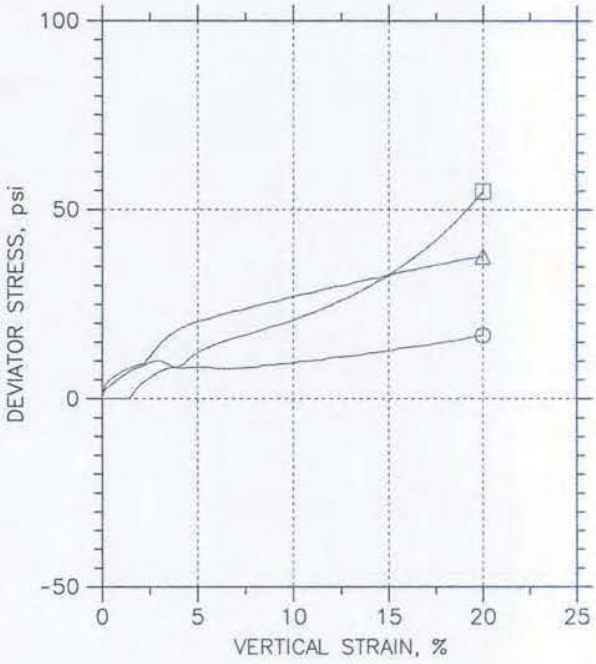
PENNIMAN & BROWNE, INC.

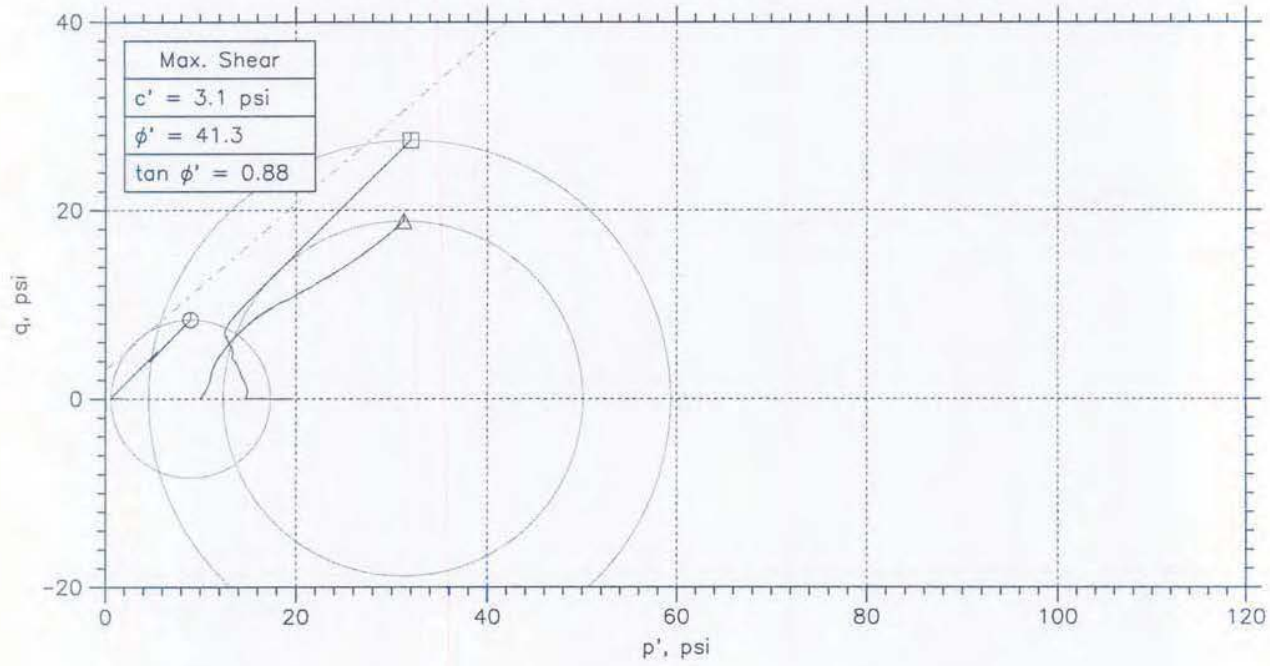
Project: U.S. EPA	Location: APGT04-SB10-12	Project No.: 201100526
Boring No.: SB-10-12	Sample Type: ST	
Description: GRAY SOIL CONTAINING ASBESTOS		
Remarks:		

Fri, 25-MAR-2011 13:29:45

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







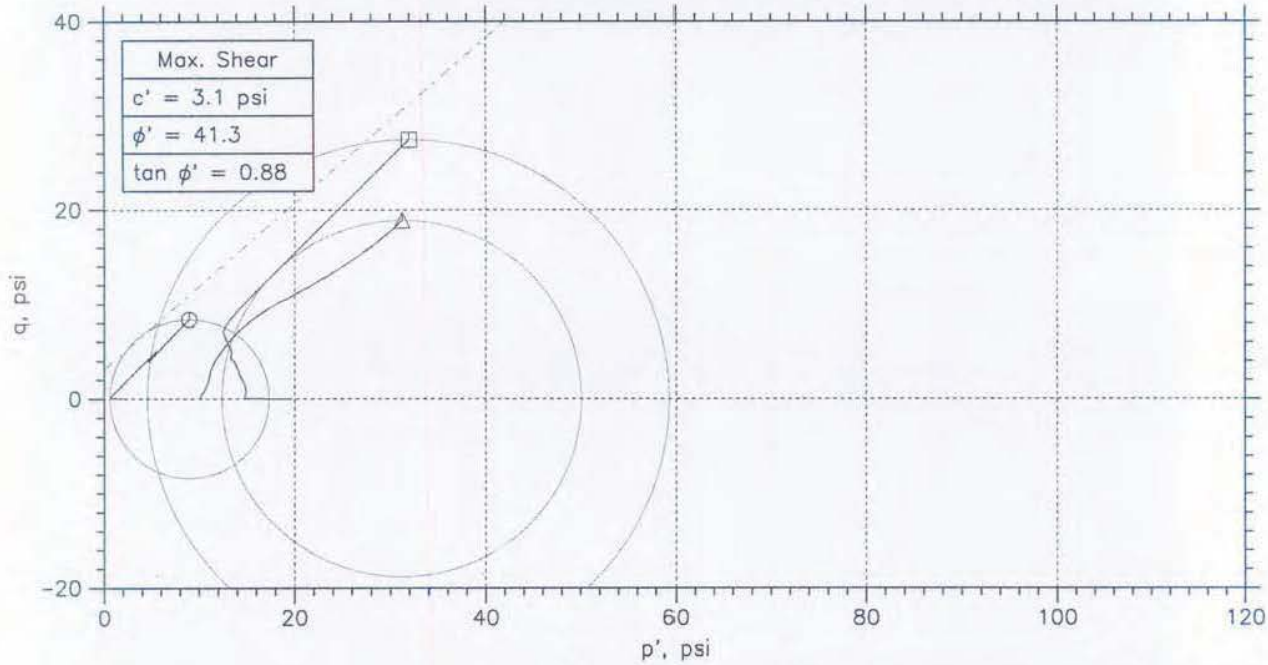
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
○	APGT04	1		AS	02.11.11			201100526-01(1)apgto4-sb10-
△	APGT04	2		AS	02.21.11			201100526-01(2)apgto4-sb10-
□	APGT04	3		AS	02.22.11			201100526-01(3)apgto4-sb10-

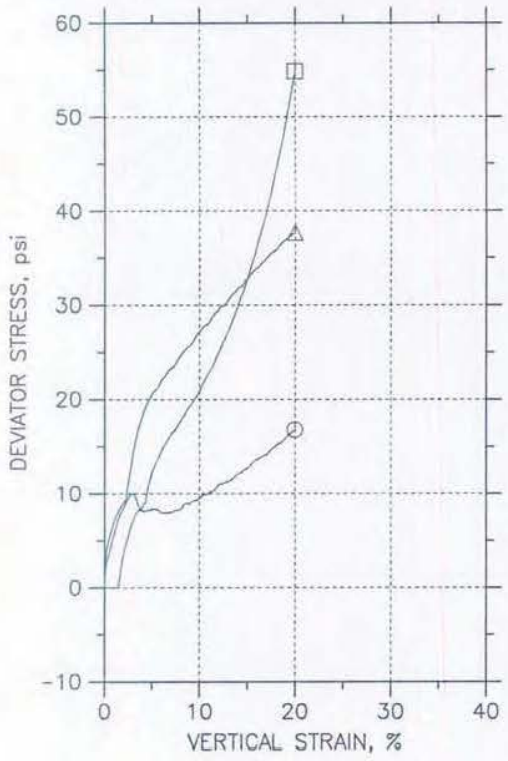
PENNIMAN & BROWNE, INC.

Project: U.S. EPA	Location: APGT04-SB10-12	Project No.: 201100526
Boring No.: SB-10-12	Sample Type: ST	
Description: GRAY SOIL CONTAINING ASBESTOS		
Remarks:		

Fri. 25-MAR-2011 13:29:43

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		⏲	△	⏍	
Sample No.		APGT04	APGT04	APGT04	
Test No.		1	2	3	
Depth					
Initial	Diameter, in	2.8	2.8	2.8	
	Height, in	5.6	5.6	5.6	
	Water Content, %	207.0	207.0	207.0	
	Dry Density, pcf	22.62	38.43	25.26	
	Saturation, %	86.8	165.9	98.8	
	Void Ratio	6.33	3.31	5.56	
Before Shear	Water Content, %	207.0	207.0	207.0	
	Dry Density, pcf	25.52	25.52	25.52	
	Saturation*, %	100.0	100.0	100.0	
	Void Ratio	5.5	5.5	5.5	
	Back Press., psi	2.008	9.999	6.845	
Ver. Eff. Cons. Stress, psi		1.895	10.	19.78	
Shear Strength, psi		8.378	18.84	27.42	
Strain at Failure, %		20	20	20	
Strain Rate, %/min		0.032	0.032	0.032	
B-Value		---	0.24	0.35	
Measured Specific Gravity		2.65	2.65	2.65	
Liquid Limit		61	61	61	
Plastic Limit		48	48	48	

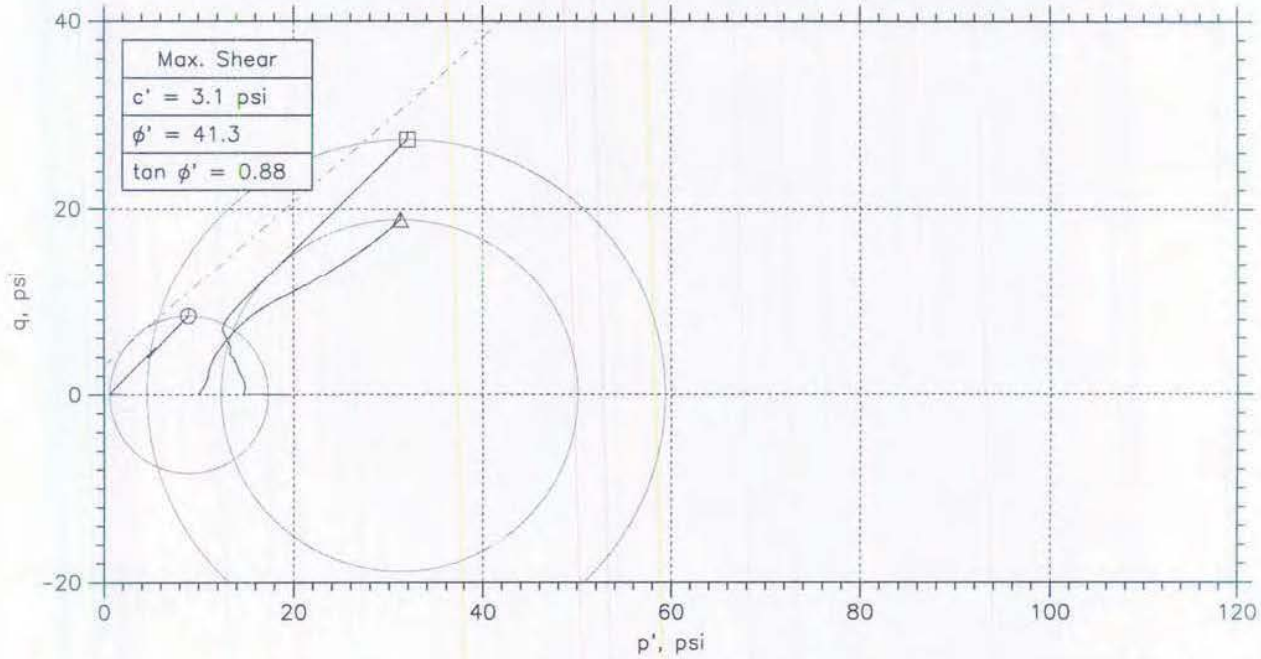
PENNIMAN & BROWNE, INC.

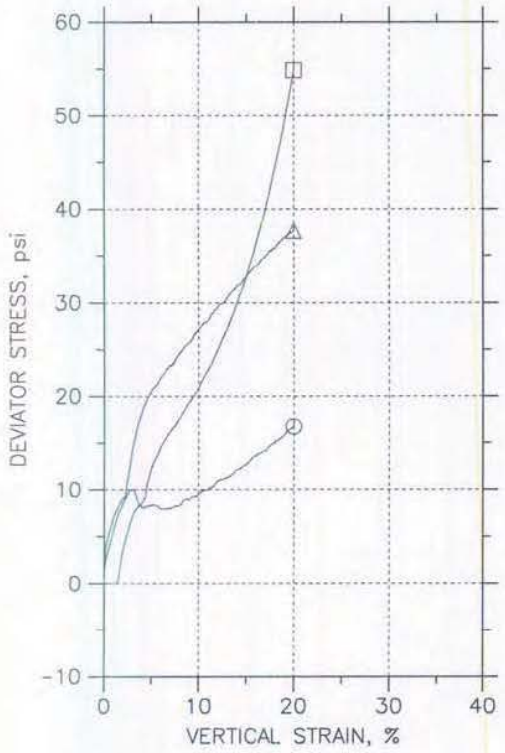
Project: U.S. EPA
Location: APGT04-SB10-12
Project No.: 201100526
Boring No.: SB-10-12
Sample Type: ST
Description: GRAY SOIL CONTAINING ASBESTOS
Remarks:

Phase calculations based on start and end of test.
* Saturation is set to 100% for phase calculations.

Fri, 25-MAR-2011 13:29:40

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		⏲	△	⊡	
Sample No.		APGT06	APGT06	APGT06	
Test No.		1	2	3	
Depth					
Initial	Diameter, in	2.8	2.8	2.8	
	Height, in	5.6	5.6	5.6	
	Water Content, %	207.0	207.0	207.0	
	Dry Density, pcf	22.62	38.43	25.26	
	Saturation, %	86.8	166.0	98.9	
	Void Ratio	6.33	3.3	5.55	
Before Shear	Water Content, %	207.0	207.0	207.0	
	Dry Density, pcf	25.52	25.51	25.51	
	Saturation*, %	100.0	100.0	100.0	
	Void Ratio	5.5	5.49	5.49	
	Back Press., psi	2.008	9.999	6.845	
Ver. Eff. Cons. Stress, psi		1.895	10.	19.78	
Shear Strength, psi		8.378	18.84	27.42	
Strain at Failure, %		20	20	20	
Strain Rate, %/min		0.032	0.032	0.032	
B-Value		---	0.24	0.35	
Measured Specific Gravity		2.65	2.65	2.65	
Liquid Limit		61	61	61	
Plastic Limit		48	48	48	

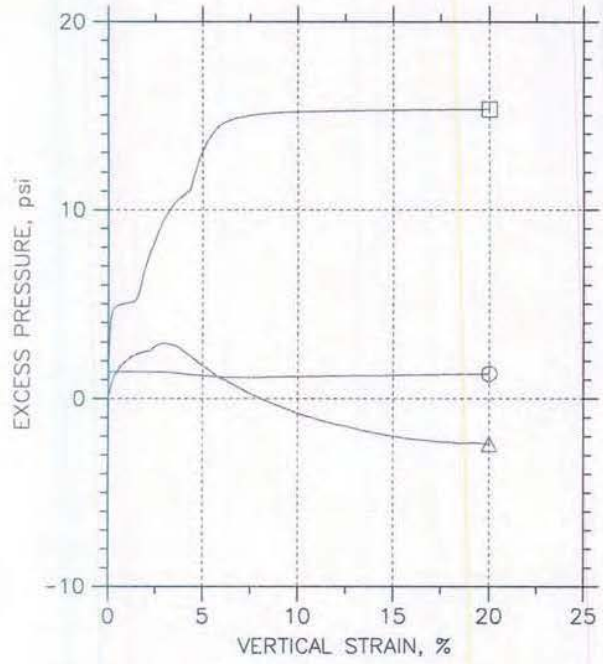
PENNIMAN & BROWNE, INC.

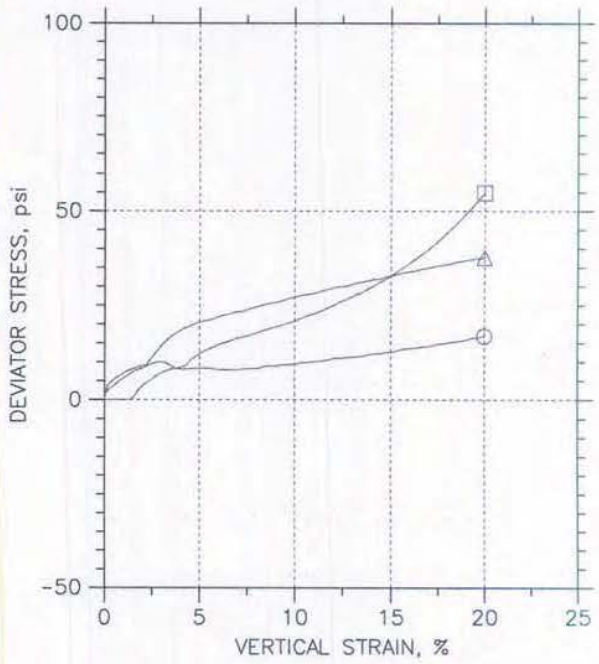
Project: U.S. EPA
Location: APGT04-SB10-12
Project No.: 201100526
Boring No.: SB-14-16
Sample Type: ST
Description: GRAY SOIL CONTAINING ASBESTOS
Remarks:

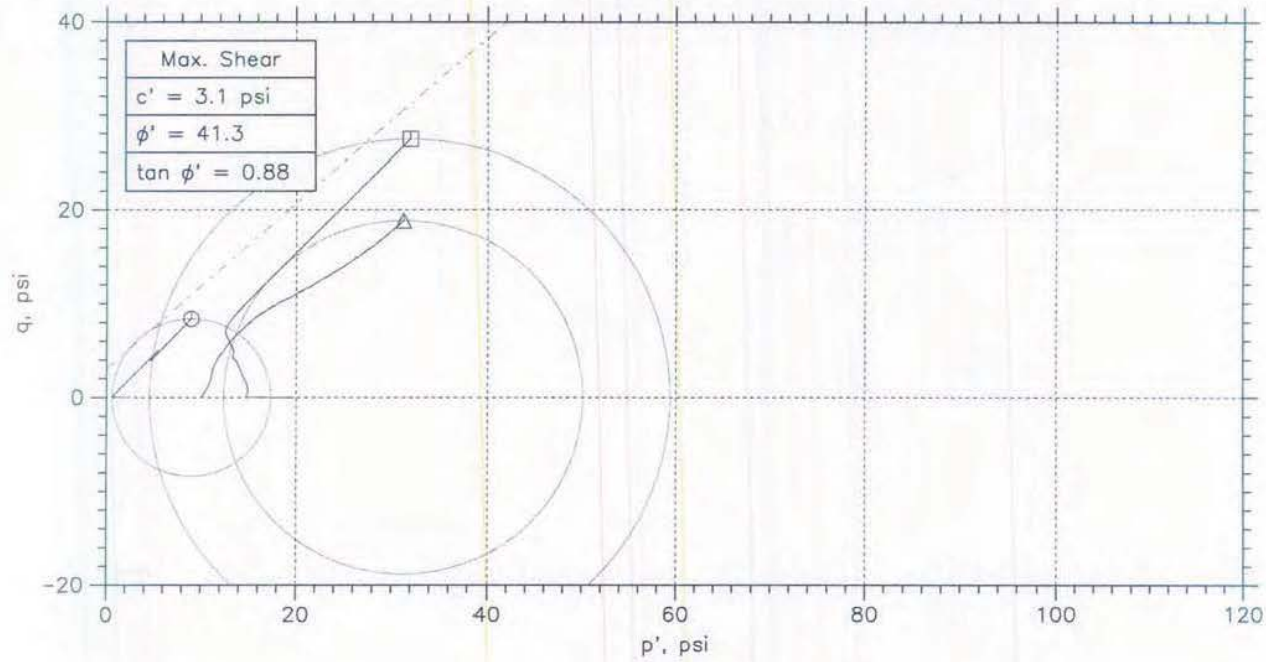
Fri, 25-FEB-2011 15:41:20

Phase calculations based on start and end of test.
* Saturation is set to 100% for phase calculations.

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







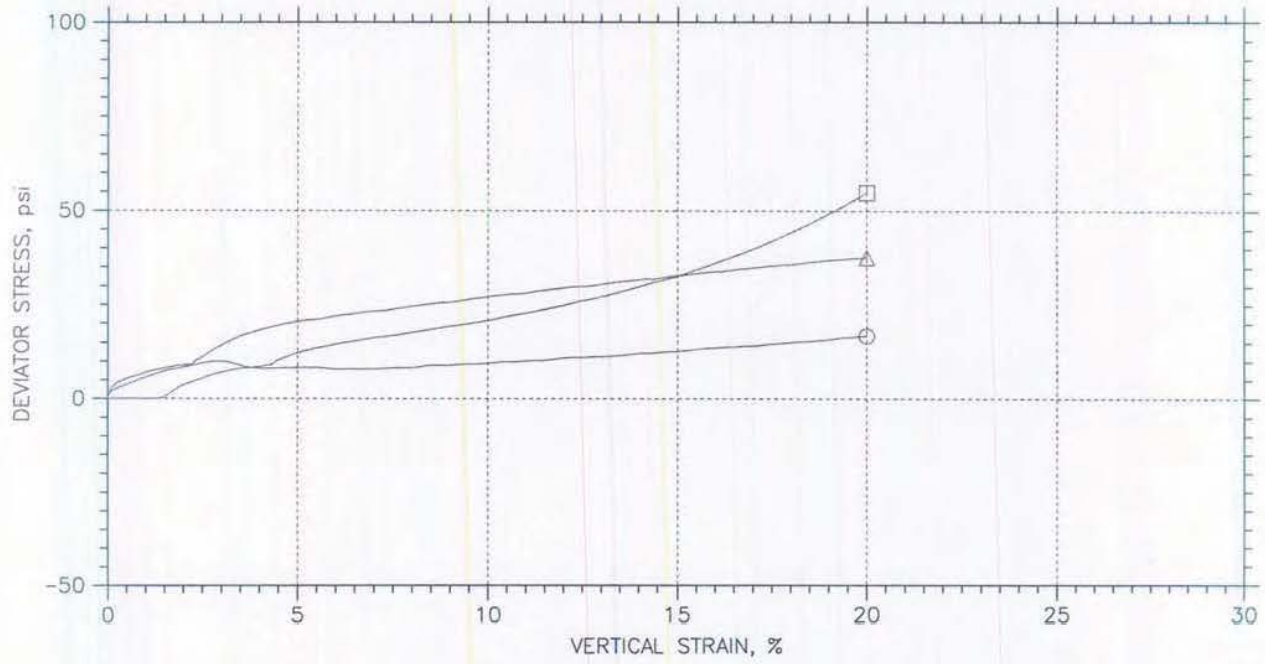
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
○	APGT06	1		AS	02.11.11			201100526-01(1)apgto4-sb10-
△	APGT06	2		AS	02.21.11			201100526-01(2)apgto4-sb10-
□	APGT06	3		AS	02.22.11			201100526-01(3)apgto4-sb10-

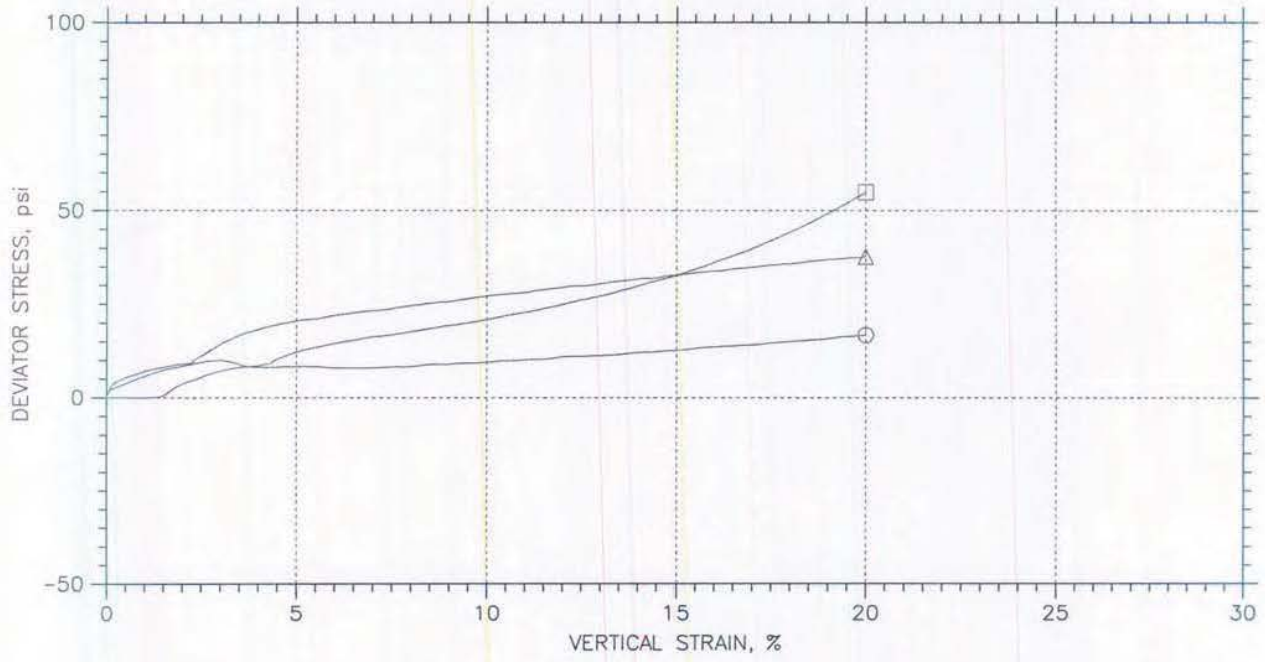
PENNIMAN & BROWNE, INC.

Project: U.S. EPA	Location: APGT04-SB10-12	Project No.: 201100526
Boring No.: SB-14-16	Sample Type: ST	
Description: GRAY SOIL CONTAINING ASBESTOS		
Remarks:		

Fri, 25-FEB-2011 15:41:24

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
⊙	APGT06	1		AS	02.11.11			201100526-01(1)apgto4-sb10-
△	APGT06	2		AS	02.21.11			201100526-01(2)apgto4-sb10-
□	APGT06	3		AS	02.22.11			201100526-01(3)apgto4-sb10-

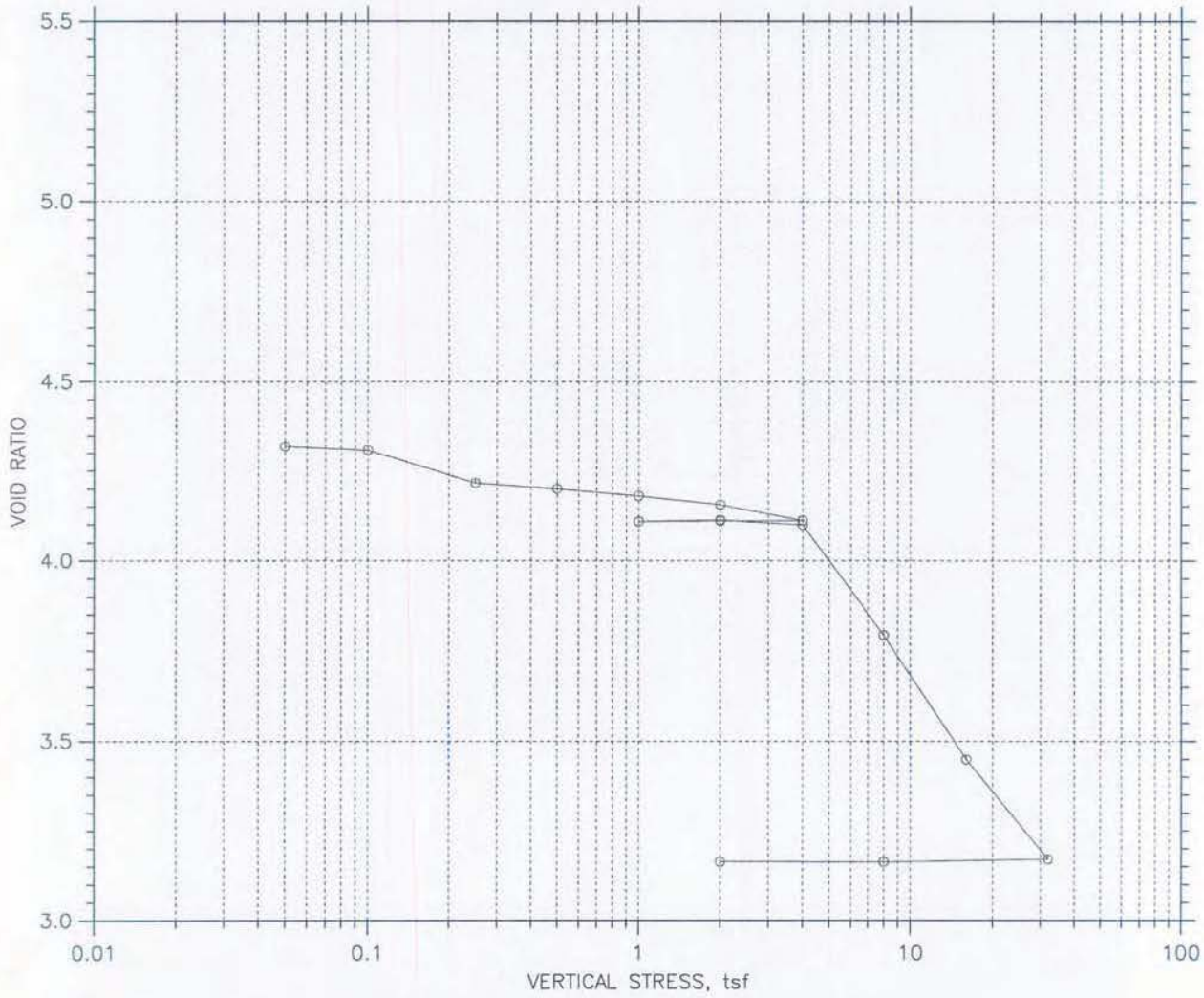
PENNIMAN & BROWNE, INC.

Project: U.S. EPA	Location: APGT04-SB10-12	Project No.: 201100526
Boring No.: SB-14-16	Sample Type: ST	
Description: GRAY SOIL CONTAINING ASBESTOS		
Remarks:		

Fri, 25-FEB-2011 15:41:28

CONSOLIDATION TEST DATA

SUMMARY REPORT



					Before Test	After Test
Overburden Pressure: 0.12 tsf				Water Content, %	116.84	78.79
Preconsolidation Pressure: 3.9 tsf				Dry Unit Weight, pcf	29.49	37.77
Compression Index: 1.09				Saturation, %	67.94	62.73
Diameter: 2.5 in		Height: 1 in		Void Ratio	4.33	3.16
LL: 112	PL: 78	PI: 34	GS: 2.52			

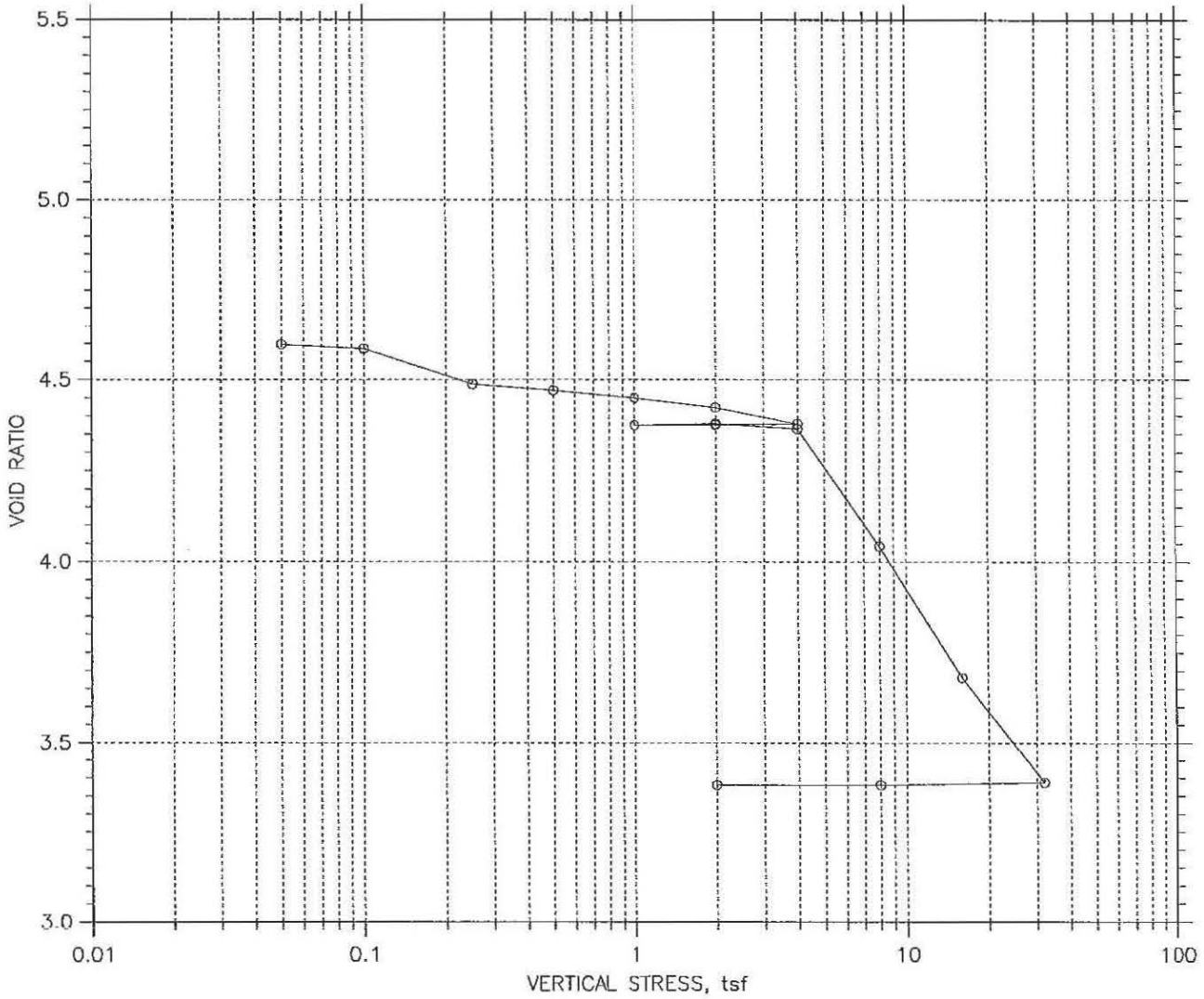
PENNIMAN & BROWNE, INC.

Project: U.S. EPA	Location: APGT06-SB4-6	Project No.: 201100526
Boring No.: SB4-6	Tested By: AS	Checked By:
Sample No.: APGT06	Test Date: 2.23.11	Depth:
Test No.:	Sample Type: ST	Elevation:
Description: GRAY SOIL CONTAINING ASBESTOS		
Remarks:		

Fri, 25-MAR-2011 13:46:46

CONSOLIDATION TEST DATA

SUMMARY REPORT



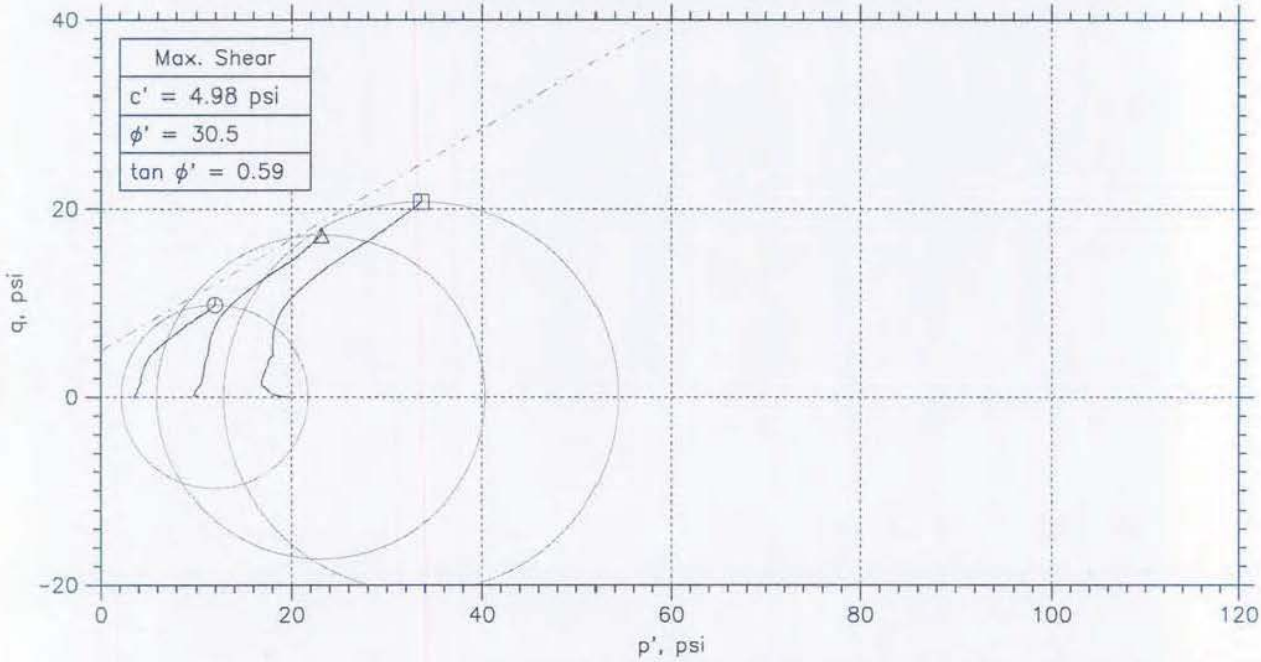
					Before Test	After Test
Overburden Pressure: 0.12 tsf				Water Content, %	116.84	78.79
Preconsolidation Pressure: 3.9 tsf				Dry Unit Weight, pcf	29.49	37.77
Compression Index: 1.09				Saturation, %	67.17	61.77
Diameter: 2.5 in		Height: 1 in		Void Ratio	4.61	3.38
LL: 112	PL: 78	PI: 34	GS: 2.65			

PENNIMAN & BROWNE, INC.

Project: U.S. EPA	Location: APGT06-SB4-6	Project No.: 201100526
Boring No.: SB4-6	Tested By: AS	Checked By:
Sample No.: APGT06	Test Date: 2.23.11	Depth:
Test No.:	Sample Type: ST	Elevation:
Description: GRAY SOIL CONTAINING ASBESTOS		
Remarks:		

Fri, 18-MAR-2011 13:49:48

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		⊙	△	⊡	
Sample No.		APGT06	APGT06	APGT06	
Test No.		2	2	3	
Depth					
Initial	Diameter, in	2.8	2.8	2.8	
	Height, in	5.6	5.6	5.6	
	Water Content, %	116.6	116.6	116.6	
	Dry Density, pcf	54.51	38.92	39.55	
	Saturation, %	155.8	96.6	98.7	
	Void Ratio	1.88	3.04	2.98	
Before Shear	Water Content, %	116.6	116.6	116.6	
	Dry Density, pcf	39.94	39.94	39.94	
	Saturation*, %	100.0	100.0	100.0	
	Void Ratio	2.94	2.94	2.94	
	Back Press., psi	1.008	4.008	2.195	
Ver. Eff. Cons. Stress, psi		3.534	9.974	19.9	
Shear Strength, psi		9.782	17.21	20.76	
Strain at Failure, %		18.6	20	20	
Strain Rate, %/min		0.032	0.032	0.032	
B-Value		---	0.86	0.37	
Measured Specific Gravity		2.52	2.52	2.52	
Liquid Limit		112	112	112	
Plastic Limit		78	78	78	

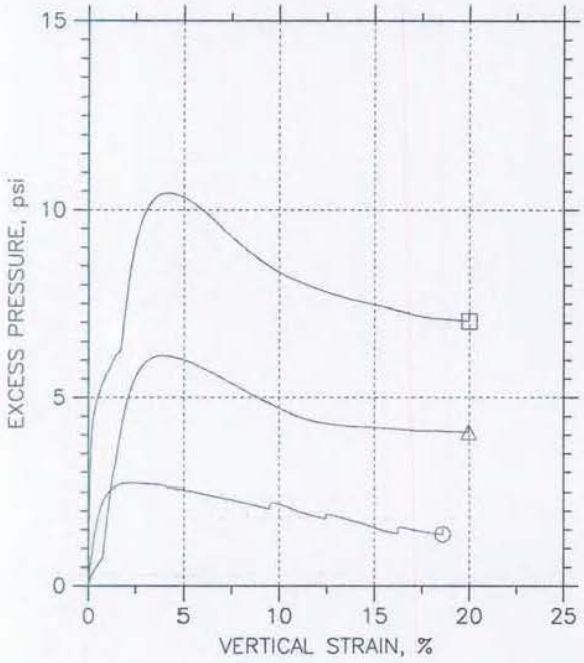
PENNIMAN & BROWNE, INC.

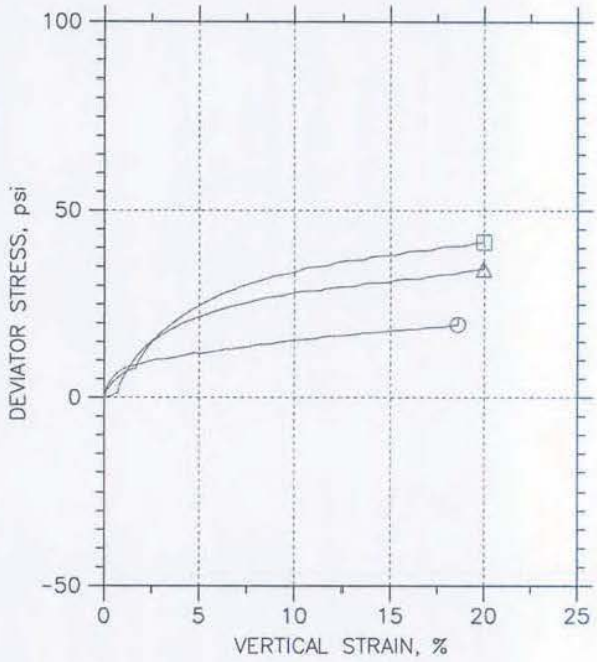
Project: U.S. EPA
Location: APGT06-SB4-6
Project No.: 201100526
Boring No.: SB-4-6
Sample Type: ST
Description: gray soil containing asbestos
Remarks:

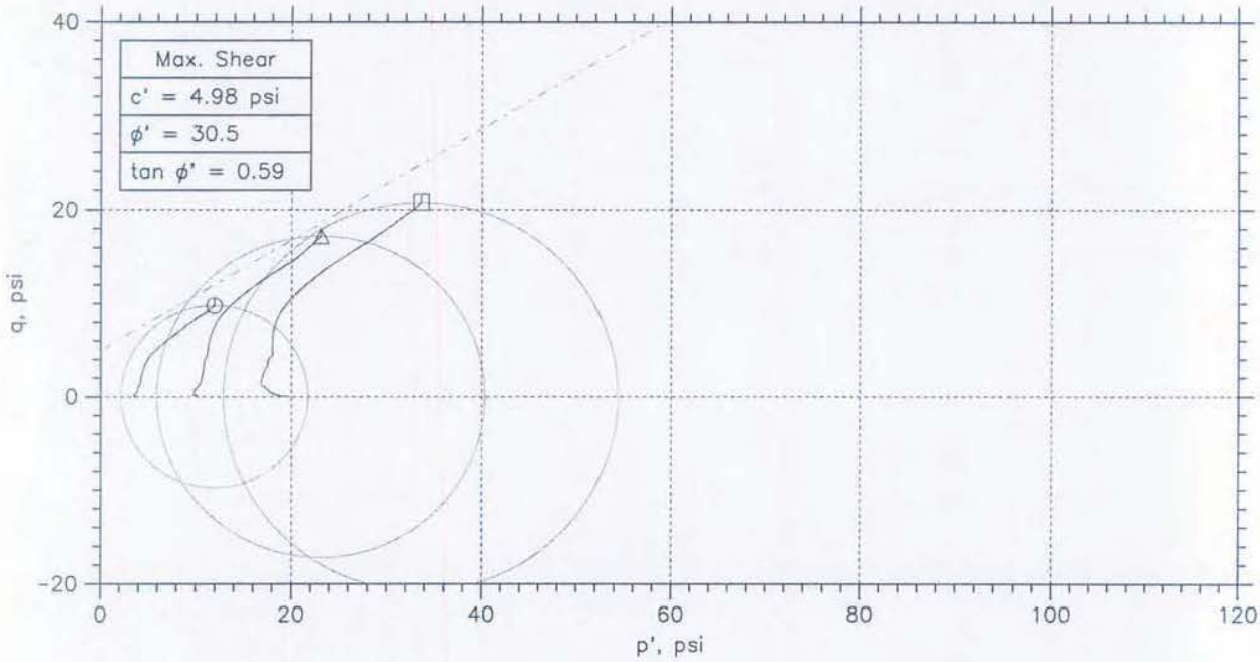
Phase calculations based on start and end of test.
* Saturation is set to 100% for phase calculations.

Fri, 25-MAR-2011 13:30:58

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
⊙	APGT06	2		AS	02.28.11			201100526(APGT06-SB4-6)-1.d
△	APGT06	2		AS	3.9.11			201100526(APGT06-SB4-6)-2.d
□	APGT06	3		AS	3.10.11			201100526(APGT06-SB4-6)-3.d

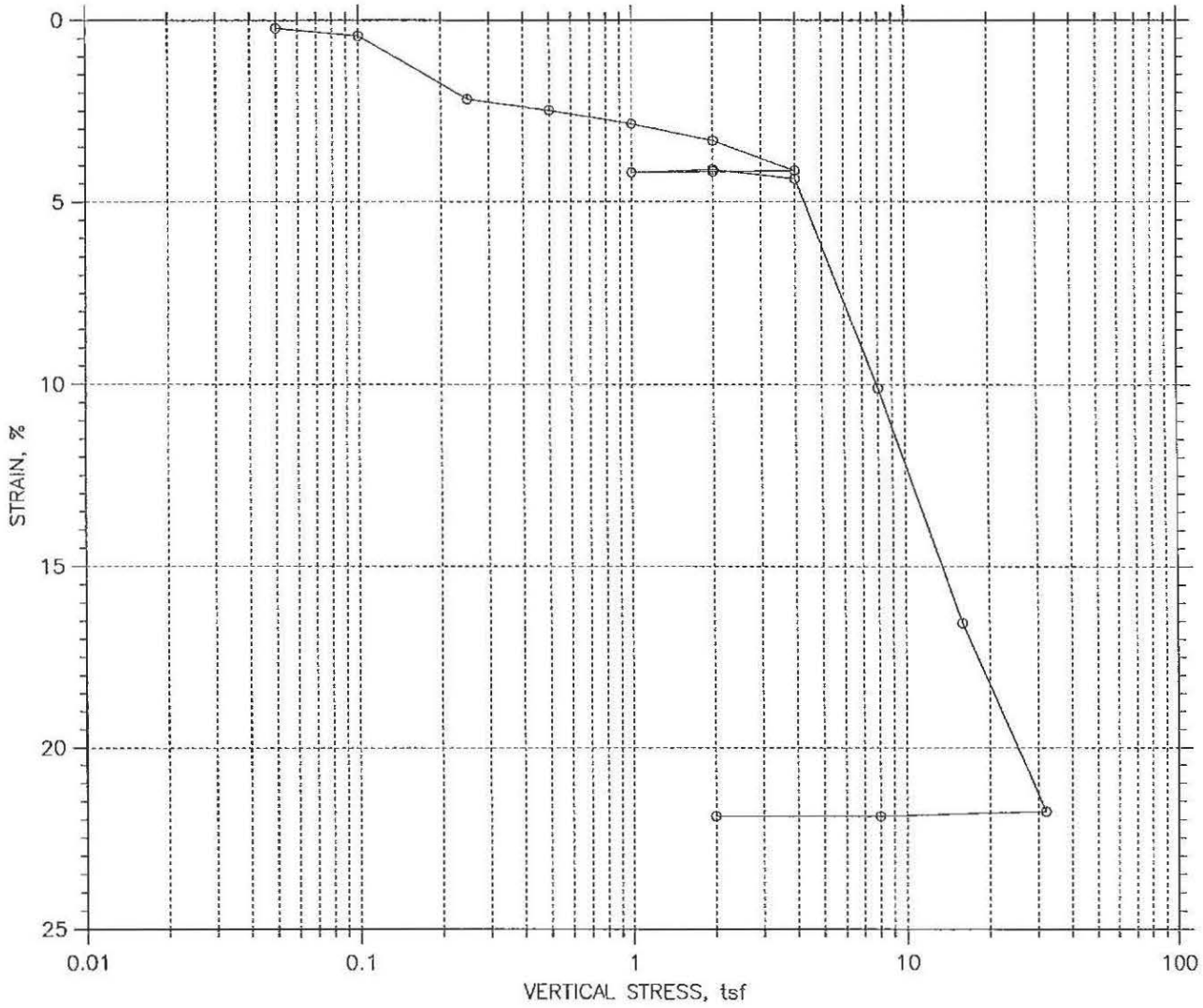
PENNIMAN & BROWNE, INC.

