CDM

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Contaminant Screening Study
Libby Asbestos Site, Operable Unit 4
Libby, Montana

Draft Summary Report for the Johnston Acres Field Investigation

August 2005

Summary Report

Response Action Contract
for Remedial, Enforcement Oversight, and Non-Time
Critical Removal Activities at Sites of Release or
Threatened Release of Hazardous Substances
in EPA Region 8

U.S. EPA Contract No. 68-W5-0022

Draft Summary Report for the Johnston Acres Field Investigation Contaminant Screening Study, Libby Asbestos Site, Operable Unit 4

August 2005

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for the
Johnston Acres Field Investigation
Contaminant Screening Study,
Libby Amphibole Asbestos Site, Operable Unit 4

Work Assignment No.: 137-RIRI-08BC

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Acronyms

CDM	CDM Federal Programs Corporation
DRO	diesel range organics
EPA	U. S. Environmental Protection Agency
EPH	extractable petroleum hydrocarbons
LA	Libby amphibole
QA/QC	quality assurance/quality control
Site	Johnston Acres Subdivision
SVOC	semi-volatile organic compounds

Section 1
Introduction

The purpose of this report is to summarize field activities conducted by CDM Federal Programs Corporation (CDM) at the Johnston Acres subdivision (Site) in Libby, Montana between January 24 and February 17, 2005. Figure 1 displays the site location.

The need to investigate the Site arose when the U.S. Environmental Protection Agency (EPA) learned that the city of Libby was moving forward on a civil works project to replace aging water lines and transfer residential properties from septic to city sewer within the Site. Information gathered during the contaminant screening study at properties within the Site, indicated that waste rock from the Libby Vermiculite Mine may have been brought in and used as fill material prior to development of the subdivision. Based on this information, EPA decided to conduct an investigation of the Site to ensure that the city contractor was working in safe conditions and to prevent the potential spread of contamination. CDM was tasked to plan and conduct an investigation to assess whether waste rock material existed within the Johnston Acres subdivision, and if so, where the waste rock material was located.

All investigation activities were conducted in accordance with the Johnston Acres Field Investigation Memo, dated January 7, 2005 (Appendix A).

Section 2
Field Activities

The Johnston Acres Site investigation consisted of completing 44 borings across the Site using Direct Push Technology and visually inspecting the cores for waste rock material and vermiculite. In addition, soil samples were collected from the borings to determine the nature and extent of Libby amphibole (LA) asbestos at the Site. Unless otherwise noted in Section 3.1, all field documentation and sample collection procedures provided or referenced in the memo were followed. The following sections summarize the investigation field activities.

2.1 Visual Inspection

On December 1, 2004, a CDM field geologist drove through the Site and documented areas that appeared to have been constructed from fill material. The purpose was to provide additional information for delineating the lateral extent of possible contamination and to allow for more targeted sampling in areas that had a higher probability of being constructed from fill material. Four areas were noted during the inspection: a raised area on the western edge of the subdivision and three terraced areas on the southern edge of the subdivision (Figure 2).

2.2 Soil Sampling

Forty-four soil borings were completed at the Site between January 24-26, 2005 (Figure 2). A sampling grid at approximate 300-foot intervals was used to select the majority of the boring locations, primarily along City rights-of-way (where the majority if the City's work will be conducted). In addition, borings were completed at the four areas noted during the visual inspection as possibly constructed of fill material. No visible evidence of waste rock or vermiculite was observed in the subsurface from any of the bore holes. Detailed core logs can be found in Appendix B.

In total, 45 grab soil samples (Figure 2) were collected from the soil boring cores at various depths ranging from 0 to 180 inches. Of these 45 samples, 14 were collected from yards and 31 were collected from rights-of-way.

Any waste rock material or vermiculite observed during the investigation were recorded in the core logs. Vermiculite was observed in the topsoil at 2 locations, but not at depth. Vermiculite was not observed in any other surface or subsurface locations during sampling.

All field sample data sheets and all logbook pages for this event are included in Appendices C and D, respectively. Photos taken during the direct push sampling are included in Appendix E.

2.3 Soil Sample Processing and Analysis

EPA determined, due to the lack of visual waste rock material and vermiculite found during the investigation, that soil samples would not be processed or analyzed for LA at this time. The samples were sent to CDM's close-support facility in Denver, Colorado where they have been logged and stored until further direction is received from EPA.

Section 3
Quality Assurance/Quality Control

CDM has established a formal quality assurance program to ensure consistently high quality project deliverables under its Response Action Contract with EPA. For work conducted by CDM in Libby, quality assurance/quality control (QA/QC) measures include the collection of quality control samples (such as soil duplicate samples and equipment blanks), implementation of a laboratory quality assurance program, review of project reports by a CDM-approved quality assurance staff member, and an auditing component to assess the effectiveness of the quality assurance program. The following sections describe deviations from the memo and the implications of those deviations on project or data quality objectives.

3.1 Deviations from the Johnston Acres Field Investigation Memo

During the sampling activities at the Site, the field technician noted that many of the cores had a strong petroleum odor and staining. On February 17, 2005, as directed by EPA, samples from two locations on the Site were sent to be analyzed for semi-volatile organic compounds (SVOC) by method 8270, diesel range organics (DRO) by method 8015M and extractable petroleum hydrocarbons (EPH) by the *Method for the Determination of Extractable Petroleum Hydrocarbons* (Massachusetts Department of Environmental Protection, 2004). The samples were split from soil samples previously collected on January 24, 2005 at locations JA-027 and JA-017 and assigned sample numbers CS-20082 and CS-20083, respectively (see Figure 2). DROs were detected in both samples. The results are as follows:

CS-20082, DRO = 860,000 ug/kg
CS-20083, DRO = 710,000 ug/kg.

Analytical results for SVOCs and EPHs are included in Appendix F.

All other requirements noted in the Memo were met without exceptions.

3.2 Achievement of Data Quality Objectives

The data quality objectives of this investigation were met.

3.3 Data Validation and Reporting

None of the analytical data contained in this report was further validated beyond that performed by the laboratory as part of their QA/QC program. Therefore, it is assumed that the raw data are useable for their intended purpose, which is to assess if waste rock material existed within the Johnston Acres subdivision, and if so, where the waste rock material was located.