Project: U.S. EPA	Location: APGT06-SB4-6	Project No.: 201100526
Boring No.: SB-4-6	Sample Type: ST	
Description: gray soil containing asbestos		
Remarks:		

Fri, 25-MAR-2011 13:31:03

CONSOLIDATION TEST DATA

SUMMARY REPORT



					Before Test	After Test
Overburden Pressure: 0.12 tsf				Water Content, %	116.84	78.79
Preconsolidation Pressure: 3.9 tsf				Dry Unit Weight, pcf	29.49	37.77
Compression Index: 1.09				Saturation, %	67.17	61.77
Diameter: 2.5 in		Height: 1 in		Void Ratio	4.61	3.38
LL: 112	PL: 78	PI: 34	GS: 2.65			

PENNIMAN & BROWNE, INC.	Project: U.S. EPA	Location: APGT06-SB4-6	Project No.: 201100526
	Boring No.: SB4-6	Tested By: AS	Checked By:
	Sample No.: APGT06	Test Date: 2.23.11	Depth:
	Test No.:	Sample Type: ST	Elevation:
	Description: GRAY SOIL CONTAINING ASBESTOS		
	Remarks:		

Fri, 18-MAR-2011 13:50:06

CONSOLIDATION TEST DATA

Project: U.S. EPA
Boring No.: SB4-6
Sample No.: APGT06
Test No.:

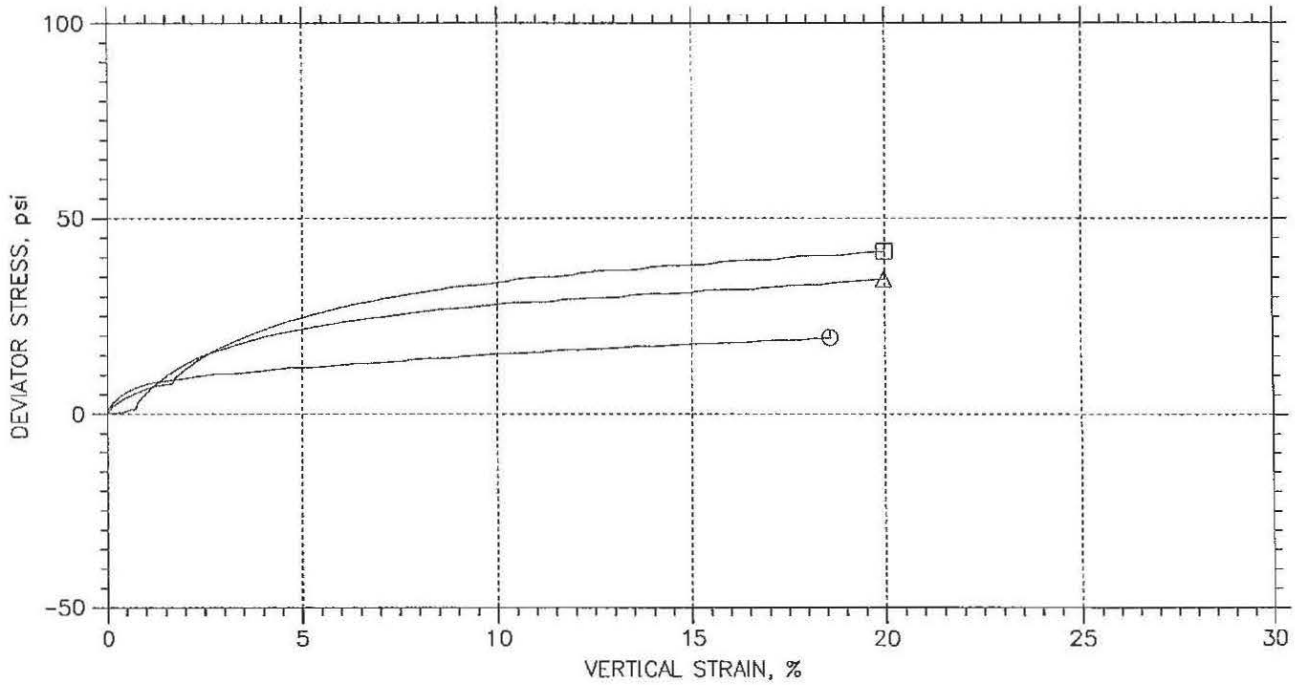
Location: APGT06-SB4-6
Tested By: AS
Test Date: 2.23.11
Sample Type: ST

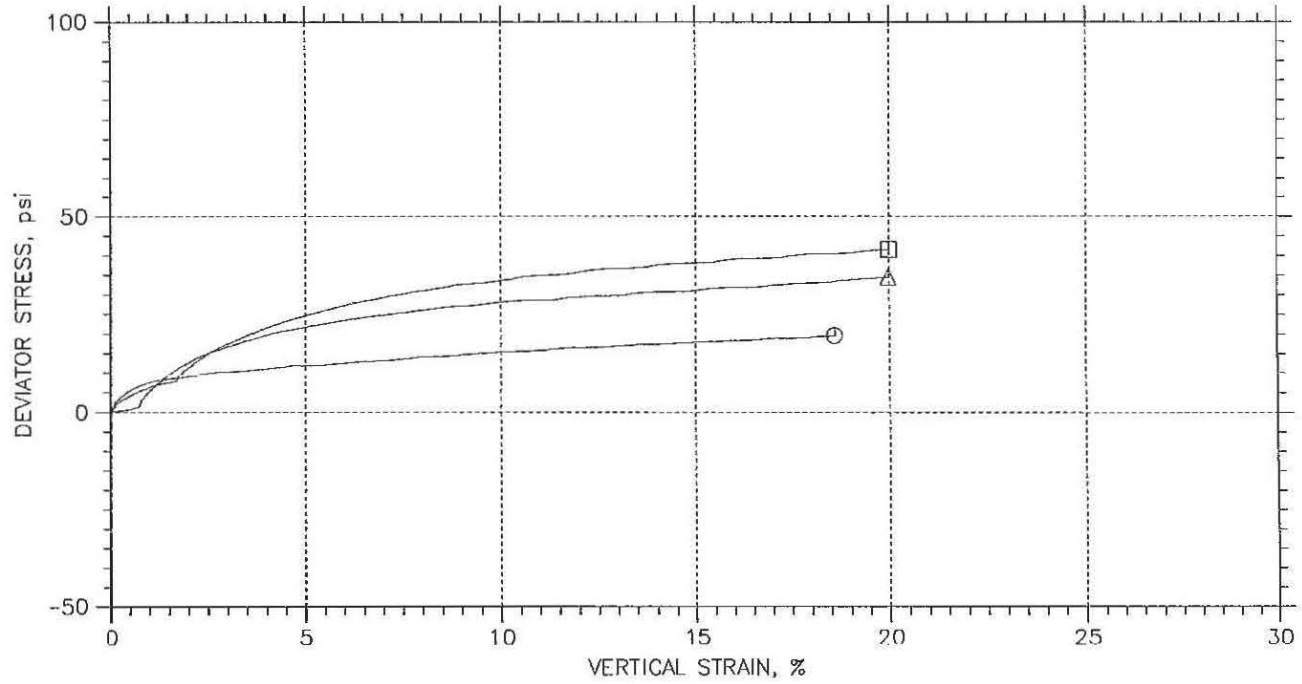
Project No.: 201100526
Checked By:
Depth:
Elevation:

Soil Description: GRAY SOIL CONTAINING ASBESTOS
Remarks:

	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	T50 Fitting Sq.Rt. min	T50 Fitting Log min	Coefficient of Consolidation Sq.Rt. ft^2/sec	Coefficient of Consolidation Log ft^2/sec	Coefficient of Consolidation Ave. ft^2/sec
1	0.05	0.002268	4.597	0.23	1.2	0.0	4.80e-006	0.00e+000	4.80e-006
2	0.1	0.004389	4.585	0.44	3.3	2.9	1.70e-006	1.94e-006	1.81e-006
3	0.25	0.02183	4.487	2.18	0.5	0.6	1.07e-005	1.00e-005	1.03e-005
4	0.5	0.0249	4.470	2.49	0.4	0.1	1.22e-005	4.22e-005	1.89e-005
5	1	0.0286	4.449	2.86	0.1	0.1	4.93e-005	5.01e-005	4.97e-005
6	2	0.0333	4.423	3.33	0.2	0.1	3.06e-005	8.12e-005	4.45e-005
7	4	0.04149	4.377	4.15	0.7	0.0	8.07e-006	0.00e+000	8.07e-006
8	2	0.04173	4.376	4.17	0.0	0.0	3.35e-004	0.00e+000	3.35e-004
9	1	0.04199	4.374	4.20	0.1	0.0	9.93e-005	0.00e+000	9.93e-005
10	2	0.04122	4.378	4.12	0.0	0.0	2.60e-004	0.00e+000	2.60e-004
11	4	0.04375	4.364	4.38	38.6	0.0	1.36e-007	0.00e+000	1.36e-007
12	8	0.1011	4.043	10.11	0.4	0.2	1.30e-005	2.33e-005	1.67e-005
13	16	0.1655	3.681	16.55	0.2	0.1	2.25e-005	3.80e-005	2.82e-005
14	32	0.2179	3.388	21.79	0.3	0.1	1.26e-005	3.55e-005	1.86e-005
15	8	0.2192	3.380	21.92	0.0	0.0	1.58e-004	0.00e+000	1.58e-004
16	2	0.2192	3.380	21.92	0.0	0.0	9.60e-005	2.00e-004	1.30e-004

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





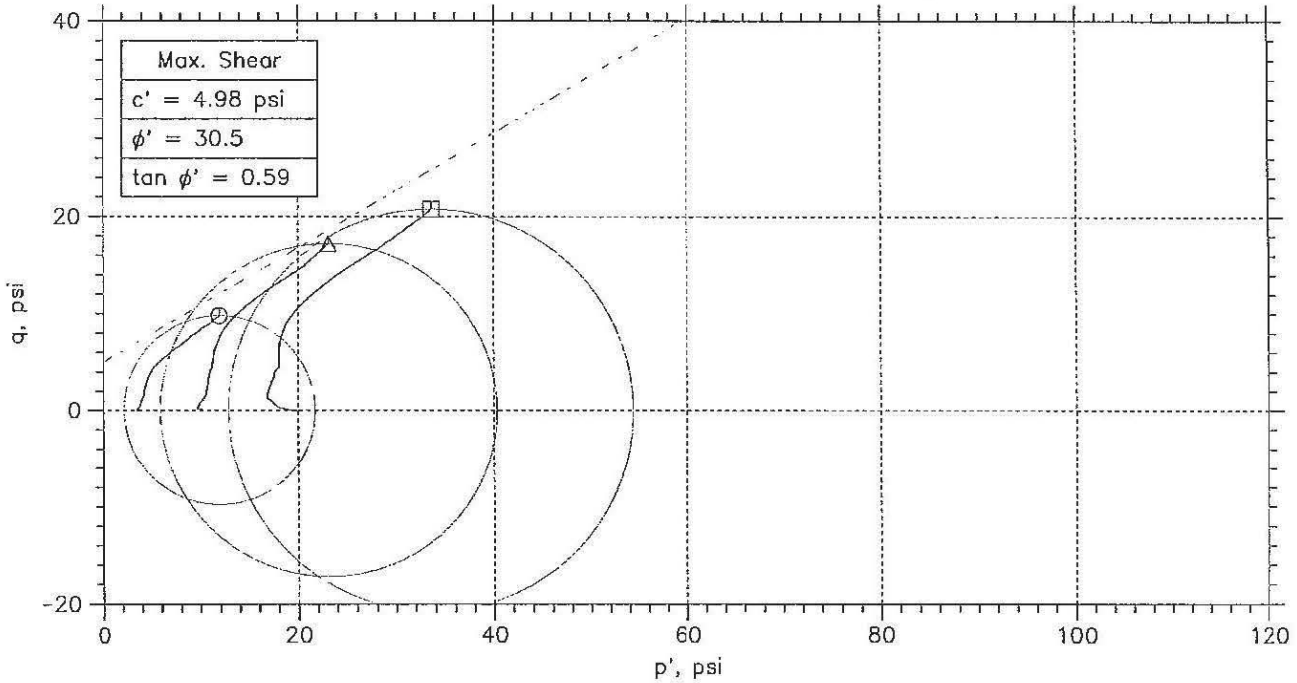
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
⏲	APGT06	2		AS	02.28.11			201100526(APGT06-SB4-6)-1.d
△	APGT06	2		AS	3.9.11			201100526(APGT06-SB4-6)-2.d
⊡	APGT06	3		AS	3.10.11			201100526(APGT06-SB4-6)-3.d

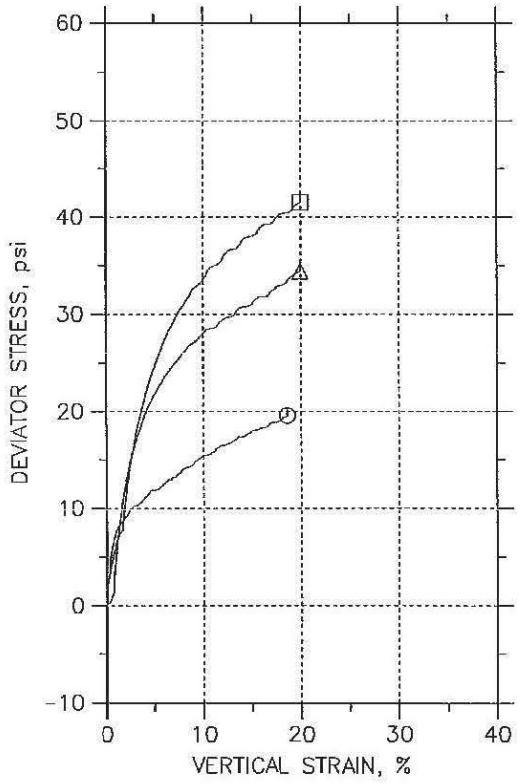
PENNIMAN & BROWNE, INC.

Project: U.S. EPA	Location: APGT06-SB4-6	Project No.: 201100526
Boring No.: SB-4-6	Sample Type: ST	
Description: gray soil containing asbestos		
Remarks:		

Fri, 18-MAR-2011 11:28:21

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		⏲	△	⏍	
Sample No.		APGT06	APGT06	APGT06	
Test No.		2	2	3	
Depth					
Initial	Diameter, in	2.8	2.8	2.8	
	Height, in	5.6	5.6	5.6	
	Water Content, %	116.6	116.6	116.6	
	Dry Density, pcf	54.51	38.92	39.55	
	Saturation, %	151.8	95.0	97.1	
	Void Ratio	2.03	3.25	3.18	
Before Shear	Water Content, %	116.6	116.6	116.6	
	Dry Density, pcf	40.45	40.45	40.45	
	Saturation*, %	100.0	100.0	100.0	
	Void Ratio	3.09	3.09	3.09	
	Back Press., psi	1.008	4.008	2.195	
Ver. Eff. Cons. Stress, psi		3.534	9.974	19.9	
Shear Strength, psi		9.782	17.21	20.76	
Strain at Failure, %		18.6	20	20	
Strain Rate, %/min		0.032	0.032	0.032	
B-Value		---	0.86	0.37	
Measured Specific Gravity		2.65	2.65	2.65	
Liquid Limit		112	112	112	
Plastic Limit		78	78	78	

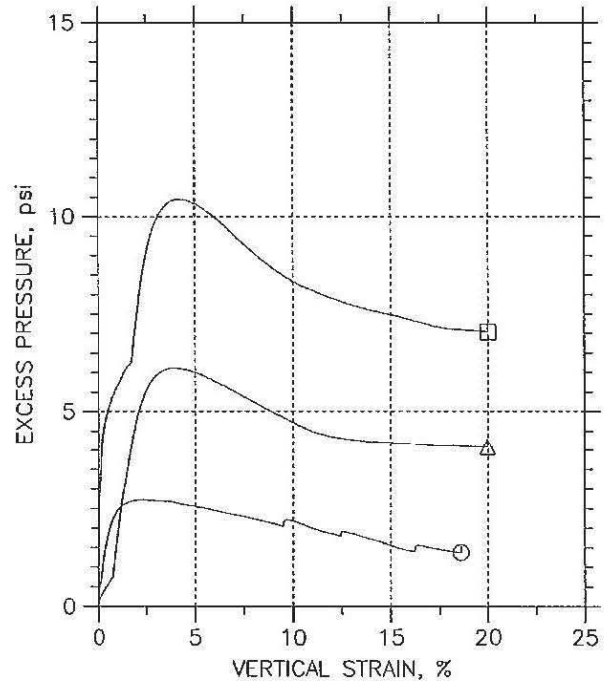
PENNIMAN & BROWNE, INC.

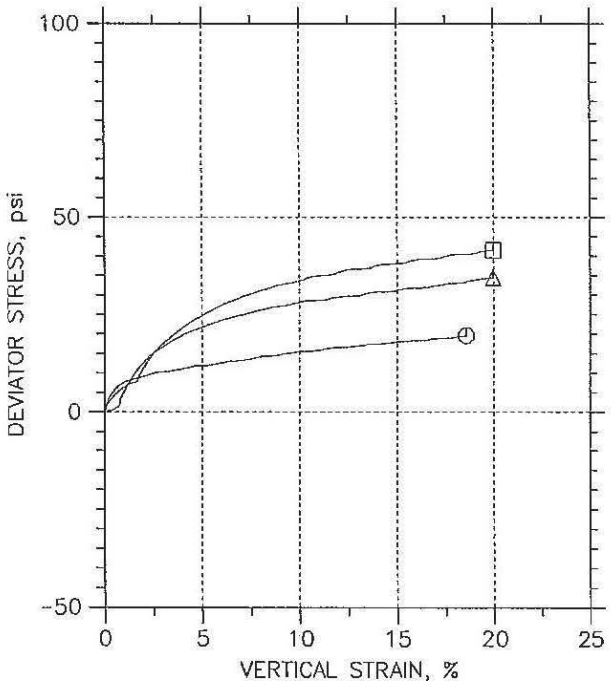
Project: U.S. EPA
Location: APGT06-SB4-6
Project No.: 201100526
Boring No.: SB-4-6
Sample Type: ST
Description: gray soil containing asbestos
Remarks:

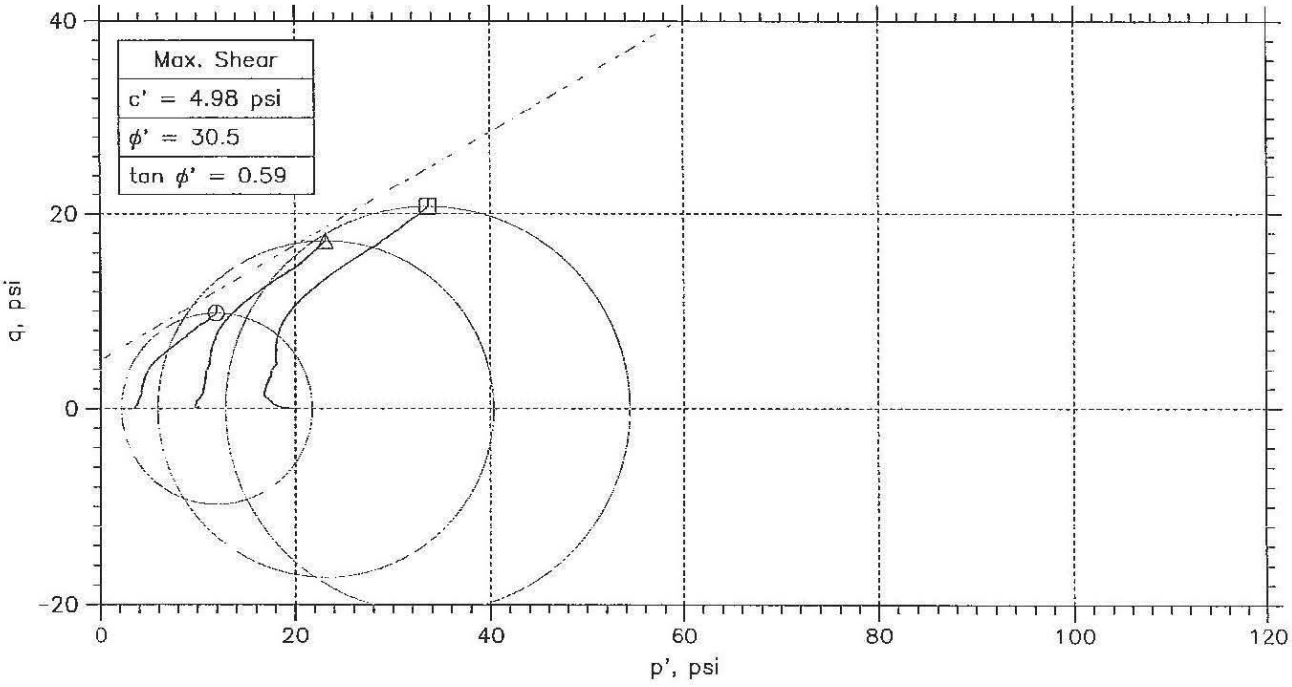
Phase calculations based on start and end of test.
* Saturation is set to 100% for phase calculations.

Fri, 18-MAR-2011 11:28:13

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







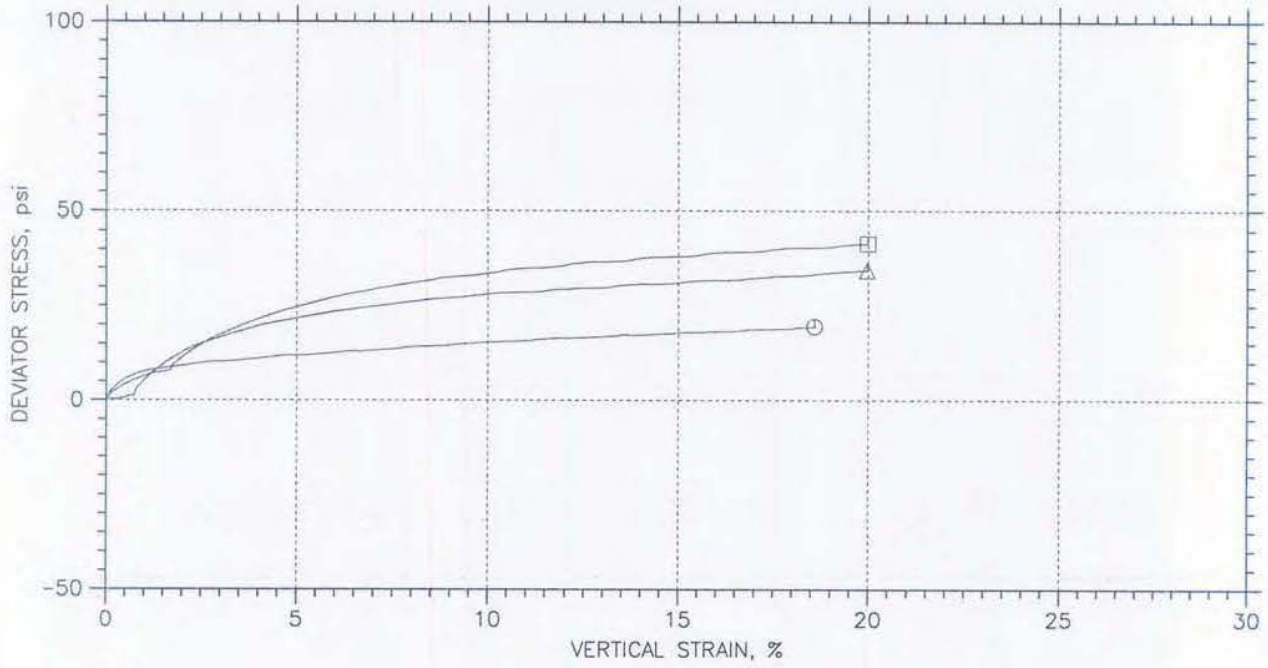
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
⊙	APGT06	2		AS	02.28.11			201100526(APGT06-SB4-6)-1.d
△	APGT06	2		AS	3.9.11			201100526(APGT06-SB4-6)-2.d
☐	APGT06	3		AS	3.10.11			201100526(APGT06-SB4-6)-3.d

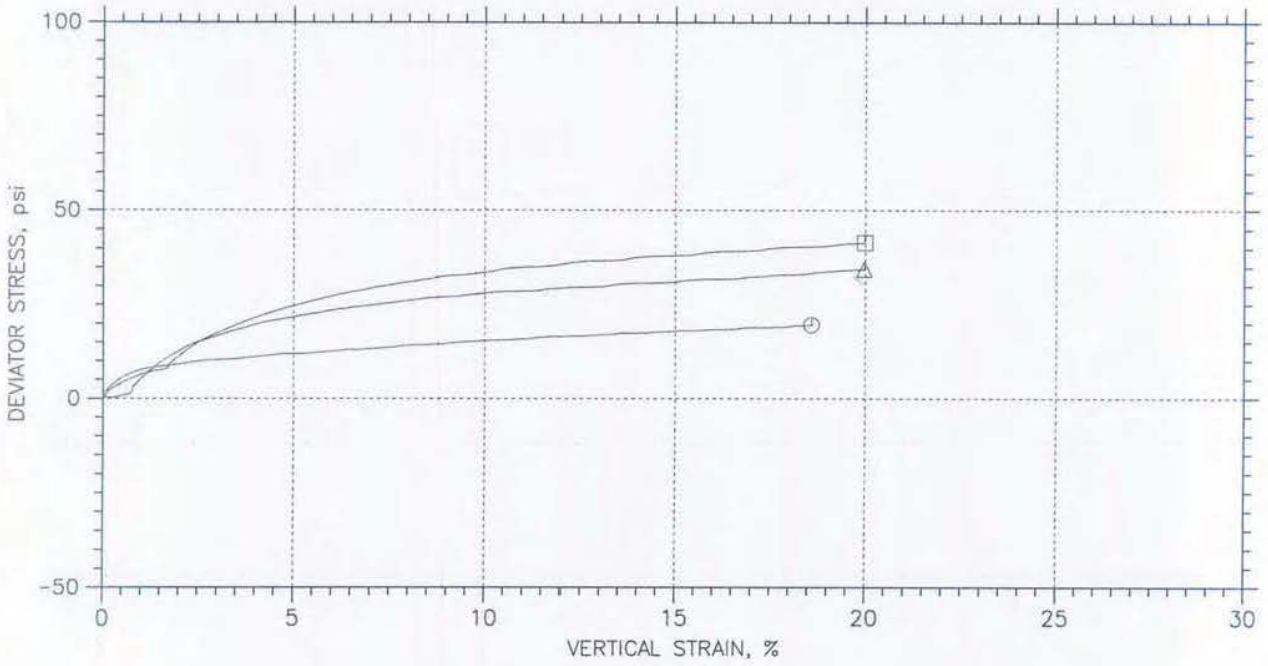
PENNIMAN & BROWNE, INC.

Project: U.S. EPA	Location: APGT06-SB4-6	Project No.: 201100526
Boring No.: SB-4-6	Sample Type: ST	
Description: gray soil containing asbestos		
Remarks:		

Fri, 18-MAR-2011 11:28:18

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
◷	APGT06	2		AS	02.28.11			201100526(APGT06-SB4-6)-1.d
△	APGT06	2		AS	3.9.11			201100526(APGT06-SB4-6)-2.d
□	APGT06	3		AS	3.10.11			201100526(APGT06-SB4-6)-3.d

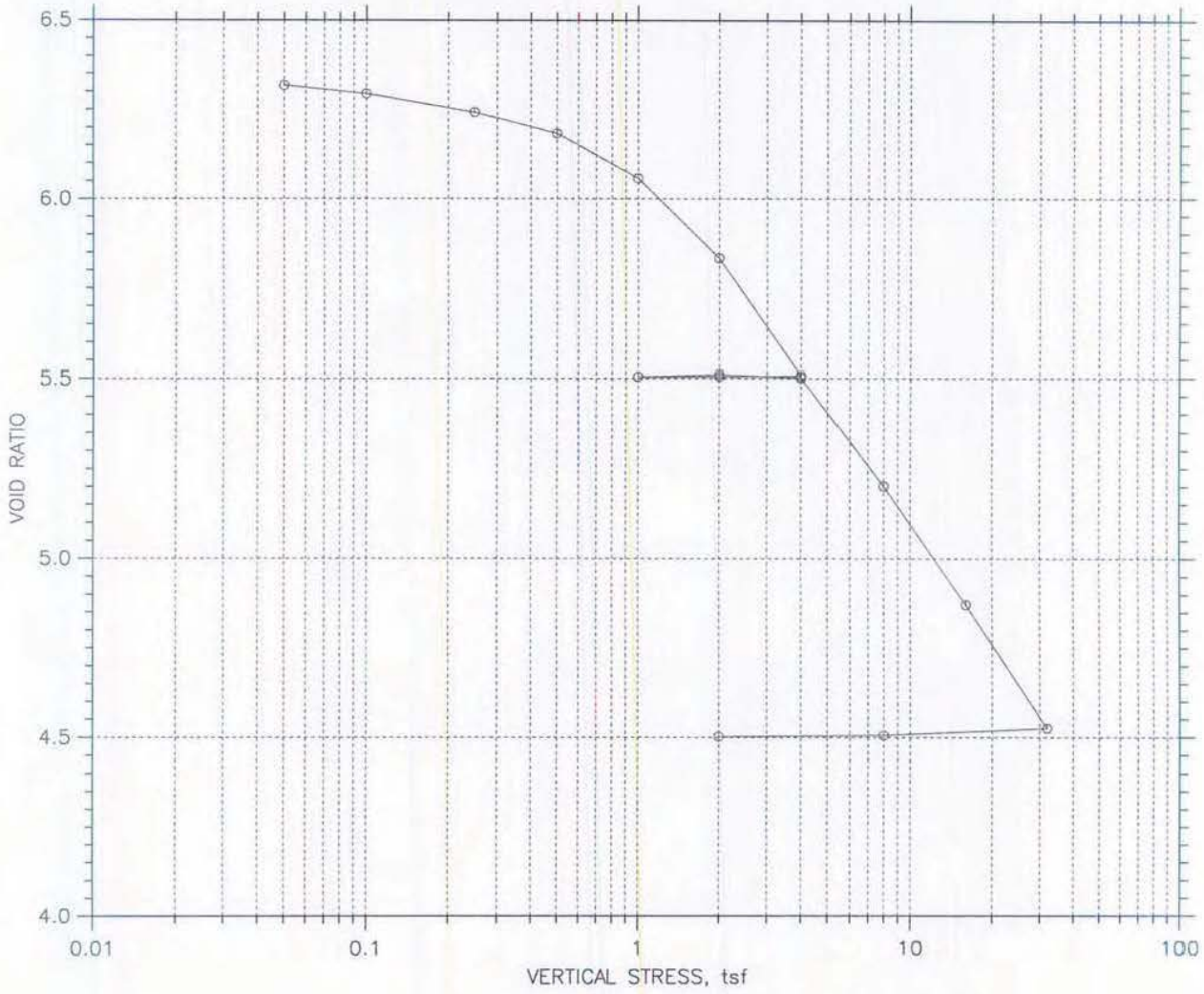
PENNIMAN & BROWNE, INC.

Project: U.S. EPA	Location: APGT06-SB4-6	Project No.: 201100526
Boring No.: SB-4-6	Sample Type: ST	
Description: gray soil containing asbestos		
Remarks:		

Fri, 25-MAR-2011 13:31:06

CONSOLIDATION TEST DATA

SUMMARY REPORT



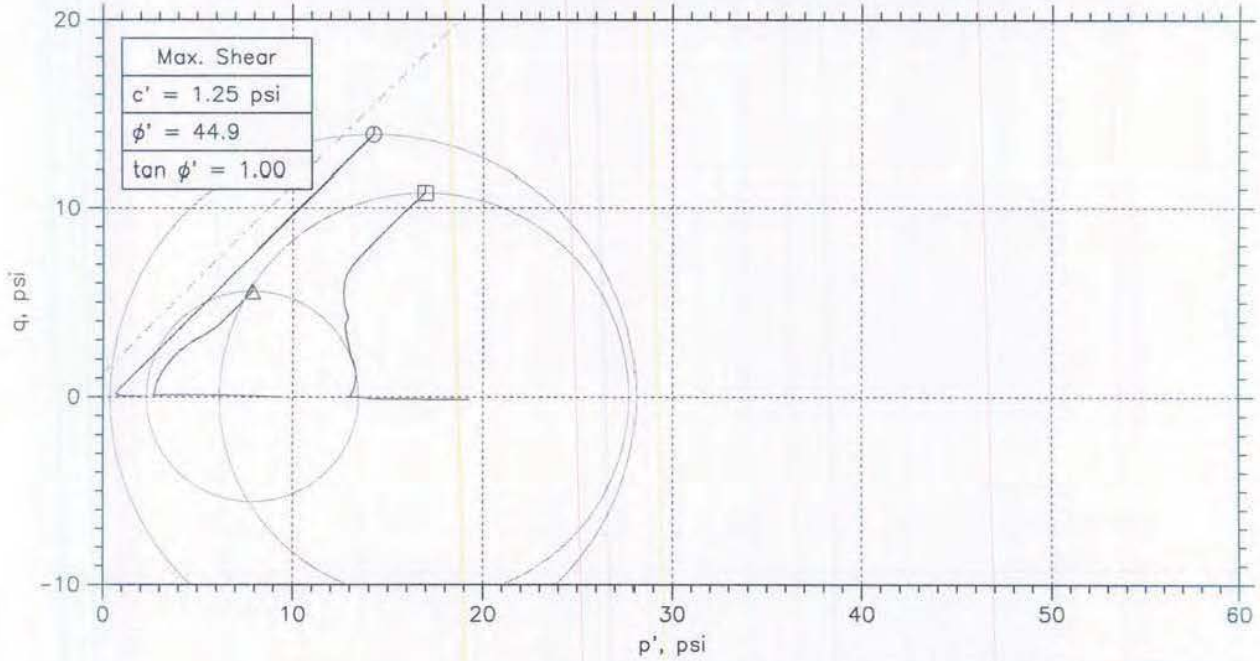
					Before Test	After Test
Overburden Pressure: 0.33 tsf				Water Content, %	215.93	100.00
Preconsolidation Pressure: 1.9 tsf				Dry Unit Weight, pcf	22.51	30.07
Compression Index: 1.03				Saturation, %	90.11	58.87
Diameter: 2.5 in		Height: 1 in		Void Ratio	6.35	4.50
LL: 110	PL: 69	PI: 41	GS: 2.65			

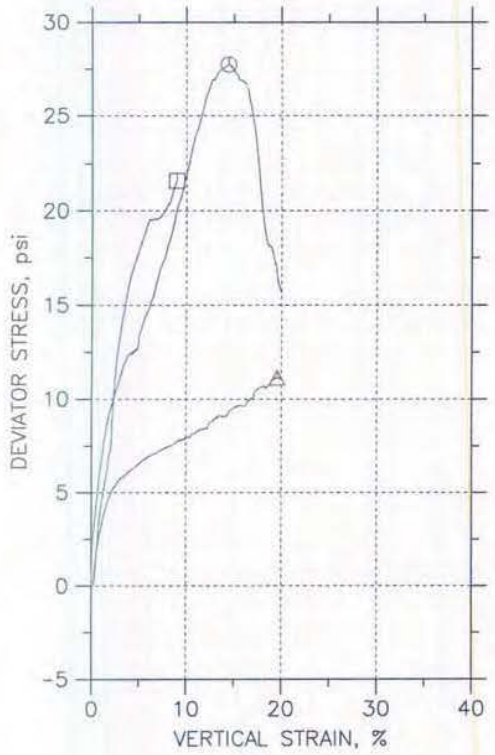
PENNIMAN & BROWNE, INC.

Project: U.S. EPA	Location: APGT06-SB14-16	Project No.: 201100526
Boring No.: SB14-16	Tested By: AS	Checked By:
Sample No.: APGT06	Test Date: 01.18.11	Depth:
Test No.:	Sample Type: ST	Elevation:
Description: GRAY SOIL CONTAINING ASBESTOS		
Remarks:		

Fri, 25-FEB-2011 15:54:10

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		⊙	△	⊡	
Sample No.		APGT06	APGT06	APGT06	
Test No.		2	1	3	
Depth					
Initial	Diameter, in	2.8	2.8	2.8	
	Height, in	5.6	5	5.6	
	Water Content, %	132.9	132.9	132.9	
	Dry Density, pcf	29.81	32.36	31.25	
	Saturation, %	77.4	85.6	82.0	
	Void Ratio	4.55	4.11	4.29	
Before Shear	Water Content, %	132.9	132.9	132.9	
	Dry Density, pcf	36.59	36.59	36.59	
	Saturation*, %	100.0	100.0	100.0	
	Void Ratio	3.52	3.52	3.52	
	Back Press., psi	4.487	.3414	15.81	
Ver. Eff. Cons. Stress, psi		2.031	9.383	19.42	
Shear Strength, psi		13.87	5.575	10.8	
Strain at Failure, %		14.4	19.6	8.96	
Strain Rate, %/min		0.032	0.032	0.032	
B-Value		---	---	0.69	
Measured Specific Gravity		2.65	2.65	2.65	
Liquid Limit		110	110	110	
Plastic Limit		69	69	69	

PENNIMAN & BROWNE, INC.

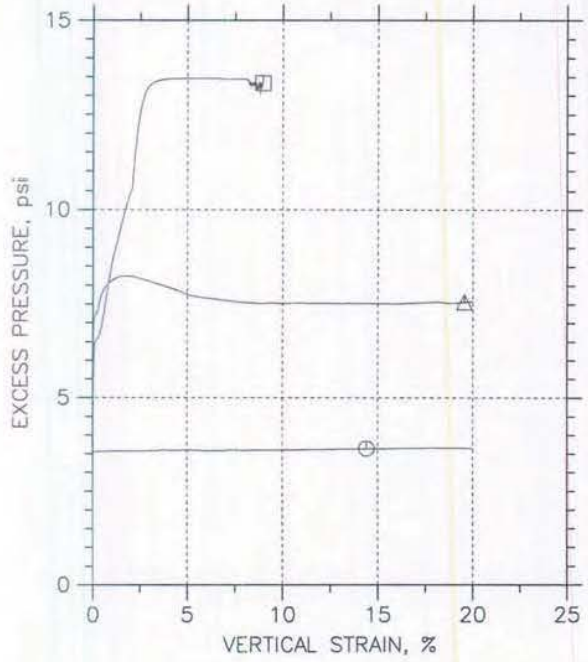
Project: U.S. EPA
Location: APGT06-SB14-16
Project No.: 201100526
Boring No.: SB-14-16
Sample Type: ST
Description: gray soil containing asbestos
Remarks:

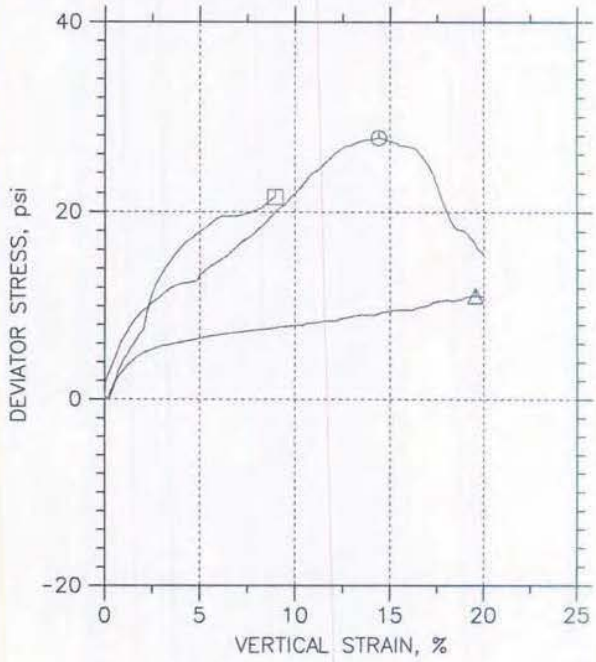
Phase calculations based on start and end of test.

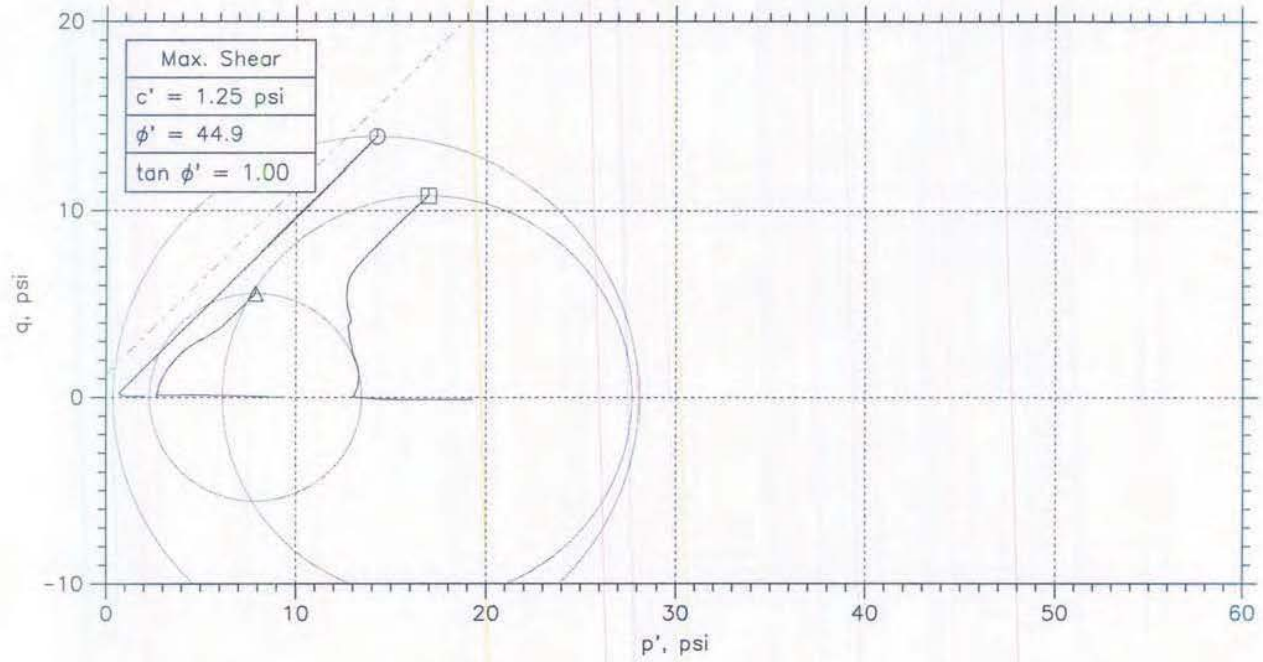
* Saturation is set to 100% for phase calculations.

Fri, 25-FEB-2011 15:43:22

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







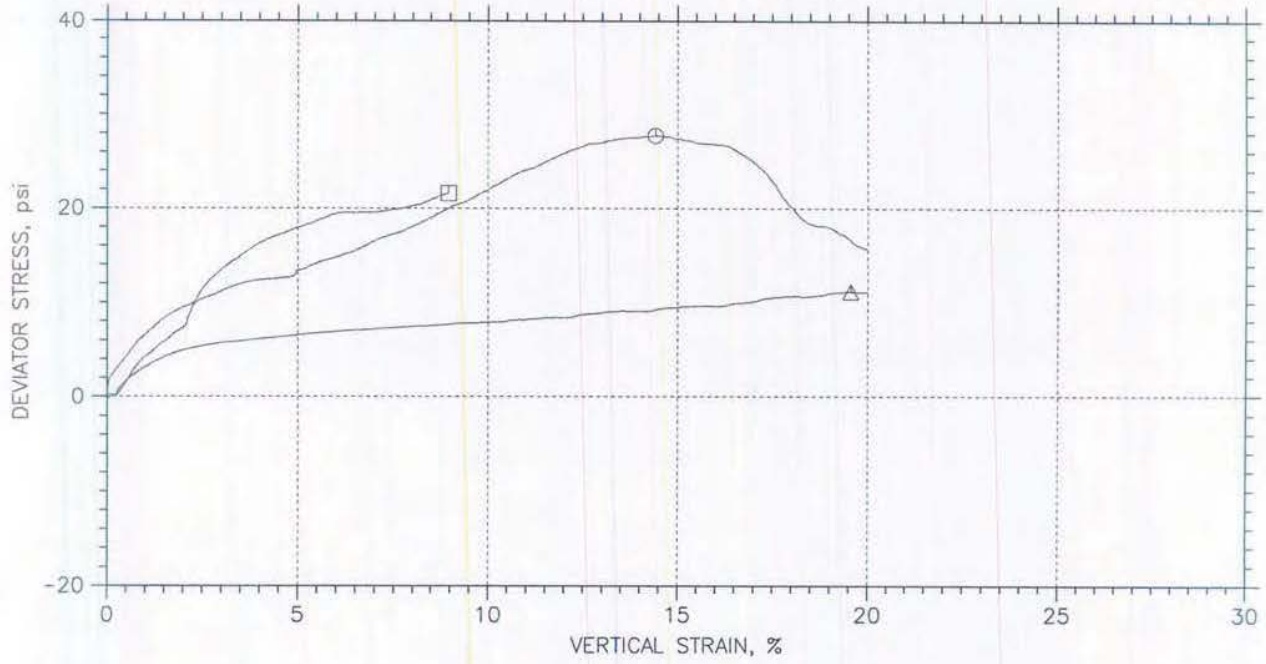
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
○	APGT06	2		AS	02.11.11			201100526-02(1).dat
△	APGT06	1		AS	02.15.11			201100526-02(2).dat
□	APGT06	3		AS	02.16.11			201100526-02(3).dat

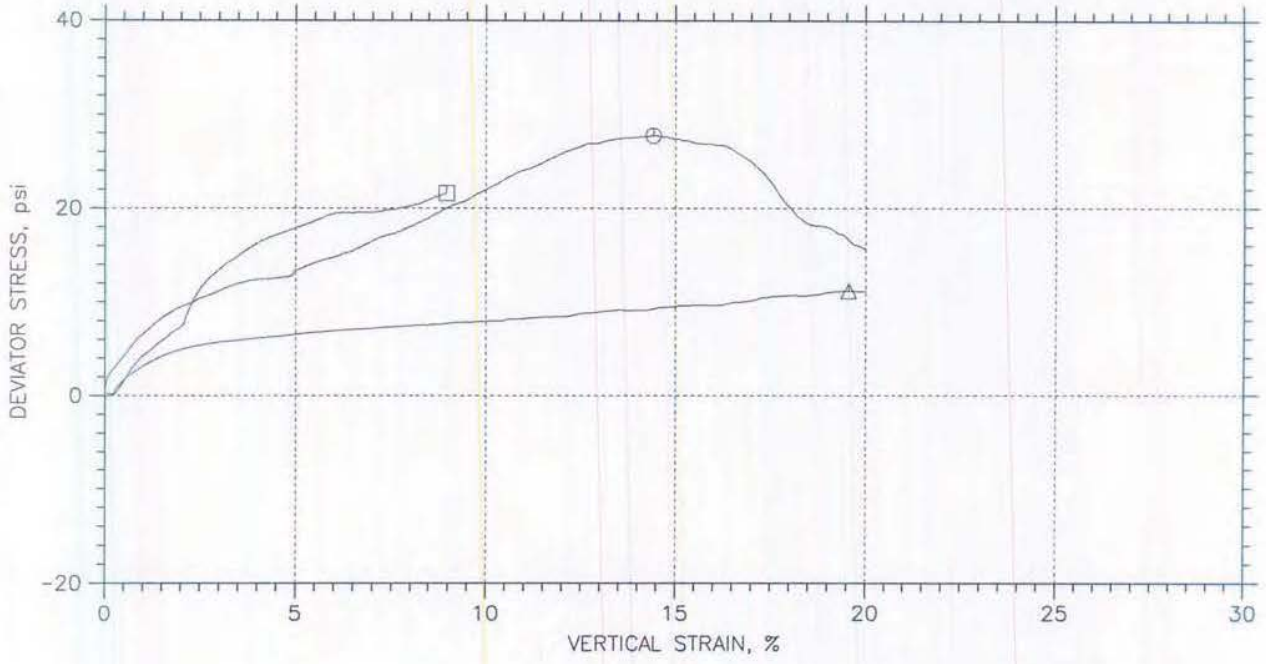
PENNIMAN & BROWNE, INC.

Project: U.S. EPA	Location: APGT06-SB14-16	Project No.: 201100526
Boring No.: SB-14-16	Sample Type: ST	
Description: gray soil containing asbestos		
Remarks:		

Fri, 25-FEB-2011 15:43:26

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
⊙	APGT06	2		AS	02.11.11			201100526-02(1).dat
△	APGT06	1		AS	02.15.11			201100526-02(2).dat
⊡	APGT06	3		AS	02.16.11			201100526-02(3).dat

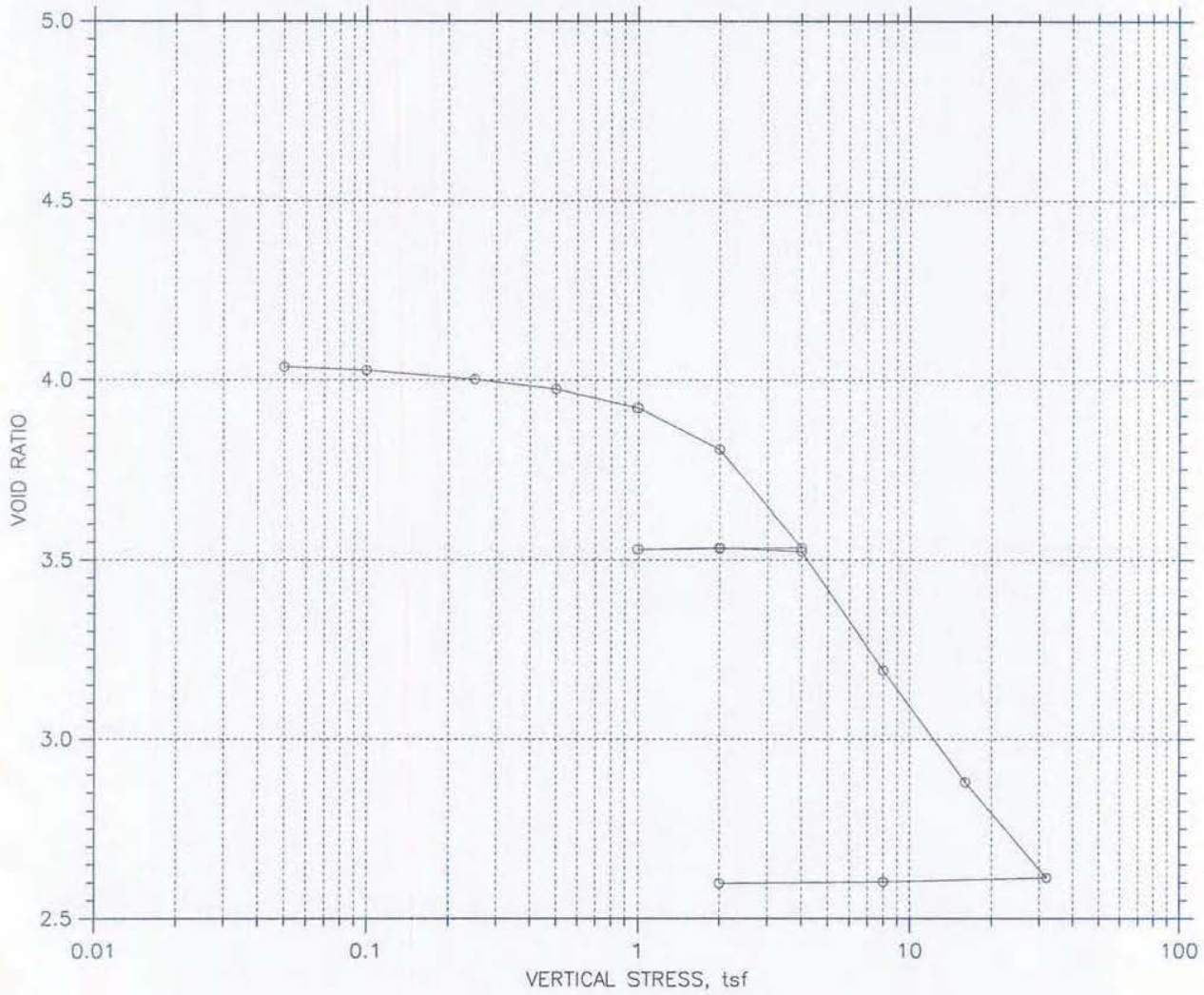
PENNIMAN & BROWNE, INC.

Project: U.S. EPA	Location: APGT06-SB14-16	Project No.: 201100526
Boring No.: SB-14-16	Sample Type: ST	
Description: gray soil containing asbestos		
Remarks:		

Fri, 25-FEB-2011 15:43:29

CONSOLIDATION TEST DATA

SUMMARY REPORT



					Before Test	After Test
Overburden Pressure: 0.32 tsf				Water Content, %	108.37	123.08
Preconsolidation Pressure: 2.3 tsf				Dry Unit Weight, pcf	31.66	44.47
Compression Index: 1.05				Saturation, %	68.51	121.42
Diameter: 2.5 in		Height: 1 in		Void Ratio	4.05	2.60
LL: 127	PL: 76	PI: 51	GS: 2.56			

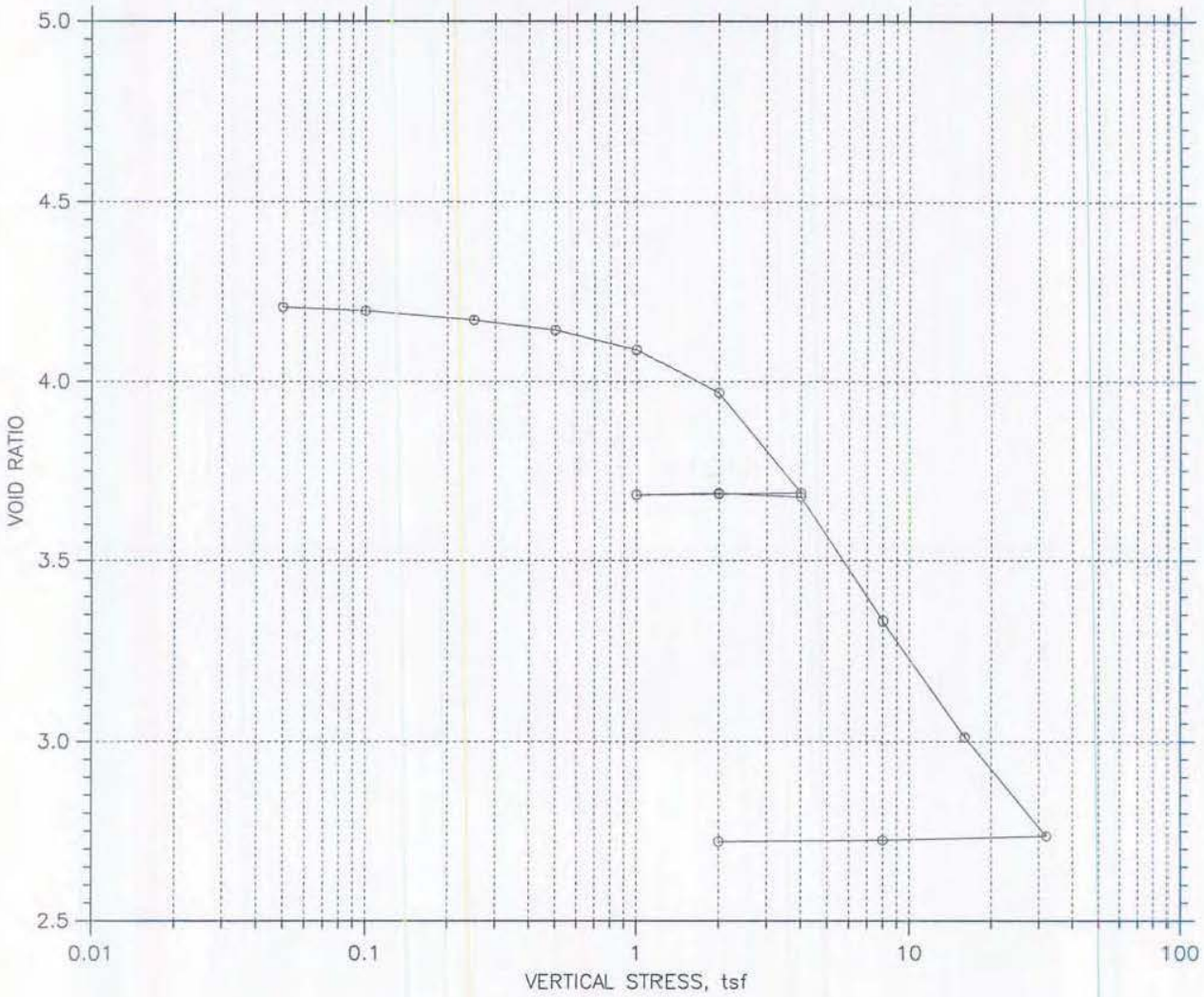
PENNIMAN & BROWNE, INC.

Project: U.S. EPA	Location: APGT07-SB10-12	Project No.: 201100526
Boring No.: SB10-12	Tested By: AS	Checked By:
Sample No.: APGT07	Test Date: 3.17.11	Depth:
Test No.:	Sample Type: ST	Elevation:
Description: GRAY SOIL CONTAINING ASBESTOS		
Remarks:		

Fri, 25-MAR-2011 13:45:19

CONSOLIDATION TEST DATA

SUMMARY REPORT



					Before Test	After Test
Overburden Pressure: 0.32 tsf				Water Content, %	108.37	123.08
Preconsolidation Pressure: 2.3 tsf				Dry Unit Weight, pcf	31.66	44.47
Compression Index: 1.05				Saturation, %	67.96	119.90
Diameter: 2.5 in		Height: 1 in		Void Ratio	4.23	2.72
LL: 127	PL: 76	PI: 51	GS: 2.65			

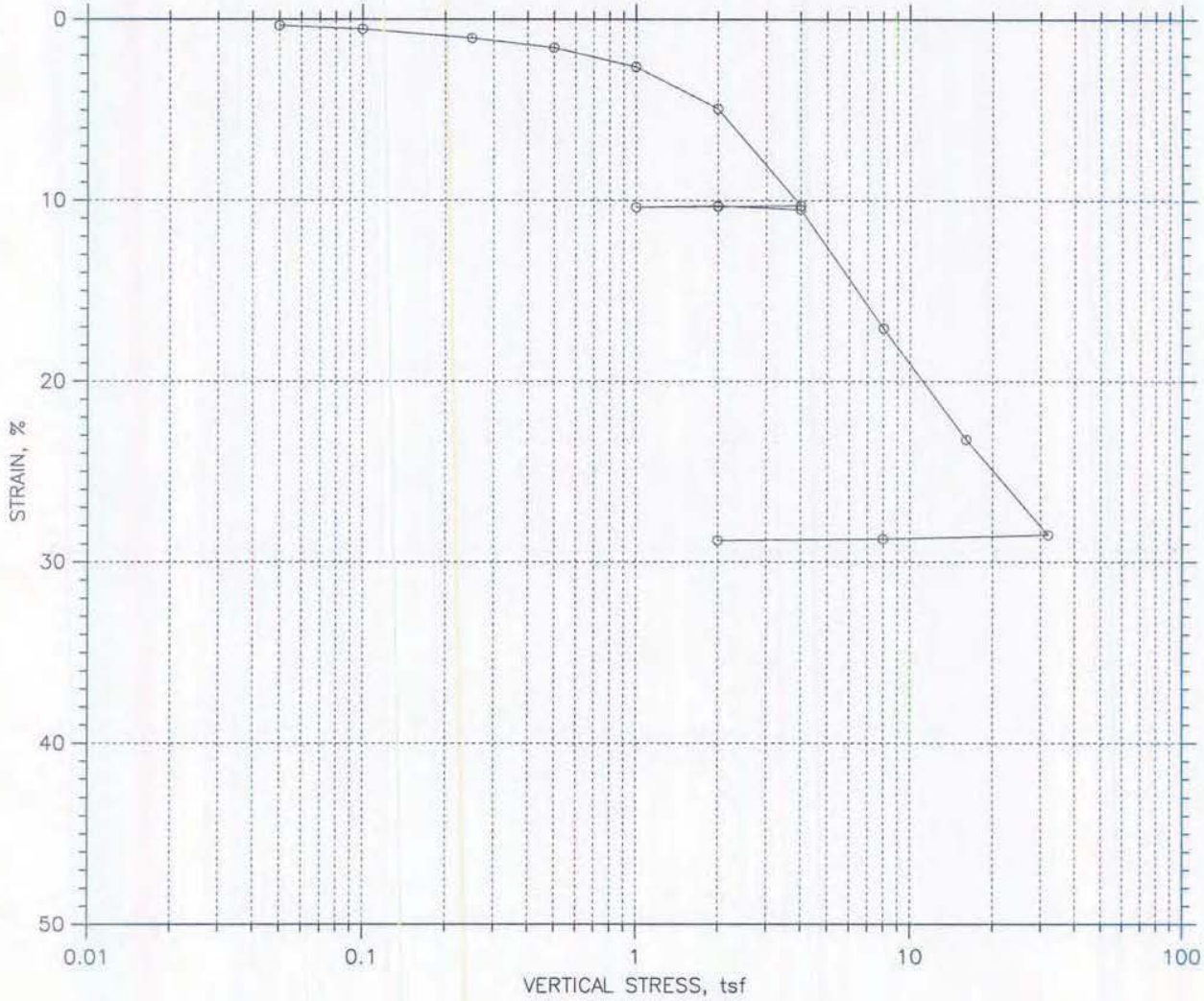
PENNIMAN & BROWNE, INC.

Project: U.S. EPA	Location: APGT07-SB10-12	Project No.: 201100526
Boring No.: SB10-12	Tested By: AS	Checked By:
Sample No.: APGT07	Test Date: 3.17.11	Depth:
Test No.:	Sample Type: ST	Elevation:
Description: GRAY SOIL CONTAINING ASBESTOS		
Remarks:		

Thu, 24-MAR-2011 14:28:20

CONSOLIDATION TEST DATA

SUMMARY REPORT



					Before Test	After Test
Overburden Pressure: 0.32 tsf				Water Content, %	108.37	123.08
Preconsolidation Pressure: 2.3 tsf				Dry Unit Weight, pcf	31.66	44.47
Compression Index: 1.05				Saturation, %	67.96	119.90
Diameter: 2.5 in		Height: 1 in		Void Ratio	4.23	2.72
LL: 127	PL: 76	PI: 51	GS: 2.65			

PENNIMAN & BROWNE, INC.

Project: U.S. EPA	Location: APGT07-SB10-12	Project No.: 201100526
Boring No.: SB10-12	Tested By: AS	Checked By:
Sample No.: APGT07	Test Date: 3.17.11	Depth:
Test No.:	Sample Type: ST	Elevation:
Description: GRAY SOIL CONTAINING ASBESTOS		
Remarks:		

Thu, 24-MAR-2011 14:28:38

CONSOLIDATION TEST DATA

Project: U.S. EPA
Boring No.: SB10-12
Sample No.: APGT07
Test No.:

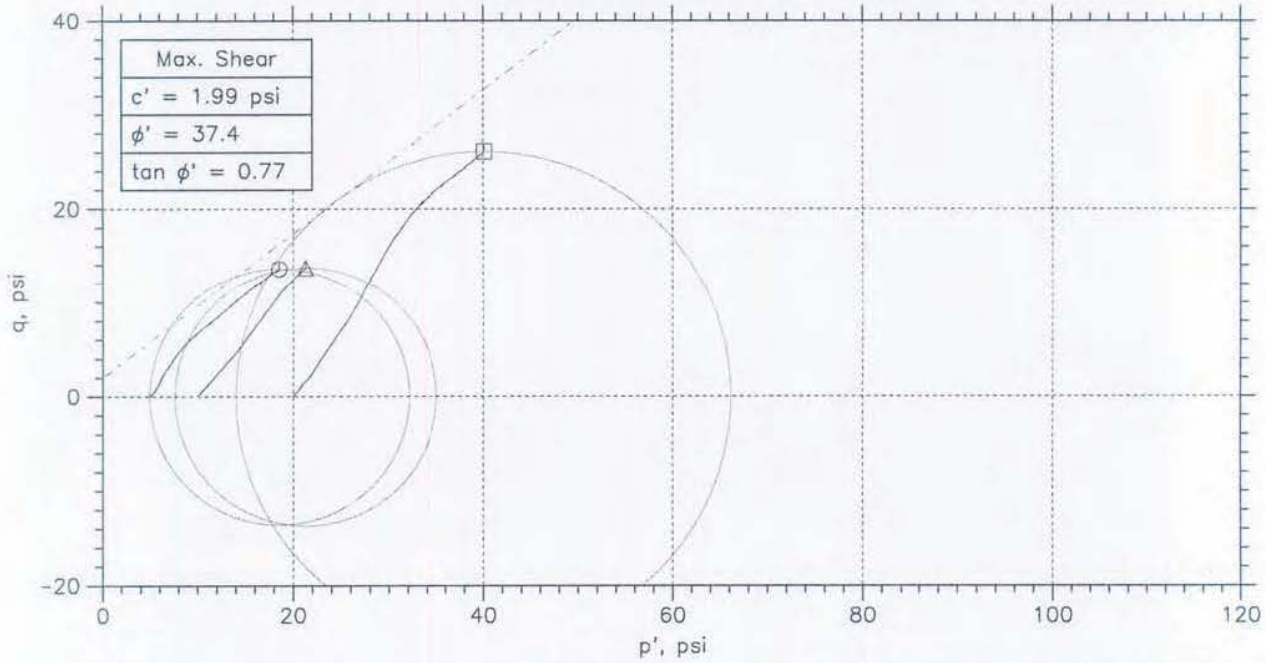
Location: APGTO7-SB10-12
Tested By: AS
Test Date: 3.17.11
Sample Type: ST

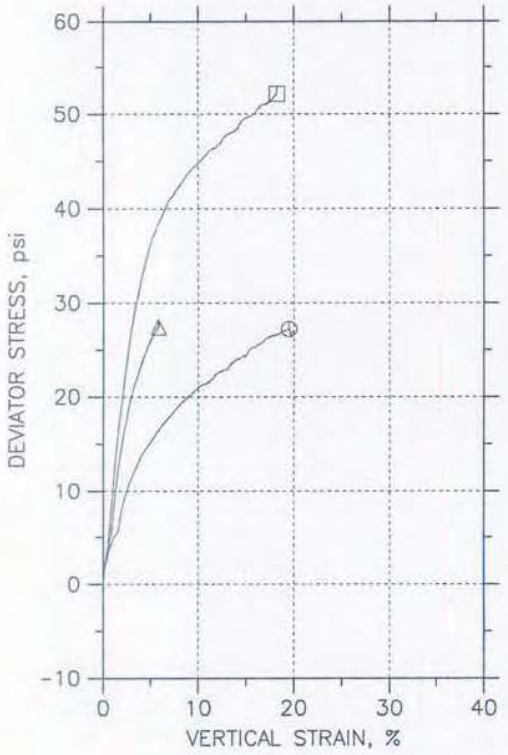
Project No.: 201100526
Checked By:
Depth:
Elevation:

Soil Description: GRAY SOIL CONTAINING ASBESTOS
Remarks:

	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	T50 Fitting Sq.Rt. min	T50 Fitting Log min	Coefficient of Consolidation Sq.Rt. ft^2/sec	Coefficient of Consolidation Log ft^2/sec	Coefficient of Consolidation Ave. ft^2/sec
1	0.05	0.003564	4.207	0.36	0.5	0.3	1.25e-005	1.77e-005	1.46e-005
2	0.1	0.005499	4.197	0.55	1.2	0.0	4.80e-006	0.00e+000	4.80e-006
3	0.25	0.0104	4.171	1.04	0.3	0.2	1.91e-005	2.87e-005	2.29e-005
4	0.5	0.01578	4.143	1.58	0.2	0.2	2.40e-005	2.67e-005	2.53e-005
5	1	0.02633	4.088	2.63	0.3	0.2	2.00e-005	2.87e-005	2.36e-005
6	2	0.04926	3.968	4.93	0.3	0.2	1.91e-005	2.37e-005	2.12e-005
7	4	0.1028	3.688	10.28	0.2	0.2	2.35e-005	2.52e-005	2.43e-005
8	2	0.1034	3.685	10.34	0.0	0.0	2.78e-004	0.00e+000	2.78e-004
9	1	0.1038	3.683	10.38	0.2	0.0	2.68e-005	2.00e-004	4.73e-005
10	2	0.1029	3.688	10.29	0.0	0.0	2.51e-004	0.00e+000	2.51e-004
11	4	0.1049	3.677	10.49	3.9	0.0	1.18e-006	0.00e+000	1.18e-006
12	8	0.1706	3.334	17.06	0.2	0.1	2.77e-005	3.03e-005	2.89e-005
13	16	0.2323	3.012	23.23	0.2	0.1	1.83e-005	3.30e-005	2.36e-005
14	32	0.285	2.736	28.50	0.3	0.2	1.01e-005	1.87e-005	1.31e-005
15	8	0.2873	2.724	28.73	0.0	0.0	1.71e-004	0.00e+000	1.71e-004
16	2	0.2881	2.720	28.81	0.0	0.0	1.93e-004	1.69e-004	1.80e-004

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		⊙	△	⊡	
Sample No.		APGT07	APGT07	APGT07	
Test No.		2	2	2	
Depth					
Initial	Diameter, in	2.8	2.8	2.8	
	Height, in	5.6	5.6	5.6	
	Water Content, %	132.0	132.0	132.0	
	Dry Density, pcf	34.38	36.14	36.14	
	Saturation, %	92.6	98.7	98.7	
	Void Ratio	3.65	3.43	3.43	
Before Shear	Water Content, %	132.0	132.0	132.0	
	Dry Density, pcf	36.5	36.5	36.5	
	Saturation*, %	100.0	100.0	100.0	
	Void Ratio	3.38	3.38	3.38	
	Back Press., psi	1.992	1.13	1.065	
Ver. Eff. Cons. Stress, psi		4.999	9.961	19.98	
Shear Strength, psi		13.59	13.7	26.07	
Strain at Failure, %		19.5	5.82	18.3	
Strain Rate, %/min		0.032	0.032	0.032	
B-Value		0.33	---	---	
Measured Specific Gravity		2.56	2.56	2.56	
Liquid Limit		127	127	127	
Plastic Limit		76	76	76	

PENNIMAN & BROWNE, INC.

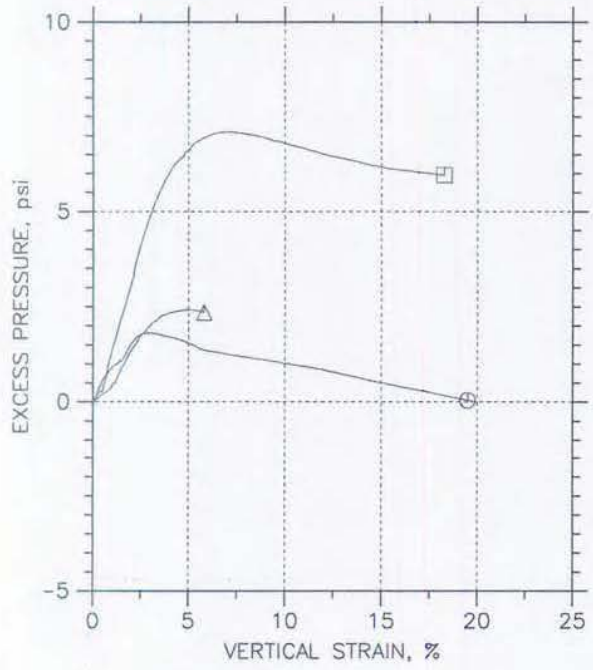
Project: U.S. EPA
Location: APGT07-10-12
Project No.: 201100526
Boring No.: SB10-12
Sample Type: ST
Description: gray soil containing asbestos
Remarks:

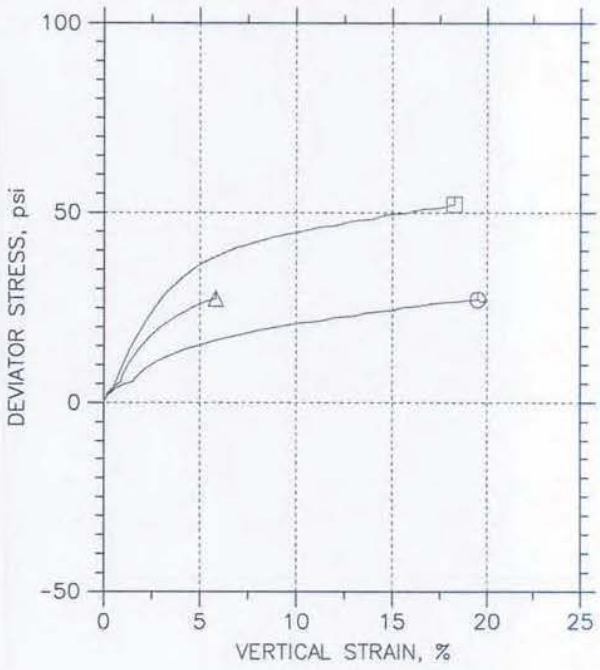
Phase calculations based on start and end of test.

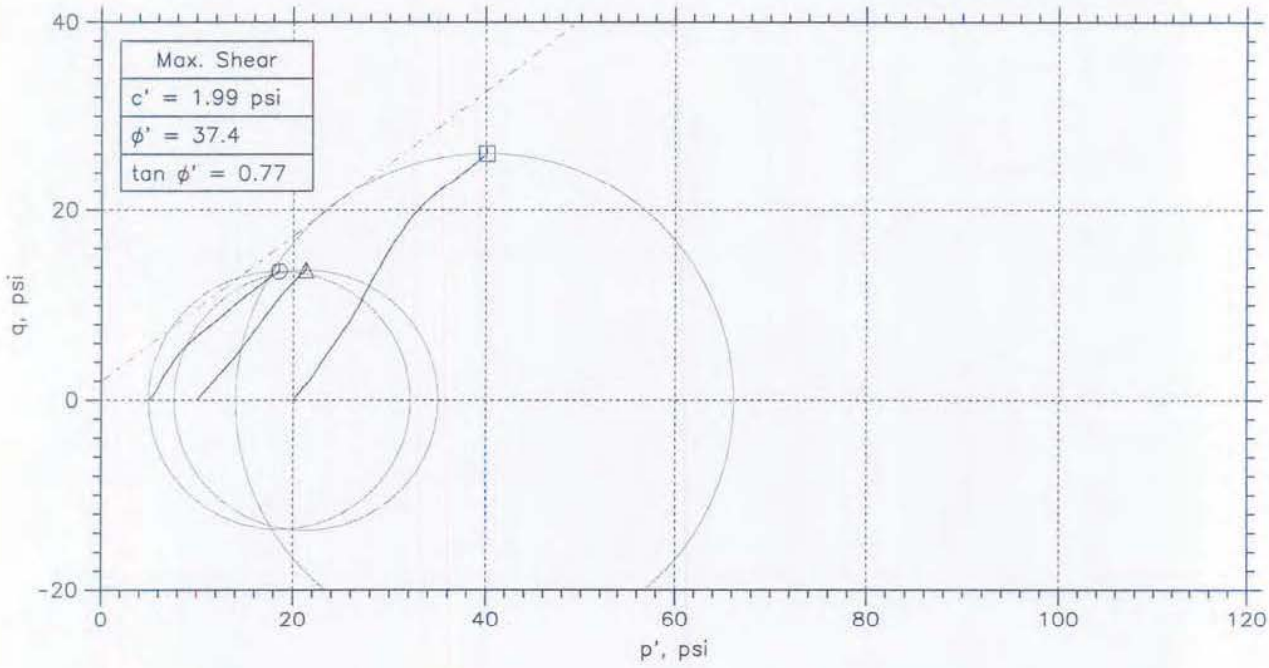
* Saturation is set to 100% for phase calculations.

Fri, 25-MAR-2011 13:32:07

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







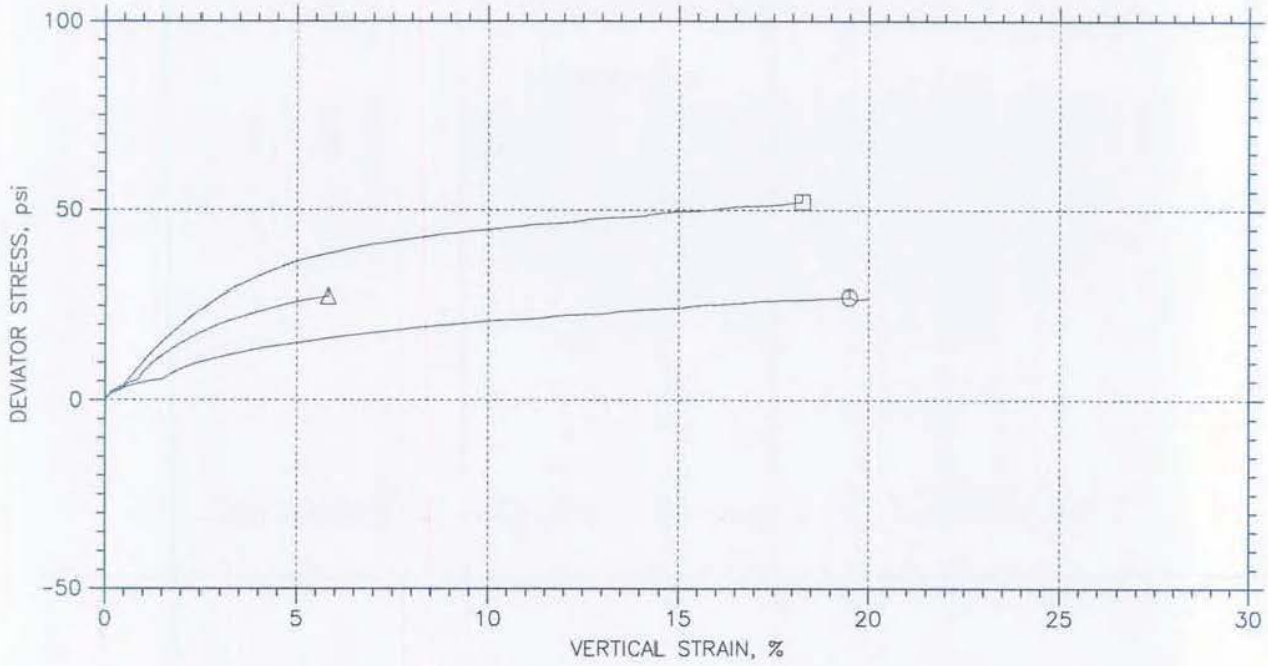
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
◷	APGT07	2		AS	3/18/11			201100526(APGT07-SB10-12)-1
△	APGT07	2		AS	3/21/11			201100526(APGT07-SB10-12)-2
◫	APGT07	2		AS	3/22/11			201100526(APGT07-SB10-12)-3

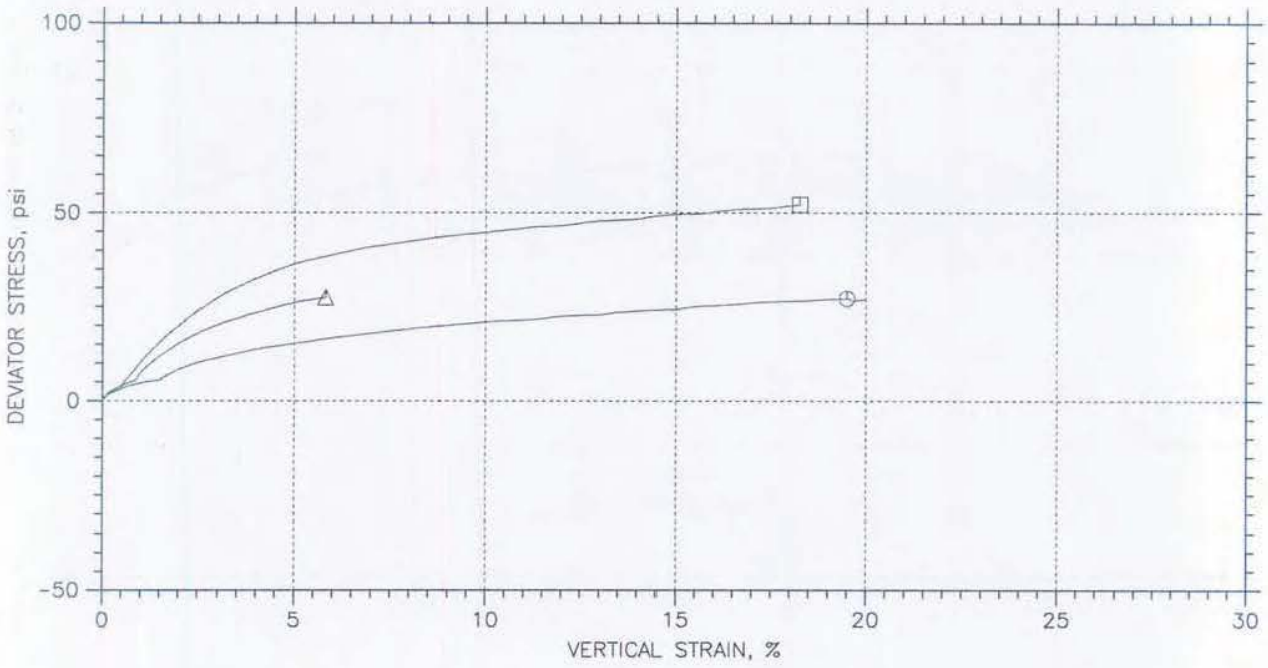
PENNIMAN & BROWNE, INC.

Project: U.S. EPA	Location: APGT07-10-12	Project No.: 201100526
Boring No.: SB10-12	Sample Type: ST	
Description: gray soil containing asbestos		
Remarks:		

Fri, 25-MAR-2011 13:32:12

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
⊙	APGT07	2		AS	3/18/11			201100526(APGT07-SB10-12)-1
△	APGT07	2		AS	3/21/11			201100526(APGT07-SB10-12)-2
□	APGT07	2		AS	3/22/11			201100526(APGT07-SB10-12)-3

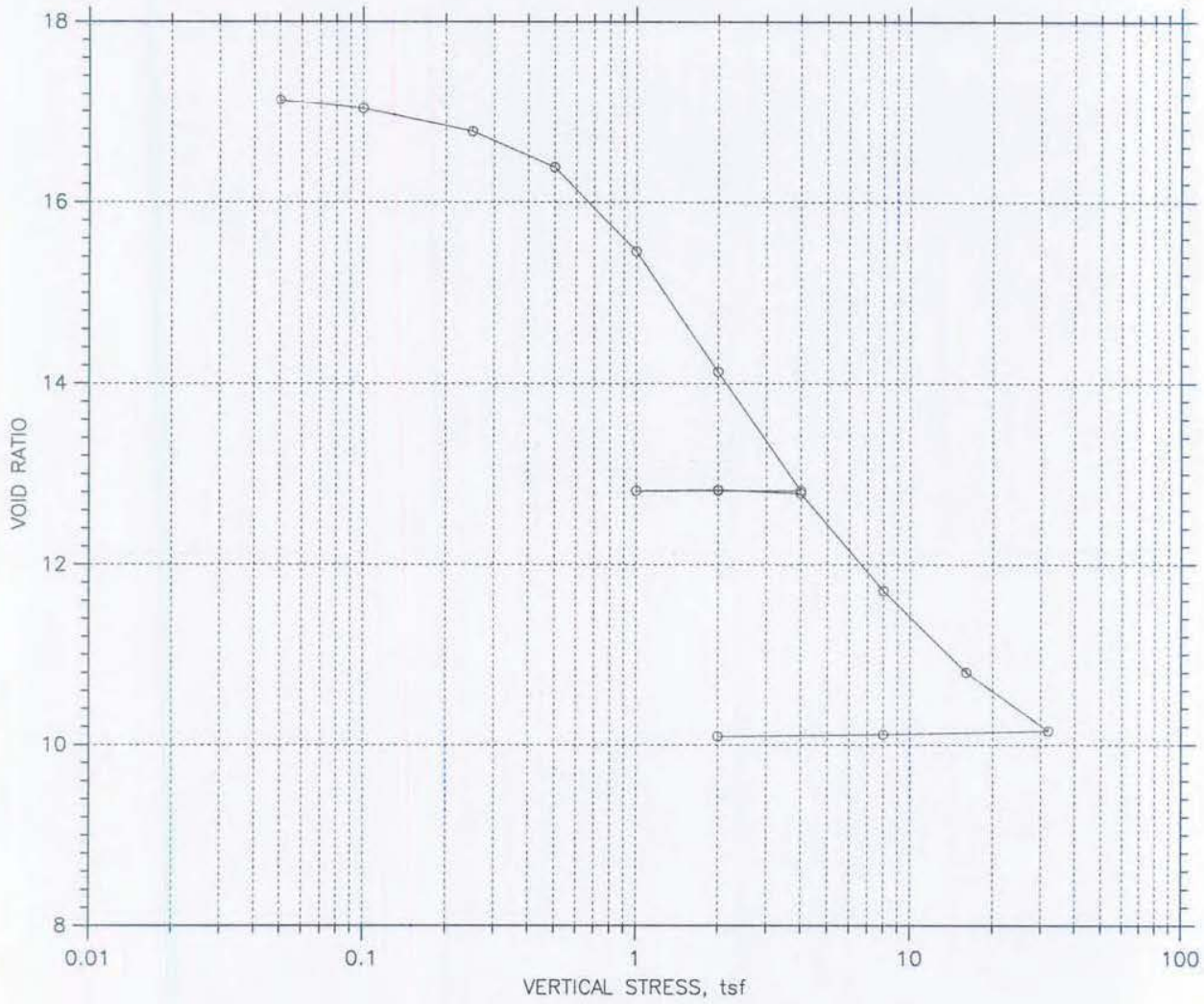
PENNIMAN & BROWNE, INC.

Project: U.S. EPA	Location: APGT07-10-12	Project No.: 201100526
Boring No.: SB10-12	Sample Type: ST	
Description: gray soil containing asbestos		
Remarks:		

Fri, 25-MAR-2011 13:32:15

CONSOLIDATION TEST DATA

SUMMARY REPORT



					Before Test	After Test
Overburden Pressure: 0.25 tsf				Water Content, %	200.00	154.55
Preconsolidation Pressure: 0.5 tsf				Dry Unit Weight, pcf	8.537	14.07
Compression Index: 3.12				Saturation, %	28.93	38.27
Diameter: 2.5 in		Height: 1 in		Void Ratio	17.27	10.09
LL: 129	PL: 83	PI: 46	GS: 2.50			

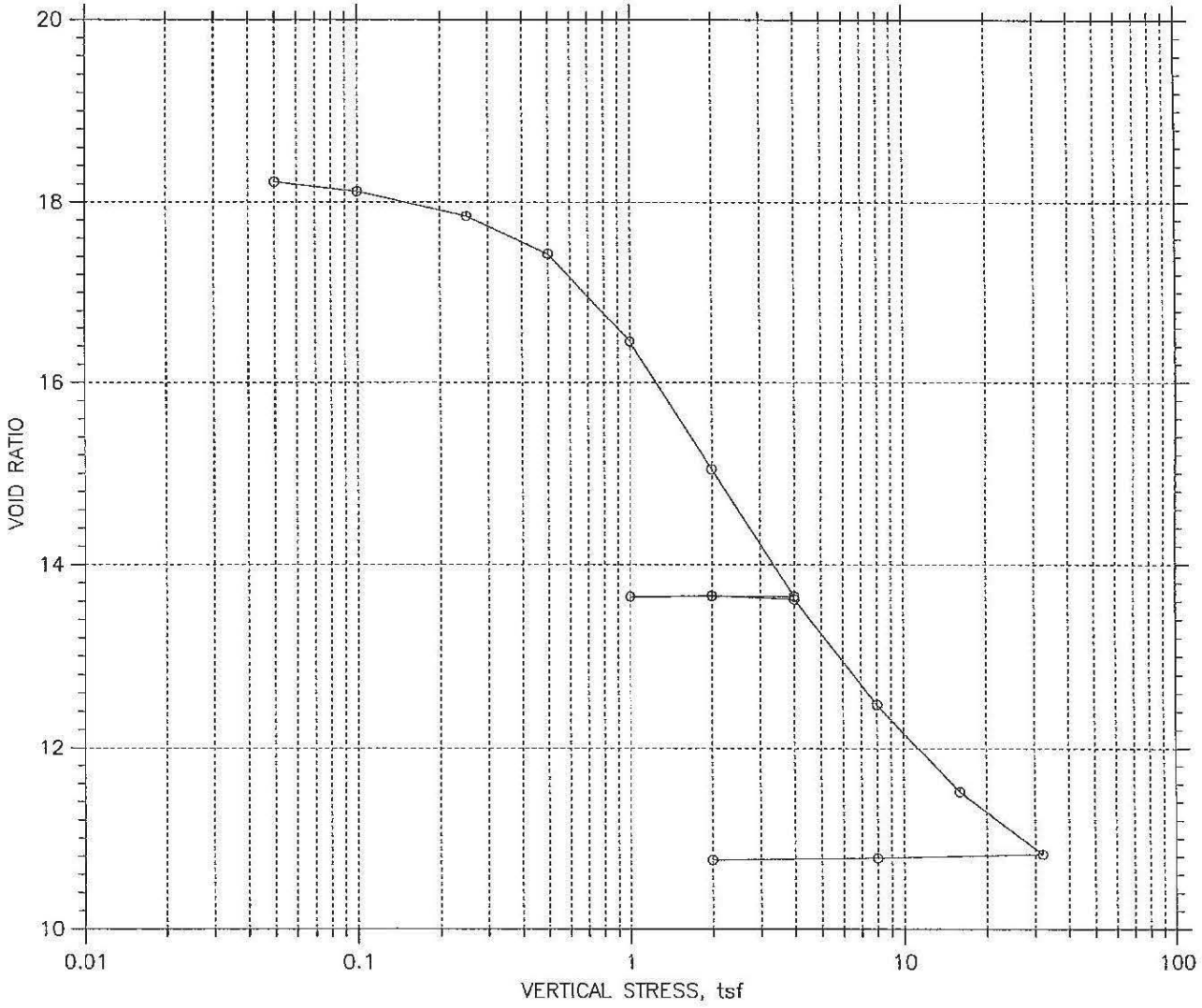
PENNIMAN & BROWNE, INC.

Project: U.S. EPA	Location: APGT07-SB20-22	Project No.: 201100526
Boring No.: SB20-22	Tested By: AS	Checked By:
Sample No.: APGT07	Test Date: 3.16.11	Depth:
Test No.:	Sample Type: ST	Elevation:
Description: GRAY REDDISH SOIL CONTAINING ASBESTOS		
Remarks:		

Fri, 25-MAR-2011 13:43:53

CONSOLIDATION TEST DATA

SUMMARY REPORT



				Before Test	After Test
Overburden Pressure: 0.25 tsf				Water Content, %	200.00	154.55
Preconsolidation Pressure: 0.5 tsf				Dry Unit Weight, pcf	8.537	14.07
Compression Index: 3.12				Saturation, %	28.84	38.06
Diameter: 2.5 in		Height: 1 in		Void Ratio	18.38	10.76
LL: 129	PL: 83	PI: 46	GS: 2.65			

PENNIMAN & BROWNE, INC.

Project: U.S. EPA	Location: APGT07-SB20-22	Project No.: 201100526
Boring No.: SB20-22	Tested By: AS	Checked By:
Sample No.: APGT07	Test Date: 3.16.11	Depth:
Test No.:	Sample Type: ST	Elevation:
Description: GRAY REDDISH SOIL CONTAINING ASBESTOS		
Remarks:		

Fri, 18-MAR-2011 13:53:36

CONSOLIDATION TEST DATA

Project: U.S. EPA
Boring No.: SB20-22
Sample No.: APGT07
Test No.:

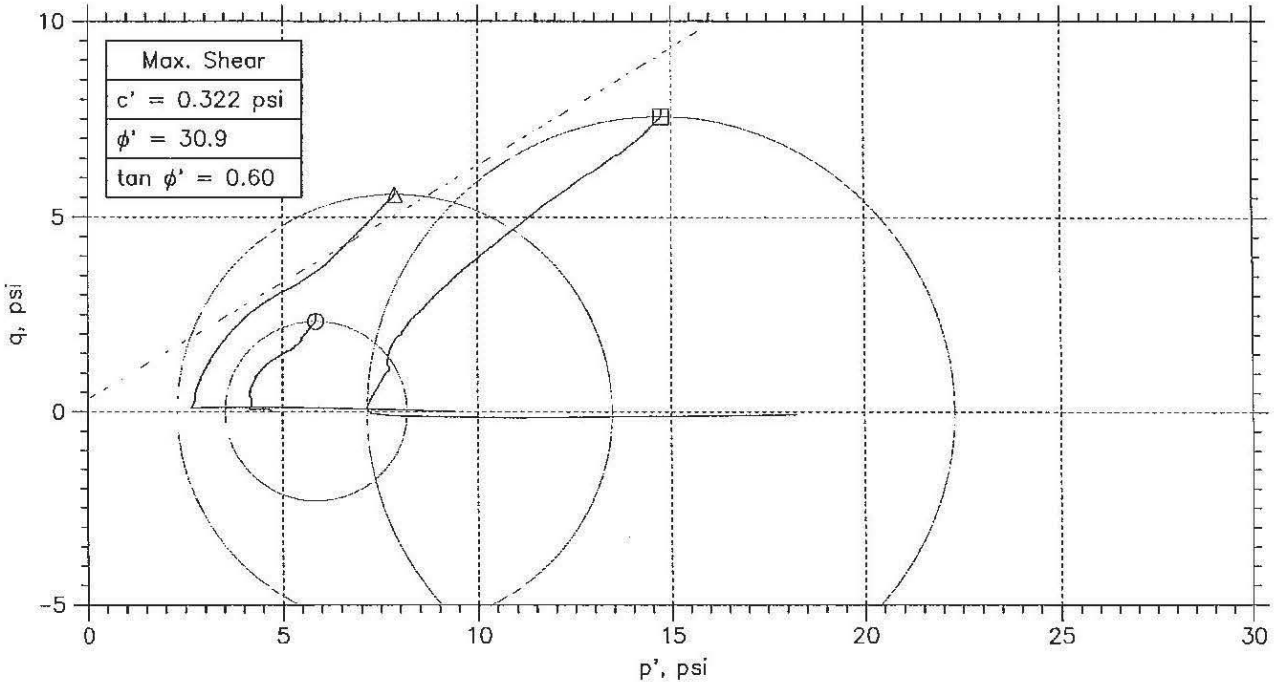
Location: APGT07-SB20-22
Tested By: AS
Test Date: 3.16.11
Sample Type: ST

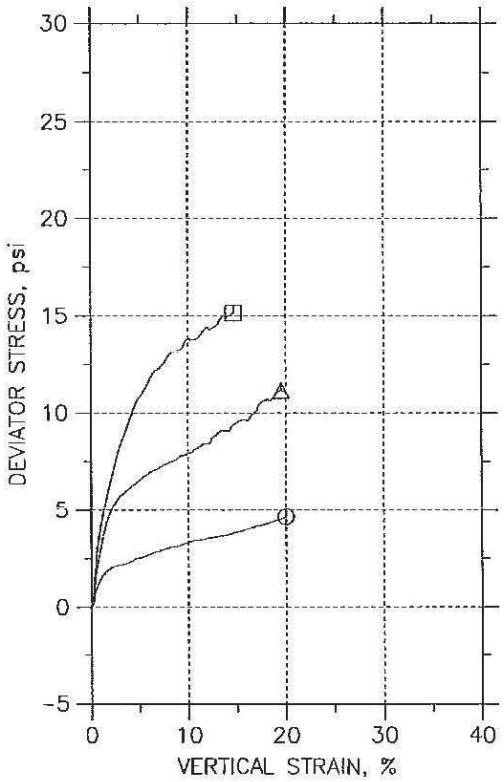
Project No.: 201100526
Checked By:
Depth:
Elevation:

Soil Description: GRAY REDDISH SOIL CONTAINING ASBESTOS
Remarks:

	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	T50 Fitting Sq.Rt. min	T50 Fitting Log min	Coefficient of Consolidation Sq.Rt. ft^2/sec	Coefficient of Consolidation Log ft^2/sec	Coefficient of Consolidation Ave. ft^2/sec
1	0.05	0.008052	18.223	0.81	1.0	0.7	5.72e-006	8.09e-006	6.70e-006
2	0.1	0.01346	18.118	1.35	0.7	0.7	7.61e-006	8.58e-006	8.07e-006
3	0.25	0.02748	17.846	2.75	0.6	0.5	8.46e-006	1.12e-005	9.66e-006
4	0.5	0.04896	17.430	4.90	0.6	0.6	8.77e-006	8.66e-006	8.71e-006
5	1	0.09943	16.452	9.94	0.6	0.5	7.88e-006	9.65e-006	8.68e-006
6	2	0.1721	15.044	17.21	0.6	0.5	7.19e-006	8.88e-006	7.94e-006
7	4	0.2439	13.651	24.39	0.4	0.3	8.68e-006	1.18e-005	1.00e-005
8	2	0.2439	13.652	24.39	0.0	0.0	8.81e-005	1.58e-004	1.13e-004
9	1	0.2441	13.649	24.41	0.2	0.0	2.06e-005	1.08e-004	3.47e-005
10	2	0.2434	13.661	24.34	0.0	0.0	1.95e-004	0.00e+000	1.95e-004
11	4	0.2455	13.621	24.55	1.6	0.0	2.02e-006	0.00e+000	2.02e-006
12	8	0.3046	12.476	30.46	0.3	0.3	9.76e-006	1.17e-005	1.06e-005
13	16	0.3542	11.514	35.42	0.2	0.2	1.19e-005	1.12e-005	1.15e-005
14	32	0.3897	10.826	38.97	0.3	0.2	7.28e-006	1.10e-005	8.76e-006
15	8	0.3919	10.784	39.19	0.0	0.0	1.20e-004	0.00e+000	1.20e-004
16	2	0.3931	10.762	39.31	0.0	0.0	1.03e-004	1.22e-004	1.12e-004

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		⊙	△	⊡	
Sample No.		APGT07	APGT07	APGT07	
Test No.		3	1	3	
Depth					
Initial	Diameter, in	2.8	2.8	2.8	
	Height, in	5.6	5	5.6	
	Water Content, %	217.9	217.9	217.9	
	Dry Density, pcf	23.49	23.7	24.74	
	Saturation, %	95.6	96.6	101.6	
	Void Ratio	6.04	5.98	5.69	
Before Shear	Water Content, %	217.9	217.9	217.9	
	Dry Density, pcf	24.42	24.42	24.42	
	Saturation*, %	100.0	100.0	100.0	
	Void Ratio	5.77	5.77	5.77	
	Back Press., psi	3.935	.3414	5.219	
Ver. Eff. Cons. Stress, psi		4.865	9.383	18.37	
Shear Strength, psi		2.325	5.575	7.565	
Strain at Failure, %		20	19.6	14.7	
Strain Rate, %/min		0.032	0.032	0.032	
B-Value		0.95	---	1.12	
Measured Specific Gravity		2.65	2.65	2.65	
Liquid Limit		129	129	129	
Plastic Limit		83	83	83	

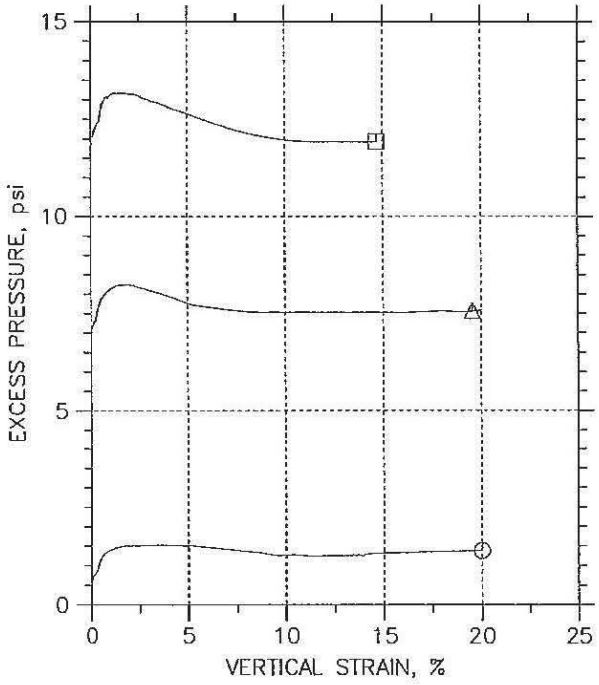
PENNIMAN & BROWNE, INC.

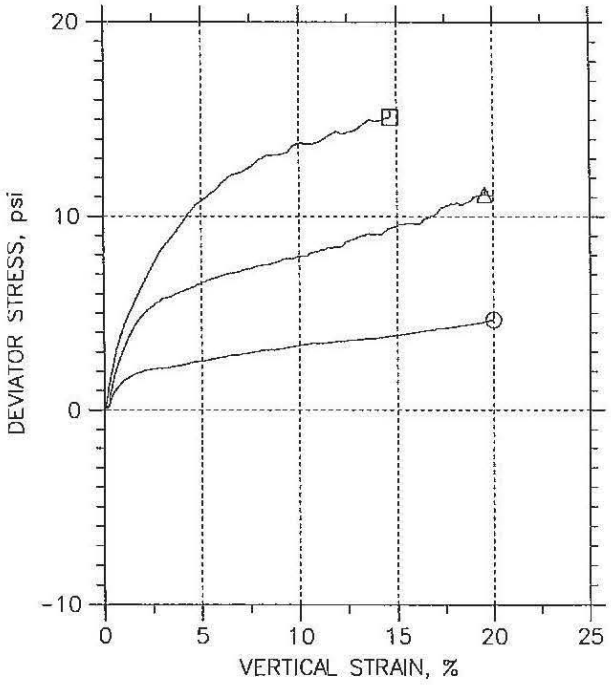
Project: U.S. EPA
Location: APGT07-SB20-22
Project No.: 201100526
Boring No.: SB20-22
Sample Type: ST
Description: gray with reddish brown soil cantoining asbestos
Remarks:

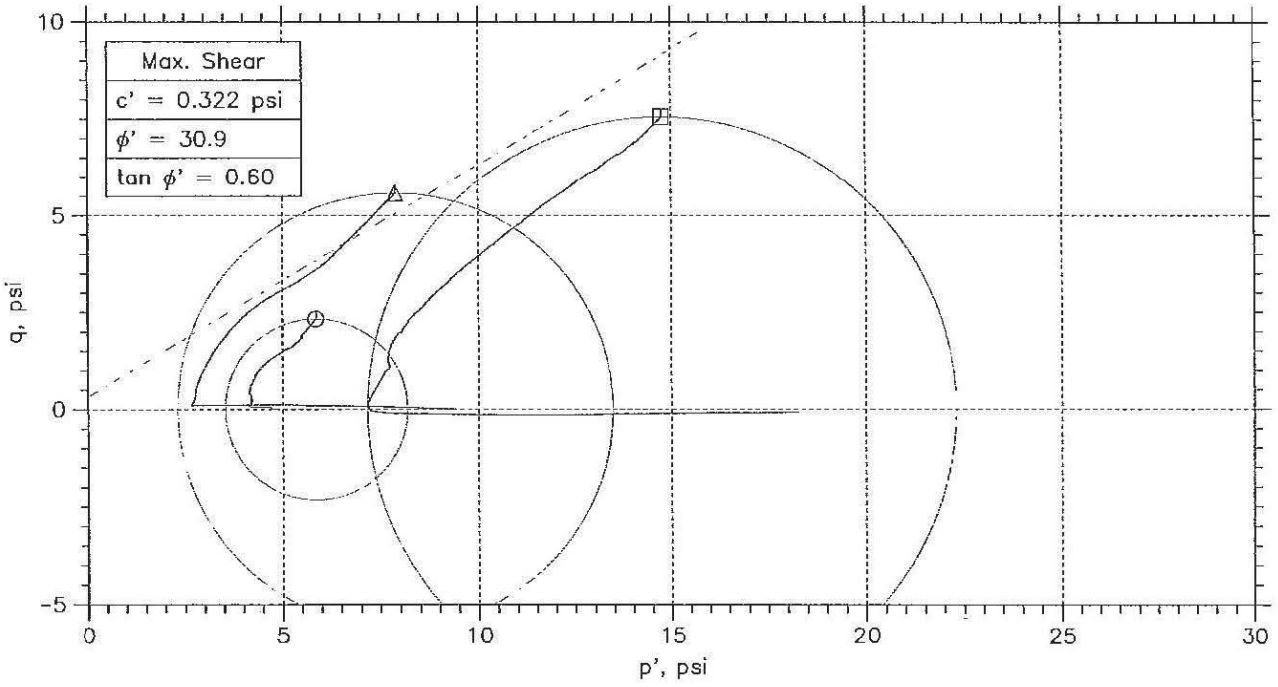
Phase calculations based on start and end of test.
* Saturation is set to 100% for phase calculations.

Fri, 18-MAR-2011 11:49:24

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







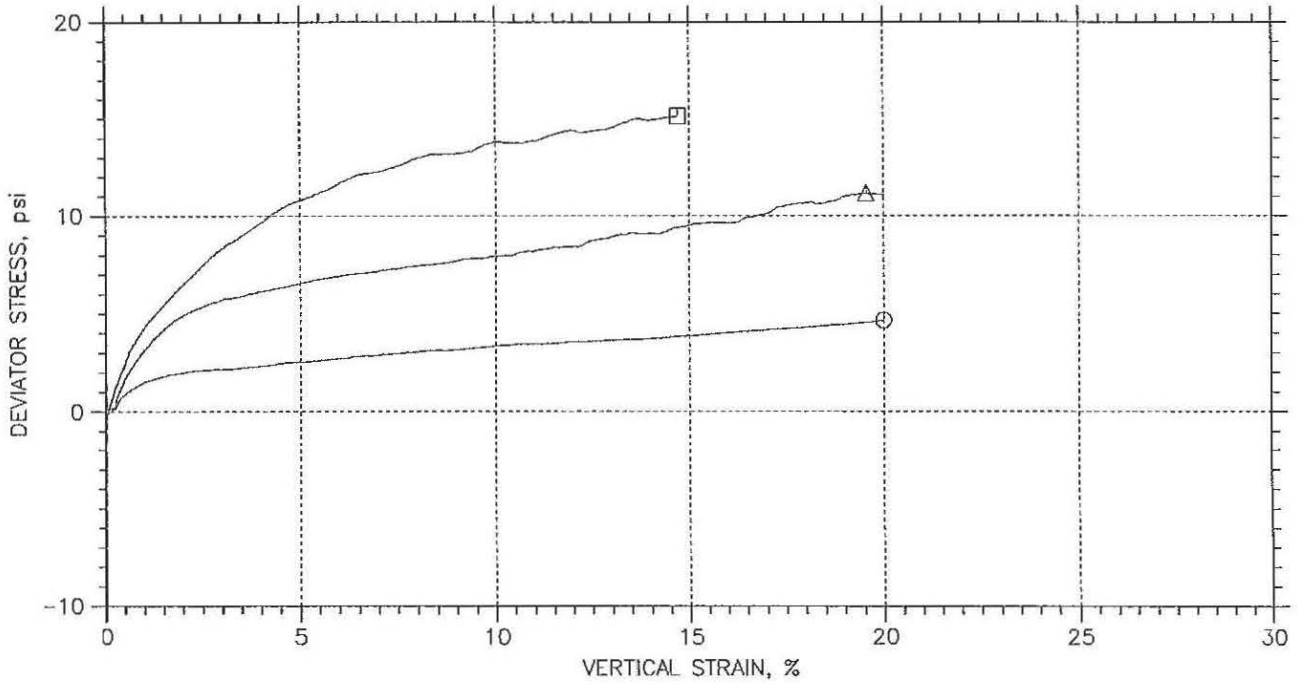
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△	APGT07	1		AS				201100526-02(2).dat
□	APGT07	3		AS	3.15.11			201100526(APGT07-SB20-22)-'

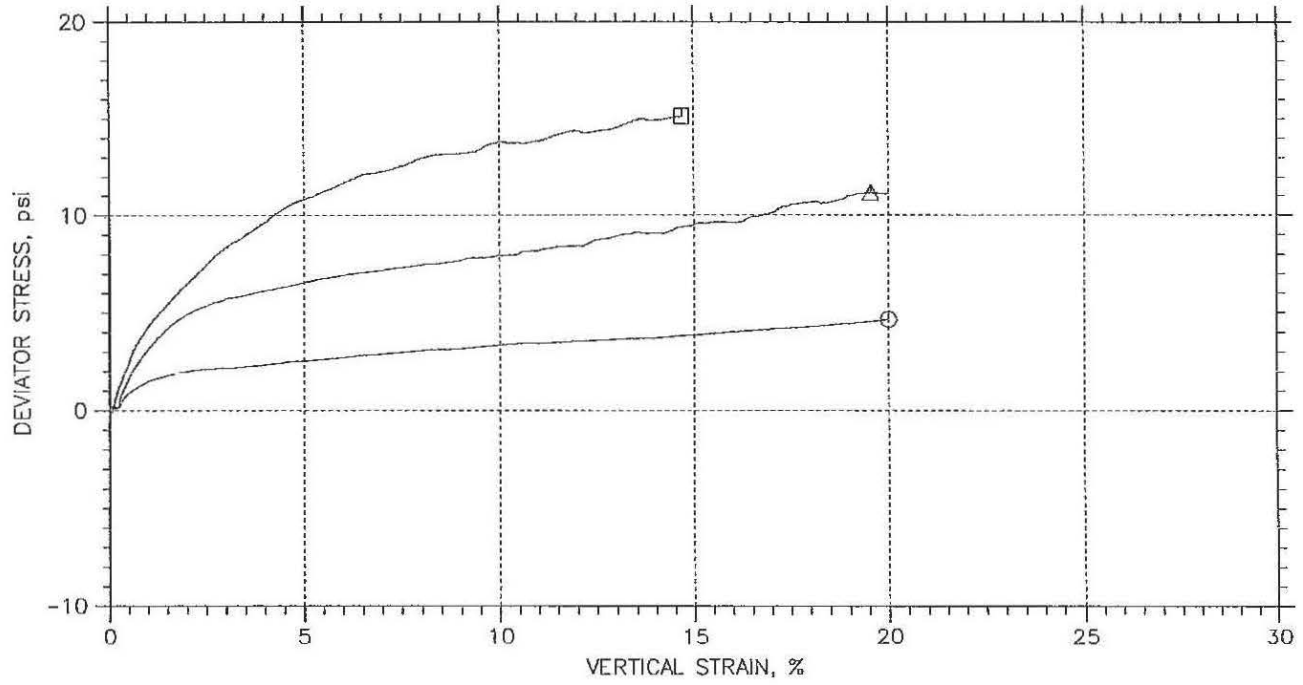
PENNIMAN & BROWNE, INC.

Project: U.S. EPA	Location: APGT07-SB20-22	Project No.: 201100526
Boring No.: SB20-22	Sample Type: ST	
Description: gray with reddish brown soil containing osbestos		
Remarks:		

Fri, 18-MAR-2011 11:49:27

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





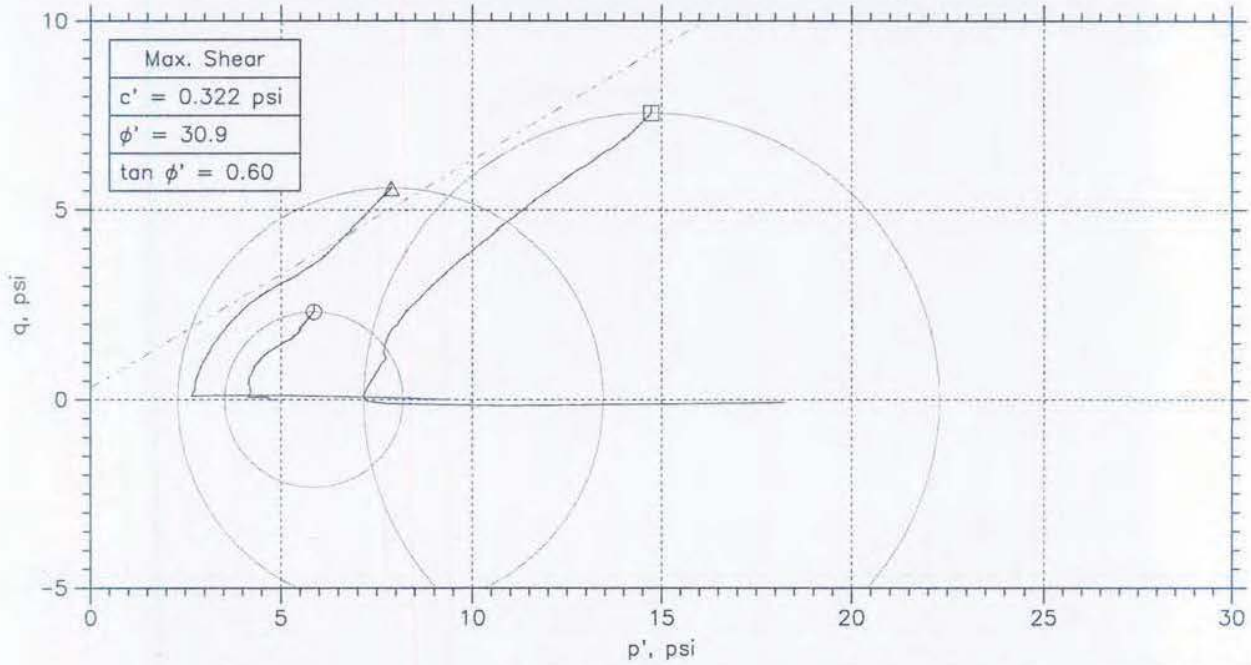
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⊙	APGT07	3		AS	3.11.11			201100526(APGT07-SB20-22)-'
△	APGT07	1		AS				201100526-02(2).dat
⊡	APGT07	3		AS	3.15.11			201100526(APGT07-SB20-22)-'

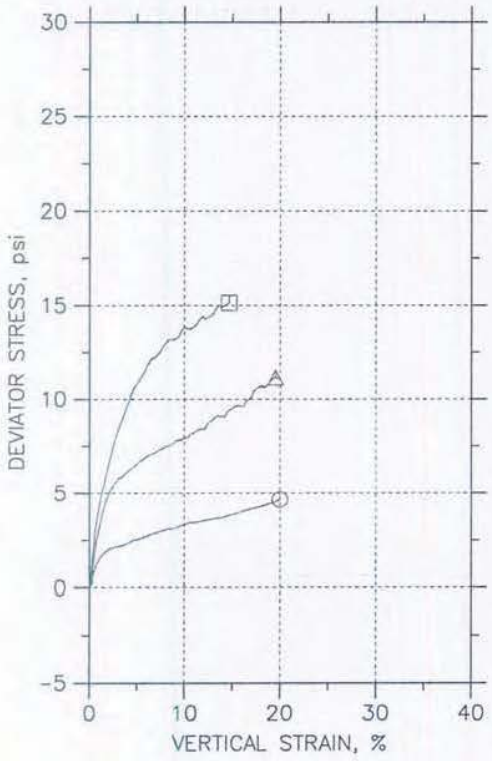
PENNIMAN & BROWNE, INC.

Project: U.S. EPA	Location: APGT07-SB20-22	Project No.: 201100526
Boring No.: SB20-22	Sample Type: ST	
Description: gray with reddish brown soil containing asbestos		
Remarks:		

Fri, 18-MAR-2011 11:49:30

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		⊙	△	⊡	
Sample No.		APGT07	APGT07	APGT07	
Test No.		3	1	3	
Depth					
Initial	Diameter, in	2.8	2.8	2.8	
	Height, in	5.6	5	5.6	
	Water Content, %	217.9	217.9	217.9	
	Dry Density, pcf	23.49	23.7	24.74	
	Saturation, %	96.5	97.6	102.6	
	Void Ratio	5.64	5.58	5.3	
Before Shear	Water Content, %	217.9	217.9	217.9	
	Dry Density, pcf	24.2	24.2	24.2	
	Saturation*, %	100.0	100.0	100.0	
	Void Ratio	5.45	5.45	5.45	
	Back Press., psi	3.935	.3414	5.219	
Ver. Eff. Cons. Stress, psi		4.865	9.383	18.37	
Shear Strength, psi		2.325	5.575	7.565	
Strain at Failure, %		20	19.6	14.7	
Strain Rate, %/min		0.032	0.032	0.032	
B-Value		0.95	---	1.12	
Measured Specific Gravity		2.5	2.5	2.5	
Liquid Limit		129	129	129	
Plastic Limit		83	83	83	

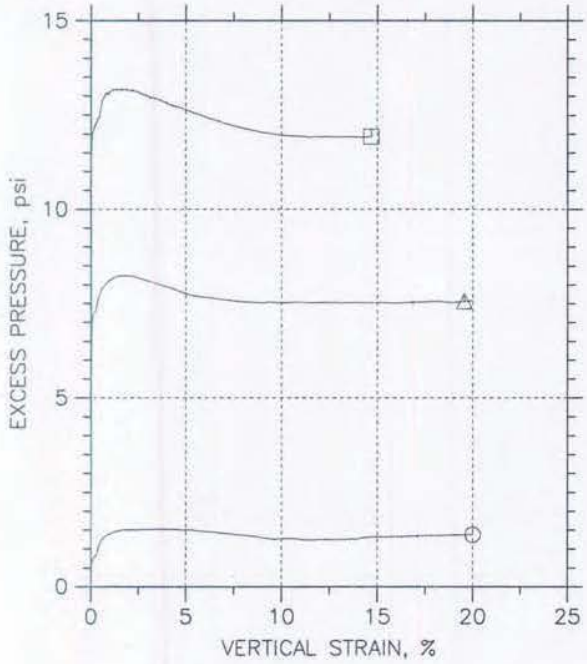
PENNIMAN & BROWNE, INC.

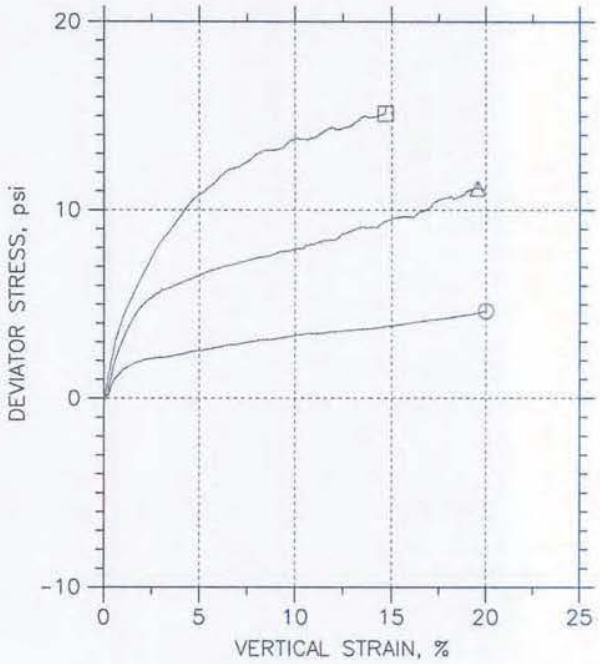
Project: U.S. EPA
Location: APGT07-SB20-22
Project No.: 201100526
Boring No.: SB20-22
Sample Type: ST
Description: gray with reddish brown soil containing asbestos
Remarks:

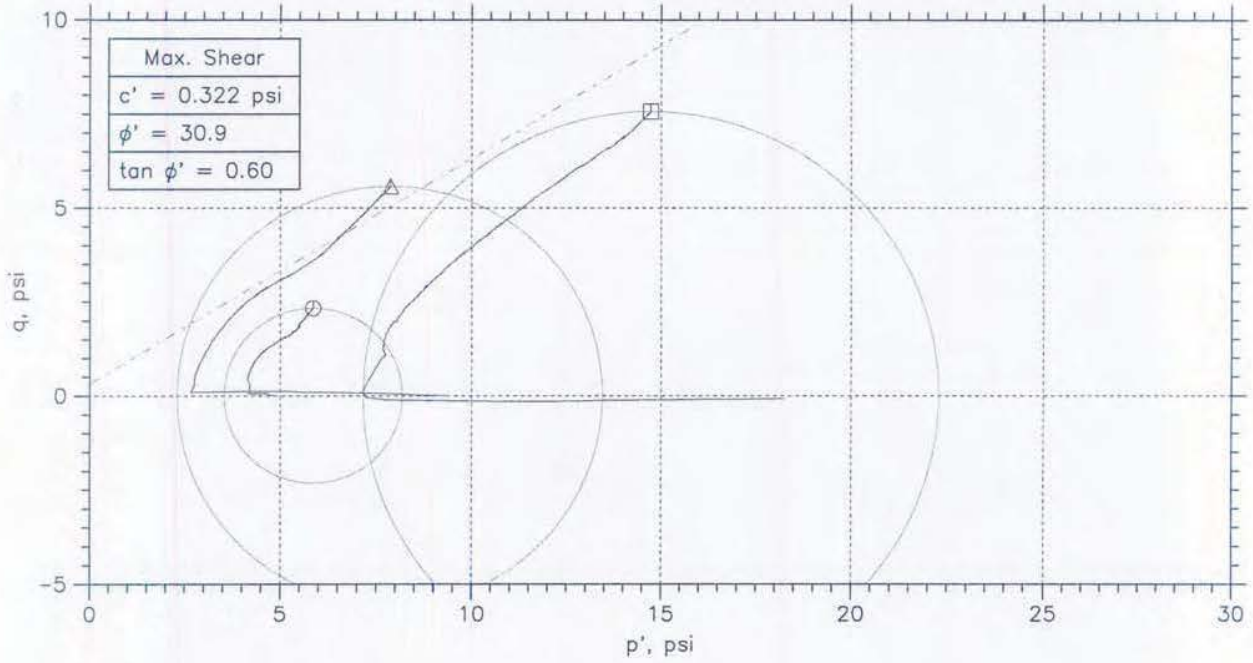
Fri, 25-MAR-2011 13:35:50

Phase calculations based on start and end of test.
* Saturation is set to 100% for phase calculations.

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







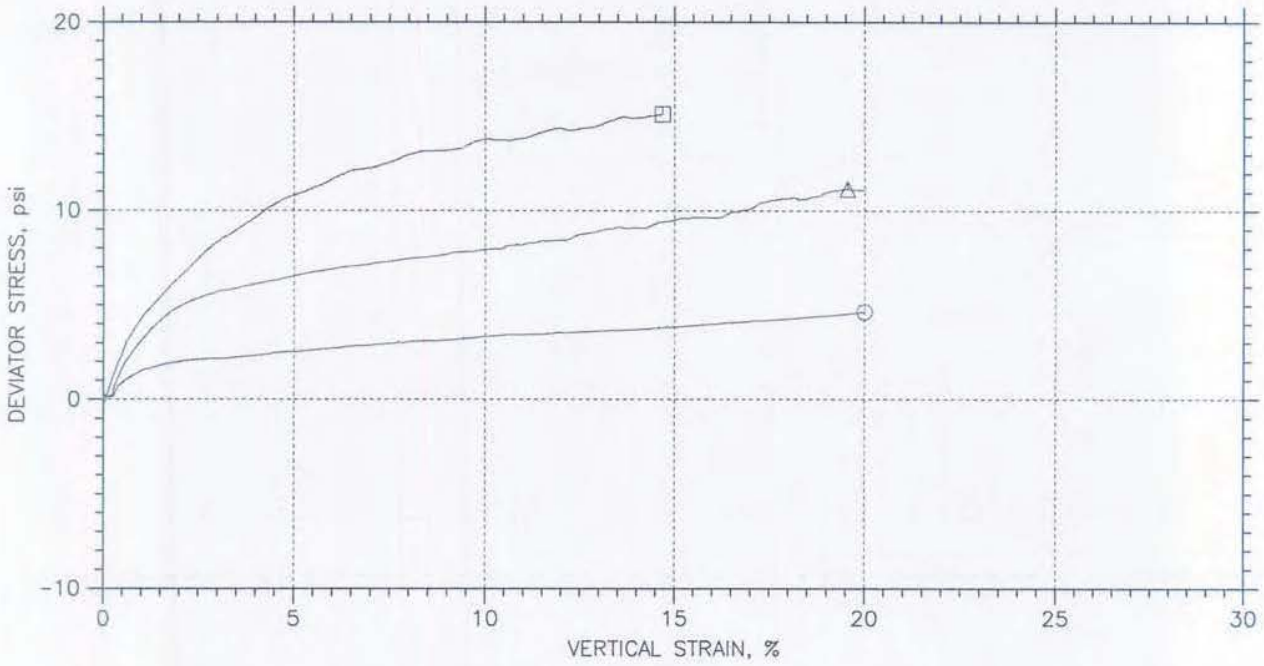
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
⊙	APGT07	3		AS	3.11.11			201100526(APGT07-SB20-22)-'
△	APGT07	1		AS	2.15.11			201100526-02(2).dat
⊡	APGT07	3		AS	3.15.11			201100526(APGT07-SB20-22)-'

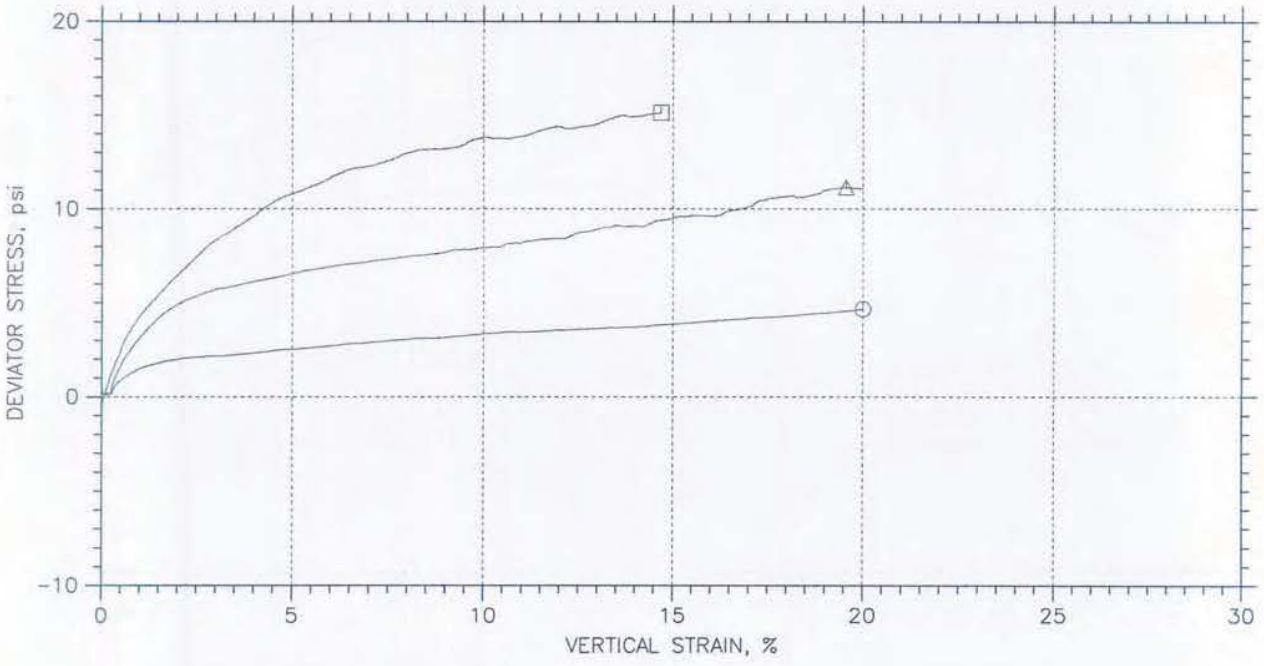
PENNIMAN & BROWNE, INC.

Project: U.S. EPA	Location: APGT07-SB20-22	Project No.: 201100526
Boring No.: SB20-22	Sample Type: ST	
Description: gray with reddish brown soil containing asbestos		
Remarks:		

Fri, 25-MAR-2011 13:35:54

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
⊙	APGT07	3		AS	3.11.11			201100526(APGT07-SB20-22)-'
△	APGT07	1		AS	2.15.11			201100526-02(2).dat
⊡	APGT07	3		AS	3.15.11			201100526(APGT07-SB20-22)-3

PENNIMAN & BROWNE, INC.

Project: U.S. EPA	Location: APGT07-SB20-22	Project No.: 201100526
Boring No.: SB20-22	Sample Type: ST	
Description: gray with reddish brown soil containing asbestos		
Remarks:		

Fri, 25-MAR-2011 13:35:56

Appendix C

Phase 2 Boring and Piezometer Logs

PROJECT: Borit Asbestos
LOCATION: Ambler, Pennsylvania

HSA/AIR HAMMER NO: USEPA

MW-01

STARTED: 10/20/10 COMPLETED: 10/26/10
DRILLING COMPANY: Uni-Tech
DRILLING EQUIPMENT: CME-85/Reichdrill T-650-W
DRILLING METHOD: HSA/Air Rotary, 6 In. Dia. Borehole
SAMPLING METHOD: Split Spoon
SURFACE COMPLETION: Steel Stickup

NORTHING: 310291.04 FT EASTING: 2672266.28 FT
G.S. ELEVATION: 191.59 FT M.P. ELEV: 193.55
WATER: 48 FT TOTAL DEPTH: 53.0 FT
LOGGED BY: S. Moller
HORIZONTAL DATUM: NAD83, COORD. SYS.: State Plane PA South

DEPTH (feet)	GRAPHIC LOG	USCS	DESCRIPTION (Sampler Length: 2 Feet)	SAMPLE INTERVAL (feet)	RECOV. (feet)	BLOW COUNTS	PID (ppm)	ELEV. (ft)	ANALYTICAL SAMPLE	SAMPLE ID	Asbestos (MFL)	Other Detections
1–4			FILL: Topsoil over silty sand with clay to trace clay, trace coarse to gravel, silt, moist, loose.	0 to 2	1.33	8 8 9 9	0	190				
			BACS: Suspect ACM at 1 foot, dark gray mottled with black, tan, brown, silty material with sand. Clay and gravel-sized ACM. Slag at 2.5 feet.	2 to 4	1.83	7 13 11 10	0					
5–10			BACS: Light gray mottled silty, clayey material with bulk ACM chips and wood fibers throughout. 4 feet slag at 8 feet. Wet at bottom of sample.	4 to 6	2	8 10 13 9	0					
				6 to 8	1.33	8 7 8 4	0	185				
				8 to 10	1.5	6 6 7 8	0					
11–12		ML	Dark brown silt with clay. Moist, firm, less clay with depth. Native.	10 to 12	1.5	8 9 8 7	0	180				
13		SM	Mottled silty sand with clay and gravel, medium dense, moist, dark brown.	12 to 14	1.5	5 5 9 10	0					
14–15			Fine medium grained reddish brown bedrock, sandstone. HSA refusal at 14.5 feet	14 to 16	0.5	50/6	0					
16–24			Overdrill with 10 inch air hammer to 25 feet, install 6-inch steel casing. Cuttings primarily sandstone.					175				
25–29			Drill below casing with 6-inch air hammer. Cuttings primarily sandstone.					170				
								165				

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Abbreviations

AAPW - Apparent asbestos process waste
ACM - Asbestos containing material
BACM - Bulk ACM debris
BACS - Bulk ACM debris mixed with soil
NM - Not measured
NR - Not recorded
WOH - Weight of hammer
WOR - Weight of rod

Consistency vs Blowcount/Foot

Granular (Sand):

V. Loose:	0-4	Dense:	30-50
Loose:	4-10	V. Dense:	>50
M. Dense:	10-30		

Fine Grained (Clay):

V. Soft:	<2	Stiff:	8-15
Soft:	2-4	V. Stiff:	15-30
M. Stiff:	4-8	Hard:	>30

Camp, Dresser & McKee Inc
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Chantilly, VA 20151
Telephone: 703-968-0900
Fax: 703-968-0915

HSA/Air Hammer LOG
Draft

PROJECT NO. 3330.029

BORIT LOGS WITH WATER DATA BORIT_ASBESTOS.GPJ STANDARD_ENVIRONMENTAL_PROJECT.GDT 02/24/11 REV.

PROJECT: Borit Asbestos
LOCATION: Ambler, Pennsylvania

HSA/AIR HAMMER NO: **MW-01**

DEPTH (feet)	GRAPHIC LOG	USCS	DESCRIPTION (Sampler Length: 2 Feet)	SAMPLE INTERVAL (feet)	RECOV. (feet)	BLOW COUNTS	PID (ppm)	ELEV. (ft)	ANALYTICAL SAMPLE	SAMPLE ID	Asbestos (MFL)	Other Detections
31			Drill below casing with 6-inch air hammer. Cuttings primarily sandstone. *(continued)*					160				
32												
33												
34												
35												
36												
37								155				
38												
39												
40												
41												
42								150				
43												
44												
45												
46												
47								145				
48			Drill below casing with 6-inch air hammer. Cuttings primarily sandstone. Water-bearing fracture encountered at 48 feet.									
49												
50												
51												
52								140				
53			End of Boring at 53 feet bgs. Well Screen installed 43 - 53 feet. See well construction diagram.									
54												
55												
56												
57								135				
58												
59												
60												
61												
62								130				
63												
64												
65												
66												

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PROJECT NO. 3330.029

PROJECT: Borit Asbestos
LOCATION: Ambler, Pennsylvania

HSA/AIR HAMMER NO: USEPA

MW-01A

STARTED: 11/11/10 COMPLETED: 11/12/10
DRILLING COMPANY: Uni-Tech
DRILLING EQUIPMENT: CME-85/Reichdrill T-650-W
DRILLING METHOD: Air Rotary, 6 In. Dia. Borehole
SAMPLING METHOD: Split Spoon
SURFACE COMPLETION: Steel Stickup

NORTHING: 310291.04 FT EASTING: 2672266.28 FT
G.S. ELEVATION: 191.59 FT M.P. ELEV: 193.55
WATER: 48 FT TOTAL DEPTH: 73.0 FT
LOGGED BY: J. Connor
HORIZONTAL DATUM: NAD83, COORD. SYS.: State Plane PA South

DEPTH (feet)	GRAPHIC LOG	USCS	DESCRIPTION (Sampler Length: Feet)	SAMPLE INTERVAL (feet)	RECOV. (feet)	BLOW COUNTS	PID (ppm)	ELEV. (ft)	ANALYTICAL SAMPLE	SAMPLE ID	Asbestos (MFL)	Other Detections
1			Over-drilled originial MW-01 installed on 10/26/2010 due to possible grout infiltration of screened interval, as determined by high pH (12.3) results in groundwater and limited production of groundwater.					190				
2												
3												
4												
5												
6								185				
7												
8												
9												
10												
11												
12								180				
13												
14												
15												
16												
17								175				
18												
19												
20												
21												
22								170				
23												
24												
25												
26												
27								165				
28												
29												

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Abbreviations

AAPW - Apparent asbestos process waste
ACM - Asbestos containing material
BACM - Bulk ACM debris
BACS - Bulk ACM debris mixed with soil
NM - Not measured
NR - Not recorded
WOH - Weight of hammer
WOR - Weight of rod

Consistency vs Blowcount/Foot

Granular (Sand):

V. Loose:	0-4	Dense:	30-50
Loose:	4-10	V. Dense:	>50
M. Dense:	10-30		

Fine Grained (Clay):

V. Soft:	<2	Stiff:	8-15
Soft:	2-4	V. Stiff:	15-30
M. Stiff:	4-8	Hard:	>30

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HSA/Air Hammer LOG
Draft

PROJECT NO. 3330.029

BORIT LOGS WITH WATER DATA BORIT_ASBESTOS.GPJ STANDARD_ENVIRONMENTAL_PROJECT.GDT 02/24/11 REV.

PROJECT: Borit Asbestos
LOCATION: Ambler, Pennsylvania

HSA/AIR HAMMER NO:

MW-01A

DEPTH (feet)	GRAPHIC LOG	USCS	DESCRIPTION (Sampler Length: Feet)	SAMPLE INTERVAL (feet)	RECOV. (feet)	BLOW COUNTS	PID (ppm)	ELEV. (ft)	ANALYTICAL SAMPLE	SAMPLE ID	Asbestos (MFL)	Other Detections
31–66			Over-drilled originial MW-01 installed on 10/26/2010 due to possible grout infiltration of screened interval, as determined by high pH (12.3) results in groundwater and limited production of groundwater. *(continued)*					160, 155, 150, 145, 140, 135, 130				
48			▽									
53–66			Water changed from whitish to brown at 64 feet. Water flow rate consistent but low. pH reading dropped from 10.5 to 8.5.									

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Draft

PROJECT NO. 3330.029

BORIT LOGS WITH WATER DATA BORIT_ASBESTOS.GPJ STANDARD_ENVIRONMENTAL_PROJECT.GDT 02/24/11 REV.

PROJECT: Borit Asbestos
LOCATION: Ambler, Pennsylvania

HSA/AIR HAMMER NO:

MW-01A

DEPTH (feet)	GRAPHIC LOG	USCS	DESCRIPTION (Sampler Length: Feet)	SAMPLE INTERVAL (feet)	RECOV. (feet)	BLOW COUNTS	PID (ppm)	ELEV. (ft)	ANALYTICAL SAMPLE	SAMPLE ID	Asbestos (MFL)	Other Detections
67												
68			pH reading dropped to 7.5.									
69												
70												
71												
72								120				
73			End of Boring at 73 feet bgs. Well Screen installed 63 - 73 feet. See well construction diagram.									
74												
75												
76												
77								115				
78												
79												
80												
81												
82								110				
83												
84												
85												
86												
87								105				
88												
89												
90												
91												
92								100				
93												
94												
95												
96								95				
97												
98												
99												
100												
101								90				
102												

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PROJECT NO. 3330.029

BORIT LOGS WITH WATER DATA BORIT_ASBESTOS.GPJ STANDARD_ENVIRONMENTAL_PROJECT.GDT 02/24/11 REV.

PROJECT: Borit Asbestos
LOCATION: Ambler, Pennsylvania

HSA/AIR HAMMER NO: USEPA

MW-02

STARTED: 10/21/10 COMPLETED: 10/26/10
DRILLING COMPANY: Uni-Tech
DRILLING EQUIPMENT: CME-85/Reichdrill T-650-W
DRILLING METHOD: HSA/Air Rotary, 6 In. Dia. Borehole
SAMPLING METHOD: Split Spoon
SURFACE COMPLETION: Steel Stickup

NORTHING: 309420.41 FT
G.S. ELEVATION: 196.48 FT
WATER:
LOGGED BY: S. Moller
EASTING: 2672617.53 FT
M.P. ELEV: 198.06
TOTAL DEPTH: 63.0 FT
HORIZONTAL DATUM: NAD83, COORD. SYS.: State Plane PA South

DEPTH (feet)	GRAPHIC LOG	USCS	DESCRIPTION (Sampler Length: 2 Feet)	SAMPLE INTERVAL (feet)	RECOV. (feet)	BLOW COUNTS	PID (ppm)	ELEV. (ft)	ANALYTICAL SAMPLE	SAMPLE ID	Asbestos (MFL)	Other Detections
1–2			FILL: Dark brown silty clay with gravel, wood pieces, dry, medium dense.	0 to 2	1.17	6 13 13 8	0	195				
3–4			BACM: White silty material with fibers and bulk ACM, moist, fine medium fill. Dry to slightly moist.	2 to 4	0.83	7 6 5 7	0					
5–6				4 to 6	1	5 9 6 5	0					
7–8			BACM: White fibrous material and greenish-white bulk ACM, moist, soft.	6 to 8	0.25	6 5 2 2	0	190				
9–10				8 to 10	0.25	5 2 2 3	0					
11–12			BACS: Bulk ACM and silty fibrous material, gray, grayish-green, red, brown, slightly moist. Less bulk ACM, more silty, sandy material with depth. Moist. Wet.	10 to 12	0.5	4 3 4 3	0	185				
13–14				12 to 14	0.67	4 3 2 3	0					
15–16				14 to 16	0.083	2 2 1 2	0					
17–18				16 to 18	0.17	2 2 2 2	0	180				
19–20			BACS: Dark brown silt with trace gravel, wet, over bulk ACM and gravelly fill.	18 to 20	0.5	7 9 10 6	0					
21–22		SM	3 - 6 inch layers of fine medium silty sand with trace clay and fine silt, wet, dark, grayish brown. Native.	20 to 22	1	4 5 3 2	0	175				
23–24		SM		22 to 24	1	2 7 3 7	0					
				24 to		10 11						

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Abbreviations

AAPW - Apparent asbestos process waste
ACM - Asbestos containing material
BACM - Bulk ACM debris
BACS - Bulk ACM debris mixed with soil
NM - Not measured
NR - Not recorded
WOH - Weight of hammer
WOR - Weight of rod

Consistency vs Blowcount/Foot

Granular (Sand):

V. Loose:	0-4	Dense:	30-50
Loose:	4-10	V. Dense:	>50
M. Dense:	10-30		

Fine Grained (Clay):

V. Soft:	<2	Stiff:	8-15
Soft:	2-4	V. Stiff:	15-30
M. Stiff:	4-8	Hard:	>30

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PROJECT NO. 3330.029

BORIT LOGS WITH WATER DATA BORIT_ASBESTOS.GPJ STANDARD_ENVIRONMENTAL_PROJECT.GDT 02/24/11 REV.

PROJECT: Borit Asbestos
LOCATION: Ambler, Pennsylvania

HSA/AIR HAMMER NO: **MW-02**

DEPTH (feet)	GRAPHIC LOG	USCS	DESCRIPTION (Sampler Length: 2 Feet)	SAMPLE INTERVAL (feet)	RECOV. (feet)	BLOW COUNTS	PID (ppm)	ELEV. (ft)	ANALYTICAL SAMPLE	SAMPLE ID	Asbestos (MFL)	Other Detections
26		SM	Fine medium sand, silty sand with gravel and trace organics, red-brown to gray-brown, medium dense to dense. *(continued)*	26	1.5	17 18	0	170				
27			Reddish brown sandstone bedrock. HSA refusal at 26.4 feet	26 to 28	0.42	50/5	0					
28			Overdrill with 10-inch air hammer to 36 feet, install 6-inch steel casing. Cuttings primarily sandstone.									
29												
30												
31												
32								165				
33												
34												
35												
36			Reddish brown fine grained bedrock.									
37								160				
38												
39												
40												
41												
42								155				
43												
44												
45												
46												
47								150				
48												
49												
50												
51												
52								145				
53												
54												
55												

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PROJECT NO. 3330.029

BORIT LOGS WITH WATER DATA BORIT_ASBESTOS.GPJ STANDARD_ENVIRONMENTAL_PROJECT.GDT 02/24/11 REV.

PROJECT: Borit Asbestos
LOCATION: Ambler, Pennsylvania

HSA/AIR HAMMER NO: **MW-02**

DEPTH (feet)	GRAPHIC LOG	USCS	DESCRIPTION (Sampler Length: 2 Feet)	SAMPLE INTERVAL (feet)	RECOV. (feet)	BLOW COUNTS	PID (ppm)	ELEV. (ft)	ANALYTICAL SAMPLE	SAMPLE ID	Asbestos (MFL)	Other Detections
56			Reddish brown fine grained bedrock. *(continued)*					140				
57												
58			Reddish brown fine grained bedrock. Water-bearing fracture encountered at 58 feet.									
59												
60												
61								135				
62												
63			End of boring at 63 feet bgs. Well Screen installed 53 - 63 feet. See well construction diagram.									
64												
65												
66												
67								130				
68												
69												
70												
71												
72								125				
73												
74												
75												
76												
77								120				
78												
79												
80												
81												
82								115				
83												
84												
85												

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PROJECT NO. 3330.029

BORIT LOGS WITH WATER DATA BORIT_ASBESTOS.GPJ STANDARD_ENVIRONMENTAL_PROJECT.GDT 02/24/11 REV.

PROJECT: Borit Asbestos
LOCATION: Ambler, Pennsylvania

HSA/AIR HAMMER NO: USEPA

MW-03

STARTED: 10/22/10 COMPLETED: 10/28/10
DRILLING COMPANY: Uni-Tech
DRILLING EQUIPMENT: CME-85/Reichdrill T-650-W
DRILLING METHOD: HSA/Air Rotary, 6 In. Dia. Borehole
SAMPLING METHOD: Split Spoon
SURFACE COMPLETION: Steel Stickup

NORTHING: 309452.96 FT EASTING: 2672863.64 FT
G.S. ELEVATION: 181.7 FT M.P. ELEV: 183.27
WATER: 48 FT TOTAL DEPTH: 53.0 FT
LOGGED BY: S. Moller
HORIZONTAL DATUM: NAD83, COORD. SYS.: State Plane PA South

DEPTH (feet)	GRAPHIC LOG	USCS	DESCRIPTION (Sampler Length: 2 Feet)	SAMPLE INTERVAL (feet)	RECOV. (feet)	BLOW COUNTS	PID (ppm)	ELEV. (ft)	ANALYTICAL SAMPLE	SAMPLE ID	Asbestos (MFL)	Other Detections
1–2			FILL: Silty clay with trace gravel, dark grayish-brown, slightly moist, medium dense.	0 to 2	0.83	10 10 9 8	0	180				
3–4		SM	Native. Fine medium silty sand with clay, trace rootlets, dark brown, slightly moist, loose.	2 to 4	1.67	7 4 6 5	0					
5–6		SP	Fine medium, trace clay sand, dark brown to black, slightly moist to wet, loose.	4 to 6	1.5	1 2 3 1	0					
7–8		SC	Fine clay, sand with gravel, black and silty clay, dark gray, wet, soft/loose.	6 to 8	1.17	1 1 1 4	0	175				
9–10		CL	Reddish clay with fine sand and sub-rounded gravel, stiff, slightly moist.	8 to 10	2	NR NR NR NR	0					
11–12		SC	Mixed reddish sandy clay and fine medium tan sand, slightly moist, very dense, layer of dark reddish brown rock at 12.4 feet.	10 to 12	1.33	3 4 15 13	0	170				
13–14				12 to 14	0.92	23 50/5	0					
15–16			Reddish brown fine grained bedrock. HSA refusal at 14.4 feet. Overdrill with 10 inch air hammer to 24 feet, install 6-inch steel casing.	14 to 16	0.42	50/5	0					
17–18								165				
19–20												
21–22								160				
23–24			Drilling below casing with 6-inch air hammer.									
25–26												
27–28								155				
29												

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Abbreviations

AAPW - Apparent asbestos process waste
ACM - Asbestos containing material
BACM - Bulk ACM debris
BACS - Bulk ACM debris mixed with soil
NM - Not measured
NR - Not recorded
WOH - Weight of hammer
WOR - Weight of rod

Consistency vs Blowcount/Foot

Granular (Sand):

V. Loose:	0-4	Dense:	30-50
Loose:	4-10	V. Dense:	>50
M. Dense:	10-30		

Fine Grained (Clay):

V. Soft:	<2	Stiff:	8-15
Soft:	2-4	V. Stiff:	15-30
M. Stiff:	4-8	Hard:	>30

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PROJECT NO. 3330.029

BORIT LOGS WITH WATER DATA BORIT_ASBESTOS.GPJ STANDARD_ENVIRONMENTAL_PROJECT.GDT 02/24/11 REV.

PROJECT: Borit Asbestos
LOCATION: Ambler, Pennsylvania

HSA/AIR HAMMER NO: **MW-03**

DEPTH (feet)	GRAPHIC LOG	USCS	DESCRIPTION (Sampler Length: 2 Feet)	SAMPLE INTERVAL (feet)	RECOV. (feet)	BLOW COUNTS	PID (ppm)	ELEV. (ft)	ANALYTICAL SAMPLE	SAMPLE ID	Asbestos (MFL)	Other Detections
31			Drilling below casing with 6-inch air hammer. *(continued)*					150				
32												
33												
34												
35												
36												
37								145				
38												
39												
40												
41												
42								140				
43												
44												
45												
46												
47								135				
48			Drilling below casing with 6-inch air hammer. Water-bearing fracture encountered at 48 feet.									
49												
50												
51												
52								130				
53			End of Boring at 53 feet bgs. Well Screen installed 43 - 53 feet. See well construction diagram.									
54												
55												
56												
57								125				
58												
59												
60												
61												
62								120				
63												
64												
65												
66												

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PROJECT NO. 3330.029

BORIT LOGS WITH WATER DATA BORIT_ASBESTOS.GPJ STANDARD_ENVIRONMENTAL_PROJECT.GDT 02/24/11 REV.

PROJECT: Borit Asbestos
LOCATION: Ambler, Pennsylvania

HSA/AIR HAMMER NO: USEPA

MW-04

STARTED: 10/27/10 COMPLETED: 11/2/10
DRILLING COMPANY: Uni-Tech
DRILLING EQUIPMENT: CME-85/Reichdrill T-650-W
DRILLING METHOD: HSA/Air Rotary, 6 In. Dia. Borehole
SAMPLING METHOD: Split Spoon
SURFACE COMPLETION: Steel Flush-mount

NORTHING: 309044.44 FT EASTING: 2673481.37 FT
G.S. ELEVATION: 195.79 FT M.P. ELEV: 195.44
WATER: 95 FT TOTAL DEPTH: 100.0 FT
LOGGED BY: S. Moller
HORIZONTAL DATUM: NAD83, COORD. SYS.: State Plane PA South

DEPTH (feet)	GRAPHIC LOG	USCS	DESCRIPTION (Sampler Length: 2 Feet)	SAMPLE INTERVAL (feet)	RECOV. (feet)	BLOW COUNTS	PID (ppm)	ELEV. (ft)	ANALYTICAL SAMPLE	SAMPLE ID	Asbestos (MFL)	Other Detections
1–2			FILL: Road gravel over dark gray wet clay, firm.	0 to 2	0.83	16 18 19 5	0	195				
3–4			BACS: 4-inch red clay over grayish-white fibrous silty material, slightly moist, soft.	2 to 4	1.17	12 8 8 6	0					
5–6				4 to 6	1.5	1 2 1 2	0	190				
7–8			BACS: 4-inch red clay over grayish-white fibrous silty material, slightly moist, soft. Layers of green, red gray, brown fill, very soft.	6 to 8	1.5	1 1 1 WOH	0					
9–10			BACS: 4-inch red clay over grayish-white fibrous silty material, slightly moist, soft. Wet in area near shoe.	8 to 10	2	WOH WOH WOH WOH	0					
11–12			BACS: White, very soft, spongy, vermiculite-like material with colored laminae. Black mucky material from 12 to 13 feet, then back to white.	10 to 12	2	WOH WOH WOH WOH	0	185				
13–14				12 to 14	2	WOH WOH WOH WOH	0					
15–16		SM	Native, dark brown silty sand, moist, very soft.	14 to 16	0.33	2 WOH WOH WOH	0					
17–18		ML	Fine silt with sand and clay, very dark brown, very soft, wet.	16 to 18	2	WOH WOH WOH WOH	0	180				
19–20			Reddish brown to green slightly cemented sand apparent weathered sandstone, dense.	18 to 20	1.5	17 22 50/6	0					
21–22			Same as above, becomes softer.	20 to 22	1.5	7 10 12 12	0	175				
23–24			Same as above, becomes denser, greenish. PID malfunctions due to rain.	22 to 24	0.83	22 25 28 40	0					
25–26				24 to 26	0.67	21 50/5	NM					
27–28			No Recovery	26 to 28	0	50/6	NM	170				
29			Same as above, becomes denser, greenish. PID malfunctions due to rain.	28 to 30	1.5	25 30 50/2	NM					

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Abbreviations

AAPW - Apparent asbestos process waste
ACM - Asbestos containing material
BACM - Bulk ACM debris
BACS - Bulk ACM debris mixed with soil
NM - Not measured
NR - Not recorded
WOH - Weight of hammer
WOR - Weight of rod

Consistency vs Blowcount/Foot

Granular (Sand):

V. Loose:	0-4	Dense:	30-50
Loose:	4-10	V. Dense:	>50
M. Dense:	10-30		

Fine Grained (Clay):

V. Soft:	<2	Stiff:	8-15
Soft:	2-4	V. Stiff:	15-30
M. Stiff:	4-8	Hard:	>30

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PROJECT NO. 3330.029

BORIT LOGS WITH WATER DATA BORIT_ASBESTOS.GPJ STANDARD_ENVIRONMENTAL_PROJECT.GDT 02/24/11 REV.

PROJECT: Borit Asbestos
LOCATION: Ambler, Pennsylvania

HSA/AIR HAMMER NO: **MW-04**

DEPTH (feet)	GRAPHIC LOG	USCS	DESCRIPTION (Sampler Length: 2 Feet)	SAMPLE INTERVAL (feet)	RECOV. (feet)	BLOW COUNTS	PID (ppm)	ELEV. (ft)	ANALYTICAL SAMPLE	SAMPLE ID	Asbestos (MFL)	Other Detections
31			Black, very fine grained, very dense rock in shoe.	30 to 32	0.25	50/4	NM	165				
32												
33			Greenish sandstone bedrock, very dense. HSA refusal at 32.1 feet.	32 to 34	0.17	50/2	NM					
34												
35			Overdrill with 10-inch air hammer to 44 feet, install 6-inch steel casings. Sandstone bedrock.									
36								160				
37												
38												
39												
40												
41								155				
42												
43												
44			Darker reddish brown bedrock cuttings.									
45												
46								150				
47												
48												
49												
50												
51								145				
52												
53												
54												
55												
56								140				
57												
58												
59												
60			Return to gray-brown apparent sandstone cuttings.									
61								135				
62												
63												
64												
65												
66								130				

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PROJECT NO. 3330.029

PROJECT: Borit Asbestos
LOCATION: Ambler, Pennsylvania

HSA/AIR HAMMER NO: **MW-04**

DEPTH (feet)	GRAPHIC LOG	USCS	DESCRIPTION (Sampler Length: 2 Feet)	SAMPLE INTERVAL (feet)	RECOV. (feet)	BLOW COUNTS	PID (ppm)	ELEV. (ft)	ANALYTICAL SAMPLE	SAMPLE ID	Asbestos (MFL)	Other Detections
67–102			Return to gray-brown apparent sandstone cuttings. *(continued)*					125, 120, 115, 110, 105, 100, 95				
82			Sandstone bedrock cuttings.									
95			Sandstone bedrock cuttings. Estimated depth of initial water-bearing fracture at 95 feet.									
100			End of boring at 100 feet bgs. Well screen installed 80 - 100 feet. See well construction diagram.									

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BORIT LOGS WITH WATER DATA BORIT_ASBESTOS.GPJ STANDARD_ENVIRONMENTAL_PROJECT.GDT 02/24/11 REV.

PROJECT: Borit Asbestos
LOCATION: Ambler, Pennsylvania

HSA/AIR HAMMER NO: USEPA

MW-05

STARTED: 10/27/10 COMPLETED: 10/29/10
DRILLING COMPANY: Uni-Tech
DRILLING EQUIPMENT: CME-85/Reichdrill T-650-W
DRILLING METHOD: HSA/Air Rotary, 6 In. Dia. Borehole
SAMPLING METHOD: Split Spoon
SURFACE COMPLETION: Steel Stickup

NORTHING: 308764.39 FT EASTING: 2673296.79 FT
G.S. ELEVATION: 190.99 FT M.P. ELEV: 192.81
WATER: 58 FT TOTAL DEPTH: 64.0 FT
LOGGED BY: S. Moller
HORIZONTAL DATUM: NAD83, COORD. SYS.: State Plane PA South

DEPTH (feet)	GRAPHIC LOG	USCS	DESCRIPTION (Sampler Length: 2 Feet)	SAMPLE INTERVAL (feet)	RECOV. (feet)	BLOW COUNTS	PID (ppm)	ELEV. (ft)	ANALYTICAL SAMPLE	SAMPLE ID	Asbestos (MFL)	Other Detections
1–2			FILL: Dark grayish-brown silty sand with clay, wet, medium dense with gravel.	0 to 2	0.67	7 14 14 7	0	190				
3–11			BACS: 6-inch gray silty material with bulk ACM over layers of dark gray, red, and white material, fibrous, slightly moist, loose/soft.	2 to 4	0.83	4 7 12 6	0					
				4 to 6	0.83	5 3 1 2	0					
				6 to 8	0.67	2 4 3 2	0	185				
				8 to 10	0.5	2 1 3 1	0					
				10 to 12	0.5	1 1 1 1	0	180				
12–18			BACM: Bulk ACM with wire reinforcing observed.	12 to 14	0.5	3 2 2 2	0					
				14 to 16	0.33	1 2 1 1	0					
				16 to 18	0.5	2 5 4 4	0	175				
19–21		ML	Native, 3-inch silt with red-brown organics, 4-inch sand with silt and gravel over fine silt with clay and trace organics, wet, very soft, dark gray.	18 to 20	2	4 3 3 WOH	0					
				20 to 22	1	2 3 1 1	0	170				
22		GWS	6-inch sand and gravel.	22 to 24	2	WOH 2 3 8	0					
23		ML	12-inch silt with clay.									
24		GWS	6-inch sand and gravel, loose/soft, wet, dark gray to dark grayish brown.	24 to 26	1	8 11 7 8	0					
25		GWS	8-inch sand and gravel, same as above.									
25		SP	4-inch weathered rock and sand, red, medium dense.	26 to 28	2	10 16 25 50	0	165				
26–29			Same as above. HSA refusal at 29 feet.	28 to 30	0.5	21 50/5	0					

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Abbreviations

AAPW - Apparent asbestos process waste
ACM - Asbestos containing material
BACM - Bulk ACM debris
BACS - Bulk ACM debris mixed with soil
NM - Not measured
NR - Not recorded
WOH - Weight of hammer
WOR - Weight of rod

Consistency vs Blowcount/Foot

Granular (Sand):
V. Loose: 0-4 Dense: 30-50
Loose: 4-10 V. Dense: >50
M. Dense: 10-30

Fine Grained (Clay):
V. Soft: <2 Stiff: 8-15
Soft: 2-4 V. Stiff: 15-30
M. Stiff: 4-8 Hard: >30

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PROJECT NO. 3330.029

BORIT LOGS WITH WATER DATA BORIT_ASBESTOS.GPJ STANDARD_ENVIRONMENTAL_PROJECT.GDT 02/24/11 REV.

PROJECT: Borit Asbestos
LOCATION: Ambler, Pennsylvania

HSA/AIR HAMMER NO: **MW-05**

DEPTH (feet)	GRAPHIC LOG	USCS	DESCRIPTION (Sampler Length: 2 Feet)	SAMPLE INTERVAL (feet)	RECOV. (feet)	BLOW COUNTS	PID (ppm)	ELEV. (ft)	ANALYTICAL SAMPLE	SAMPLE ID	Asbestos (MFL)	Other Detections
31			Overdrill with 10-inch air hammer to 39 feet, install 6-inch steel casing.					160				
32												
33												
34												
35												
36								155				
37												
38												
39			Drilling below casing with 6-inch air hammer.									
40												
41								150				
42												
43												
44												
45												
46								145				
47												
48												
49												
50												
51								140				
52												
53												
54												
55												
56								135				
57												
58			Drilling below casing with 6-inch air hammer. Water-bearing fracture encountered at 58 to 59 feet.									
59												
60												
61								130				
62												
63												
64			End of boring at 64 feet bgs. Well screen installed at 54 - 64 feet. See well construction diagram.									
65												
66								125				

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PROJECT NO. 3330.029

BORIT LOGS WITH WATER DATA BORIT_ASBESTOS.GPJ STANDARD_ENVIRONMENTAL_PROJECT.GDT 02/24/11 REV.

PROJECT: Borit Asbestos
LOCATION: Ambler, Pennsylvania

HSA/AIR HAMMER NO: USEPA

MW-06

STARTED: 11/1/10 COMPLETED: 11/3/10
DRILLING COMPANY: Uni-Tech
DRILLING EQUIPMENT: CME-85/Reichdrill T-650-W
DRILLING METHOD: HSA/Air Rotary, 6 In. Dia. Borehole
SAMPLING METHOD: Split Spoon
SURFACE COMPLETION: Steel Stickup

NORTHING: 308974.05 FT EASTING: 2673915.60 FT
G.S. ELEVATION: 195.07 FT M.P. ELEV: 196.95
WATER: 48 FT TOTAL DEPTH: 53.0 FT
LOGGED BY: S. Moller
HORIZONTAL DATUM: NAD83, COORD. SYS.: State Plane PA South

DEPTH (feet)	GRAPHIC LOG	USCS	DESCRIPTION (Sampler Length: 2 Feet)	SAMPLE INTERVAL (feet)	RECOV. (feet)	BLOW COUNTS	PID (ppm)	ELEV. (ft)	ANALYTICAL SAMPLE	SAMPLE ID	Asbestos (MFL)	Other Detections
1–2			FILL: Road gravel over silty clay with gravel, possible ACM at 8 - 12 inches.	0 to 2	1	11 25 17 9	0					
3–6			BACS: Layers of sand, fine medium, and red, gray, black silty material with asbestos fibers. Brick, fragments, possible slag, wet at 4 feet.	2 to 4	0.5	6 2 2 3	0					
				4 to 6	0.5	5 4 8 4	0	190				
7–8			AAPW: Grayish white silty ACM, wet, very soft, paste texture.	6 to 8	1.5	1 1 2 2	0					
9			FILL: Grayish brown silt with sand and clay, wet, soft, over 6 inch gray silty clay, wet, soft.	8 to 10	2	2 2 2 2	0					
10–12		SM	Native, dark grayish-brown silt and fine medium sand, wet, loose. Trace organics, reddish-brown mottling below 10 feet.	10 to 12	2	WOH WOH WOH WOH	0	185				
				12 to 14	2	8 14 9 8	0					
13–20			Weathered sandstone bedrock, greenish-white to reddish-brown to grayish-brown, dry, sense. Very dense below 16 feet. HSA refusal at 18 feet.	14 to 16	1	15 14 24 28	0	180				
				16 to 18	0.42	50/5	0					
				18 to 20	0.25	50/3	0					
20–28			Overdrill with 10-inch air hammer to 28 feet, install 6-inch steel casing.					175 170				
28–29			Sandstone cuttings.									

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Abbreviations

AAPW - Apparent asbestos process waste
ACM - Asbestos containing material
BACM - Bulk ACM debris
BACS - Bulk ACM debris mixed with soil
NM - Not measured
NR - Not recorded
WOH - Weight of hammer
WOR - Weight of rod

Consistency vs Blowcount/Foot

Granular (Sand):

V. Loose:	0-4	Dense:	30-50
Loose:	4-10	V. Dense:	>50
M. Dense:	10-30		

Fine Grained (Clay):

V. Soft:	<2	Stiff:	8-15
Soft:	2-4	V. Stiff:	15-30
M. Stiff:	4-8	Hard:	>30

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PROJECT NO. 3330.029

BORIT LOGS WITH WATER DATA BORIT_ASBESTOS.GPJ STANDARD_ENVIRONMENTAL_PROJECT.GDT 02/24/11 REV.

PROJECT: Borit Asbestos
LOCATION: Ambler, Pennsylvania

HSA/AIR HAMMER NO:

MW-06

DEPTH (feet)	GRAPHIC LOG	USCS	DESCRIPTION (Sampler Length: 2 Feet)	SAMPLE INTERVAL (feet)	RECOV. (feet)	BLOW COUNTS	PID (ppm)	ELEV. (ft)	ANALYTICAL SAMPLE	SAMPLE ID	Asbestos (MFL)	Other Detections
31–42			Sandstone cuttings. *(continued)*					160–155				
42–48			Dark brown cuttings at 42 feet. Slightly moist, back dry almost immediately. Water bearing fracture encountered at 48 feet.					155–150				
48–53			Dark brown cuttings at 42 feet. Slightly moist, back dry almost immediately.					150–145				
53–66			Dark brown cuttings at 42 feet. Slightly moist, back dry almost immediately. Water bearing fracture encountered at 48 feet.					145–130				

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BORIT LOGS WITH WATER DATA BORIT_ASBESTOS.GPJ STANDARD_ENVIRONMENTAL_PROJECT.GDT 02/24/11 REV.

CDM Federal Programs Corporation
14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Well Name: MW-01
North: 310291.043 **East**: 2672266.282

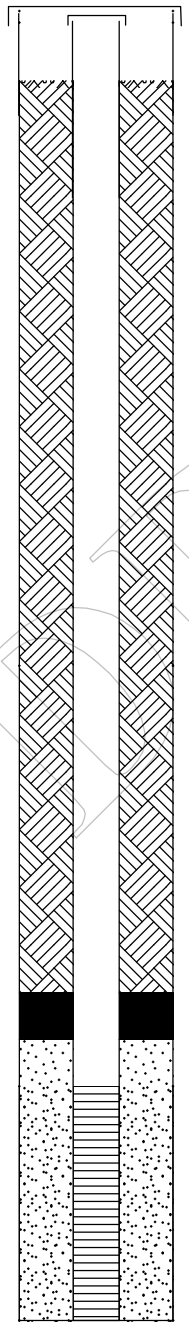
Client: USEPA
Drilling Company: Uni-Tech

Project Location: Ambler, Pennsylvania
Project Name: Borit Asbestos
Project Number: 3330.029

Date Started: 10/20/2010
Date Completed: 10/26/2010
Logged By: S. Moller
Drilling Method: HSA/Air Rotary

Hole Depth: 53 ft. bgs
Elevation (ft. above msl): 191.6
Depth to Water (ft. bgs): 48

WELL DIAGRAM



ELEVATION (feet)	DEPTH (feet)	INTERVAL
195		TPC
		TRC
	0	CP
190		
	5	
185		
	10	
180		
	15	
175		
	20	
170		
	25	BPC
165		
	30	
160		
	35	
155		
		BGR
	40	BBS
150		TSC
	45	
145		
		▽
	50	
140		BSC
		TD

WELL CONSTRUCTION DETAILS
(in feet bgs, unless otherwise indicated)

CONCRETE PAD
Dimensions: 3'x3'
Mount: Steel Stickup

OUTER RISER CASING:
Diameter: 6 inches
Type: Carbon Steel
Interval: -3-25

INNER RISER CASING:
Diameter: 2 inches
Type: PVC
Interval: -2.5-43

GROUT
Type: Cement-bentonite
Interval: 0 - 39

BENTONITE SEAL
Type: Bentonite slurry
Interval: 39 - 41

SANDPACK
Type: # 1 Sand
Interval: 41 - 53

SCREEN
Diameter: 2 Inches
Type: 0.010 Slot PVC
Interval: 43 - 53

COMMENTS
Comment: Well over-drilled and replaced by MW-01A.

LEGEND

▽ WATER LEVEL DURING DRILLING
▼ STATIC WATER LEVEL, 11/3/10

CONCRETE PAD
CEMENT GROUT
BENTONITE SLURRY
FILTER PACK
SCREEN

TPC TOP PROTECTIVE CASING
TRC TOP OF RISER CASING
CP CONCRETE PAD
BPC BOTTOM OF PROTECTIVE-CASING
BGR BOTTOM OF GROUT
BSS BOTTOM OF SAND SEAL
BBS BOTTOM OF BENTONITE SEAL
TSC TOP OF SCREEN
BSC BOTTOM OF SCREEN
TD TOTAL DEPTH

DRAFT

CDM Federal Programs Corporation

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Well Name: MW-01A
North: 310291.043 **East**: 2672266.282

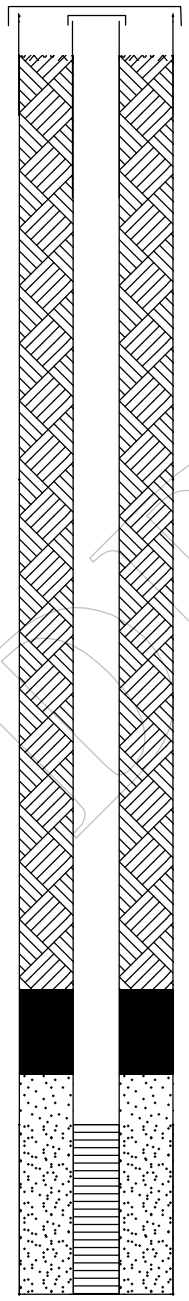
Client: USEPA
Drilling Company: Uni-Tech

Project Location: Ambler, Pennsylvania
Project Name: Borit Asbestos
Project Number: 3330.029

Date Started: 11/11/2010
Date Completed: 11/12/2010
Logged By: J. Connor
Drilling Method: Air Rotary

Hole Depth: 73 ft. bgs
Elevation (ft. above msl): 191.6
Depth to Water (ft. bgs): 48

WELL DIAGRAM



ELEVATION (feet)	DEPTH (feet)	INTERVAL
195		
		TPC
		TRC
	0	CP
190		
	5	
185		
	10	
180		
	15	
175		
	20	
170		
	25	BPC
165		
	30	
160		
	35	
155		
	40	
150		
	45	
145		
	50	
140		
	55	BGR
135		
	60	BBS
130		
		TSC
	65	
125		
	70	
120		
		BSC
		TD

WELL CONSTRUCTION DETAILS
(in feet bgs, unless otherwise indicated)

CONCRETE PAD
Dimensions: 3'x3'
Mount: Steel Stickup

OUTER RISER CASING:
Diameter: 6 inches
Type: Carbon Steel
Interval: -2.3 - 25

INNER RISER CASING:
Diameter: 2 inches
Type: PVC
Interval: -2-63

GROUT
Type: Cement-bentonite
Interval: 0 - 55

BENTONITE SEAL
Type: Bentonite slurry
Interval: 55 - 60

SANDPACK
Type: # 1 Sand
Interval: 60 - 73

SCREEN
Diameter: 2 Inches
Type: 0.010 Slot PVC
Interval: 63 - 73

COMMENTS
Comment:

LEGEND

WATER LEVEL DURING DRILLING
STATIC WATER LEVEL, 11/8/10

CONCRETE PAD
CEMENT GROUT
BENTONITE SLURRY
FILTER PACK
SCREEN

TPC TOP PROTECTIVE CASING
TRC TOP OF RISER CASING
CP CONCRETE PAD
BPC BOTTOM OF PROTECTIVE-CASING
BGR BOTTOM OF GROUT
BSS BOTTOM OF SAND SEAL
BBS BOTTOM OF BENTONITE SEAL
TSC TOP OF SCREEN
BSC BOTTOM OF SCREEN
TD TOTAL DEPTH

DRAFT

BORIT MW WELL DIAGRAM BORIT_ASBESTOS.GPJ FEDERAL.GDT 02/25/11

CDM Federal Programs Corporation

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Well Name: MW-02
North: 309420.408 **East**: 2672617.528

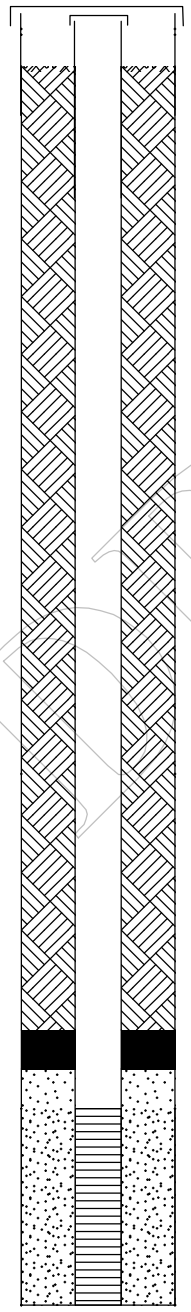
Client: USEPA
Drilling Company: Uni-Tech

Project Location: Ambler, Pennsylvania
Project Name: Borit Asbestos
Project Number: 3330.029

Date Started: 10/21/2010
Date Completed: 10/26/2010
Logged By: S. Moller
Drilling Method: HSA/Air Rotary

Hole Depth: 63 ft. bgs
Elevation (ft. above msl): 196.5
Depth to Water (ft. bgs): 58

WELL DIAGRAM



ELEVATION (feet)	DEPTH (feet)	INTERVAL
200		
		TPC
		TRC
	0	CP
195		
	5	
190		
	10	
185		
	15	
180		
	20	▼
175		
	25	
170		
	30	
165		
	35	BPC
160		
	40	
155		
	45	
150		
		BGR
	50	BBS
145		TSC
	55	
140		▽
	60	
135		BSC
		TD

WELL CONSTRUCTION DETAILS
(in feet bgs, unless otherwise indicated)

CONCRETE PAD
Dimensions: 3'x3'
Mount: Steel Stickup

OUTER RISER CASING:
Diameter: 6 inches
Type: Carbon Steel
Interval: -1.9 - 36

INNER RISER CASING:
Diameter: 2 inches
Type: PVC
Interval: -1.6-53

GROUT
Type: Cement-bentonite
Interval: 0 - 49

BENTONITE SEAL
Type: Bentonite slurry
Interval: 49 - 51

SANDPACK
Type: # 1 Sand
Interval: 51 - 63

SCREEN
Diameter: 2 Inches
Type: 0.010 Slot PVC
Interval: 53 - 63

COMMENTS
Comment:

LEGEND

▽ WATER LEVEL DURING DRILLING
▼ STATIC WATER LEVEL, 11/8/10

CONCRETE PAD
CEMENT GROUT
BENTONITE SLURRY
FILTER PACK
SCREEN

TPC TOP PROTECTIVE CASING
TRC TOP OF RISER CASING
CP CONCRETE PAD
BPC BOTTOM OF PROTECTIVE-CASING
BGR BOTTOM OF GROUT
BSS BOTTOM OF SAND SEAL
BBS BOTTOM OF BENTONITE SEAL
TSC TOP OF SCREEN
BSC BOTTOM OF SCREEN
TD TOTAL DEPTH

DRAFT

BORIT MW WELL DIAGRAM BORIT_ASBESTOS.GPJ FEDERAL.GDT 02/25/11

CDM Federal Programs Corporation
14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Well Name: MW-03
North: 309452.958 **East**: 2672863.643

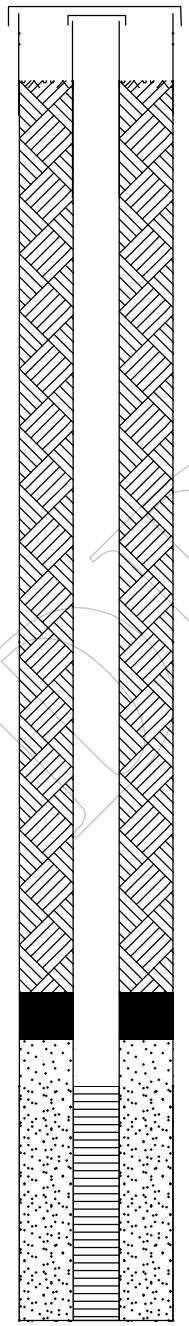
Client: USEPA
Drilling Company: Uni-Tech

Project Location: Ambler, Pennsylvania
Project Name: Borit Asbestos
Project Number: 3330.029

Date Started: 10/22/2010
Date Completed: 10/28/2010
Logged By: S. Moller
Drilling Method: HSA/Air Rotary

Hole Depth: 53 ft. bgs
Elevation (ft. above msl): 181.7
Depth to Water (ft. bgs): 48

WELL DIAGRAM



ELEVATION (feet)	DEPTH (feet)	INTERVAL
185		
		TPC
		TRC
	0	CP
180		
	5	
175		
	10	
170		
	15	
165		
	20	
160		
		BPC
	25	
155		
	30	
150		
	35	
145		
		BGR
	40	BBS
140		TSC
	45	
135		
		▽
	50	
130		
		BSC
		TD

WELL CONSTRUCTION DETAILS
(in feet bgs, unless otherwise indicated)

CONCRETE PAD
Dimensions: 3'x3'
Mount: Steel Stickup

OUTER RISER CASING:
Diameter: 6 inches
Type: Carbon Steel
Interval: -2 - 24

INNER RISER CASING:
Diameter: 2 inches
Type: PVC
Interval: -2-43

GROUT
Type: Cement-bentonite
Interval: 0 - 39

BENTONITE SEAL
Type: Bentonite slurry
Interval: 39 - 41

SANDPACK
Type: # 1 Sand
Interval: 41 - 53

SCREEN
Diameter: 2 Inches
Type: 0.010 Slot PVC
Interval: 43 - 53

COMMENTS
Comment:

LEGEND

▽ WATER LEVEL DURING DRILLING
▼ STATIC WATER LEVEL, 11/8/10

CONCRETE PAD
CEMENT GROUT
BENTONITE SLURRY
FILTER PACK
SCREEN

TPC TOP PROTECTIVE CASING
TRC TOP OF RISER CASING
CP CONCRETE PAD
BPC BOTTOM OF PROTECTIVE-CASING
BGR BOTTOM OF GROUT
BSS BOTTOM OF SAND SEAL
BBS BOTTOM OF BENTONITE SEAL
TSC TOP OF SCREEN
BSC BOTTOM OF SCREEN
TD TOTAL DEPTH

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CDM Federal Programs Corporation

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Well Name: MW-04
North: 309044.437 **East**: 2673481.366

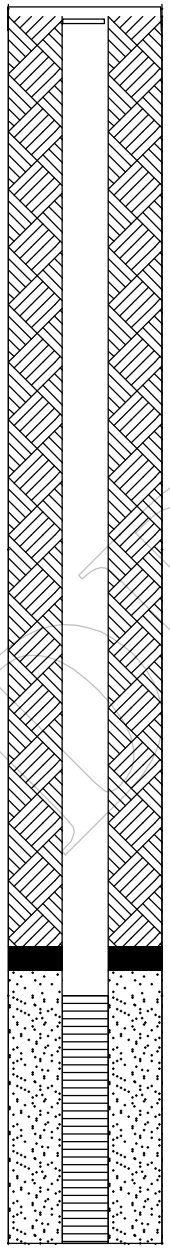
Client: USEPA
Drilling Company: Uni-Tech

Project Location: Ambler, Pennsylvania
Project Name: Borit Asbestos
Project Number: 3330.029

Date Started: 10/27/2010
Date Completed: 11/2/2010
Logged By: S. Moller
Drilling Method: HSA/Air Rotary

Hole Depth: 100 ft. bgs
Elevation (ft. above msl): 195.8
Depth to Water (ft. bgs): 95

WELL DIAGRAM



ELEVATION (feet)	DEPTH (feet)	INTERVAL
195	0	CP
		TRC
		TPC
190	5	
185	10	
180	15	
175	20	
170	25	
165	30	
160	35	
155	40	
		BPC
150	45	
145	50	
140	55	
135	60	
130	65	
125	70	
120	75	BGR
		BBS
115	80	TSC
110	85	
105	90	
100	95	
	100	BSC
		TD

WELL CONSTRUCTION DETAILS
(in feet bgs, unless otherwise indicated)

CONCRETE PAD
Dimensions: 3'x3'
Mount: Steel Flush-mount

OUTER RISER CASING:
Diameter: 6 inches
Type: Carbon Steel
Interval: 1 - 44

INNER RISER CASING:
Diameter: 2 inches
Type: PVC
Interval: 0.35-80

GROUT
Type: Cement-bentonite
Interval: 0 - 76

BENTONITE SEAL
Type: Bentonite slurry
Interval: 76 - 78

SANDPACK
Type: # 1 Sand
Interval: 78 - 100

SCREEN
Diameter: 2 Inches
Type: 0.010 Slot PVC
Interval: 80 - 100

COMMENTS
Comment:

LEGEND

WATER LEVEL DURING DRILLING
STATIC WATER LEVEL, 11/8/10

CONCRETE PAD
CEMENT GROUT
BENTONITE SLURRY
FILTER PACK
SCREEN

TPC TOP PROTECTIVE CASING
TRC TOP OF RISER CASING
CP CONCRETE PAD
BPC BOTTOM OF PROTECTIVE-CASING
BGR BOTTOM OF GROUT
BSS BOTTOM OF SAND SEAL
BBS BOTTOM OF BENTONITE SEAL
TSC TOP OF SCREEN
BSC BOTTOM OF SCREEN
TD TOTAL DEPTH

DRAFT

BORIT MW WELL DIAGRAM BORIT_ASBESTOS.GPJ FEDERAL.GDT 02/25/11

CDM Federal Programs Corporation

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Well Name: MW-05
North: 308764.389 **East**: 2673296.791

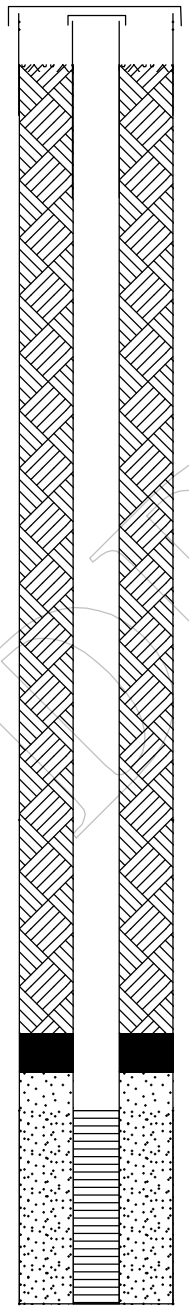
Client: USEPA
Drilling Company: Uni-Tech

Project Location: Ambler, Pennsylvania
Project Name: Borit Asbestos
Project Number: 3330.029

Date Started: 10/27/2010
Date Completed: 10/29/2010
Logged By: S. Moller
Drilling Method: HSA/Air Rotary

Hole Depth: 64 ft. bgs
Elevation (ft. above msl): 191.0
Depth to Water (ft. bgs): 58

WELL DIAGRAM



ELEVATION (feet)	DEPTH (feet)	INTERVAL
		TPC
		TRC
190	0	CP
185	5	
180	10	
175	15	
170	20	
165	25	
160	30	
155	35	
		BPC
150	40	
145	45	
		BGR
140	50	BBS
		TSC
135	55	
130	60	
		BSC
		TD

WELL CONSTRUCTION DETAILS
(in feet bgs, unless otherwise indicated)

CONCRETE PAD
Dimensions: 3'x3'
Mount: Steel Stickup

OUTER RISER CASING:
Diameter: 6 inches
Type: Carbon Steel
Interval: -2.2 - 39

INNER RISER CASING:
Diameter: 2 inches
Type: PVC
Interval: -1.8-54

GROUT
Type: Cement-bentonite
Interval: 0 - 50

BENTONITE SEAL
Type: Bentonite slurry
Interval: 50 - 52

SANDPACK
Type: # 1 Sand
Interval: 52 - 64

SCREEN
Diameter: 2 Inches
Type: 0.010 Slot PVC
Interval: 54 - 64

COMMENTS
Comment:

LEGEND

WATER LEVEL DURING DRILLING
STATIC WATER LEVEL, 11/8/10

CONCRETE PAD
CEMENT GROUT
BENTONITE SLURRY
FILTER PACK
SCREEN

TPC TOP PROTECTIVE CASING
TRC TOP OF RISER CASING
CP CONCRETE PAD
BPC BOTTOM OF PROTECTIVE-CASING
BGR BOTTOM OF GROUT
BSS BOTTOM OF SAND SEAL
BBS BOTTOM OF BENTONITE SEAL
TSC TOP OF SCREEN
BSC BOTTOM OF SCREEN
TD TOTAL DEPTH

DRAFT

BORIT MW WELL DIAGRAM BORIT_ASBESTOS.GPJ FEDERAL.GDT 02/25/11

CDM Federal Programs Corporation
14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Well Name: MW-06
North: 308974.051 **East**: 2673915.598

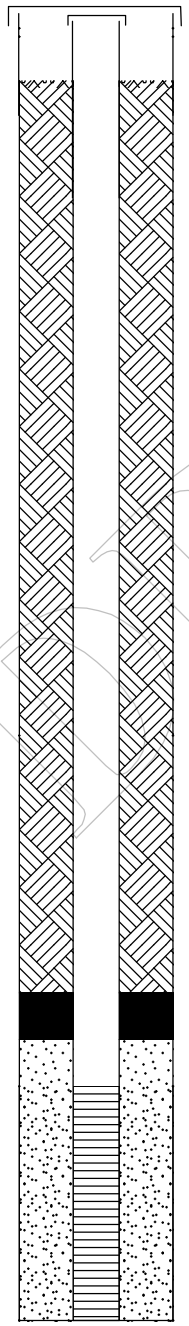
Client: USEPA
Drilling Company: Uni-Tech

Project Location: Ambler, Pennsylvania
Project Name: Borit Asbestos
Project Number: 3330.029

Date Started: 11/1/2010
Date Completed: 11/3/2010
Logged By: S. Moller
Drilling Method: HSA/Air Rotary

Hole Depth: 53 ft. bgs
Elevation (ft. above msl): 195.1
Depth to Water (ft. bgs): 48

WELL DIAGRAM



ELEVATION (feet)	DEPTH (feet)	INTERVAL
		TPC
		TRC
195	0	CP
190	5	
185	10	
		▼
180	15	
175	20	
170	25	
		BPC
165	30	
160	35	
		BGR
155	40	
		BBS
		TSC
150	45	
		▽
145	50	
		BSC
		TD

WELL CONSTRUCTION DETAILS
(in feet bgs, unless otherwise indicated)

CONCRETE PAD
Dimensions: 3'x3'
Mount: Steel Stickup

OUTER RISER CASING:
Diameter: 6 inches
Type: Carbon Steel
Interval: -2.2 - 28

INNER RISER CASING:
Diameter: 2 inches
Type: PVC
Interval: -1.9-43

GROUT
Type: Cement-bentonite
Interval: 0 - 39

BENTONITE SEAL
Type: Bentonite slurry
Interval: 39 - 41

SANDPACK
Type: # 1 Sand
Interval: 41 - 53

SCREEN
Diameter: 2 Inches
Type: 0.010 Slot PVC
Interval: 43 - 53

COMMENTS
Comment:

LEGEND

▽ WATER LEVEL DURING DRILLING
▼ STATIC WATER LEVEL, 11/8/10

CONCRETE PAD
CEMENT GROUT
BENTONITE SLURRY
FILTER PACK
SCREEN

TPC TOP PROTECTIVE CASING
TRC TOP OF RISER CASING
CP CONCRETE PAD
BPC BOTTOM OF PROTECTIVE-CASING
BGR BOTTOM OF GROUT
BSS BOTTOM OF SAND SEAL
BBS BOTTOM OF BENTONITE SEAL
TSC TOP OF SCREEN
BSC BOTTOM OF SCREEN
TD TOTAL DEPTH

DRAFT

CDM Federal Programs Corporation

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Well Name: GT-06

North: 308999.388 **East**: 2673705.112

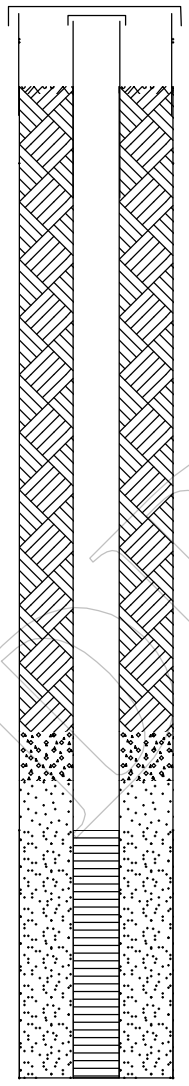
Client: USEPA
Drilling Company: Uni-Tech

Project Location: Ambler, Pennsylvania
Project Name: Borit Asbestos
Project Number: 3330.029

Date Started: 11/10/2010
Date Completed: 11/10/2010
Logged By: J. Connor
Drilling Method: HSA

Hole Depth: 40 ft. bgs
Elevation (ft. above msl): 220.1
Depth to Water (ft. bgs): 16

WELL DIAGRAM



ELEVATION (feet)	DEPTH (feet)	INTERVAL
		TPC TRC
220	0	CP
		BPC
215	5	
210	10	
205	15	▽
200	20	
195	25	BGR
		BSS
190	30	TSC
		▼
185	35	
	40	BSC TD

WELL CONSTRUCTION DETAILS
(in feet bgs, unless otherwise indicated)

CONCRETE PAD
Dimensions: 3'x3'
Mount: Steel Stickup

OUTER RISER CASING:
Diameter: 6 inches
Type: Carbon Steel
Interval: -1.91-3.09

INNER RISER CASING:
Diameter: 1 inches
Type: PVC
Interval: -1.8-26

GROUT
Type: Cement-bentonite
Interval: 0 - 26

SAND SEAL
Type: # 00 Sand
Interval: 26 - 28

SANDPACK
Type: # 1 Sand
Interval: 28 - 40

SCREEN
Diameter: 1 Inch
Type: 0.010 Slot PVC
Interval: 30 - 40

COMMENTS
Comment:

LEGEND

▽ WATER LEVEL DURING DRILLING
▼ STATIC WATER LEVEL, 1/13/11

CONCRETE PAD
CEMENT GROUT
SAND SEAL
FILTER PACK
SCREEN

TPC TOP PROTECTIVE CASING
TRC TOP OF RISER CASING
CP CONCRETE PAD
BPC BOTTOM OF PROTECTIVE-CASING
BGR BOTTOM OF GROUT
BSS BOTTOM OF SAND SEAL
BBS BOTTOM OF BENTONITE SEAL
TSC TOP OF SCREEN
BSC BOTTOM OF SCREEN
TD TOTAL DEPTH

DRAFT

BORIT GT WELL DIAGRAM BORIT_ASBESTOS.GPJ FEDERAL.GDT 02/24/11

CDM Federal Programs Corporation
14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Well Name: GT-07
North: 308906.631 **East**: 2673704.869

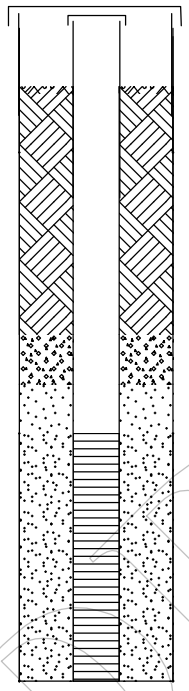
Client: USEPA
Drilling Company: Uni-Tech

Project Location: Ambler, Pennsylvania
Project Name: Borit Asbestos
Project Number: 3330.029

Date Started: 11/9/2010
Date Completed: 11/9/2010
Logged By: J. Connor
Drilling Method: HSA

Hole Depth: 24 ft. bgs
Elevation (ft. above msl): 208.6
Depth to Water (ft. bgs): 22

WELL DIAGRAM



ELEVATION (feet)	DEPTH (feet)	INTERVAL
210	0	TPC TRC
		CP
		BPC
205	5	
200	10	BGR
		BSS
195	15	TSC
190	20	▼
		▽
185		BSC TD

WELL CONSTRUCTION DETAILS
(in feet bgs, unless otherwise indicated)

CONCRETE PAD
Dimensions: 3'x3'
Mount: Steel Stickup

OUTER RISER CASING:
Diameter: 6 inches
Type: Carbon Steel
Interval: -2.34-2.66

INNER RISER CASING:
Diameter: 1 inches
Type: PVC
Interval: -2-10

GROUT
Type: Cement-bentonite
Interval: 0 - 10

SAND SEAL
Type: # 00 Sand
Interval: 10 - 12

SANDPACK
Type: # 1 Sand
Interval: 12 - 24

SCREEN
Diameter: 1 Inch
Type: 0.010 Slot PVC
Interval: 14 - 24

COMMENTS
Comment:

LEGEND

▽ WATER LEVEL DURING DRILLING
▼ STATIC WATER LEVEL, 1/13/11

CONCRETE PAD
CEMENT GROUT
SAND SEAL
FILTER PACK
SCREEN

TPC TOP PROTECTIVE CASING
TRC TOP OF RISER CASING
CP CONCRETE PAD
BPC BOTTOM OF PROTECTIVE-CASING
BGR BOTTOM OF GROUT
BSS BOTTOM OF SAND SEAL
BBS BOTTOM OF BENTONITE SEAL
TSC TOP OF SCREEN
BSC BOTTOM OF SCREEN
TD TOTAL DEPTH

DRAFT

CDM Federal Programs Corporation
14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Well Name: GT-08
North: 308870.812 **East**: 2673579.425

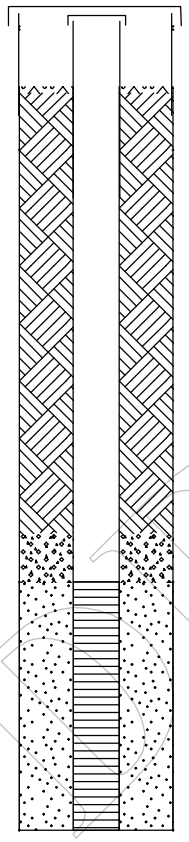
Client: USEPA
Drilling Company: Uni-Tech

Project Location: Ambler, Pennsylvania
Project Name: Borit Asbestos
Project Number: 3330.029

Date Started: 11/9/2010
Date Completed: 11/9/2010
Logged By: J. Connor
Drilling Method: HSA

Hole Depth: 30 ft. bgs
Elevation (ft. above msl): 212.9
Depth to Water (ft. bgs): 12

WELL DIAGRAM



ELEVATION (feet)	DEPTH (feet)	INTERVAL
215	0	TPC, TRC
		CP
210		BPC
	5	
205		
	10	
200		
	15	
195		BGR
	20	BSS, TSC
190		
	25	
185		
	30	BSC, TD

WELL CONSTRUCTION DETAILS
(in feet bgs, unless otherwise indicated)

CONCRETE PAD
Dimensions: 3'x3'
Mount: Steel Stickup

OUTER RISER CASING:
Diameter: 6 inches
Type: Carbon Steel
Interval: -2.43-2.57

INNER RISER CASING:
Diameter: 1 inches
Type: PVC
Interval: -2.3-18

GROUT
Type: Cement-bentonite
Interval: 0 - 18

SAND SEAL
Type: # 00 Sand
Interval: 18 - 20

SANDPACK
Type: # 1 Sand
Interval: 20 - 30

SCREEN
Diameter: 1 Inch
Type: 0.010 Slot PVC
Interval: 20 - 30

COMMENTS
Comment:

LEGEND

▽ WATER LEVEL DURING DRILLING
▼ STATIC WATER LEVEL, 11/12/10

CONCRETE PAD
CEMENT GROUT
SAND SEAL
FILTER PACK
SCREEN

TPC TOP PROTECTIVE CASING
TRC TOP OF RISER CASING
CP CONCRETE PAD
BPC BOTTOM OF PROTECTIVE-CASING
BGR BOTTOM OF GROUT
BSS BOTTOM OF SAND SEAL
BBS BOTTOM OF BENTONITE SEAL
TSC TOP OF SCREEN
BSC BOTTOM OF SCREEN
TD TOTAL DEPTH

DRAFT

Appendix D

Particulate Data

Table D-1
Activity-Based Sampling Particulate Data
BoRit Asbestos Superfund Site, OU-1
Phase 2 Remedial Investigation - July 2011

Location	Date	Min	Max	Average	Direction	Notes
AP-ABS01	7/6/2011	---	---	---	SW	Data was irretrievable
AP-ABS02	7/11/2011	0.043	0.104	0.047	NE	
AP-ABS03	7/11/2011	0.039	0.048	0.042	NE	
PK-ABS02	7/11/2011	0.040	0.067	0.056	NE	*Test started at 1712, 14 minutes after scenario began at 1658
RS-ABS05	7/12/2011	0.017	0.027	0.020	N	
RS-ABS04	7/12/2011	0.024	1.930	0.028	E	
RS-ABS02	7/12/2011	0.025	0.034	0.027	SW	*Test started at 1624, 24 minutes after scenario began at 1600
RS-ABS01	7/13/2011	0.011	0.041	0.017	W	
WT-ABS01	7/13/2011	0.010	0.024	0.022	S	*Test started at 1329, 53 minutes after scenario began at 1236
RS-ABS03	7/13/2011	0.000	0.060	0.005	S	
RS-ABS06	7/14/2011	0.000	0.583	0.001	S	*Before performing zero calibration again
		0.006	0.018	0.007		*After performing zero calibration again
RS-ABS07	7/14/2011	0.000	0.026	0.007	S	
RS-ABS08	7/14/2011	0.006	0.021	0.006	SW	
OW-ABS01	7/15/2011	0.007	0.333	0.011	N	
RV-ABS01	7/15/2011	0.007	0.019	0.010	SE	
PK-ABS01	7/18/2011	0.019	0.152	0.023	N	
PK-ABS07	7/18/2011	0.029	0.088	0.038	N	
PK-ABS03	7/18/2011	0.034	0.102	0.048	SE	
PK-ABS04	7/19/2011	0.040	0.117	0.049	SE	
PK-ABS05	7/19/2011	0.001	0.342	0.041	SE	*Test ended at 1309, 25 minutes before scenario ended at 1334

Notes:
ABS = Activity based sampling
AP = Asbestos Pile parcel
PK = Park parcel
RS = Residential
RV = Reservoir parcel
OW = The other side of Wissahickon Creek
WT = Walking Trail

Appendix E

Meteorological Data from ABS and Ambient Air

Table E-1
Activity-Based Sampling Meteorological Data
BoRit Asbestos Superfund Site, OU-1
Phase 2 Remedial Investigation - July 2011

Location	Date	Time	Temperature (°F)	Humidity (%)	Wind Speed Average (mph)	Wind Speed Gust (mph)	Wind Direction	Precipitation (inches)	Soil Moisture (%)
AP-ABS01	7/6/2011	11:00 AM	86.1	62	1	5	NNW	0	6.4
		11:10 AM	86.4	59	1	7	NNW	0	
		11:20 AM	86.6	57	2	7	NNW	0	
		11:30 AM	87.2	57	1	4	N	0	
		11:40 AM	87	57	1	4	N	0	
		11:50 AM	86.5	57	0	3	N	0	
		12:00 PM	86.1	61	1	4	N	0	
		12:10 PM	85.5	60	0	0	---	0	
		12:20 PM	85.5	60	0	1	N	0	
		12:30 PM	85.9	60	0	2	N	0	
		12:40 PM	85.9	60	0	3	N	0	
		12:50 PM	85.9	60	0	3	N	0	
		1:00 PM	85.9	60	1	4	N	0	
		1:10 PM	86.1	61	0	3	N	0	
		1:20 PM	87.4	61	1	6	N	0	
		1:30 PM	87.9	56	1	4	NNE	0	
		1:40 PM	88.8	52	2	7	N	0	
		1:50 PM	89.7	52	3	6	N	0	
		Average	**86.7**	**58.4**	**0.83**	**4.1**	**N**	**0.0**	
AP-ABS02	7/11/2011	9:00 AM	79.8	72	0	0	---	0	7.4
		9:10 AM	80.2	72	0	0	---	0	
		9:20 AM	80.7	71	0	0	---	0	
		9:30 AM	81.1	71	0	0	---	0	
		9:40 AM	81.8	69	0	0	---	0	
		9:50 AM	82.4	68	0	0	---	0	
		10:00 AM	82.5	67	0	0	---	0	
		10:10 AM	83.1	67	0	1	E	0	
		10:20 AM	83.8	65	0	0	---	0	
		10:30 AM	83.9	65	0	0	---	0	
		10:40 AM	84.5	66	0	0	---	0	
		10:50 AM	84.9	65	0	1	E	0	
		11:00 AM	85.2	63	0	2	E	0	
		11:10 AM	86.1	62	0	1	E	0	
		11:20 AM	86.5	63	0	2	NE	0	
		Average	**83.1**	**67.1**	**0.0**	**0.5**	**E**	**0.0**	
AP-ABS03	7/11/2011	12:30 PM	88.8	59	0	2	WNW	0	7.4
		12:40 PM	88.9	58	0	2	NW	0	
		12:50 PM	88.8	57	0	3	N	0	
		1:00 PM	89	58	0	2	NE	0	
		1:10 PM	89.4	57	0	1	NNW	0	
		1:20 PM	89.7	57	0	3	NE	0	
		1:30 PM	90	56	0	3	NNE	0	
		1:40 PM	90.3	56	0	3	NE	0	
		1:50 PM	90.2	55	1	5	NE	0	
		2:00 PM	90	57	0	0	---	0	
		2:10 PM	90.3	58	0	3	N	0	
		2:20 PM	89.8	60	0	1	NW	0	
		2:30 PM	90.2	59	0	1	NW	0	
		2:40 PM	89.6	60	0	2	NE	0	
		2:50 PM	90.3	59	0	2	NE	0	
		Average	**89.7**	**57.7**	**0.1**	**2.2**	**NE**	**0.0**	

Notes:
ABS = Activity based sampling
AP = Asbestos Pile parcel
PK = Park parcel
RS = Residential
RV = Reservoir parcel
OW = The other side of Wissahickon Creek
WT = Walking Trail

Table E-1
Activity-Based Sampling Meteorological Data
BoRit Asbestos Superfund Site, OU-1
Phase 2 Remedial Investigation - July 2011

Location	Date	Time	Temperature (°F)	Humidity (%)	Wind Speed Average (mph)	Wind Speed Gust (mph)	Wind Direction	Precipitation (inches)	Soil Moisture (%)
OW-ABS01	7/15/2011	8:40 AM	72.3	73	0	1	N	0	17.8
		8:50 AM	72.8	72	0	0	---	0	
		9:00 AM	73	70	0	0	---	0	
		9:10 AM	73.2	71	0	0	---	0	
		9:20 AM	73.7	69	0	0	---	0	
		9:30 AM	74	69	0	1	N	0	
		9:40 AM	74.6	67	0	1	N	0	
		9:50 AM	74.8	67	0	1	N	0	
		10:00 AM	75.4	66	0	1	N	0	
		10:10 AM	75.8	66	0	0	---	0	
		10:20 AM	76.5	65	0	1	N	0	
		10:30 AM	77.2	64	0	0	---	0	
		10:40 AM	77.1	63	0	0	---	0	
		10:50 AM	77.8	62	0	0	---	0	
		11:00 AM	78.3	60	0	1	N	0	
		11:10 AM	78.9	57	0	1	N	0	
		Average	**75.3**	**66.3**	**0.0**	**0.5**	**N**	**0.0**	
PK-ABS01	7/18/2011	8:20 AM	78.7	75	0	0	---	0	6.0
		8:30 AM	79.4	74	0	0	---	0	
		8:40 AM	80	73	0	0	---	0	
		8:50 AM	80.8	74	0	1	N	0	
		9:00 AM	81.5	69	0	0	---	0	
		9:10 AM	81.7	69	0	0	---	0	
		9:20 AM	82.3	69	0	0	---	0	
		9:30 AM	83.3	66	0	0	---	0	
		9:40 AM	83.4	65	0	0	---	0	
		9:50 AM	84.2	65	0	0	---	0	
		10:00 AM	84.8	63	0	0	---	0	
		10:10 AM	85.4	65	0	0	---	0	
		10:20 AM	85.8	61	0	0	---	0	
		10:30 AM	86.2	60	0	0	---	0	
		Average	**82.7**	**67.7**	**0.0**	**0.1**	**---**	**0.0**	
PK-ABS02	7/11/2011	5:00 PM	90.6	61	0	0	---	0	13.6
		5:10 PM	90.1	61	0	0	---	0	
		5:20 PM	91	60	0	0	---	0	
		5:30 PM	90.8	58	0	0	---	0	
		5:40 PM	90.6	58	0	0	---	0	
		5:50 PM	90.2	59	0	0	---	0	
		6:00 PM	89.9	60	0	0	---	0	
		6:10 PM	89.4	62	0	0	---	0	
		6:20 PM	89.4	61	0	0	---	0	
		6:30 PM	89.7	61	0	0	---	0	
		6:40 PM	89.3	61	0	0	---	0	
		6:50 PM	89.1	62	0	0	---	0	
		7:00 PM	89.2	62	0	0	---	0	
		Average	**89.9**	**60.5**	**0.0**	**0.0**	**---**	**0.0**	
PK-ABS03	7/18/2011	3:00 PM	92.3	47	0	1	N	0	6.4
		3:10 PM	91.8	48	0	1	N	0	
		3:20 PM	91.6	49	0	0	---	0	
		3:30 PM	91.4	51	0	0	---	0	
		3:40 PM	91.8	50	0	0	---	0	
		3:50 PM	91.8	51	0	0	---	0	
		4:00 PM	91.5	52	0	1	N	0	
		4:10 PM	91.1	51	0	1	N	0	
		4:20 PM	91	52	0	1	N	0	
		4:30 PM	90.7	51	0	1	N	0	
		4:40 PM	90.9	52	0	0	---	0	
		4:50 PM	91.9	52	0	0	---	0	
		5:00 PM	91.8	52	0	1	N	0	
		5:10 PM	92.1	51	0	0	---	0	
		Average	**91.6**	**50.6**	**0.0**	**0.5**	**N**	**0.0**	

Notes:
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WT = Walking Trail

Table E-1
Activity-Based Sampling Meteorological Data
BoRit Asbestos Superfund Site, OU-1
Phase 2 Remedial Investigation - July 2011

Location	Date	Time	Temperature (°F)	Humidity (%)	Wind Speed Average (mph)	Wind Speed Gust (mph)	Wind Direction	Precipitation (inches)	Soil Moisture (%)
PK-ABS04	7/19/2011	8:20 AM	80.5	76	0	0	---	0	7.2
		8:30 AM	80.9	76	0	0	---	0	
		8:40 AM	82	74	0	0	---	0	
		8:50 AM	83.1	72	0	0	---	0	
		9:00 AM	84.2	69	0	0	---	0	
		9:10 AM	85	68	0	0	---	0	
		9:20 AM	85.8	66	0	0	---	0	
		9:30 AM	86.3	66	0	0	---	0	
		9:40 AM	86.5	66	0	0	---	0	
		9:50 AM	87.2	64	0	0	---	0	
		10:00 AM	88.1	62	0	0	---	0	
		10:10 AM	88.2	62	0	0	---	0	
		10:20 AM	89.1	60	0	0	---	0	
		10:30 AM	90.1	56	0	0	---	0	
		Average	**85.5**	**66.9**	**0.0**	**0.0**	**---**	**0.0**	
PK-ABS05	7/19/2011	11:30 AM	92.9	54	0	0	---	0	5.8
		11:40 AM	93.1	54	0	0	---	0	
		11:50 AM	92.8	53	0	1	N	0	
		12:00 PM	94	50	0	1	N	0	
		12:10 PM	93.8	51	0	1	N	0	
		12:20 PM	95.2	50	0	0	---	0	
		12:30 PM	95.2	50	0	0	---	0	
		12:40 PM	94.4	51	0	0	---	0	
		12:50 PM	94.4	49	0	0	---	0	
		1:00 PM	94.5	48	0	0	---	0	
		1:10 PM	96.2	47	0	0	---	0	
		1:20 PM	96.4	46	0	0	---	0	
		1:30 PM	96.3	46	0	1	N	0	
		1:40 PM	96.2	47	0	1	N	0	
		Average	**94.7**	**49.7**	**0.0**	**0.4**	**N**	**0.0**	
PK-ABS07	7/18/2011	11:10 AM	89	56	0	0	---	0	5.3
		11:20 AM	88.9	56	0	0	---	0	
		11:30 AM	89.3	56	0	0	---	0	
		11:40 AM	89.4	55	0	0	---	0	
		11:50 AM	90.3	53	0	0	---	0	
		12:00 PM	90.6	52	0	0	---	0	
		12:10 PM	90.4	52	0	0	---	0	
		12:20 PM	91	52	0	0	---	0	
		12:30 PM	92.2	50	0	4	N	0	
		12:40 PM	91.9	49	0	0	---	0	
		12:50 PM	91.4	49	0	1	N	0	
		1:00 PM	92.1	49	0	1	N	0	
		1:10 PM	92.9	49	0	1	N	0	
		1:20 PM	91.9	49	0	1	N	0	
		Average	**90.8**	**51.9**	**0.0**	**0.6**	**N**	**0.0**	
RS-ABS01	7/13/2011	8:30 AM	80.5	67	0	0	---	0	21.3
		8:40 AM	81	68	0	0	---	0	
		8:50 AM	81.1	64	0	0	---	0	
		9:00 AM	81.7	63	0	0	---	0	
		9:10 AM	82.2	63	0	0	---	0	
		9:20 AM	82.8	63	0	0	---	0	
		9:30 AM	82.6	59	0	0	---	0	
		9:40 AM	82.7	60	0	0	---	0	
		9:50 AM	82.4	64	0	0	---	0	
		10:00 AM	82	66	0	0	---	0	
		10:10 AM	82.1	61	0	0	---	0	
		10:20 AM	82.7	63	0	0	---	0	
		10:30 AM	83.4	62	0	0	---	0	
		10:40 AM	84.3	58	0	0	---	0	
		Average	**82.3**	**62.9**	**0.0**	**0.0**	**---**	**0.0**	

Notes:
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WT = Walking Trail

Table E-1
Activity-Based Sampling Meteorological Data
BoRit Asbestos Superfund Site, OU-1
Phase 2 Remedial Investigation - July 2011

Location	Date	Time	Temperature (°F)	Humidity (%)	Wind Speed Average (mph)	Wind Speed Gust (mph)	Wind Direction	Precipitation (inches)	Soil Moisture (%)
RS-ABS02	7/12/2011	4:20 PM	95	45	0	0	---	0	24.1
		4:30 PM	95.2	46	0	0	---	0	
		4:40 PM	94.8	47	0	1	SSE	0	
		4:50 PM	93.8	47	0	1	NE	0	
		5:00 PM	94.2	47	0	0	---	0	
		5:10 PM	94.3	46	0	2	WSW	0	
		5:20 PM	94	47	0	1	ENE	0	
		5:30 PM	93.4	47	0	1	SW	0	
		5:40 PM	93.3	49	0	1	WSW	0	
		5:50 PM	93.2	48	0	0	---	0	
		6:00 PM	93.1	47	0	2	WSW	0	
		6:10 PM	93.2	48	0	2	WSW	0	
		6:20 PM	92.2	48	0	1	SW	0	
		6:30 PM	91.7	48	0	0	---	0	
		6:40 PM	91	50	0	2	WSW	0	
		6:50 PM	90.6	50	0	0	---	0	
		Average	**93.3**	**47.5**	**0.0**	**0.9**	**WSW**	**0.0**	
RS-ABS03	7/13/2011	4:00 PM	83.5	58	0	0	---	0	8.2
		4:10 PM	83.6	57	0	0	---	0	
		4:20 PM	83.9	55	0	0	---	0	
		4:30 PM	84	52	0	0	---	0	
		4:40 PM	84.5	52	0	0	---	0	
		4:50 PM	85	50	0	0	---	0	
		5:00 PM	85.7	46	0	1	NE	0	
		5:10 PM	85.8	44	0	0	---	0	
		5:20 PM	85.5	45	0	0	---	0	
		5:30 PM	85.6	46	0	0	---	0	
		5:40 PM	85.6	45	0	2	WSW	0	
		5:50 PM	85.4	45	0	0	---	0	
		6:00 PM	85.2	45	0	0	---	0	
		6:10 PM	85.4	45	0	0	---	0	
		6:20 PM	85.1	45	0	0	---	0	
		Average	**84.9**	**48.7**	**0.0**	**0.2**	**---**	**0.0**	
RS-ABS04	7/12/2011	12:10 PM	87.4	58	0	0	---	0	16.8
		12:20 PM	87.2	59	0	0	---	0	
		12:30 PM	87.8	59	0	0	---	0	
		12:40 PM	88.2	57	0	0	---	0	
		12:50 PM	88.6	57	0	0	---	0	
		1:00 PM	88.9	57	0	0	---	0	
		1:10 PM	88.3	57	0	0	---	0	
		1:20 PM	89	55	0	0	---	0	
		1:30 PM	89.4	55	0	0	---	0	
		1:40 PM	89.2	55	0	2	N	0	
		1:50 PM	89.7	54	0	1	N	0	
		2:00 PM	90.1	53	0	1	N	0	
		2:10 PM	90.6	52	0	0	---	0	
		2:20 PM	90.6	52	0	0	---	0	
		Average	**88.9**	**55.7**	**0.0**	**0.3**	**N**	**0.0**	
RS-ABS05	7/12/2011	8:50 AM	81.4	67	0	0	---	0	19.9
		9:00 AM	82.2	66	0	2	ESE	0	
		9:10 AM	82.8	65	0	0	---	0	
		9:20 AM	83.4	64	0	0	---	0	
		9:30 AM	83.8	62	0	0	---	0	
		9:40 AM	84.3	63	0	0	---	0	
		9:50 AM	85	63	0	0	---	0	
		10:00 AM	85.5	61	0	0	---	0	
		10:10 AM	86	61	0	0	---	0	
		10:20 AM	86.6	61	0	0	---	0	
		10:30 AM	87.6	60	0	0	---	0	
		10:40 AM	88.2	59	0	0	---	0	
		10:50 AM	89	57	0	0	---	0	
		11:00 AM	89.2	56	0	0	---	0	
		Average	**85.4**	**61.8**	**0.0**	**0.1**	**---**	**0.0**	

Notes:
ABS = Activity based sampling
AP = Asbestos Pile parcel
PK = Park parcel
RS = Residential
RV = Reservoir parcel
OW = The other side of Wissahickon Creek
WT = Walking Trail

Table E-1
Activity-Based Sampling Meteorological Data
BoRit Asbestos Superfund Site, OU-1
Phase 2 Remedial Investigation - July 2011

Location	Date	Time	Temperature (°F)	Humidity (%)	Wind Speed Average (mph)	Wind Speed Gust (mph)	Wind Direction	Precipitation (inches)	Soil Moisture (%)
RS-ABS06	7/14/2011	8:30 AM	69.9	64	0	0	---	0	7.5
		8:40 AM	70.3	63	0	0	---	0	
		8:50 AM	71	62	0	0	---	0	
		9:00 AM	71.4	62	0	0	---	0	
		9:10 AM	71.9	63	0	0	---	0	
		9:20 AM	72	60	0	1	ENE	0	
		9:30 AM	72.3	60	0	0	---	0	
		9:40 AM	72.8	60	0	0	---	0	
		9:50 AM	73	59	0	0	---	0	
		10:00 AM	73.7	57	0	0	---	0	
		10:10 AM	74.2	56	0	0	---	0	
		10:20 AM	74.7	56	0	0	---	0	
		10:30 AM	74.9	53	0	0	---	0	
		10:40 AM	75.3	53	0	0	---	0	
		10:50 AM	75.7	53	0	0	---	0	
		Average	**72.9**	**58.7**	**0.0**	**0.1**	**---**	**0.0**	
RS-ABS07	7/14/2011	1:00 PM	82.9	42	0	0	---	0	22.2
		1:10 PM	83	41	0	0	---	0	
		1:20 PM	83.2	41	0	3	W	0	
		1:30 PM	82.6	40	0	0	---	0	
		1:40 PM	82.8	41	0	1	E	0	
		1:50 PM	83	42	0	1	WNW	0	
		2:00 PM	83.3	42	0	0	---	0	
		2:10 PM	82.8	43	0	1	W	0	
		2:20 PM	82.9	42	0	1	ENE	0	
		2:30 PM	83.2	42	0	0	---	0	
		2:40 PM	84.1	41	0	0	---	0	
		2:50 PM	83.8	40	0	2	WSW	0	
		3:00 PM	84.6	40	0	0	---	0	
		3:10 PM	84.1	40	0	1	ESE	0	
		Average	**83.3**	**41.2**	**0.0**	**0.7**	**---**	**0.0**	
RS-ABS08	7/14/2011	4:10 PM	83.4	39	0	2	SE	0	18.7
		4:20 PM	82.3	42	0	0	---	0	
		4:30 PM	82.1	43	0	0	---	0	
		4:40 PM	83	42	0	0	---	0	
		4:50 PM	82.7	43	0	1	WSW	0	
		5:00 PM	81.3	46	0	0	---	0	
		5:10 PM	81	43	0	0	---	0	
		5:20 PM	81.5	43	0	0	---	0	
		5:30 PM	80.3	49	0	0	---	0	
		5:40 PM	79.5	47	0	0	---	0	
		5:50 PM	80.6	49	0	1	WSW	0	
		6:00 PM	81.1	46	0	0	---	0	
		6:10 PM	80.4	45	0	0	---	0	
		6:20 PM	79.6	46	0	0	---	0	
		Average	**81.3**	**44.5**	**0.0**	**0.3**	**WSW**	**0.0**	
RV-ABS01	7/15/2011	1:00 PM	86.6	37	0	0	---	0	6.4
		1:10 PM	84.7	41	0	0	---	0	
		1:20 PM	85.6	38	0	0	---	0	
		1:30 PM	86.1	37	0	0	---	0	
		1:40 PM	85.7	39	0	0	---	0	
		1:50 PM	85.9	40	0	0	---	0	
		2:00 PM	86.2	41	0	0	---	0	
		2:10 PM	86.1	40	0	0	---	0	
		2:20 PM	86.5	36	0	0	---	0	
		2:30 PM	87	39	0	0	---	0	
		2:40 PM	87.4	35	0	0	---	0	
		2:50 PM	88.2	36	0	0	---	0	
		3:00 PM	88.3	37	0	0	---	0	
		3:10 PM	87.7	35	0	0	---	0	
		3:20 PM	88.4	36	0	0	---	0	
		Average	**86.7**	**37.8**	**0.0**	**0.0**	**---**	**0.0**	

Notes:
ABS = Activity based sampling
AP = Asbestos Pile parcel
PK = Park parcel
RS = Residential
RV = Reservoir parcel
OW = The other side of Wissahickon Creek
WT = Walking Trail

Table E-1
Activity-Based Sampling Meteorological Data
BoRit Asbestos Superfund Site, OU-1
Phase 2 Remedial Investigation - July 2011

Location	Date	Time	Temperature (°F)	Humidity (%)	Wind Speed Average (mph)	Wind Speed Gust (mph)	Wind Direction	Precipitation (inches)	Soil Moisture (%)
WT-ABS01	7/13/2011	12:40 PM	79.5	74	0	0	---	0	11.4
		12:50 PM	79	71	0	0	---	0	
		1:00 PM	79	76	0	0	---	0	
		1:10 PM	79.1	69	0	0	---	0	
		1:20 PM	79.2	69	0	0	---	0	
		1:30 PM	79.6	73	0	0	---	0	
		1:40 PM	79.8	72	0	0	---	0	
		1:50 PM	79.4	75	0	0	---	0	
		2:00 PM	79.1	78	0	0	---	0	
		2:10 PM	78.6	77	0	0	---	0	
		2:20 PM	78	79	0	0	---	0	
		2:30 PM	77.8	79	0	0	---	0	
		2:40 PM	78	77	0	0	---	0	
		2:50 PM	78.9	77	0	0	---	0	
		Average	**78.9**	**74.7**	**0.0**	**0.0**	**---**	**0.0**	

Notes:
ABS = Activity based sampling
AP = Asbestos Pile parcel
PK = Park parcel
RS = Residential
RV = Reservoir parcel
OW = The other side of Wissahickon Creek
WT = Walking Trail

Table E-2
Ambient Air Meteorological Data
BoRit Asbestos Superfund Site, OU-1
Phase 2 Remedial Investigation - November 2010 through October 2011

Date	Temperature (°F)			Humidity (%)			Wind (mph)			Precipitation (in)	Wind Direction
	high	avg	low	high	avg	low	high	avg	gust	sum	monthly avg
12-Nov-10	64	41	26	78	47	1	0	0	7	0	WSW
13-Nov-10	66	44	28	82	53	12	0	0	2	0	
14-Nov-10	**64**	**44**	**27**	**92**	**60**	**15**	**2**	**0**	**11**	**0**	
15-Nov-10	**57**	**49**	**41**	**84**	**76**	**58**	**1**	**0**	**4**	**0**	
12-Dec-10	56	48	40	83	75	64	5	2	21	1.06	WNW
13-Dec-10	41	31	18	74	48	31	5	3	16	0	
14-Dec-10	**25**	**21**	**17**	**55**	**35**	**25**	**5**	**4**	**16**	**0**	
15-Dec-10	**28**	**24**	**21**	**61**	**40**	**28**	**5**	**3**	**16**	**0**	
12-Jan-11	30	26	22	74	56	39	5	2	23	0	WSW
13-Jan-11	29	22	8	56	42	30	4	2	15	0	
14-Jan-11	**30**	**17**	**6**	**63**	**51**	**37**	**2**	**0**	**8**	**0**	
15-Jan-11	**36**	**26**	**10**	**65**	**54**	**40**	**4**	**1**	**15**	**0**	
12-Feb-11	40	28	14	76	50	22	5	2	18	0	W
13-Feb-11	47	36	19	83	47	19	6	2	16	0	
14-Feb-11	**58**	**47**	**39**	**56**	**33**	**12**	**6**	**3**	**20**	**0**	
15-Feb-11	**38**	**30**	**21**	**59**	**39**	**22**	**5**	**2**	**19**	**0**	
15-Mar-11	51	38	24	90	57	27	4	1	14	0	WSW
16-Mar-11	58	46	38	79	67	45	3	1	12	0.66	
17-Mar-11	**64**	**52**	**38**	**71**	**47**	**19**	**3**	**1**	**12**	**0**	
18-Mar-11	**79**	**63**	**46**	**78**	**40**	**15**	**4**	**2**	**13**	**0**	
24-Apr-11	82	67	57	82	64	28	4	1	16	0.27	SSW
25-Apr-11	84	69	57	82	61	30	5	1	16	0	
26-Apr-11	**79**	**72**	**63**	**77**	**56**	**35**	**8**	**4**	**23**	**0**	
27-Apr-11	**77**	**71**	**66**	**77**	**67**	**56**	**6**	**3**	**20**	**0.04***	
10-May-11	74	60	46	73	41	9	2	0	9	0	SW
11-May-11	72	60	44	82	52	29	2	1	9	0	
12-May-11	**77**	**63**	**49**	**86**	**56**	**27**	**3**	**1**	**9**	**0**	
13-May-11	**70**	**60**	**49**	**79**	**58**	**43**	**3**	**1**	**10**	**0**	
17-Jun-11	84	72	65	100	80	50	3	0	8	0.31	SW
18-Jun-11	87	73	60	100	78	49	2	0	7	0.01	
19-Jun-11	**87**	**73**	**61**	**100**	**74**	**40**	**2**	**0**	**5**	**0**	
20-Jun-11	**81**	**72**	**63**	**92**	**71**	**44**	**4**	**1**	**8**	**0**	
18-Jul-11	95	83	70	94	68	42	5	1	12	0	SSW
19-Jul-11	99	84	71	97	71	40	4	1	10	0.05	
20-Jul-11	**92**	**81**	**68**	**100**	**78**	**56**	**5**	**1**	**10**	**0.01**	
21-Jul-11	**99**	**86**	**72**	**100**	**74**	**44**	**6**	**2**	**15**	**0**	
10-Aug-11	86	75	64	100	76	48	1	0	4	0.11	SW
11-Aug-11	84	72	61	99	69	38	1	0	4	0.01	
12-Aug-11	**86**	**70**	**54**	**98**	**68**	**30**	**2**	**0**	**7**	**0.01**	
13-Aug-11	**85**	**70**	**59**	**100**	**83**	**43**	**4**	**1**	**8**	**0**	
29-Aug-11	78	67	53	99	73	43	2	0	3	0.04	SW
30-Aug-11	84	67	53	100	76	37	1	0	4	0	
31-Aug-11	**85**	**68**	**55**	**100**	**79**	**40**	**1**	**0**	**3**	**0**	
1-Sep-11	**82**	**70**	**58**	**100**	**78**	**50**	**3**	**1**	**7**	**0**	S
10-Sep-11	79	72	66	100	92	75	1	0	3	0.18	S
11-Sep-11	73	67	64	100	95	85	1	0	5	0.09	
12-Sep-11	**84**	**69**	**62**	**100**	**89**	**56**	**2**	**0**	**5**	**0.13****	
13-Sep-11	**85**	**70**	**59**	**100**	**84**	**55**	**3**	**1**	**9**	**0**	
6-Oct-11	68	53	40	98	74	33	1	0	4	0	SSW
7-Oct-11	70	52	39	100	77	34	2	0	5	0	
8-Oct-11	**78**	**57**	**42**	**100**	**81**	**42**	**1**	**0**	**5**	**0**	
9-Oct-11	**84**	**63**	**46**	**100**	**80**	**43**	**1**	**0**	**2**	**0**	
20-Oct-11	70	61	54	100	77	56	9	4	18	0.05	SSW
21-Oct-11	57	52	45	91	72	58	1	0	8	0.01	
22-Oct-11	**58**	**49**	**39**	**100**	**81**	**62**	**1**	**0**	**4**	**0**	
23-Oct-11	**64**	**49**	**36**	**100**	**80**	**49**	**1**	**0**	**6**	**0**	

Notes:
Actual sampling days are bolded in table.
Included two days prior to sampling to show that sampling met sampling requirements of:
1) Wait 24 hours if rainfall exceeds 0.25 inches.
2) Wait 48 hours if rainfall exceeds 0.50 inches.
3) Ambient air sampling not performed during rain event.
KPAAMBLE2 meteorological station went offline at the end of May; switched to MAR075 meteorological station.
Both KPAAMBLE2 and MAR075 meteorological stations are shown to be along Greystone Road which is between Skippack Pike and Morris Road in Ambler, PA.
* Rainfall did not start until 1500 hours and ambient air monitors were finished sampling at 1250 hrs on 27-Apr-11.
** Rainfall stopped at 0254 hours and ambient air monitors started sampling at 0840 hrs on 12-Sep-11.

Appendix F

Phase 2 Analytical Results

Appendix F
Groundwater Analytical Results
BoRit Asbestos Superfund Site, OU1
Phase 2 Remedial Investigation

Analyte	RSL	Location	MW01				MW02		MW03		MW04		MW05				MW06		RV-SPSW01	RV-SPSW01
		Sample Name	PKMW01-1011		PKMW01A-1011		PKMW02-1011		RVMW03-1011		RVMW04-1011		APMW05-1011		APMW05D-1011		APMW06-1011		RV-SPSW-01	RV-SPSWD-01
		Sample Date	11/10/10		11/15/10		11/9/10		11/8/10		11/9/10		11/9/10				11/10/10		10/12/10	10/12/10
		QC Type	----		----		----		----		----		Dup. of APMW05D-1011		Dup. of APMW05-1011		----		Dup. of RV-SPSWD-01	Dup. of RV-SPSW-01
		Filtered/Unfiltered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Unfiltered
Volatile Organice Compounds (µg/L)																				
1,1,1-Trichloroethane	750		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
1,1,2,2-Tetrachloroethane	0.066		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
1,1,2-Trichloroethane	0.041		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
1,1-Dichloroethane	2.4		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
1,1-Dichloroethylene	26		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
1,2,3-Trichlorobenzene	0.52		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
1,2,4-Trichlorobenzene	0.39		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
1,-2-Dibromo-3-Chloropropane (DBCP)	0.00032		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
1,2-Dibromoethane	0.0065		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
1,2-Dichlorobenzene	28		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
1,2-Dichloroethane	0.15		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
1,2-Dichloropropane	0.38		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
1,4-Dichlorobenzene	0.42		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
1,4-Dioxane	0.67		100 U	NA	100 U	NA	100 UL	NA	100 UL	NA	100 UL	NA	100 UL	NA	100 UL	NA	100 U	NA	100 U	100 U
2-Butanone	490		10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U
4-Methyl-2-Pentanone	100		10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U
Acetone	1200		13	NA	9.4 B	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	6.3 J	6.5 J
Benzene	0.39		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Bromodichloromethane	0.12		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Bromomethane	0.7		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Carbon Disulfide	72		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Carbon Tetrachloride	0.39		5.0 U	NA	5.0 U	NA	5.8	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
CFC-11	110		5.0 U	NA	5.0 U	NA	30	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
CFC-12	19		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Chlorinated Fluorocarbon (Freon 113)	5300		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Chlorobenzene	7.2		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Chlorobromomethane	8.3		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Chlorodibromomethane	0.15		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Chloroethane	2100		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Chloroform	0.19		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Chloromethane	19		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
cis-1,2-Dichloroethene	2.8		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
cis-1,3-Dichloropropene[1]	0.41		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Cyclohexane	1300		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Dichloromethane	4.7		9 B	NA	13 B	NA	6.6 B	NA	6.3 B	NA	6.7 B	NA	6.8 B	NA	6.6 B	NA	9.6 B	NA	3.4 J	3.1 J
Ethylbenzene	1.3		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Isopropylbenzene	39		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
m,p-Xylene	NV		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
m-Dichlorobenzene	NV		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Methyl Acetate	1600		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Methyl N-Butyl Ketone	3.4		10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U
Methyl Tert-Butyl Ether	12		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Methylbenzene	86		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Methylcylohexane	NV		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
o-Xylene	19		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Styrene (Monomer)	110		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Tetrachloroethene	0.072		5.0 U	NA	5.0 U	NA	22	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Trans-1,2-Dichloroethene	8.6		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Trans-1,3-Dichloropropene[1]	0.41		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Tribomomethane	7.9		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Trichloroethylene	0.26		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Vinyl Chloride	0.015		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Semi-Volatile Organic Compounds (µg/L)																				
1,1'-Biphenyl	0.083		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
1,2,4,5-Tetrachlorobenzene	0.12		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
1,2-Benzphenanthracene	2.9		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
2,2'-Oxybis(1-Chloropropane)	0.31		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
2,4,5-Trichlorophenol	89		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
2,4,6-Trichlorophenol	0.9		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
2,4-Dichlorophenol	3.5		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
2,4-Dimethylphenol	27		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
2,4-Dinitrophenol	3		10 U	NA	10 R	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U
2,4-Dinitrotoluene	0.2		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
2,6-Dinitrotoluene	1.5		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
2-Chloronaphthalene	55		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U

Appendix F
Groundwater Analytical Results
BoRit Asbestos Superfund Site, OU1
Phase 2 Remedial Investigation

Analyte	RSL	Location	MW01				MW02		MW03		MW04		MW05				MW06		RV-SPSW01	RV-SPSW01
		Sample Name	PKMW01-1011		PKMW01A-1011		PKMW02-1011		RVMW03-1011		RVMW04-1011		APMW05-1011		APMW05D-1011		APMW06-1011		RV-SPSW-01	RV-SPSWD-01
		Sample Date	11/10/10		11/15/10		11/9/10		11/8/10		11/9/10		11/9/10				11/10/10		10/12/10	10/12/10
		QC Type	----		----		----		----		----		Dup. of APMW05D-1011		Dup. of APMW05-1011		----		Dup. of RV-SPSWD-01	Dup. of RV-SPSW-01
		Filtered/Unfiltered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Unfiltered
Semi-Volatile Organic Compounds (µg/L)																				
2-Chlorophenol	7.1		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
2-Methylnaphthalene	2.7		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
2-Methylphenol	72		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
2-Nitroaniline	15		10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U
2-Nitrophenol	NV		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
3,3'-Dichlorobenzidine	0.11		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
3,5,5-Trimethyl-2-Cyclohexene-1-One	67		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
3-Nitroaniline	NV		10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U
4,6-Dinitro-2-Methylphenol	0.12		10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U
4-Bromophenyl Phenyl Ether	NV		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
4-Chloro-3-Methylphenol	110		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
4-Chlorophenyl Phenyl Ether	NV		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
4-Methylphenol	7.2		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
4-Nitrophenol	NV		10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U
Acenaphthene	40		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Acenaphthylene[2]	40		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Acetophenone	150		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Anthracene	130		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Atrazine	0.26		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Benzaldehyde	150		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Benzo(a)anthracene	0.029		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Benzo(a)pyrene	0.0029		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Benzo(b)fluoranthene	0.029		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Benzo(g,h,i)perylene[3]	8.7		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Benzo(k)fluoranthene	0.29		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Benzyl Butyl Phthalate	14		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Bis(2-Chloroethoxy)Methane	4.7		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Bis(2-Chloroethyl)Ether	0.012		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Bis(2-Ethylhexyl)Phthalate	0.071		3.1 J	NA	5.0 U	NA	55	NA	5.0 U	NA	3 J	NA	42	NA	26	NA	14	NA	5.0 U	44 B
Caprolactam	770		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Carbazole	NV		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Chlorophenols	17		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Dibenzo(a,h)anthracene	0.0029		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Dibenzofuran	0.58		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Diethyl Phthalate	1100		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Dimethyl Phthalate	NV		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Di-n-butylphthalate	67		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Di-n-octylphthalate	NV		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Fluoranthene	63		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Fluorene	22		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Hexachloro-1,3-Butadiene	0.26		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Hexachlorobenzene	0.042		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Hexachlorocyclopentadiene	2.2		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Hexachloroethane	0.51		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Indeno(1,2,3-cd)pyrene	0.029		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Naphthalene	0.14		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Nitrobenzene	0.12		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
N-Nitroso-di-n-propylamine	0.0093		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
n-Nitrosodiphenylamine	10		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
p-Chloroaniline	0.32		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Pentachlorophenol	0.17		10 U	NA	10 R	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U
Phenanthrene[3]	8.7		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Phenol	450		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
p-Nitroaniline	3.3		10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U
Pyrene	8.7		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
Pesticides and PCBs (µg/L)																				
1,1,1-Trichloro-2,2-Bis (P-Methoxphenyl)-Ethane	2.7		0.50 U	NA	0.50 U	NA	0.50 U	NA	0.50 U	NA	0.50 U	NA	0.50 U	NA	0.50 U	NA	0.50 U	NA	0.50 U	0.50 U
4,4'-DDD	0.28		0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	0.10 U
4,4'-DDE	0.2		0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	0.10 U
4,4'-DDT	0.2		0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	0.10 U
Aldrin	0.00021		0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	0.050 U
Alpha-BHC	0.0062		0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	0.050 U
Alpha-Chlordane[4]	0.19		0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	0.050 U

Appendix F
Groundwater Analytical Results
BoRit Asbestos Superfund Site, OU1
Phase 2 Remedial Investigation

Analyte	RSL	Location	MW01				MW02		MW03		MW04		MW05				MW06		RV-SPSW01	RV-SPSW01
		Sample Name	PKMW01-1011		PKMW01A-1011		PKMW02-1011		RVMW03-1011		RVMW04-1011		APMW05-1011		APMW05D-1011		APMW06-1011		RV-SPSW-01	RV-SPSWD-01
		Sample Date	11/10/10		11/15/10		11/9/10		11/8/10		11/9/10		11/9/10				11/10/10		10/12/10	10/12/10
		QC Type	----		----		----		----		----		Dup. of APMW05D-1011		Dup. of APMW05-1011		----		Dup. of RV-SPSWD-01	Dup. of RV-SPSW-01
		Filtered/Unfiltered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Unfiltered
Pesticides and PCBs (µg/L)																				
Aroclor-1016	0.11		1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	1.0 U
Aroclor-1221	0.0043		1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	1.0 U
Aroclor-1232	0.0043		1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	1.0 U
Aroclor-1242	0.034		1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	1.0 U
Aroclor-1248	0.034		1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	1.0 U
Aroclor-1254	0.031		1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	1.0 U
Aroclor-1260	0.034		1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	1.0 U
Aroclor-1262	NV		1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	1.0 U
Aroclor-1268	NV		1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	1.0 U
beta-BHC	0.022		0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	0.050 U
Camphechlor	0.013		5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	5.0 U
delta-BHC	NV		0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	0.050 U
Dieldrin	0.0015		0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	0.10 U
Endosulfan I[5]	7.8		0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	0.050 U
Endosulfan II[5]	7.8		0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	0.10 U
Endosulfan Sulfate[5]	7.8		0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	0.10 U
Endrin	0.17		0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	0.10 U
Endrin Aldehyde[6]	0.17		0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	0.10 U
Endrin Ketone[6]	0.17		0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	NA	0.10 U	0.10 U
gamma-BHC (Lindane)	0.036		0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	0.050 U
gamma-Chlordane[4]	0.19		0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	0.050 U
Heptachlor	0.0018		0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	0.050 U
Heptachlor Epoxide	0.0033		0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	NA	0.050 U	0.050 U
Inorganics (µg/L)																				
Aluminum	1600		1530	1510	441	200 U	200 U	200 U	200 U	200 U	307	200 U	200 U	200 U	200 U	200 U	200 U	200 U	554	690
Antimony	0.6		60 U	60 UL	60 U	60 UL	60 U	60 UL	60 U	60 UL	60 U	60 UL	60 U	60 UL	60 U	60 UL	60 U	60 UL	2.7 B	4.5 B
Arsenic	0.045		10 U	10 U	10 U	10 U	10 U	10 U	10 U	7.6 J	10 U	10 U	10 U	10 U	10 U	5 J	5.2 J	10 U	10 UL	10 UL
Barium	290		670	669	175 J	175 J	99 J	112 J	525	561	20.9 J	20.4 J	8.1 J	27.4 J	7.1 J	20.8 J	94 J	101 J	65.5 J	67.8 J
Beryllium	1.6		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Cadmium[7]	0.69		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	0.71 J	5 U	1.1 J	5 U	5 U	5 U	5 U
Calcium	NV		310000	281000 J	60800	58300 J	105000	105000 J	101000	104000 J	115000	92500 J	164000	268000 J	162000	264000 J	116000	113000 J	35000	35900
Chromium[8]	0.031		19 B	19.4 B	10 U	8.3 B	10 U	2.7 B	10 U	3.8 B	10 U	1.7 B	10 U	10 UL	10 U	10 UL	2 B	5.4 B	10 U	10 U
Cobalt	0.47		50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Copper	62		26.5	25.9	3.6 J	1.1 J	1.4 J	0.98 J	3.5 J	3 J	0.8 J	25 U	0.81 J	1.1 J	0.67 J	0.98 J	2.5 J	1.8 J	2.4 B	2.5 B
Cyanide	31		10 U	NA	3.8 J	NA	10 U	NA	8.2 J	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 UL	10 UL
Iron	1100		269	78.2 J	446	100 U	55.4 J	100 U	52.5 J	100 U	360	147	178	135	175	125	100 U	100 U	708	1070
Lead[9]	15		6.9 B	13.3 B	10 UL	10 U	10 UL	10 U	10 UL	3 B	10 UL	10 U	10 UL	10 U	10 UL	10 U	10 UL	10 U	10 U	10 U
Magnesium	NV		5000 U	5000 U	15600	15200	20200	19000	15400	15300	6030	4860 J	8870	10800	8480	10500	16700	16200	6930	7610
Manganese[10]	32		5.3 J	15 U	24.3	4.4 J	14.8 J	15 U	9190	9620	95.9	86.7	157	156	149	121	450	426	52.9	59.5
Mercury	0.063		0.076 B	0.2 U	0.2 U	0.08 B	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.05 B	0.2 U	0.2 U	0.2 U	0.1 B	0.2 U	0.2 U
Nickel	30		27.3 J	40 U	40 U	40 U	40 U	40 U	8.2 J	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U
Potassium	NV		60400	73200	5000 U	1490 J	2040 J	2150 J	1660 J	2140 J	1770 J	5000 U	1520 J	3120 J	1490 J	2670 J	3460 J	4260 J	7820	8090
Selenium	7.8		35 U	35 U	35 U	35 U	35 U	35 U	35 U	35 U	35 U	35 U	35 U	14.3 J	35 U	13.1 J	35 U	35 U	35 U	35 U
Silver	7.1		10 U	2.8 B	10 U	1.8 B	10 UL	1.2 B	10 UL	1.6 B	10 UL	10 U	10 U	2.1 B	10 U	1.2 B	1.7 B	2.7 B	10 R	10 R
Sodium	NV		97800 J	94200	14400 J	13500	24100 J	22900	34100 J	34400	1120000 J	13400	20100 J	38500	19900 J	37200	42300 J	40600	13800	14300
Thallium	0.016		7.6 B	3.6 B	7.4 B	25 U	7.8 B	6.7 B	11.7 B	9.1 B	7.9 B	25 U	8.5 B	3.7 B	7.3 B	3.7 B	7.9 B	3.9 B	6.3 B	7.3 B
Vanadium	7.8		50 U	50 U	50 U	50 U	10.6 J	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Zinc	470		32.7 J	18.3 J	4.7 J	9.1 J	60 U	4.6 J	5.8 J	9.5 J	4.5 J	60 U	60 U	60 U	60 U	60 U	14.1 J	10 J	10.4 J	11.6 J

Notes:
µg/L = micrograms per liter
AP = Asbestos Pile parcel
dup. = duplicate
NA = Not analyzed
NV = No screening level available.
PK = Park parcel
QC = quality control
RV = Reservoir parcel
RSL = Regional Screening Level (EPA Region 3 Risk Based Concentration Values for Residential Tapwater (November 2011))
1. No RSL available for this compound; 1,3-Dichloropropene RSL used as surrogate.
2. No RSL available for this compound; acenaphthene RSL used as surrogate.
3. No RSL available for this compound; pyrene RSL used as surrogate.
4. No RSL available for this compound; Chlordane RSL used as surrogate.
5. No RSL available for this compound; Endosulfan RSL used as surrogate.
6. No RSL available for this compound; Endrin RSL used as surrogate.
7. No RSL available for this compound; cadmium (water) RSL used as surrogate.
8. No RSL available for this compound; chromium (VI) used as surrogate.
9. No RSL available for this compound; lead maximum contaminant level used as surrogate (May 2009).
10. No RSL available for this compound; manganese (non-diet) RSL used as surrogate.

B = Not detected substantially above the level reported in laboratory or field blanks.
J = Analyte present. Reported value may not accurate or precise.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
R = Unusable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
UL = Not detected, quantitation limit is probably higher.

Appendix F
Groundwater Asbestos Results
BoRit Asbestos Superfund Site, OU1
Phase 2 Remedial Investigation

Analyte	Unit	MCL	Location	MW01A		MW02		MW03
			Sample Name	PKMW01A-1011-TAG063	PKMW01A-1011-TAG065	PKMW02-1011-TAG049	PKMW02-1011-TAG052	RVMW03-1011
			Sample Date	11/15/10		11/9/10		11/8/10
			Filtered/Unfiltered	Filtered	Unfiltered	Unfiltered	Filtered	Unfiltered
Asbestos								
Fibers	MFL	7		<0.17	<0.20	<0.20	<0.20	<0.20

Analyte	Unit	MCL	Location	MW04		MW05	MW06	RV-SPSW01
			Sample Name	RVMW04-1011-TAG042	RVMW04-1011-TAG043	APMW05-1011-TAG045	APMW06-1011-TAG061	RV-SPSW-01
			Sample Date	11/9/10		11/9/10	11/10/10	10/12/10
			Filtered/Unfiltered	Filtered	Unfiltered	Unfiltered	Unfiltered	Unfiltered
Asbestos								
Fibers	MFL	7		0.51	<0.20	<0.20	<0.20	5.1

Notes:
MFL = million fibers per liter
MCL = Maximum contaminant level, May 2009
AP = Asbestos Pile parcel
PK = Park parcel
RV = Reservoir parcel

CDM Smith

Appendix F
Soil Analytical Results
BoRit Asbestos Superfund Site, OU1
Phase 2 Remedial Investigation

Analyte	RSL	Location	AP-FT-SS01				AP-FT-SS02			AP-FT-SS03			AP-FT-SS04			AP-FT-SS05		
		Sample Name	APFT-SS01-A	APFT-SS01D-A	APFT-SS01-B	APFT-SS01-C	APFT-SS02-A	APFT-SS02-B	APFT-SS02-C	APFT-SS03-A	APFT-SS03-B	APFT-SS03-C	APFT-SS04-A	APFT-SS04-B	APFT-SS04-C	APFT-SS05-A	APFT-SS05-B	APFT-SS05-C
		Sample Date	10/7/10				10/7/10			10/7/10			10/7/10			10/7/10		
		QC Type	Dup. of APFT-SS01D-A	Dup. of APFT-SS01-A	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Pesticides and PCBs (µg/kg)																		
1,1,1-Trichloro-2,2-Bis (P-Methoxphenyl)-Ethane	31000		17 U	17 U	17 U	17 U	17 U	17 U	17 U	17 U	17 U	17 U	17 U	17 U	17 U	17 U	17 U	17 U
4,4'-DDD	2000		3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U
4,4'-DDE	1400		3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U
4,4'-DDT	1700		3.3 U	3.3 U	1.4 J	3.3 U	3 J	1.1 J	1 J	3.1 J	3.3 U	3.3 U	3.3 U	1.9 J	1.7 J	3.3 U	2.1 J	3.3 U
Aldrin	29		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
alpha-BHC	77		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
alpha-Chlordane[1]	1600		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Aroclor-1016	390		33 U	33 U	12 J	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	2.6 J	33 U
Aroclor-1221	140		33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U
Aroclor-1232	140		33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U
Aroclor-1242	220		33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U
Aroclor-1248	220		33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U
Aroclor-1254	110		14 J	16 J	10 J	33 U	31 J	11 J	33 U	32 J	33 U	33 U	11 J	28 J	33 U	33 U	33 U	33 U
Aroclor-1260	220		11 J	12 J	10 J	33 U	23 J	13 J	33 U	21 J	33 U	19 J	8.3 J	21 J	22 J	33 U	12 J	33 U
Aroclor-1262	NV		33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U
Aroclor-1268	NV		33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U
beta-BHC	270		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Camphechlor	440		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
delta-BHC	NV		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Dieldrin	30		3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U
Endosulfan I[2]	37000		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Endosulfan II[2]	37000		3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U
Endosulfan Sulfate[2]	37000		3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U
Endrin	1800		3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U
Endrin Aldehyde[3]	1800		3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U
Endrin Ketone[3]	1800		3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U
gamma-BHC (Lindane)	520		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
gamma-Chlordane[1]	NV		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Heptachlor	110		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Heptachlor Epoxide	53		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Semi-Volatile Organic Compounds (µg/kg)																		
1,1'-Biphenyl	5100		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
1,2,4,5-Tetrachlorobenzene	1800		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
1,2-Benzphenanthracene	15000		2900	1700	1200	4100	440	730	14000	1200	2800	9100	1200	1800	800	690	660	500
2,2'-Oxybis(1-Chloropropane)	4600		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
2,4,5-Trichlorophenol	610000		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
2,4,6-Trichlorophenol	6100		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
2,4-Dichlorophenol	18000		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
2,4-Dimethylphenol	120000		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
2,4-Dinitrophenol	12000		330 U	330 U	330 U	330 U	330 U	330 R	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U
2,4-Dinitrotoluene	1600		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
2,6-Dinitrotoluene	6100		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
2-Chloronaphthalene	630000		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
2-Chlorophenol	39000		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
2-Methylnaphthalene	31000		170 U	170 U	170 U	170 U	69 J	170 U	280	170 U	170 U	380	170 U	170 U	170 U	170 U	170 U	170 U
2-Methylphenol	310000		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
2-Nitroaniline	61000		330 U	330 U	330 U	330 U	330 U	330 R	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U
2-Nitrophenol	NV		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
3,3'-Dichlorobenzidine	1100		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
3,5,5-Trimethyl-2-Cyclohexene-1-One	510000		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
3-Nitroaniline	NV		330 U	330 U	330 U	330 U	330 U	330 R	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U
4,6-Dinitro-2-Methylphenol	490		330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U
4-Bromophenyl Phenyl Ether	NV		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
4-Chloro-3-methylphenol	610000		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
4-Chlorophenyl Phenyl Ether	NV		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
4-Methylphenol	31000		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
4-Nitrophenol	NV		330 U	330 U	330 U	330 U	330 U	330 R	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U
Acenaphthene	340000		170 U	100 J	170 U	190 J	170 U	170 U	1400	170 U	290	2000	170 U	120 J	170 U	170 U	170 U	170 U
Acenaphthylene	NV		140 J	100 J	170 U	170 U	170 U	170 U	100 J	170 U	170 U	320	170 U	170 U	170 U	170 U	170 U	170 U
Acetophenone	780000		170 U	170 U	170 U	170 U	460	84 J	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
Anthracene	1700000		500	430	190 J	1100	110 J	94 J	4800	190 J	1200	6200	240	460	230	110 J	180 J	110 J
Atrazine	2100		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
Benzaldehyde	780000		170 U	170 U	170 U	170 U	490	92 J	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
Benzo(a)anthracene	150		2700	1700	1300	4300	370	540	15000	1200	3100	9600	1200	1900	810	680	690	490
Benzo(a)pyrene	15		2900	1600	1200	4000	370	520	13000	1300	3000	7100	1500	1900	770	760	670	500
Benzo(b)fluoranthene	150		3200	1500	1300	3100	350	560	10000	1300	3100	6100	1500	2000	810	780	690	510
Benzo(g,h,i)perylene[4]	170000		1600	1000	870	2800	280	380	8200	900	1900	3900	1000	1200	520	480	400	310
Benzo(k)fluoranthene	1500		2600	1600	980	3300	320	400	11000	870	2000	6500	960	1400	540	530	450	340
Benzyl Butyl Phthalate	260000		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
Bis(2-Chloroethoxy)Methane	18000		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
Bis(2-Chloroethyl)Ether	210		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
Bis(2-Ethylhexyl)Phthalate	35000		4400	290 B	990 B	1200 B	410 B	280000	5500	2100 B	1400 B	1200 B	1400 B	1100 B	840 B	720 B	460 B	480 B
Caprolactam	3100000		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
Carbazole	NV		380	250	83 J	140 J	170 U	170 U	440	170 U	460	1600	93 J	170 J	170 U	170 U	170 U	170 U
Chlorophenols	180000		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
Dibenzo(a,h)anthracene	15		670	430	330	1100	130 J	170 J	2700	370	850	2100	480	580	220	240	200	140 J

Appendix F
Soil Analytical Results
BoRit Asbestos Superfund Site, OU1
Phase 2 Remedial Investigation

Analyte	RSL	Location	AP-FT-SS01				AP-FT-SS02			AP-FT-SS03			AP-FT-SS04			AP-FT-SS05		
		Sample Name	APFT-SS01-A	APFT-SS01D-A	APFT-SS01-B	APFT-SS01-C	APFT-SS02-A	APFT-SS02-B	APFT-SS02-C	APFT-SS03-A	APFT-SS03-B	APFT-SS03-C	APFT-SS04-A	APFT-SS04-B	APFT-SS04-C	APFT-SS05-A	APFT-SS05-B	APFT-SS05-C
		Sample Date	10/7/10				10/7/10			10/7/10			10/7/10			10/7/10		
		QC Type	Dup. of APFT-SS01D-A	Dup. of APFT-SS01-A	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Semi-Volatile Organic Compounds (µg/kg)																		
Dibenzofuran	7800		170 U	94 J	170 U	120 J	170 U	170 U	1300	170 U	220	1800	170 U	91 J	170 U	170 U	170 U	170 U
Diethyl Phthalate	4900000		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
Dimethyl Phthalate	NV		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
Di-n-butylphthalate	610000		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	260	170 U	170 U	170 U	170 U	170 U	170 U	170 U
Di-n-octylphthalate	NV		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
Fluoranthene	230000		5000	2800	1800	8600	770	990	38000	2300	7200	25000	2400	4100	1600	1200	1400	1000
Fluorene	230000		150 J	180 J	78 J	140 J	170 U	170 U	1800	170 U	540	4200	170 U	180 J	94 J	170 U	170 U	170 U
Hexachloro-1,3-Butadiene	6100		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
Hexachlorobenzene	300		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
Hexachlorocyclopentadiene	37000		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
Hexachloroethane	4300		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
Indeno(1,2,3-cd)pyrene	150		1800	1000	910	3000	280	370	8000	960	2000	4000	1100	1300	520	530	450	330
Naphthalene	3600		170 U	170 U	170 U	170 U	170 U	170 U	240	170 U	170 U	210	170 U	170 U	170 U	170 U	170 U	170 U
Nitrobenzene	4800		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
N-Nitroso-di-n-propylamine	69		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
n-Nitrosodiphenylamine	99000		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
p-Chloroaniline	2400		170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
Pentachlorophenol	890		330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U
Phenanthrene[4]	170000		1900	1700	640	3500	430	460	21000	790	4800	21000	880	2000	730	400	660	460
Phenol	1800000		170 U	170 U	170 U	170 U	170 U	220	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U
p-Nitroaniline	24000		330 U	330 U	330 U	330 U	330 U	330 R	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U
Pyrene	170000		4900	3000	1800	6300	570	660	26000	1600	5100	14000	1600	2700	1100	880	980	680
Dioxins and Furans (pg/g)																		
1,2,3,4,6,7,8-Heptachlorodibenzo-P-Dioxin	NV		904	973	333	77.5	261	143	110	504	412	637	372	415	214	430	941	198
1,2,3,4,7,8-Hexachlorodibenzo-P-Dioxin	NV		20.9	23	5.73 J	1.59 J	3.51 J	2.16 J	1.92 J	3.98 J	2.55 J	4.55 J	3.2 J	3.45 J	2.18 J	2.56 J	4.39 J	2 J
1,2,3,6,7,8-Hexachlorodibenzo-P-Dioxin	NV		36.9	40.1	11.4	2.86 J	9.34	4.51 J	3.69 J	14.8	11.1	18.3	9.92	12.4	6.09	11.8	26	5.87
1,2,3,7,8,9-Hexachlorodibenzo-P-Dioxin	NV		45.3	66.5	21.1 J	4.22 J	9.97	6.05 J	4.56 J	11.4	7.57	9.27 J	8.39	10.8 J	4.19 J	8.06	8.86 J	6.02 J
1,2,3,7,8-Pentachlorodibenzofuran	NV		1.72 J	1.67 J	1.55 J	0.5 B	2.22 J	1.24 J	1.05 B	1.23 J	0.78 J	0.94 B	0.68 J	0.94 B	0.86 B	0.48 J	5.00 U	0.72 B
1,2,3,7,8-Pentachlorodibenzo-P-Dioxin	NV		12.5	13.3	3.97 J	1.07 J	2.82 J	1.53 J	1.7 J	1.71 J	1.18 J	2.02 J	1.45 J	2.14 J	1.16 J	1.16 J	1.47 J	1.06 J
1,2,3,4,6,7,8,9-OCDD	NV		9910	10500	7940	3020	4340	2470	2100	7710	7130	8410	6840	7360	8190	7220	13000	4040
1,2,3,4,6,7,8,9-OCDF	NV		245	273	116	20.4	100	58.2	54.5	561	528	987	335	446	181	605	2010	237
1,2,3,4,6,7,8-HpCDF	NV		147	156	65.4	16	52.3	26.2	26	127	105	208	83	86.5	40.6	131	311	51.9
1,2,3,4,7,8,9-HpCDF	NV		7.59	8.23	3.29 J	0.76 J	3.42 J	5.00 U	2.2 J	8.13	6.65	13.4	5.65	6.32	2.71 J	7.89	20.1	3.16 J
1,2,3,4,7,8-HxCDF	NV		9.94	10.6	4.76 J	5.00 U	7.55	4.01 J	4.13 J	4.44 J	3.44 J	6.32 J	3.44 J	4.79 J	2.54 J	3.23 J	7.98	2.5 J
1,2,3,6,7,8-HxCDF	NV		11.3	11.4	3.85 J	1.45 J	4.06 J	1.93 J	2.45 J	3.53 J	2.56 J	5.9	2.65 J	3.78 J	1.92 J	2.59 J	4.98 J	1.99 J
1,2,3,7,8,9-HxCDF	NV		0.27 J	0.24 J	5.00 U	5.00 U	0.29 J	5.00 U	0.46 J	0.15 J	0.17 J	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
2,3,7,8-Tetrachlorodibenzofuran	NV		3.23 J	2.54	1.7 J	0.82 J	3.84 J	1.56 J	3.04 J	1.01	0.99 J	1.26 J	1.05	1.46 J	0.93 J	0.85 J	0.55 J	0.75 J
2,3,4,6,7,8-HxCDF	NV		7.75	13.6	5.8	1.13 J	4.84 J	2.78 J	4.19 J	5.08	4.03 J	3.75 J	4.11 J	4.92 J	1.6 J	4.23 J	3.05 J	3.17 J
2,3,4,7,8-PeCDF	NV		3.21 J	2.8 J	1.93 J	0.8 J	3.22 J	1.52 J	2.36 J	1.08 J	0.93 J	1.24 J	0.98 J	1.44 J	0.89 J	0.66 J	5.00 U	0.96 J
2,3,7,8-TCDD	NV		1.84	0.56 J	1.00 U	0.32 J	1.05 J	0.67 J	2.05 J	0.27 J	0.22 J	0.72 J	0.28 J	0.86 J	0.57 J	0.56 J	1.5 J	1.00 U
Total TEQ	4.5		42.546	46.1523	16.4632	4.69172	13.7418	7.44366	8.93035	15.6525	12.4773	19.4501	12.0794	15.012	9.0264	13.3008	25.775	7.3917
Inorganics (mg/kg)																		
Aluminum	7700		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	3.1		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.39		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	1500		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	16		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	7		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NV		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium[5]	0.29		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	2.3		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	310		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	5500		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NV		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	180		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	150		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NV		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	39		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	39		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NV		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	0.078		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NV		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2300		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
pg/g = picograms per gram
AP = Asbestos Pile parcel
dup. = duplicate
FT = fire training area
NA = Not Analyzed
NV = No screening value available.
SL = former slag pile
RSL = Regional Screening Level (EPA Region 3 Risk Based Concentration Values for Residential Soil (November 2011)
1. No RSL available for this compound; Chlordane RSL used as surrogate.
2 No RSL available for this compound; Endosulfan RSL used as surrogate.
3. No RSL available for this compound; Endrin RSL used as surrogate.
4. No RSL available for this compound; pyrene RSL used as surrogate.
5. No RSL available for this compound; chromium (VI) used as surrogate.
B = Not detected substantially above the level reported in laboratory or field blanks.
J = Analyte present. Reported value may not accurate or precise.
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
R = Unusable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
UL = Not detected, quantitation limit is probably higher.

Appendix F
Soil Analytical Results
BoRit Asbestos Superfund Site, OU1
Phase 2 Remedial Investigation

Analyte	RSL	Location	AP-SL-SS01				AP-SL-SS02		
		Sample Name	APSL-SS01-A	APSL-SS01D-A	APSL-SS01-B	APSL-SS01-C	APSL-SS02-A	APSL-SS02-B	APSL-SS02-C
		Sample Date	10/7/10				10/7/10		
		QC Type	Field Dup. of APSL-SS01D-A	Field Dup. of APSL-SS01-A	----	----	----	----	----
Pesticides and PCBs (µg/kg)									
1,1,1-Trichloro-2,2-Bis (P-Methoxphenyl)-Ethane	31000		17 U	NA	17 U	17 U	17 U	17 U	17 U
4,4'-DDD	2000		3.3 U	NA	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U
4,4'-DDE	1400		3.3 U	NA	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U
4,4'-DDT	1700		3.3 U	NA	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U
Aldrin	29		1.7 U	NA	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
alpha-BHC	77		1.7 U	NA	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
alpha-Chlordane[1]	1600		1.7 U	NA	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Aroclor-1016	390		33 U	NA	33 U	33 U	33 U	33 U	33 U
Aroclor-1221	140		33 U	NA	33 U	33 U	33 U	33 U	33 U
Aroclor-1232	140		33 U	NA	33 U	33 U	33 U	33 U	33 U
Aroclor-1242	220		33 U	NA	33 U	33 U	33 U	33 U	33 U
Aroclor-1248	220		33 U	NA	33 U	33 U	33 U	33 U	33 U
Aroclor-1254	110		33 U	NA	33 U	33 U	33 U	33 U	33 U
Aroclor-1260	220		33 U	NA	33 U	33 U	33 U	33 U	33 U
Aroclor-1262	NV		33 U	NA	33 U	33 U	33 U	33 U	33 U
Aroclor-1268	NV		33 U	NA	33 U	33 U	33 U	33 U	33 U
beta-BHC	270		1.7 U	NA	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Camphechlor	440		170 U	NA	170 U	170 U	170 U	170 U	170 U
delta-BHC	NV		1.7 U	NA	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Dieldrin	30		3.3 U	NA	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U
Endosulfan I[2]	37000		1.7 U	NA	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Endosulfan II[2]	37000		3.3 U	NA	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U
Endosulfan Sulfate[2]	37000		3.3 U	NA	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U
Endrin	1800		3.3 U	NA	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U
Endrin Aldehyde[3]	1800		3.3 U	NA	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U
Endrin Ketone[3]	1800		3.3 U	NA	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U
gamma-BHC (Lindane)	520		1.7 U	NA	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
gamma-Chlordane[1]	NV		1.7 U	NA	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Heptachlor	110		1.7 U	NA	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Heptachlor Epoxide	53		1.7 U	NA	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Semi-Volatile Organic Compounds (µg/kg)									
1,1'-Biphenyl	5100		170 U	NA	170 U	170 U	170 U	170 U	170 U
1,2,4,5-Tetrachlorobenzene	1800		170 U	NA	170 U	170 U	170 U	170 U	170 U
1,2-Benzphenanthracene	15000		140 J	NA	250	560	260	170 U	170 J
2,2'-Oxybis(1-Chloropropane)	4600		170 U	NA	170 U	170 U	170 U	170 U	170 U
2,4,5-Trichlorophenol	610000		170 U	NA	170 U	170 U	170 U	170 U	170 U
2,4,6-Trichlorophenol	6100		170 U	NA	170 U	170 U	170 U	170 U	170 U
2,4-Dichlorophenol	18000		170 U	NA	170 U	170 U	170 U	170 U	170 U
2,4-Dimethylphenol	120000		170 U	NA	170 U	170 U	170 U	170 U	170 U
2,4-Dinitrophenol	12000		330 U	NA	330 R	330 U	330 U	330 U	330 U
2,4-Dinitrotoluene	1600		170 U	NA	170 U	170 U	170 U	170 U	170 U
2,6-Dinitrotoluene	6100		170 U	NA	170 U	170 U	170 U	170 U	170 U
2-Chloronaphthalene	630000		170 U	NA	170 U	170 U	170 U	170 U	170 U
2-Chlorophenol	39000		170 U	NA	170 U	170 U	170 U	170 U	170 U
2-Methylnaphthalene	31000		170 U	NA	170 U	170 U	170 U	170 U	170 U
2-Methylphenol	310000		170 U	NA	170 U	170 U	170 U	170 U	170 U
2-Nitroaniline	61000		330 U	NA	330 R	330 U	330 U	330 U	330 U
2-Nitrophenol	NV		170 U	NA	170 U	170 U	170 U	170 U	170 U
3,3'-Dichlorobenzidine	1100		170 U	NA	170 U	170 U	170 U	170 U	170 U
3,5,5-Trimethyl-2-Cyclohexene-1-One	510000		170 U	NA	170 U	170 U	170 U	170 U	170 U
3-Nitroaniline	NV		330 U	NA	330 R	330 U	330 U	330 U	330 U
4,6-Dinitro-2-Methylphenol	490		330 U	NA	330 U	330 U	330 U	330 U	330 U
4-Bromophenyl Phenyl Ether	NV		170 U	NA	170 U	170 U	170 U	170 U	170 U
4-Chloro-3-methylphenol	610000		170 U	NA	170 U	170 U	170 U	170 U	170 U
4-Chlorophenyl Phenyl Ether	NV		170 U	NA	170 U	170 U	170 U	170 U	170 U
4-Methylphenol	31000		170 U	NA	170 U	170 U	170 U	170 U	170 U
4-Nitrophenol	NV		330 U	NA	330 R	330 U	330 U	330 U	330 U
Acenaphthene	340000		170 U	NA	170 U	170 U	170 U	170 U	170 U
Acenaphthylene	NV		170 U	NA	170 U	170 U	170 U	170 U	170 U
Acetophenone	780000		170 U	NA	170 U	170 U	170 U	170 U	170 U
Anthracene	1700000		170 U	NA	170 U	72 J	170 U	170 U	170 U
Atrazine	2100		170 U	NA	170 U	170 U	170 U	170 U	170 U
Benzaldehyde	780000		170 U	NA	170 U	170 U	170 U	170 U	170 U
Benzo(a)anthracene	150		120 J	NA	220	480	220	170 U	160 J
Benzo(a)pyrene	15		130 J	NA	250	560	230	170 U	170 J
Benzo(b)fluoranthene	150		150 J	NA	260	450	210	170 U	130 J
Benzo(g,h,i)perylene[4]	170000		79 J	NA	140 J	450	170 J	170 U	140 J
Benzo(k)fluoranthene	1500		110 J	NA	170 J	490	180 J	170 U	150 J
Benzyl Butyl Phthalate	260000		170 U	NA	170 U	170 U	170 U	170 U	170 U
Bis(2-Chloroethoxy)Methane	18000		170 U	NA	170 U	170 U	170 U	170 U	170 U
Bis(2-Chloroethyl)Ether	210		170 U	NA	170 U	170 U	170 U	170 U	170 U
Bis(2-Ethylhexyl)Phthalate	35000		410 B	NA	540 B	480 B	65 B	170 U	170 U
Caprolactam	3100000		170 U	NA	170 U	170 U	170 U	170 U	170 U
Carbazole	NV		170 U	NA	170 U	170 U	170 U	170 U	170 U
Chlorophenols	180000		170 U	NA	170 U	170 U	170 U	170 U	170 U
Dibenzo(a,h)anthracene	15		170 U	NA	170 U	150 J	63 J	170 U	170 U

Appendix F
Soil Analytical Results
BoRit Asbestos Superfund Site, OU1
Phase 2 Remedial Investigation

Analyte	RSL	Location	AP-SL-SS01				AP-SL-SS02		
		Sample Name	APSL-SS01-A	APSL-SS01D-A	APSL-SS01-B	APSL-SS01-C	APSL-SS02-A	APSL-SS02-B	APSL-SS02-C
		Sample Date	10/7/10				10/7/10		
		QC Type	Field Dup. of APSL-SS01D-A	Field Dup. of APSL-SS01-A	----	----	----	----	----
Semi-Volatile Organic Compounds (µg/kg)									
Dibenzofuran	7800		170 U	NA	170 U	170 U	170 U	170 U	170 U
Diethyl Phthalate	4900000		170 U	NA	170 U	170 U	170 U	170 U	170 U
Dimethyl Phthalate	NV		170 U	NA	170 U	170 U	170 U	170 U	170 U
Di-n-butylphthalate	610000		170 U	NA	170 U	170 U	170 U	170 U	170 U
Di-n-octylphthalate	NV		170 U	NA	170 U	170 U	170 U	170 U	170 U
Fluoranthene	230000		180 J	NA	370	740	390	110 J	360
Fluorene	230000		170 U	NA	170 U	170 U	170 U	170 U	170 U
Hexachloro-1,3-Butadiene	6100		170 U	NA	170 U	170 U	170 U	170 U	170 U
Hexachlorobenzene	300		170 U	NA	170 U	170 U	170 U	170 U	170 U
Hexachlorocyclopentadiene	37000		170 U	NA	170 U	170 U	170 U	170 U	170 U
Hexachloroethane	4300		170 U	NA	170 U	170 U	170 U	170 U	170 U
Indeno(1,2,3-cd)pyrene	150		84 J	NA	160 J	400	140 J	170 U	110 J
Naphthalene	3600		170 U	NA	170 U	170 U	170 U	170 U	170 U
Nitrobenzene	4800		170 U	NA	170 U	170 U	170 U	170 U	170 U
N-Nitroso-di-n-propylamine	69		170 U	NA	170 U	170 U	170 U	170 U	170 U
n-Nitrosodiphenylamine	99000		170 U	NA	170 U	170 U	170 U	170 U	170 U
p-Chloroaniline	2400		170 U	NA	170 U	170 U	170 U	170 U	170 U
Pentachlorophenol	890		330 U	NA	330 U	330 U	330 U	330 U	330 U
Phenanthrene[4]	170000		170 U	NA	150 J	250	210	170 U	210
Phenol	1800000		170 U	NA	170 U	170 U	170 U	170 U	170 U
p-Nitroaniline	24000		330 U	NA	330 R	330 U	330 U	330 U	330 U
Pyrene	170000		140 J	NA	290	650	360	120 J	300
Dioxins and Furans (pg/g)									
1,2,3,4,6,7,8-Heptachlorodibenzo-P-Dioxin	NV		53.3	NA	240	52.8	116	97	346
1,2,3,4,7,8-Hexachlorodibenzo-P-Dioxin	NV		0.74 J	NA	2.97 J	5.00 U	0.64 J	0.69 J	5.00 U
1,2,3,6,7,8-Hexachlorodibenzo-P-Dioxin	NV		1.49 J	NA	3.93 J	5.00 U	1.89 J	3.12 J	6.54
1,2,3,7,8,9-Hexachlorodibenzo-P-Dioxin	NV		2.25 J	NA	8.7 J	2.24 J	2.33 J	3.09 J	15.5 J
1,2,3,7,8-Pentachlorodibenzofuran	NV		0.25 J	NA	5.00 U	0.25 B	0.36 J	0.42 J	5.00 U
1,2,3,7,8-Pentachlorodibenzo-P-Dioxin	NV		0.42 J	NA	1.6 J	0.51 J	0.38 J	0.45 J	0.96 J
1,2,3,4,6,7,8,9-OCDD	NV		2590	NA	14000	4110	23800	14500	12900
1,2,3,4,6,7,8,9-OCDF	NV		19	NA	19.5	15.4	13.3	33.5	24.1 J
1,2,3,4,6,7,8-HpCDF	NV		9.59	NA	6.66	6.7	44.3	100	67.4
1,2,3,4,7,8,9-HpCDF	NV		0.62 J	NA	5.00 U	5.00 U	0.61 J	0.96 J	5.00 U
1,2,3,4,7,8-HxCDF	NV		0.89 J	NA	1.03 J	1.1 J	1.46 J	2.61 J	3.27 J
1,2,3,6,7,8-HxCDF	NV		0.61 J	NA	5.00 U	0.68 J	1.07 J	1.97 J	5.00 U
1,2,3,7,8,9-HxCDF	NV		5.00 U	NA	5.00 U	5.00 U	0.05 J	5.00 U	5.00 U
2,3,7,8-Tetrachlorodibenzofuran	NV		0.62 J	NA	0.73 J	0.57 J	0.51 J	0.75 J	0.55 J
2,3,4,6,7,8-HxCDF	NV		0.92 J	NA	0.59 J	1.01 J	1.57 J	2.7 J	2.79 J
2,3,4,7,8-PeCDF	NV		0.43 J	NA	5.00 U	5.00 U	0.49 J	0.8 J	0.93 J
2,3,7,8-TCDD	NV		1.00 U	NA	0.41 J	1.00 U	1.00 U	0.37 J	1.00 U
Total TEQ	4.5		2.7263	NA	10.47745	2.90262	10.24359	8.90525	12.11523
Inorganics (mg/kg)									
Aluminum	7700		15400	15600	19200	22600	20900	17500	18200
Antimony	3.1		1.9 J	1.9 J	1.5 J	1.7 J	2.4 J	2.1 J	2.4 J
Arsenic	0.39		4.6	2.7	3.7	3.5	5.2	5.9	6.4
Barium	1500		112	111	88.5	103	91.6	97	108
Beryllium	16		0.98	1.1	0.64	0.71	0.53 J	0.43 J	0.69
Cadmium	7		0.31 J	0.42 J	0.32 J	0.27 J	0.21 J	0.25 J	0.28 J
Calcium	NV		24900	35200	6850	18700	2930	2720	13800
Chromium[5]	0.29		37.2 K	37.6 K	22.3 K	25.7 K	29.3 K	26.5 K	29.8 K
Cobalt	2.3		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Copper	310		36	30.4	20.3	23.1	21.2	26.3	25.2
Iron	5500		26400 J	27300 J	17700	15700	25000 J	24000 J	28400 J
Lead	400		1 R	1 R	1 R	17.5 L	1 R	1 R	1 R
Magnesium	NV		12600	17300	3930	5210	4030	3730	5220
Manganese	180		659 J	656 J	430 J	364 J	341 J	385 J	336 J
Nickel	150		31.5	33.5	18.2	28	24.3	24.9	32.9
Potassium	NV		4640	5860	1440	1530	2150	2120	2420
Selenium	39		3.5 UL	3.5 UL	3.5 UL	3.5 UL	3.5 UL	3.5 UL	3.5 UL
Silver	39		1 UL	1 UL	1 UL	1 UL	1 UL	1 UL	1 UL
Sodium	NV		220 J	290 J	500 U	196 J	500 U	500 U	500 U
Thallium	0.078		3.1	2.8 B	2.4 B	1.4 B	2.7 B	2.7 B	3.1 B
Vanadium	NV		38.6	38	25.8	23.2	38	32.4	36.6
Zinc	2300		122	176	366	117	226	110	86.8

Notes:
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
pg/g = picograms per gram
AP = Asbestos Pile parcel
dup. = duplicate
FT = fire training area
NA = Not Analyzed
NV = No screening value available.
SL = former slag pile
RSL = Regional Screening Level (EPA Region 3 Risk Based Concentration Values for Residential Soil (November 2011)
1. No RSL available for this compound; Chlordane RSL used as surrogate.
2 No RSL available for this compound; Endosulfan RSL used as surrogate.
3. No RSL available for this compound; Endrin RSL used as surrogate.
4. No RSL available for this compound; pyrene RSL used as surrogate.
5. No RSL available for this compound; chromium (VI) used as surrogate.
B = Not detected substantially above the level reported in laboratory or field blanks.
J = Analyte present. Reported value may not accurate or precise.
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
R = Unusable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
UL = Not detected, quantitation limit is probably higher.

Appendix F
Soil Asbestos Results
BoRit Asbestos Superfund Site, OU1
Phase 2 Remedial Investigation

Analyte	Unit	SL	Location	AP-ABS01	AP-ABS02	AP-ABS03	AP-SL-SS01			AP-SL-SS02			AP-SS01	CK-SS01	CK-SS01	CK-SS02	CK-SS03	CK-SS04	CK-SS05	CK-SB07
			Sample Name	AP-ABSS01-A	AP-ABSS02-A	AP-ABSS03-A	APSL-SS01-A	APSL-SS01-B	APSL-SS01-C	APSL-SS02-A	APSL-SS02-B	APSL-SS02-C	APSS-01	CKSS-01	PK-ABSS07-A	CKSS-02	CKSS-03	CKSS-04	CKSS-05	PK-ABSS01-A
			Sample Date	7/6/11	7/6/11	7/11/11	10/7/10	10/7/10	10/7/10	10/7/10	10/7/10	10/7/10	8/17/10	8/17/10	10/19/10	8/17/10	8/17/10	8/17/10	8/17/10	10/19/10
Asbestos																				
Asbestos	%	1		2.2	3.5	1.3	<0.1	<0.1	0.8	<0.1	0.2	0.5	<0.25	0.2	<0.1	<0.25	<0.25	<0.25	<0.25	<0.1

Analyte	Unit	SL	Location	KP-SS01	KP-SS02	MW01	MW02	MW03	MW04	MW05	MW06	OW-ABS01	PK-SB06	PK-SB06	PK-SB08	PK-SB08	PK-SB10	PK-SB10	PK-SB12	PK-SB40
			Sample Name	KPSS-01A	KPSS-02A	PKMW01-SB12-12.25	PKMW02-SB22-22.25	RVMW03-SB2.25-2.5	APMW04-SB16-16.25	APMW05-SB18.5-18.75	APMW06-SB9.75-10	OW-ABSS01-A	PKSB-06	PK-ABSS03-A	PKSB-08	PK-ABSS04-A	PKSB-10	PK-ABSS05-A	PKSB-12	PKSB-40
			Sample Date	10/4/10	10/4/10	10/20/10	10/21/10	10/22/10	10/27/10	10/27/10	11/1/10	7/15/11	8/17/10	10/19/10	8/17/10	10/19/10	8/17/10	10/18/10	8/17/10	8/17/10
Asbestos																				
Asbestos	%	1		<0.1	<0.1	<0.1	<0.1	1.5	<0.1	<0.1	<0.1	<0.1	1.5	<0.1	1.1	<0.1	0.7	<0.1	<0.25	0.9

Analyte	Unit	SL	Location	PK-SB40	PK-SB29	PK-SS01	PK-SS01	PK-SS02	RS-01	RS-02	RS-03	RS-04	RS-05	RS-06	RS-ABS02	RS-07	RS-08	RV-ABS01	RV-SS01	WT-ABS01
			Sample Name	PK-ABSS06-A	PKSB-29	PKSS-01	PK-ABSS02-A	PKSS-02	RS01-ABSS-A	RS02-ABSS-A	RS03-ABSS-A	RS04-ABSS-A	RS05-ABSS-A	RS06-ABSS-A	RS07-ABSS2-A	RS07-ABSS-A	RS08-ABSS-A	RV-ABSS01-A	RVSS-01	WT-ABSS01-A
			Sample Date	10/19/10	8/17/10	8/17/10	10/19/10	8/17/10	10/13/10	10/13/10	10/13/10	10/13/10	10/13/10	10/13/10	7/14/11	10/13/10	10/13/10	7/15/11	8/17/10	7/13/11
Asbestos																				
Asbestos	%	1		<0.1	<0.25	1.2	<0.1	0.4	<0.1	<0.1	<0.1	0.6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.8	0.3

Notes:
AP = Asbestos Pile parcel
CK = Creek
KP = Kid's Park
PK = Park parcel
RS = residential
RV = Reservoir parcel
SL = screening level (value provided in the Framework for Investigating Asbestos-Contaminated Superfund Sites (September 2008))
Soil sample collected at MW-04 (APMW04-SB16-16.25) was mislabeled in the field. It should have been labeled RVMW04-SB16-16.25.
Grab samples were collected in August 2010 to determine ABS locations.
30 point composite samples were collected across the entire designated sampling area.

Appendix F
Personal and Perimeter Air Results
BoRit Asbestos Superfund Site, OU1
Phase 2 Remedial Investigation

Analyte	Unit	SL	Location	GT-04	GT-05	GT-06	GT-06	GT-06	GT-06	GT-06	GT-07	GT-07	GT-07
			Sample Name	APGT04-PE-TWA01	APGT05-PE-EXC01	APGT06-PA-HED1	APGT06-PA-HND1	APGT06-PA-HSD1	APGT06-PA-HWD1	APGT06-PE-TWA01	APGT07-PA-HED1	APGT07-PA-HED2	APGT07-PA-HND1
			Sample Date	11/8/10	11/8/10	11/10/10	11/10/10	11/10/10	11/10/10	11/10/10	11/9/10	11/10/10	11/9/10
			Sample Information	8-Hour Time Weighted Average - Day 1 at GT-04	30 Min Excursion - Day 1 at GT-05	High Volume Perimeter Air (East) - Day 1 at GT-6	High Volume Perimeter Air (North) - Day 1 at GT-06	High Volume Perimeter Air (South) - Day 1 at GT-06	High Volume Perimeter Air (West) - Day 1 at GT-06	8-Hour Time Weighted Average - Day 1 at GT06	High Volume Perimeter Air (East) - Day 1 at GT-07	High Volume Perimeter Air (East) - Day 2 at GT-07	High Volume Perimeter Air (North) - Day 1 at GT-07
Asbestos	f/cc	1		NA	<0.039	<0.005	<0.005	<0.005	<0.005	NA	<0.014	<0.014	<0.015
		0.1		0.017	NA	NA	NA	NA	NA	0.023	NA	NA	NA

Analyte	Unit	SL	Location	GT-07	GT-07	GT-07	GT-07	GT-07	GT-07	GT-07	GT-07	GT-08	GT-09
			Sample Name	APGT07-PA-HND2	APGT07-PA-HSD1	APGT07-PA-HSD2	APGT07-PA-HWD1	APGT07-PA-HWD2	APGT07-PE-EXC02	APGT07-PE-TWA01	APGT07-PE-TWA02	APGT08-PE-TWA01	APGT09-PE-EXC01
			Sample Date	11/10/10	11/9/10	11/10/10	11/9/10	11/10/10	11/10/10	11/9/10	11/10/10	11/9/10	11/9/10
			Sample Information	High Volume Perimeter Air (North) - Day 2 at GT-07	High Volume Perimeter Air (South) - Day 1 at GT-07	High Volume Perimeter Air (South) - Day 2 at GT-07	High Volume Perimeter Air (West) - Day 1 at GT-07	High Volume Perimeter Air (West) - Day 2 at GT-07	30 Min Excursion - Day 2 at GT-7	8-Hour Time Weighted Average - Day 1 at GT-07	8-Hour Time Weighted Average - Day 2 at GT-07	8-Hour Time Weighted Average - Day 1 at GT-08	30 Min Excursion - Day 1 at APGT09
Asbestos	f/cc	1		<0.014	<0.014	<0.014	<0.013	<0.014	<0.040	NA	NA	NA	<0.039
		0.1		NA	NA	NA	NA	NA	NA	0.038	0.15	<0.009	NA

Analyte	Unit	SL	Location	GT-09	MW04	MW04	MW04	MW05	MW05	MW05	MW05	MW05	MW05
			Sample Name	APGT09-PE-TWA01	APMW04-PE-EXC02	APMW04-PE-TWA01	APMW04-PE-TWA02	APMW05-PA-HED1	APMW05-PA-HED2	APMW05-PA-HND1	APMW05-PA-HND2	APMW05-PA-HSD1	APMW05-PA-HSD2
			Sample Date	11/9/10	11/1/10	10/27/10	11/1/10	10/27/10	10/28/10	10/27/10	10/28/10	10/27/10	10/28/10
			Sample Information	8-Hour Time Weighted Average - Day 1 at APGT-09	30 Minute Excursion - Day 1 at MW-04	8 Hour Time Weighted Average - Day 1 at MW-04	8 Hour Time Weighted Average - Day 2 at MW-04	High Volume Perimeter Air (East) - Day 1 at MW-05	High Volume Perimeter Air (East) - Day 2 at MW-05	High Volume Perimeter Air (North) - Day 1 at MW-05	High Volume Perimeter Air (North) - Day 2 at MW-05	High Volume Perimeter Air (South) - Day 1 at MW-05	High Volume Perimeter Air (South) - Day 2 at MW-05
Asbestos	f/cc	1		NA	<0.044	NA	NA	<0.009	<0.008	<0.009	<0.008	<0.009	0.009
		0.1		<0.023	NA	<0.009	NR	NA	NA	NA	NA	NA	NA

Analyte	Unit	SL	Location	MW05	MW05	MW05	MW05	MW05	MW05	MW05	MW06	MW06	MW06
			Sample Name	APMW05-PA-HWD1	APMW05-PA-HWD2	APMW05-PE-EXC01	APMW05-PE-EXC03	APMW05-PE-TWA01	APMW05-PE-TWA02	APMW05-PE-TWA03	APMW06-PE-EXC03	APMW06-PE-TWA01	APMW06-PE-TWA02
			Sample Date	10/27/10	10/28/10	10/27/10	10/29/10	10/27/10	10/28/10	10/29/10	11/3/10	11/1/10	11/2/10
			Sample Information	High Volume Perimeter Air (West) - Day 1 at MW-05	High Volume Perimeter Air (West) - Day 2 at MW-05	30 Minute Excursion - Day 1 at MW-05	30 Minute Excursion - Day 3 at MW-05	8 Hour Time Weighted Average - Day 1 at MW-05	8 Hour Time Weighted Average - Day 2 at MW-05	8 Hour Time Weighted Average - Day 3 at MW-05	30 Minute Excursion - Day 3 at MW-06	8 Hour Time Weighted Average - Day 1 at MW-06	8 Hour Time Weighted Average - Day 2 at MW-06
Asbestos	f/cc	1		<0.009	<0.008	<0.044	<0.044	NA	NA	NA	<0.044	NA	NA
		0.1		NA	NA	NA	NA	<0.019	NR	<0.010	NA	<0.014	<0.011

Analyte	Unit	SL	Location	MW06	MW01	MW01	MW01	MW01	MW01	MW01	MW01	MW01	MW01
			Sample Name	APMW06-PE-TWA03	PKMW01-PA-HED1	PKMW01-PA-HND1	PKMW01-PA-HSD1	PKMW01-PA-HWD1	PKMW01-PE-EXC01	PKMW01-PE-EXC02	PKMW01-PE-TWA01	PKMW01-PE-TWA02	PKMW01-PE-TWA03
			Sample Date	11/3/10	10/20/10	10/20/10	10/20/10	10/20/10	10/20/10	10/21/10	10/20/10	10/21/10	10/26/10
			Sample Information	8 Hour Time Weighted Average - Day 3 at MW-06	High Volume Perimeter Air (East) - Day 1 at MW-01	High Volume Perimeter Air (North) - Day 1 at MW-01	High Volume Perimeter Air (South) - Day 1 at MW-01	High Volume Perimeter Air (West) - Day 1 at MW-01	30 Minute Excursion - Day 1 at MW-01	30 Minute Excursion - Day 2 at MW-01	8 Hour Time Weighted Average - Day 1 at MW-01	8 Hour Time Weighted Average - Day 2 at MW-01	8 Hour Time Weighted Average - Day 3 at MW-01
Asbestos	f/cc	1		NA	<0.010	<0.010	<0.011	<0.009	<0.044	<0.044	<0.028	NA	NA
		0.1		<0.021	NA	NA	NA	NA	NA	NA	NA	<0.013	NR

Analyte	Unit	SL	Location	MW01	MW01	MW02	MW02	MW02	MW02	MW02	MW02	MW02	MW02
			Sample Name	PKMW01-PE-TWA04-1	PKMW01-PE-TWA04-2	PKMW02-PA-HED1	PKMW02-PA-HND1	PKMW02-PA-HSD1	PKMW02-PA-HWD1	PKMW02-PE-EXC02	PKMW02-PE-EXC04	PKMW02-PE-TWA01	PKMW02-PE-TWA02
			Sample Date	11/11/10	11/11/10	10/21/10	10/21/10	10/21/10	10/21/10	10/22/10	10/26/10	10/21/10	10/22/10
			Sample Information	8-Hour Time Weighted Average - Day 1 at MW-01	8-Hour Time Weighted Average - Day 2 at MW-01	High Volume Perimeter Air (East) - Day 1 at MW-02	High Volume Perimeter Air (North) - Day 1 at MW-02	High Volume Perimeter Air (South) - Day 1 at MW-02	High Volume Perimeter Air (West) - Day 1 at MW-02	30 Minute Excursion - Day 2 at MW-02	8 Hour Time Weighted Average - Day 4 at MW-02	8 Hour Time Weighted Average - Day 1 at MW-02	8 Hour Time Weighted Average - Day 2 at MW-02
Asbestos	f/cc	1		NA	NA	<0.010	<0.009	<0.009	<0.009	<0.044	<0.044	NA	NA
		0.1		<0.007	<0.015	NA	NA	NA	NA	NA	NA	<0.015	<0.009

Analyte	Unit	SL	Location	MW02	MW02	MW03	MW03	MW03	MW04	MW03	MW03	MW03	MW03
			Sample Name	PKMW02-PE-TWA03	PKMW02-PE-TWA04	PKMW03-PE-EXC02	PKMW03-PE-TWA01	PKMW03-PE-TWA02	PKMW04-PE-EXC04	RVMW03-PA-HED1	RVMW03-PA-HED2	RVMW03-PA-HND1	RVMW03-PA-HND2
			Sample Date	10/25/10	10/26/10	10/25/10	10/22/10	10/25/10	11/11/10	10/22/10	10/25/10	10/22/10	10/25/10
			Sample Information	8 Hour Time Weighted Average - Day 3 at MW-02	30 Minute Excursion - Day 4 at MW-02	30 Minute Excursion - Day 2 at MW-03	8 Hour Time Weighted Average - Day 1 at MW-03	8 Hour Time Weighted Average - Day 2 at MW-03	30 Min Excursion - Day 1 at MW-04	High Volume Perimeter Air (East) - Day 1 at MW-03	High Volume Perimeter Air (East) - Day 2 at MW-03	High Volume Perimeter Air (North) - Day 1 at MW-03	High Volume Perimeter Air (North) - Day 2 at MW-03
Asbestos	f/cc	1		NA	<0.014	<0.044	NA	NA	<0.039	<0.026	<0.006	<0.026	<0.006
		0.1		<0.022	NA	NA	0.051	<0.013	NA	NA	NA	NA	NA

Analyte	Unit	SL	Location	MW03	MW03	MW03	MW03	MW03	MW03	MW04	MW04
			Sample Name	RVMW03-PA-HSD1	RVMW03-PA-HSD2	RVMW03-PA-HWD1	RVMW03-PA-HWD2	RVMW03-PE-EXC03	RVMW03-PE-TWA03	RVMW04-PE-EXC03	RVMW04-PE-TWA03
			Sample Date	10/22/10	10/25/10	10/22/10	10/25/10	10/28/10	10/28/10	11/2/10	11/2/10
			Sample Information	High Volume Perimeter Air (South) - Day 1 at MW-03	High Volume Perimeter Air (South) - Day 2 at MW-03	High Volume Perimeter Air (West) - Day 1 at MW-03	High Volume Perimeter Air (West) - Day 2 at MW-03	30 Minute Excursion - Day 3 at MW-03	8 Hour Time Weighted Average - Day 3 at MW-03	30 Minute Excursion - Day 3 at MW-04	8 Hour Time Weighted Average - Day 3 at MW-04
Asbestos	f/cc	1		<0.026	<0.006	<0.023	<0.006	<0.044	NA	<0.034	NA
		0.1		NA	NA	NA	NA	NA	<0.019	NA	<0.006

Notes:
Personal air samples were collected during drilling activities.
Perimeter air samples were collected during drilling activities, immediately adjacent to the drilling area.
Air sample collected at MW-04 (PKMW04-PE-EXC04) was mislabeled in the field. It should have been labeled RVMW04-PE-EXC04.
f/cc = fibers per cubic centimeter
NR = No result. Sample was considered overloaded and was not reanalyzed
NA = Not analyzed
OSHA PEL = 0.1 fibers/cc
OSHA STEL = 1.0 fibers/cc
PEL = Permissible Exposure Limit
STEL = Short Term Exposure Limit

CDM Smith

Appendix F
Ambient Air Asbestos Results
BoRit Asbestos Superfund Site, OU1
Phase 2 Remedial Investigation

Analyte	Unit	SL	Location	Location 1													
			Sample Name	CM01-AA-HD1	CM01-AA-HD10	CM01-AA-HD11	CM01-AA-HD12	CM01-AA-HD13	CM01-AA-HD14	CM01-AA-HD2	CM01-AA-HD3	CM01-AA-HD4	CM01-AA-HD5	CM01-AA-HD6	CM01-AA-HD7	CM01-AA-HD8	CM01-AA-HD9
			Sample Date	11/14/10	8/13/11	9/1/11	9/13/11	10/9/11	10/23/11	12/15/10	1/15/11	2/15/11	3/18/11	4/27/11	5/13/11	6/20/11	7/21/11
PCME Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Amosite (AM)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Anthophyllite (AN)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Crocidolite (CR)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Libby amphibole (LA)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Other amphibole (OA)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Other mineral class (OM)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Solid Soln: Amosite	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Solid Soln: Trem-Act	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Total Amphibole	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Total Asbestos	s/cc	0.04		<0.00038	<0.00038	<0.00039	0.00117	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Total Chrysotile (CH)	s/cc	NV		<0.00038	<0.00038	<0.00039	0.00117	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Tremolite (TR)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
TEM-EPASM Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Amosite (AM)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Anthophyllite (AN)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Crocidolite (CR)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Libby amphibole (LA)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Other amphibole (OA)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Other mineral class (OM)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Solid Soln: Amosite	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Solid Soln: Trem-Act	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Total Amphibole	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Total Asbestos	s/cc	NV		<0.00038	<0.00038	<0.00039	0.0137	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	0.00077
Total Chrysotile (CH)	s/cc	NV		<0.00038	<0.00038	<0.00039	0.0137	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	0.00077
Tremolite (TR)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
AHERA Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Amosite (AM)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Anthophyllite (AN)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Crocidolite (CR)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Libby amphibole (LA)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Other amphibole (OA)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Other mineral class (OM)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Solid Soln: Amosite	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Solid Soln: Trem-Act	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Total Amphibole	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Total Asbestos	s/cc	NV		<0.00038	<0.00038	<0.00039	0.01057	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	0.00077
Total Chrysotile (CH)	s/cc	NV		<0.00038	<0.00038	<0.00039	0.01057	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	0.00077
Tremolite (TR)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
BCPS (2003) Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Amosite (AM)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Anthophyllite (AN)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Crocidolite (CR)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Libby amphibole (LA)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Other amphibole (OA)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Other mineral class (OM)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Solid Soln: Amosite	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Solid Soln: Trem-Act	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Total Amphibole	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Total Asbestos	s/cc	NV		<0.00038	<0.00038	<0.00039	0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Total Chrysotile (CH)	s/cc	NV		<0.00038	<0.00038	<0.00039	0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038
Tremolite (TR)	s/cc	NV		<0.00038	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00041	<0.00035	<0.00038

Notes:
Residential screening value (0.04 s/cc) for PCME provided by EPA Work Assignment Manager in an email dated 10/27/2011.
AHERA = Asbestos Hazard Emergency Response Act
CM = commercial property
PCME = phase contract microscopy equivalents
s/cc = structures per cubic centimeter
SL = screening level
TEM - ISO = Transmission Electron Micrscopy International Standard Method 10312

Appendix F
Ambient Air Asbestos Results
BoRit Asbestos Superfund Site, OU1
Phase 2 Remedial Investigation

Analyte	Unit	SL	Location	Location 2													
			Sample Name	CM02-AA-HD1	CM02-AA-HD10	CM02-AA-HD11	CM02-AA-HD12	CM02-AA-HD13	CM02-AA-HD14	CM02-AA-HD2	CM02-AA-HD3	CM02-AA-HD4	CM02-AA-HD5	CM02-AA-HD6	CM02-AA-HD7	CM02-AA-HD8	CM02-AA-HD9
			Sample Date	11/14/10	8/12/11	9/1/11	9/13/11	10/9/11	10/23/11	12/15/10	1/15/11	2/15/11	3/18/11	4/27/11	5/13/11	6/20/11	7/21/11
PCME Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Amosite (AM)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Anthophyllite (AN)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Crocidolite (CR)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Libby amphibole (LA)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Other amphibole (OA)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Other mineral class (OM)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Solid Soln: Amosite	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Solid Soln: Trem-Act	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Total Amphibole	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Total Asbestos	s/cc	0.04		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Total Chrysotile (CH)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Tremolite (TR)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
TEM-EPASM Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Amosite (AM)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Anthophyllite (AN)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Crocidolite (CR)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Libby amphibole (LA)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Other amphibole (OA)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Other mineral class (OM)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Solid Soln: Amosite	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Solid Soln: Trem-Act	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Total Amphibole	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Total Asbestos	s/cc	NV		<0.00038	0.0008	<0.00039	<0.00038	<0.00038	0.0008	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	0.00203	<0.00038	<0.00037
Total Chrysotile (CH)	s/cc	NV		<0.00038	0.0008	<0.00039	<0.00038	<0.00038	0.0008	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	0.00203	<0.00038	<0.00037
Tremolite (TR)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
AHERA Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Amosite (AM)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Anthophyllite (AN)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Crocidolite (CR)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Libby amphibole (LA)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Other amphibole (OA)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Other mineral class (OM)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Solid Soln: Amosite	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Solid Soln: Trem-Act	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Total Amphibole	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Total Asbestos	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Total Chrysotile (CH)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Tremolite (TR)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
BCPS (2003) Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Amosite (AM)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Anthophyllite (AN)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Crocidolite (CR)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Libby amphibole (LA)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Other amphibole (OA)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Other mineral class (OM)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Solid Soln: Amosite	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Solid Soln: Trem-Act	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Total Amphibole	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Total Asbestos	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Total Chrysotile (CH)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037
Tremolite (TR)	s/cc	NV		<0.00038	<0.00040	<0.00039	<0.00038	<0.00038	<0.00040	<0.00038	<0.00039	<0.00039	<0.00038	<0.00039	<0.00041	<0.00038	<0.00037

Notes:
Residential screening value (0.04 s/cc) for PCME provided by EPA Wo
AHERA = Asbestos Hazard Emergency Response Act
CM = commercial property
PCME = phase contract microscopy equivalents
s/cc = structures per cubic centimeter
SL = screening level
TEM - ISO = Transmission Electron Micrscopy International Standard M

Appendix F
Ambient Air Asbestos Results
BoRit Asbestos Superfund Site, OU1
Phase 2 Remedial Investigation

Analyte	Unit	SL	Location	Location 3													
			Sample Name	CM03-AA-HD1	CM03-AA-HD10	CM03-AA-HD11	CM03-AA-HD12	CM03-AA-HD13	CM03-AA-HD14	CM03-AA-HD2	CM03-AA-HD3	CM03-AA-HD4	CM03-AA-HD5	CM03-AA-HD6	CM03-AA-HD7	CM03-AA-HD8	CM03-AA-HD9
			Sample Date	11/14/10	8/13/11	9/1/11	9/13/11	10/9/11	10/23/11	12/15/10	1/15/11	2/15/11	3/18/11	4/27/11	5/13/11	6/20/11	7/21/11
PCME Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Amosite (AM)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Anthophyllite (AN)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Crocidolite (CR)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Libby amphibole (LA)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Other amphibole (OA)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Other mineral class (OM)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Solid Soln: Amosite	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Solid Soln: Trem-Act	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Total Amphibole	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Total Asbestos	s/cc	0.04		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Total Chrysotile (CH)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Tremolite (TR)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
TEM-EPASM Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Amosite (AM)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Anthophyllite (AN)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Crocidolite (CR)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Libby amphibole (LA)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Other amphibole (OA)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Other mineral class (OM)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Solid Soln: Amosite	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Solid Soln: Trem-Act	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Total Amphibole	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Total Asbestos	s/cc	NV		<0.00038	0.00265	<0.00038	<0.00038	0.00037	<0.00039	<0.00039	<0.00040	<0.00038	0.00077	<0.00039	<0.00040	<0.00036	0.00192
Total Chrysotile (CH)	s/cc	NV		<0.00038	0.00265	<0.00038	<0.00038	0.00037	<0.00039	<0.00039	<0.00040	<0.00038	0.00077	<0.00039	<0.00040	<0.00036	0.00192
Tremolite (TR)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
AHERA Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Amosite (AM)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Anthophyllite (AN)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Crocidolite (CR)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Libby amphibole (LA)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Other amphibole (OA)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Other mineral class (OM)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Solid Soln: Amosite	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Solid Soln: Trem-Act	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Total Amphibole	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Total Asbestos	s/cc	NV		<0.00038	0.00113	<0.00038	<0.00038	0.00037	<0.00039	<0.00039	<0.00040	<0.00038	0.00077	<0.00039	<0.00040	<0.00036	0.00154
Total Chrysotile (CH)	s/cc	NV		<0.00038	0.00113	<0.00038	<0.00038	0.00037	<0.00039	<0.00039	<0.00040	<0.00038	0.00077	<0.00039	<0.00040	<0.00036	0.00154
Tremolite (TR)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
BCPS (2003) Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Amosite (AM)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Anthophyllite (AN)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Crocidolite (CR)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Libby amphibole (LA)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Other amphibole (OA)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Other mineral class (OM)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Solid Soln: Amosite	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Solid Soln: Trem-Act	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Total Amphibole	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038
Total Asbestos	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	0.00038
Total Chrysotile (CH)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	0.00038
Tremolite (TR)	s/cc	NV		<0.00038	<0.00038	<0.00038	<0.00038	<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00038	<0.00039	<0.00040	<0.00036	<0.00038

Notes:
Residential screening value (0.04 s/cc) for PCME provided by EPA Wo
AHERA = Asbestos Hazard Emergency Response Act
CM = commercial property
PCME = phase contract microscopy equivalents
s/cc = structures per cubic centimeter
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Appendix F
Ambient Air Asbestos Results
BoRit Asbestos Superfund Site, OU1
Phase 2 Remedial Investigation

Analyte	Unit	SL	Location	Location 4													
			Sample Name	CM04-AA-HD1	CM04-AA-HD10	CM04-AA-HD11	CM04-AA-HD12	CM04-AA-HD13	CM04-AA-HD14	CM04-AA-HD2	CM04-AA-HD3	CM04-AA-HD4	CM04-AA-HD5	CM04-AA-HD6	CM04-AA-HD7	CM04-AA-HD8	CM04-AA-HD9
			Sample Date	11/14/10	8/13/11	9/1/11	9/13/11	10/9/11	10/23/11	12/15/10	1/15/11	2/15/11	3/18/11	4/27/11	5/13/11	6/20/11	7/21/11
PCME Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Amosite (AM)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Anthophyllite (AN)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Crocidolite (CR)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Libby amphibole (LA)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Other amphibole (OA)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Other mineral class (OM)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Solid Soln: Amosite	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Solid Soln: Trem-Act	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Total Amphibole	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Total Asbestos	s/cc	0.04		<0.00040	0.00075	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Total Chrysotile (CH)	s/cc	NV		<0.00040	0.00075	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Tremolite (TR)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
TEM-EPASM Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Amosite (AM)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Anthophyllite (AN)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Crocidolite (CR)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Libby amphibole (LA)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Other amphibole (OA)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Other mineral class (OM)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Solid Soln: Amosite	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Solid Soln: Trem-Act	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Total Amphibole	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Total Asbestos	s/cc	NV		<0.00040	0.00338	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	0.00188
Total Chrysotile (CH)	s/cc	NV		<0.00040	0.00338	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	0.00188
Tremolite (TR)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
AHERA Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Amosite (AM)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Anthophyllite (AN)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Crocidolite (CR)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Libby amphibole (LA)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Other amphibole (OA)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Other mineral class (OM)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Solid Soln: Amosite	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Solid Soln: Trem-Act	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Total Amphibole	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Total Asbestos	s/cc	NV		<0.00040	0.00075	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	0.0015
Total Chrysotile (CH)	s/cc	NV		<0.00040	0.00075	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	0.0015
Tremolite (TR)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
BCPS (2003) Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Amosite (AM)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Anthophyllite (AN)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Crocidolite (CR)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Libby amphibole (LA)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Other amphibole (OA)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Other mineral class (OM)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Solid Soln: Amosite	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Solid Soln: Trem-Act	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Total Amphibole	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Total Asbestos	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Total Chrysotile (CH)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038
Tremolite (TR)	s/cc	NV		<0.00040	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00039	<0.00038	<0.00040	<0.00038	<0.00039	<0.00038	<0.00036	<0.00038

Notes:
Residential screening value (0.04 s/cc) for PCME provided by EPA Wo
AHERA = Asbestos Hazard Emergency Response Act
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BoRit Asbestos Superfund Site, OU1
Phase 2 Remedial Investigation

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			Sample Date	11/14/10	8/13/11	9/1/11	9/13/11	10/9/11	10/23/11	12/15/10	1/15/11	2/15/11	3/18/11	4/27/11	5/13/11	6/20/11	7/21/11
PCME Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Amosite (AM)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Anthophyllite (AN)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Crocidolite (CR)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Libby amphibole (LA)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Other amphibole (OA)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Other mineral class (OM)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Solid Soln: Amosite	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Solid Soln: Trem-Act	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Total Amphibole	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Total Asbestos	s/cc	0.04		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Total Chrysotile (CH)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Tremolite (TR)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
TEM-EPASM Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Amosite (AM)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Anthophyllite (AN)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Crocidolite (CR)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Libby amphibole (LA)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Other amphibole (OA)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Other mineral class (OM)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Solid Soln: Amosite	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Solid Soln: Trem-Act	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Total Amphibole	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Total Asbestos	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Total Chrysotile (CH)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Tremolite (TR)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
AHERA Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Amosite (AM)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Anthophyllite (AN)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Crocidolite (CR)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Libby amphibole (LA)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Other amphibole (OA)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Other mineral class (OM)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Solid Soln: Amosite	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Solid Soln: Trem-Act	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Total Amphibole	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Total Asbestos	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Total Chrysotile (CH)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Tremolite (TR)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
BCPS (2003) Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Amosite (AM)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Anthophyllite (AN)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Crocidolite (CR)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Libby amphibole (LA)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Other amphibole (OA)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Other mineral class (OM)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Solid Soln: Amosite	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Solid Soln: Trem-Act	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Total Amphibole	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Total Asbestos	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Total Chrysotile (CH)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039
Tremolite (TR)	s/cc	NV		<0.00037	<0.00039	<0.00039	<0.00040	<0.00038	<0.00039	<0.00040	<0.00038	<0.00040	<0.00040	<0.00040	<0.00039	<0.00036	<0.00039

Notes:
Residential screening value (0.04 s/cc) for PCME provided by EPA Wo
AHERA = Asbestos Hazard Emergency Response Act
CM = commercial property
PCME = phase contract microscopy equivalents
s/cc = structures per cubic centimeter
SL = screening level
TEM - ISO = Transmission Electron Micrscopy International Standard M

Appendix F
Ambient Air Asbestos Results
BoRit Asbestos Superfund Site, OU1
Phase 2 Remedial Investigation

Analyte	Unit	SL	Location	Location 6													
			Sample Name	CM06-AA-HD1	CM06-AA-HD10	CM06-AA-HD11	CM06-AA-HD12	CM06-AA-HD13	CM06-AA-HD14	CM06-AA-HD2	CM06-AA-HD3	CM06-AA-HD4	CM06-AA-HD5	CM06-AA-HD6	CM06-AA-HD7	CM06-AA-HD8	CM06-AA-HD9
			Sample Date	11/14/10	8/13/11	9/1/11	9/13/11	10/9/11	10/23/11	12/15/10	1/15/11	2/15/11	3/18/11	4/27/11	5/13/11	6/20/11	7/21/11
PCME Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Amosite (AM)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Anthophyllite (AN)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Crocidolite (CR)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Libby amphibole (LA)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Other amphibole (OA)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Other mineral class (OM)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Solid Soln: Amosite	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Solid Soln: Trem-Act	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Total Amphibole	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Total Asbestos	s/cc	0.04		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Total Chrysotile (CH)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Tremolite (TR)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
TEM-EPASM Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Amosite (AM)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Anthophyllite (AN)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Crocidolite (CR)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Libby amphibole (LA)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Other amphibole (OA)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Other mineral class (OM)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Solid Soln: Amosite	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Solid Soln: Trem-Act	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Total Amphibole	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Total Asbestos	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Total Chrysotile (CH)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Tremolite (TR)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
AHERA Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Amosite (AM)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Anthophyllite (AN)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Crocidolite (CR)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Libby amphibole (LA)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Other amphibole (OA)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Other mineral class (OM)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Solid Soln: Amosite	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Solid Soln: Trem-Act	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Total Amphibole	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Total Asbestos	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Total Chrysotile (CH)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Tremolite (TR)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
BCPS (2003) Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Amosite (AM)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Anthophyllite (AN)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Crocidolite (CR)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Libby amphibole (LA)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Other amphibole (OA)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Other mineral class (OM)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Solid Soln: Amosite	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Solid Soln: Trem-Act	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Total Amphibole	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Total Asbestos	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Total Chrysotile (CH)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038
Tremolite (TR)	s/cc	NV		<0.00038	<0.00039	<0.00038	<0.00038	<0.00039	<0.00040	<0.00039	<0.00038	<0.00038	<0.00038	<0.00039	<0.00040	<0.00038	<0.00038

Notes:
Residential screening value (0.04 s/cc) for PCME provided by EPA Wo
AHERA = Asbestos Hazard Emergency Response Act
CM = commercial property
PCME = phase contract microscopy equivalents
s/cc = structures per cubic centimeter
SL = screening level
TEM - ISO = Transmission Electron Micrscopy International Standard M

Appendix F
Ambient Air Asbestos Results
BoRit Asbestos Superfund Site, OU1
Phase 2 Remedial Investigation

Analyte	Unit	SL	Location	Location 7								Location 7B					
			Sample Name	CM07-AA-HD1	CM07-AA-HD2	CM07-AA-HD3	CM07-AA-HD4	CM07-AA-HD5	CM07-AA-HD6	CM07-AA-HD7	CM07-AA-HD8	CM07B-AA-HD10	CM07B-AA-HD11	CM07B-AA-HD12	CM07B-AA-HD13	CM07B-AA-HD14	CM07B-AA-HD9
			Sample Date	11/14/10	12/15/10	1/15/11	2/15/11	3/18/11	4/27/11	5/13/11	6/20/11	8/13/11	9/1/11	9/13/11	10/9/11	10/23/11	7/21/11
PCME Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Amosite (AM)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Anthophyllite (AN)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Crocidolite (CR)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Libby amphibole (LA)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Other amphibole (OA)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Other mineral class (OM)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Solid Soln: Amosite	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Solid Soln: Trem-Act	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Total Amphibole	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Total Asbestos	s/cc	0.04		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	0.00079	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Total Chrysotile (CH)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	0.00079	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Tremolite (TR)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
TEM-EPASM Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Amosite (AM)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Anthophyllite (AN)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Crocidolite (CR)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Libby amphibole (LA)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Other amphibole (OA)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Other mineral class (OM)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Solid Soln: Amosite	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Solid Soln: Trem-Act	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Total Amphibole	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Total Asbestos	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	0.00039	<0.00039	<0.00039	0.00254	0.02394	0.00079	<0.00037	0.00261	<0.00037	<0.00039
Total Chrysotile (CH)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	0.00039	<0.00039	<0.00039	0.00254	0.02394	0.00079	<0.00037	0.00261	<0.00037	<0.00039
Tremolite (TR)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
AHERA Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Amosite (AM)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Anthophyllite (AN)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Crocidolite (CR)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Libby amphibole (LA)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Other amphibole (OA)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Other mineral class (OM)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Solid Soln: Amosite	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Solid Soln: Trem-Act	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Total Amphibole	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Total Asbestos	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	0.00039	<0.00039	<0.00039	0.00145	0.02198	0.00079	<0.00037	0.00261	<0.00037	<0.00039
Total Chrysotile (CH)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	0.00039	<0.00039	<0.00039	0.00145	0.02198	0.00079	<0.00037	0.00261	<0.00037	<0.00039
Tremolite (TR)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
BCPS (2003) Analysis Method																	
Actinolite (AC)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Amosite (AM)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Anthophyllite (AN)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Crocidolite (CR)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Libby amphibole (LA)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Other amphibole (OA)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Other mineral class (OM)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Solid Soln: Amosite	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Solid Soln: Trem-Act	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Total Amphibole	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Total Asbestos	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	0.00079	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Total Chrysotile (CH)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	0.00079	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039
Tremolite (TR)	s/cc	NV		<0.00039	<0.00039	<0.00039	<0.00038	<0.00039	<0.00039	<0.00039	<0.00036	<0.00039	<0.00040	<0.00037	<0.00037	<0.00037	<0.00039

Notes:
Residential screening value (0.04 s/cc) for PCME provided by EPA Wo
AHERA = Asbestos Hazard Emergency Response Act
CM = commercial property
PCME = phase contract microscopy equivalents
s/cc = structures per cubic centimeter
SL = screening level
TEM - ISO = Transmission Electron Micrscopy International Standard M

Appendix F
ABS Asbestos Results
BoRit Asbestos Superfund Site, OU1
Phase 2 Remedial Investigation

Binning Category/ Asbestos Structure	Unit	SL	Location	AP-ABS01					AP-ABS02				
			Sample Name	AP01-ABRK01-CH	AP01-ABRK01-L	AP01-PA01-H	AP01-PA02-L	AP01-PA03-H	AP02-ABRK01-CH	AP02-ABRK01-H	AP02-PA01-H	AP02-PA02-H	AP02-PA03-H
			Sample Date	7/6/11	7/6/11	7/6/11	7/6/11	7/6/11	7/11/11	7/11/11	7/11/11	7/11/11	7/11/11
			Location Information	Asbestos Pile ABS Location 1	Asbestos Pile ABS Location 1	Asbestos Pile ABS Location 1	Asbestos Pile ABS Location 1	Asbestos Pile ABS Location 1	Asbestos Pile ABS Location 2	Asbestos Pile ABS Location 2	Asbestos Pile ABS Location 2	Asbestos Pile ABS Location 2	Asbestos Pile ABS Location 2
PCME													
Actinolite (AC)	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Amosite (AM)	s/cc	NV		<0.00272	0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	0.01157	<0.01511
Anthophyllite (AN)	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Crocidolite (CR)	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Libby amphibole (LA)	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Other amphibole (OA)	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Other mineral class (OM)	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Solid Soln: Amosite	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Solid Soln: Trem-Act	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Total Amphibole	s/cc	NV		<0.00272	0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	0.01157	<0.01511
Total Asbestos	s/cc	0.04		0.04085	0.05804	0.01595	0.04051	0.03204	0.04013	0.09642	<0.01157	0.02314	0.03022
Total Chrysotile (CH)	s/cc	NV		0.04085	0.02902	0.01595	0.04051	0.03204	0.04013	0.09642	<0.01157	0.01157	0.03022
Tremolite (TR)	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Total TEM-ISO													
Actinolite (AC)	s/cc	NV		<0.00272	<0.02902	<0.00159	0.0162	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Amosite (AM)	s/cc	NV		<0.00272	0.02902	0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	0.01157	<0.01511
Anthophyllite (AN)	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Crocidolite (CR)	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	0.01808	<0.01157	<0.01157	<0.01511
Libby amphibole (LA)	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Other amphibole (OA)	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Other mineral class (OM)	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Solid Soln: Amosite	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Solid Soln: Trem-Act	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Total Amphibole	s/cc	NV		<0.00272	0.02902	0.00159	0.0162	<0.00291	<0.04013	0.01808	<0.01157	0.01157	<0.01511
Total Asbestos	s/cc	NV		0.47658	4.44029	0.26788	1.53125	0.48063	5.89951	1.23536	1.57331	1.4692	2.03983
Total Chrysotile (CH)	s/cc	NV		0.47658	4.41127	0.26628	1.51504	0.48063	5.89951	1.21728	1.57331	1.45763	2.03983
Tremolite (TR)	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
AHERA													
Actinolite (AC)	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Amosite (AM)	s/cc	NV		<0.00272	<0.02902	0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	0.01157	<0.01511
Anthophyllite (AN)	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Crocidolite (CR)	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	0.00603	<0.01157	<0.01157	<0.01511
Libby amphibole (LA)	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Other amphibole (OA)	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Other mineral class (OM)	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Solid Soln: Amosite	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Solid Soln: Trem-Act	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Total Amphibole	s/cc	NV		<0.00272	0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	0.01157	<0.01511
Total Asbestos	s/cc	NV		0.27778	2.90215	0.16423	0.83449	0.2942	4.97645	0.65083	1.15685	1.16841	1.72252
Total Chrysotile (CH)	s/cc	NV		0.27778	2.90215	0.16264	0.83449	0.2942	4.97645	0.6448	1.15685	1.15685	1.72252
Tremolite (TR)	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Berman Crump													
Actinolite (AC)	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Amosite (AM)	s/cc	NV		<0.00272	0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	0.01157	<0.01511
Anthophyllite (AN)	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Crocidolite (CR)	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Libby amphibole (LA)	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Other amphibole (OA)	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Other mineral class (OM)	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Solid Soln: Amosite	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Solid Soln: Trem-Act	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511
Total Amphibole	s/cc	NV		<0.00272	0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	0.01157	<0.01511
Total Asbestos	s/cc	NV		0.01362	0.08706	0.00797	0.0162	0.01748	<0.04013	0.03013	0.01157	0.06941	0.06044
Total Chrysotile (CH)	s/cc	NV		0.01362	0.05804	0.00797	0.0162	0.01748	<0.04013	0.03013	0.01157	0.05784	0.06044
Tremolite (TR)	s/cc	NV		<0.00272	<0.02902	<0.00159	<0.00810	<0.00291	<0.04013	<0.00603	<0.01157	<0.01157	<0.01511

Notes:
NV = No screening value
s/cc = structures per cubic centimeter
Residential screening value provided by EPA Work Assignment Manager in an email dated 10/27/2011
AHERA = Asbestos Hazard Emergency Response Act
PCME = phase contrast microscopy equivalents
TEM - ISO = Transmission Electron Micrscopy International Standard Method 10312

Appendix F
ABS Asbestos Results
BoRit Asbestos Superfund Site, OU1
Phase 2 Remedial Investigation

Binning Category/ Asbestos Structure	Unit	SL	Location	AP-ABS03					OW-ABS01				
			Sample Name	AP03-ABRK01-CH	AP03-ABRK01-H	AP03-PA01-H	AP03-PA02-H	AP03-PA03-H	OW01-ABMG01-CH	OW01-ABMG01-L	OW01-PA01-H	OW01-PA02-H	OW01-PA03-H
			Sample Date	7/11/11	7/11/11	7/11/11	7/11/11	7/11/11	7/15/11	7/15/11	7/15/11	7/15/11	7/15/11
			Location Information	Asbestos Pile ABS Location 3	Asbestos Pile ABS Location 3	Asbestos Pile ABS Location 3	Asbestos Pile ABS Location 3	Asbestos Pile ABS Location 3	Other Side of Wissahickon Creek ABS Location 1	Other Side of Wissahickon Creek ABS Location 1	Other Side of Wissahickon Creek ABS Location 1	Other Side of Wissahickon Creek ABS Location 1	Other Side of Wissahickon Creek ABS Location 1
PCME													
Actinolite (AC)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Amosite (AM)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Crocidolite (CR)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Other amphibole (OA)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Other mineral class (OM)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Total Amphibole	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Total Asbestos	s/cc	0.04		0.06503	0.12681	0.01484	0.01978	0.0008	0.0008	<0.00040	<0.00040	<0.00036	<0.00040
Total Chrysotile (CH)	s/cc	NV		0.06503	0.12681	0.01484	0.01978	0.0008	0.0008	<0.00040	<0.00040	<0.00036	<0.00040
Tremolite (TR)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Total TEM-ISO													
Actinolite (AC)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Amosite (AM)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	0.0004	<0.00036	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Crocidolite (CR)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Other amphibole (OA)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Other mineral class (OM)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Total Amphibole	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	0.0004	<0.00036	<0.00040
Total Asbestos	s/cc	NV		1.25998	1.58026	0.4748	0.68252	0.04939	0.00799	<0.00040	0.0072	0.00144	0.0008
Total Chrysotile (CH)	s/cc	NV		1.25998	1.58026	0.4748	0.68252	0.04939	0.00799	<0.00040	0.0068	0.00144	0.0008
Tremolite (TR)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
AHERA													
Actinolite (AC)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Amosite (AM)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	0.0004	<0.00036	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Crocidolite (CR)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Other amphibole (OA)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Other mineral class (OM)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Total Amphibole	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Total Asbestos	s/cc	NV		0.80477	1.04375	0.29304	0.51436	0.03226	0.00799	<0.00040	0.0072	0.00144	0.0008
Total Chrysotile (CH)	s/cc	NV		0.80477	1.04375	0.29304	0.51436	0.03226	0.00799	<0.00040	0.0068	0.00144	0.0008
Tremolite (TR)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Berman Crump													
Actinolite (AC)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Amosite (AM)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Crocidolite (CR)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Other amphibole (OA)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Other mineral class (OM)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Total Amphibole	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040
Total Asbestos	s/cc	NV		0.00813	0.00975	0.00742	<0.00495	0.00119	0.0008	<0.00040	<0.00040	<0.00036	0.0004
Total Chrysotile (CH)	s/cc	NV		0.00813	0.00975	0.00742	<0.00495	0.00119	0.0008	<0.00040	<0.00040	<0.00036	0.0004
Tremolite (TR)	s/cc	NV		<0.00813	<0.00975	<0.00371	<0.00495	<0.00040	<0.00040	<0.00040	<0.00040	<0.00036	<0.00040

Notes:
NV = No screening value
s/cc = structures per cubic centimeter
Residential screening value provided by EPA Work Assignment Manager in an email dated 10/27/2011
AHERA = Asbestos Hazard Emergency Response Act
PCME = phase contrast microscopy equivalents
TEM - ISO = Transmission Electron Micrscopy International Standard Method 10312

Appendix F
ABS Asbestos Results
BoRit Asbestos Superfund Site, OU1
Phase 2 Remedial Investigation

Binning Category/ Asbestos Structure	Unit	SL	Location	PK-ABS01					PK-ABS02				
			Sample Name	PK01-ABRK01-CH	PK01-ABRK01-H	PK01-PA01-H	PK01-PA02-L	PK01-PA03-H	PK02-ABRK01-CH	PK02-ABRK01-H	PK02-PA01-H	PK02-PA02-H	PK02-PA03-H
			Sample Date	7/18/11	7/18/11	7/18/11	7/18/11	7/18/11	7/11/11	7/11/11	7/11/11	7/11/11	7/11/11
			Location Information	Park ABS Location 1	Park ABS Location 1	Park ABS Location 1	Park ABS Location 1	Park ABS Location 1	Park ABS Location 2	Park ABS Location 2	Park ABS Location 2	Park ABS Location 2	Park ABS Location 2
PCME													
Actinolite (AC)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Amosite (AM)	s/cc	NV		<0.00668	<0.01438	<0.00475	0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Crocidolite (CR)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	0.00258	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Other amphibole (OA)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Other mineral class (OM)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Total Amphibole	s/cc	NV		<0.00668	<0.01438	<0.00475	0.00682	0.00258	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Total Asbestos	s/cc	0.04		0.04006	0.15819	0.02374	0.13645	0.01034	0.0742	0.00904	0.00065	<0.00040	<0.00040
Total Chrysotile (CH)	s/cc	NV		0.04006	0.15819	0.02374	0.12963	0.00775	0.0742	0.00904	0.00065	<0.00040	<0.00040
Tremolite (TR)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Total TEM-ISO													
Actinolite (AC)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Amosite (AM)	s/cc	NV		<0.00668	<0.01438	<0.00475	0.02047	<0.00086	0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Crocidolite (CR)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	0.00517	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Other amphibole (OA)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Other mineral class (OM)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Total Amphibole	s/cc	NV		<0.00668	<0.01438	<0.00475	0.02047	0.00517	0.00256	0.00113	<0.00065	<0.00040	<0.00040
Total Asbestos	s/cc	NV		0.72115	1.63944	0.18521	0.88693	0.10856	0.30702	0.12209	0.07301	0.02276	0.0028
Total Chrysotile (CH)	s/cc	NV		0.72115	1.63944	0.18521	0.86647	0.10339	0.30446	0.12096	0.07301	0.02276	0.0028
Tremolite (TR)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	0.00113	<0.00065	<0.00040	<0.00040
AHERA													
Actinolite (AC)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Amosite (AM)	s/cc	NV		<0.00668	<0.01438	<0.00475	0.02047	<0.00086	0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Crocidolite (CR)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	0.00345	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Other amphibole (OA)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Other mineral class (OM)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Total Amphibole	s/cc	NV		<0.00668	<0.01438	<0.00475	0.02047	0.00345	0.00256	0.00113	<0.00065	<0.00040	<0.00040
Total Asbestos	s/cc	NV		0.66774	1.45249	0.15197	0.74366	0.08616	0.25585	0.11079	0.06526	0.01877	0.0028
Total Chrysotile (CH)	s/cc	NV		0.66774	1.45249	0.15197	0.7232	0.08271	0.25329	0.10966	0.06526	0.01877	0.0028
Tremolite (TR)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	0.00113	<0.00065	<0.00040	<0.00040
Berman Crump													
Actinolite (AC)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Amosite (AM)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Crocidolite (CR)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Other amphibole (OA)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Other mineral class (OM)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Total Amphibole	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040
Total Asbestos	s/cc	NV		0.01335	0.04314	0.0095	0.01365	0.00431	<0.00256	0.00226	<0.00065	0.0004	<0.00040
Total Chrysotile (CH)	s/cc	NV		0.01335	0.04314	0.0095	0.01365	0.00345	<0.00256	0.00226	<0.00065	0.0004	<0.00040
Tremolite (TR)	s/cc	NV		<0.00668	<0.01438	<0.00475	<0.00682	<0.00086	<0.00256	<0.00113	<0.00065	<0.00040	<0.00040

Notes:
NV = No screening value
s/cc = structures per cubic centimeter
Residential screening value provided by EPA Work Assignment Manager in an email dated 10/27/2011
AHERA = Asbestos Hazard Emergency Response Act
PCME = phase contrast microscopy equivalents
TEM - ISO = Transmission Electron Micrscopy International Standard Method 10312

Appendix F
ABS Asbestos Results
BoRit Asbestos Superfund Site, OU1
Phase 2 Remedial Investigation

Binning Category/ Asbestos Structure	Unit	SL	Location	PK-ABS03					PK-ABS04				
			Sample Name	PK03-ABRK01-CL	PK03-ABRK01-H	PK03-PA01-H	PK03-PA02-L	PK03-PA03-L	PK04-ABRK01-CH	PK04-ABRK01-H	PK04-PA01-H	PK04-PA02-L	PK04-PA03-H
			Sample Date	7/18/11	7/18/11	7/18/11	7/18/11	7/18/11	7/19/11	7/19/11	7/19/11	7/19/11	7/19/11
			Location Information	Park ABS Location 3	Park ABS Location 3	Park ABS Location 3	Park ABS Location 3	Park ABS Location 3	Park ABS Location 4	Park ABS Location 4	Park ABS Location 4	Park ABS Location 4	Park ABS Location 4
PCME													
Actinolite (AC)	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Amosite (AM)	s/cc	NV		<0.01080	0.01215	<0.00343	<0.01796	0.0154	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Anthophyllite (AN)	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Crocidolite (CR)	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	0.01414	<0.00512	<0.00412	<0.00943	0.00767
Libby amphibole (LA)	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Other amphibole (OA)	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Other mineral class (OM)	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Solid Soln: Amosite	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Solid Soln: Trem-Act	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Total Amphibole	s/cc	NV		<0.01080	0.01215	<0.00343	<0.01796	0.0154	0.01414	<0.00512	<0.00412	<0.00943	0.00767
Total Asbestos	s/cc	0.04		0.08642	0.02431	0.07196	0.08982	0.16938	0.05658	0.03072	<0.00412	0.01886	0.00767
Total Chrysotile (CH)	s/cc	NV		0.08642	0.01215	0.07196	0.08982	0.15398	0.04243	0.03072	<0.00412	0.01886	<0.00767
Tremolite (TR)	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Total TEM-ISO													
Actinolite (AC)	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Amosite (AM)	s/cc	NV		<0.01080	0.01215	0.01028	0.01796	0.0154	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Anthophyllite (AN)	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Crocidolite (CR)	s/cc	NV		<0.01080	<0.01215	0.00343	<0.01796	<0.01540	0.02829	<0.00512	<0.00412	<0.00943	0.01534
Libby amphibole (LA)	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Other amphibole (OA)	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Other mineral class (OM)	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Solid Soln: Amosite	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Solid Soln: Trem-Act	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Total Amphibole	s/cc	NV		0.0108	0.01215	0.01371	0.01796	0.0154	0.02829	<0.00512	<0.00412	<0.00943	0.01534
Total Asbestos	s/cc	NV		1.20987	1.3368	0.38035	1.99402	1.60137	1.58412	0.56316	0.45684	1.3484	1.13544
Total Chrysotile (CH)	s/cc	NV		1.19907	1.32465	0.36664	1.97606	1.58598	1.55583	0.56316	0.45684	1.3484	1.1201
Tremolite (TR)	s/cc	NV		0.0108	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
AHERA													
Actinolite (AC)	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Amosite (AM)	s/cc	NV		<0.01080	0.01215	0.01028	0.01796	0.0154	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Anthophyllite (AN)	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Crocidolite (CR)	s/cc	NV		<0.01080	<0.01215	0.00343	<0.01796	<0.01540	0.02829	<0.00512	<0.00412	<0.00943	0.01534
Libby amphibole (LA)	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Other amphibole (OA)	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Other mineral class (OM)	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Solid Soln: Amosite	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Solid Soln: Trem-Act	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Total Amphibole	s/cc	NV		0.0108	0.01215	0.01371	0.01796	0.0154	0.02829	<0.00512	<0.00412	<0.00943	0.01534
Total Asbestos	s/cc	NV		1.10185	1.26388	0.35636	1.92216	1.53978	1.54169	0.53756	0.43626	0.94293	0.77486
Total Chrysotile (CH)	s/cc	NV		1.09104	1.25173	0.34265	1.9042	1.52439	1.5134	0.53756	0.43626	0.94293	0.75952
Tremolite (TR)	s/cc	NV		0.0108	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Berman Crump													
Actinolite (AC)	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Amosite (AM)	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Anthophyllite (AN)	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Crocidolite (CR)	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	0.00767
Libby amphibole (LA)	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Other amphibole (OA)	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Other mineral class (OM)	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Solid Soln: Amosite	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Solid Soln: Trem-Act	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767
Total Amphibole	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	0.00767
Total Asbestos	s/cc	NV		0.04321	0.01215	0.01371	0.03593	0.04619	0.08486	0.0256	0.00823	<0.00943	0.00767
Total Chrysotile (CH)	s/cc	NV		0.04321	0.01215	0.01371	0.03593	0.04619	0.08486	0.0256	0.00823	<0.00943	<0.00767
Tremolite (TR)	s/cc	NV		<0.01080	<0.01215	<0.00343	<0.01796	<0.01540	<0.01414	<0.00512	<0.00412	<0.00943	<0.00767

Notes:
NV = No screening value
s/cc = structures per cubic centimeter
Residential screening value provided by EPA Work Assignment Manager in an email dated 10/27/2011
AHERA = Asbestos Hazard Emergency Response Act
PCME = phase contrast microscopy equivalents
TEM - ISO = Transmission Electron Micrscopy International Standard Method 10312

Appendix F
ABS Asbestos Results
BoRit Asbestos Superfund Site, OU1
Phase 2 Remedial Investigation

Binning Category/ Asbestos Structure	Unit	SL	Location	PK-ABS05					PK-ABS07				
			Sample Name	PK05-ABRK01-CH	PK05-ABRK01-H	PK05-PA01-H	PK05-PA02-L	PK05-PA03-L	PK07-ABRK01-CH	PK07-ABRK01-L	PK07-PA01-H	PK07-PA02-H	PK07-PA03-H
			Sample Date	7/19/11	7/19/11	7/19/11	7/19/11	7/19/11	7/18/11	7/18/11	7/18/11	7/18/11	7/18/11
			Location Information	Park ABS Location 5	ABS Raking Scenario at PK05 ((Personal Air))	ABS Raking Scenario at PK05 (Perimeter Air)	Park ABS Location 5	Park ABS Location 5	Park ABS Location 7	Park ABS Location 7	Park ABS Location 7	Park ABS Location 7	Park ABS Location 7
PCME													
Actinolite (AC)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	0.0004	0.0004	<0.00040	<0.00040
Amosite (AM)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Crocidolite (CR)	s/cc	NV		<0.10005	<0.06527	0.00627	0.0072	0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Other amphibole (OA)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Other mineral class (OM)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Total Amphibole	s/cc	NV		<0.10005	<0.06527	0.00627	0.0072	0.00789	<0.00739	0.0004	0.0004	<0.00040	<0.00040
Total Asbestos	s/cc	0.04		0.2001	0.45688	0.05645	0.05041	0.01579	0.04433	0.0012	0.0004	<0.00040	<0.00040
Total Chrysotile (CH)	s/cc	NV		0.2001	0.45688	0.05017	0.04321	0.00789	0.04433	0.0008	<0.00040	<0.00040	<0.00040
Tremolite (TR)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Total TEM-ISO													
Actinolite (AC)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	0.0004	0.0004	0.0004	<0.00040
Amosite (AM)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Crocidolite (CR)	s/cc	NV		<0.10005	<0.06527	0.00627	0.0144	0.02368	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Other amphibole (OA)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Other mineral class (OM)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Total Amphibole	s/cc	NV		<0.10005	<0.06527	0.00627	0.0144	0.02368	<0.00739	0.0004	0.0004	0.0004	<0.00040
Total Asbestos	s/cc	NV		15.70816	9.33333	0.71499	0.75609	0.89982	0.82009	0.00519	0.00282	0.0004	<0.00040
Total Chrysotile (CH)	s/cc	NV		15.70816	9.33333	0.70872	0.74169	0.87614	0.82009	0.00479	0.00241	<0.00040	<0.00040
Tremolite (TR)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
AHERA													
Actinolite (AC)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	0.0004	0.0004	0.0004	<0.00040
Amosite (AM)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Crocidolite (CR)	s/cc	NV		<0.10005	<0.06527	0.00627	0.0144	0.01579	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Other amphibole (OA)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Other mineral class (OM)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Total Amphibole	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Total Asbestos	s/cc	NV		13.40696	6.72261	0.62718	0.72008	0.79722	0.73882	0.00519	0.00282	0.0004	<0.00040
Total Chrysotile (CH)	s/cc	NV		13.40696	6.72261	0.62091	0.70568	0.78143	0.73882	0.00479	0.00241	<0.00040	<0.00040
Tremolite (TR)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Berman Crump													
Actinolite (AC)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Amosite (AM)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Crocidolite (CR)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Other amphibole (OA)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Other mineral class (OM)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Total Amphibole	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040
Total Asbestos	s/cc	NV		<0.10005	<0.06527	<0.00627	0.0144	0.01579	<0.00739	0.0008	0.0004	<0.00040	<0.00040
Total Chrysotile (CH)	s/cc	NV		<0.10005	<0.06527	<0.00627	0.0144	0.01579	<0.00739	0.0008	0.0004	<0.00040	<0.00040
Tremolite (TR)	s/cc	NV		<0.10005	<0.06527	<0.00627	<0.00720	<0.00789	<0.00739	<0.00040	<0.00040	<0.00040	<0.00040

Notes:
NV = No screening value
s/cc = structures per cubic centimeter
Residential screening value provided by EPA Work Assignment Manager in an email dated 10/27/2011
AHERA = Asbestos Hazard Emergency Response Act
PCME = phase contrast microscopy equivalents
TEM - ISO = Transmission Electron Micrscopy International Standard Method 10312

Appendix F
ABS Asbestos Results
BoRit Asbestos Superfund Site, OU1
Phase 2 Remedial Investigation

Binning Category/ Asbestos Structure	Unit	SL	Location	RS-ABS01					RS-ABS02				
			Sample Name	RS01-ABRK01-CL	RS01-ABRK01-H	RS01-PA01-H	RS01-PA02-H	RS01-PA03-H	RS02-ABRK01-CH	RS02-ABRK01-H	RS02-PA01-H	RS02-PA02-H	RS02-PA03-H
			Sample Date	7/13/11	7/13/11	7/13/11	7/13/11	7/13/11	7/12/11	7/12/11	7/12/11	7/12/11	7/12/11
			Location Information	Residential ABS Location 1	Residential ABS Location 1	Residential ABS Location 1	Residential ABS Location 1	Residential ABS Location 1	Residential ABS Location 2	Residential ABS Location 2	Residential ABS Location 2	Residential ABS Location 2	Residential ABS Location 2
PCME													
Actinolite (AC)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Amosite (AM)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Crocidolite (CR)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Other amphibole (OA)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Other mineral class (OM)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Total Amphibole	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Total Asbestos	s/cc	0.04		<0.00040	<0.00040	0.0004	<0.00040	<0.00040	<0.00040	0.0012	<0.00040	<0.00040	<0.00040
Total Chrysotile (CH)	s/cc	NV		<0.00040	<0.00040	0.0004	<0.00040	<0.00040	<0.00040	0.0012	<0.00040	<0.00040	<0.00040
Tremolite (TR)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Total TEM-ISO													
Actinolite (AC)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Amosite (AM)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Crocidolite (CR)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.0004	<0.00040	<0.00040
Other amphibole (OA)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Other mineral class (OM)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Total Amphibole	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.0004	<0.00040	<0.00040
Total Asbestos	s/cc	NV		<0.00040	0.0008	0.00399	0.0008	0.0012	0.00721	0.00399	0.0004	<0.00040	<0.00040
Total Chrysotile (CH)	s/cc	NV		<0.00040	0.0008	0.00399	0.0008	0.0012	0.00721	0.00399	<0.00040	<0.00040	<0.00040
Tremolite (TR)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
AHERA													
Actinolite (AC)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Amosite (AM)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Crocidolite (CR)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.0004	<0.00040	<0.00040
Other amphibole (OA)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Other mineral class (OM)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Total Amphibole	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.0004	<0.00040	<0.00040
Total Asbestos	s/cc	NV		<0.00040	0.0008	0.00319	0.0008	0.0012	0.00601	0.00359	0.0004	<0.00040	<0.00040
Total Chrysotile (CH)	s/cc	NV		<0.00040	0.0008	0.00319	0.0008	0.0012	0.00601	0.00359	<0.00040	<0.00040	<0.00040
Tremolite (TR)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Berman Crump													
Actinolite (AC)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Amosite (AM)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Crocidolite (CR)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Other amphibole (OA)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Other mineral class (OM)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Total Amphibole	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Total Asbestos	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Total Chrysotile (CH)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Tremolite (TR)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040

Notes:
NV = No screening value
s/cc = structures per cubic centimeter
Residential screening value provided by EPA Work Assignment Manager in an email dated 10/27/2011
AHERA = Asbestos Hazard Emergency Response Act
PCME = phase contrast microscopy equivalents
TEM - ISO = Transmission Electron Micrscopy International Standard Method 10312

Appendix F
ABS Asbestos Results
BoRit Asbestos Superfund Site, OU1
Phase 2 Remedial Investigation

Binning Category/ Asbestos Structure	Unit	SL	Location	RS-ABS03					RS-ABS04				
			Sample Name	RS03-ABRK01-CH	RS03-ABRK01-H	RS03-PA01-H	RS03-PA02-L	RS03-PA03-L	RS04-ABRK01-CH	RS04-ABRK01-L	RS04-PA01-H	RS04-PA02-H	RS04-PA03-H
			Sample Date	7/13/11	7/13/11	7/13/11	7/13/11	7/13/11	7/12/11	7/12/11	7/12/11	7/12/11	7/12/11
			Location Information	Residential ABS Location 3	Residential ABS Location 3	Residential ABS Location 3	Residential ABS Location 3	Residential ABS Location 3	Residential ABS Location 4	Residential ABS Location 4	Residential ABS Location 4	Residential ABS Location 4	Residential ABS Location 4
PCME													
Actinolite (AC)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Amosite (AM)	s/cc	NV		<0.03472	<0.03110	<0.00134	0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Crocidolite (CR)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Other amphibole (OA)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Other mineral class (OM)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Total Amphibole	s/cc	NV		<0.03472	<0.03110	<0.00134	0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Total Asbestos	s/cc	0.04		<0.03472	<0.03110	0.0094	0.03899	0.01786	0.00941	0.0073	0.0004	0.0004	<0.00040
Total Chrysotile (CH)	s/cc	NV		<0.03472	<0.03110	0.0094	0.03411	0.01786	0.00941	0.0073	0.0004	0.0004	<0.00040
Tremolite (TR)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Total TEM-ISO													
Actinolite (AC)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Amosite (AM)	s/cc	NV		<0.03472	<0.03110	<0.00134	0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Crocidolite (CR)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	0.0004	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Other amphibole (OA)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Other mineral class (OM)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Total Amphibole	s/cc	NV		<0.03472	<0.03110	<0.00134	0.00487	<0.00447	<0.00059	<0.00073	<0.00040	0.0004	<0.00040
Total Asbestos	s/cc	NV		3.95775	3.17186	0.14232	0.50682	0.5135	0.06232	0.07665	0.0012	0.00159	0.0004
Total Chrysotile (CH)	s/cc	NV		3.95775	3.17186	0.14232	0.50195	0.5135	0.06232	0.07665	0.0012	0.00119	0.0004
Tremolite (TR)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
AHERA													
Actinolite (AC)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Amosite (AM)	s/cc	NV		<0.03472	<0.03110	<0.00134	0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Crocidolite (CR)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	0.0004	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Other amphibole (OA)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Other mineral class (OM)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Total Amphibole	s/cc	NV		<0.03472	<0.03110	<0.00134	0.00487	<0.00447	<0.00059	<0.00073	<0.00040	0.0004	<0.00040
Total Asbestos	s/cc	NV		3.74945	3.10966	0.13427	0.49708	0.45098	0.05762	0.073	0.0012	0.00159	0.0004
Total Chrysotile (CH)	s/cc	NV		3.74945	3.10966	0.13427	0.4922	0.45098	0.05762	0.073	0.0012	0.00119	0.0004
Tremolite (TR)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Berman Crump													
Actinolite (AC)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Amosite (AM)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Crocidolite (CR)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Other amphibole (OA)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Other mineral class (OM)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Total Amphibole	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Total Asbestos	s/cc	NV		<0.03472	0.0311	0.00134	<0.00487	0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Total Chrysotile (CH)	s/cc	NV		<0.03472	0.0311	0.00134	<0.00487	0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040
Tremolite (TR)	s/cc	NV		<0.03472	<0.03110	<0.00134	<0.00487	<0.00447	<0.00059	<0.00073	<0.00040	<0.00040	<0.00040

Notes:
NV = No screening value
s/cc = structures per cubic centimeter
Residential screening value provided by EPA Work Assignment Manager in an email dated 10/27/2011
AHERA = Asbestos Hazard Emergency Response Act
PCME = phase contrast microscopy equivalents
TEM - ISO = Transmission Electron Micrscopy International Standard Method 10312

Appendix F
ABS Asbestos Results
BoRit Asbestos Superfund Site, OU1
Phase 2 Remedial Investigation

Binning Category/ Asbestos Structure	Unit	SL	Location	RS-ABS05					RS-ABS06				
			Sample Name	RS05-ABRK01-CH	RS05-ABRK01-H	RS05-PA01-H	RS05-PA02-H	RS05-PA03-H	RS06-ABRK01-CH	RS06-ABRK01-L	RS06-PA01-H	RS06-PA02-H	RS06-PA03-L
			Sample Date	7/12/11	7/12/11	7/12/11	7/12/11	7/12/11	7/14/11	7/14/11	7/14/11	7/14/11	7/14/11
			Location Information	Residential ABS Location 5	Residential ABS Location 5	Residential ABS Location 5	Residential ABS Location 5	Residential ABS Location 5	Residential ABS Location 6	Residential ABS Location 6	Residential ABS Location 6	Residential ABS Location 6	Residential ABS Location 6
PCME													
Actinolite (AC)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Amosite (AM)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Crocidolite (CR)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Other amphibole (OA)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Other mineral class (OM)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Total Amphibole	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Total Asbestos	s/cc	0.04		0.00156	0.00077	<0.00040	<0.00040	0.0004	0.0004	<0.00040	<0.00050	<0.00040	0.0004
Total Chrysotile (CH)	s/cc	NV		0.00156	0.00077	<0.00040	<0.00040	0.0004	0.0004	<0.00040	<0.00050	<0.00040	0.0004
Tremolite (TR)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Total TEM-ISO													
Actinolite (AC)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Amosite (AM)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Crocidolite (CR)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Other amphibole (OA)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Other mineral class (OM)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Total Amphibole	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Total Asbestos	s/cc	NV		0.03538	0.00803	<0.00040	<0.00040	0.00481	0.008	0.0004	0.00897	0.00439	0.00998
Total Chrysotile (CH)	s/cc	NV		0.03538	0.00803	<0.00040	<0.00040	0.00481	0.008	0.0004	0.00897	0.00439	0.00998
Tremolite (TR)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
AHERA													
Actinolite (AC)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Amosite (AM)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Crocidolite (CR)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Other amphibole (OA)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Other mineral class (OM)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Total Amphibole	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Total Asbestos	s/cc	NV		0.02566	0.00689	<0.00040	<0.00040	0.002	0.008	0.0004	0.00748	0.0036	0.00918
Total Chrysotile (CH)	s/cc	NV		0.02566	0.00689	<0.00040	<0.00040	0.002	0.008	0.0004	0.00748	0.0036	0.00918
Tremolite (TR)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Berman Crump													
Actinolite (AC)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Amosite (AM)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Crocidolite (CR)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Other amphibole (OA)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Other mineral class (OM)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Total Amphibole	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Total Asbestos	s/cc	NV		0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Total Chrysotile (CH)	s/cc	NV		0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040
Tremolite (TR)	s/cc	NV		<0.00039	<0.00038	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040

Notes:
NV = No screening value
s/cc = structures per cubic centimeter
Residential screening value provided by EPA Work Assignment Manager in an email dated 10/27/2011
AHERA = Asbestos Hazard Emergency Response Act
PCME = phase contrast microscopy equivalents
TEM - ISO = Transmission Electron Micrscopy International Standard Method 10312

Appendix F
ABS Asbestos Results
BoRit Asbestos Superfund Site, OU1
Phase 2 Remedial Investigation

Binning Category/ Asbestos Structure	Unit	SL	Location	RS-ABS07					RS-ABS08				
			Sample Name	RS07-ABRK01-CH	RS07-ABRK01-H	RS07-PA01-H	RS07-PA02-H	RS07-PA03-H	RS08-ABRK01-CH	RS08-ABRK01-H	RS08-PA01-H	RS08-PA02-H	RS08-PA03-H
			Sample Date	7/14/11	7/14/11	7/14/11	7/14/11	7/14/11	7/14/11	7/14/11	7/14/11	7/14/11	7/14/11
			Location Information	Residential ABS Location 7	Residential ABS Location 7	Residential ABS Location 7	Residential ABS Location 7	Residential ABS Location 7	Residential ABS Location 8	Residential ABS Location 8	Residential ABS Location 8	Residential ABS Location 8	Residential ABS Location 8
PCME													
Actinolite (AC)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Amosite (AM)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Crocidolite (CR)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Other amphibole (OA)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Other mineral class (OM)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Total Amphibole	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Total Asbestos	s/cc	0.04		<0.00040	<0.00040	0.0004	0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Total Chrysotile (CH)	s/cc	NV		<0.00040	<0.00040	0.0004	0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Tremolite (TR)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Total TEM-ISO													
Actinolite (AC)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Amosite (AM)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Crocidolite (CR)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Other amphibole (OA)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Other mineral class (OM)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Total Amphibole	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Total Asbestos	s/cc	NV		0.0004	0.0004	0.0008	0.00443	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Total Chrysotile (CH)	s/cc	NV		0.0004	0.0004	0.0008	0.00443	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Tremolite (TR)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
AHERA													
Actinolite (AC)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Amosite (AM)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Crocidolite (CR)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Other amphibole (OA)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Other mineral class (OM)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Total Amphibole	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Total Asbestos	s/cc	NV		0.0004	0.0004	0.0008	0.00362	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Total Chrysotile (CH)	s/cc	NV		0.0004	0.0004	0.0008	0.00362	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Tremolite (TR)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Berman Crump													
Actinolite (AC)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Amosite (AM)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Crocidolite (CR)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Other amphibole (OA)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Other mineral class (OM)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Total Amphibole	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Total Asbestos	s/cc	NV		0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Total Chrysotile (CH)	s/cc	NV		0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Tremolite (TR)	s/cc	NV		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040

Notes:
NV = No screening value
s/cc = structures per cubic centimeter
Residential screening value provided by EPA Work Assignment Manager in an email dated 10/27/2011
AHERA = Asbestos Hazard Emergency Response Act
PCME = phase contrast microscopy equivalents
TEM - ISO = Transmission Electron Micrscopy International Standard Method 10312

Appendix F
ABS Asbestos Results
BoRit Asbestos Superfund Site, OU1
Phase 2 Remedial Investigation

Binning Category/ Asbestos Structure	Unit	SL	Location	RV-ABS01					WT-ABS01				
			Sample Name	RV01-ABSH01-CH	RV01-ABSH01-H	RV01-PA01-H	RV01-PA02-H	RV01-PA03-H	WT01-ABHK01-CH	WT01-ABHK01-H	WT01-PA01-H	WT01-PA02-H	WT01-PA03-L
			Sample Date	7/16/11	7/15/11	7/15/11	7/15/11	7/15/11	7/13/11	7/13/11	7/13/11	7/13/11	7/13/11
			Location Information	Reservoir ABS Location 1	Reservoir ABS Location 1	Reservoir ABS Location 1	Reservoir ABS Location 1	Reservoir ABS Location 1	Walking Trail ABS Location 1	Walking Trail ABS Location 1	Walking Trail ABS Location 1	Walking Trail ABS Location 1	Walking Trail ABS Location 1
PCME													
Actinolite (AC)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Amosite (AM)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Crocidolite (CR)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Other amphibole (OA)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Other mineral class (OM)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Total Amphibole	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Total Asbestos	s/cc	0.04		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	0.00504	<0.00040
Total Chrysotile (CH)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	0.00504	<0.00040
Tremolite (TR)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Total TEM-ISO													
Actinolite (AC)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	0.00126	<0.00040
Amosite (AM)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Crocidolite (CR)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Other amphibole (OA)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Other mineral class (OM)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Total Amphibole	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	0.00126	<0.00040
Total Asbestos	s/cc	NV		<0.00040	<0.00040	0.00079	0.00118	0.00039	0.00481	<0.00039	<0.00040	0.1361	<0.00040
Total Chrysotile (CH)	s/cc	NV		<0.00040	<0.00040	0.00079	0.00118	0.00039	0.00481	<0.00039	<0.00040	0.13484	<0.00040
Tremolite (TR)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
AHERA													
Actinolite (AC)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	0.00126	<0.00040
Amosite (AM)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Crocidolite (CR)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Other amphibole (OA)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Other mineral class (OM)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Total Amphibole	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	0.00126	<0.00040
Total Asbestos	s/cc	NV		<0.00040	<0.00040	0.00079	0.00118	0.00039	0.0036	<0.00039	<0.00040	0.12728	<0.00040
Total Chrysotile (CH)	s/cc	NV		<0.00040	<0.00040	0.00079	0.00118	0.00039	0.0036	<0.00039	<0.00040	0.12602	<0.00040
Tremolite (TR)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Berman Crump													
Actinolite (AC)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Amosite (AM)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Anthophyllite (AN)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Crocidolite (CR)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Libby amphibole (LA)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Other amphibole (OA)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Other mineral class (OM)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Solid Soln: Amosite	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Solid Soln: Trem-Act	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Total Amphibole	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Total Asbestos	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Total Chrysotile (CH)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040
Tremolite (TR)	s/cc	NV		<0.00040	<0.00040	<0.00039	<0.00039	<0.00039	<0.00040	<0.00039	<0.00040	<0.00126	<0.00040

Notes:
NV = No screening value
s/cc = structures per cubic centimeter
Residential screening value provided by EPA Work Assignment Manager in an email dated 10/27/2011
AHERA = Asbestos Hazard Emergency Response Act
PCME = phase contrast microscopy equivalents
TEM - ISO = Transmission Electron Micrscopy International Standard Method 10312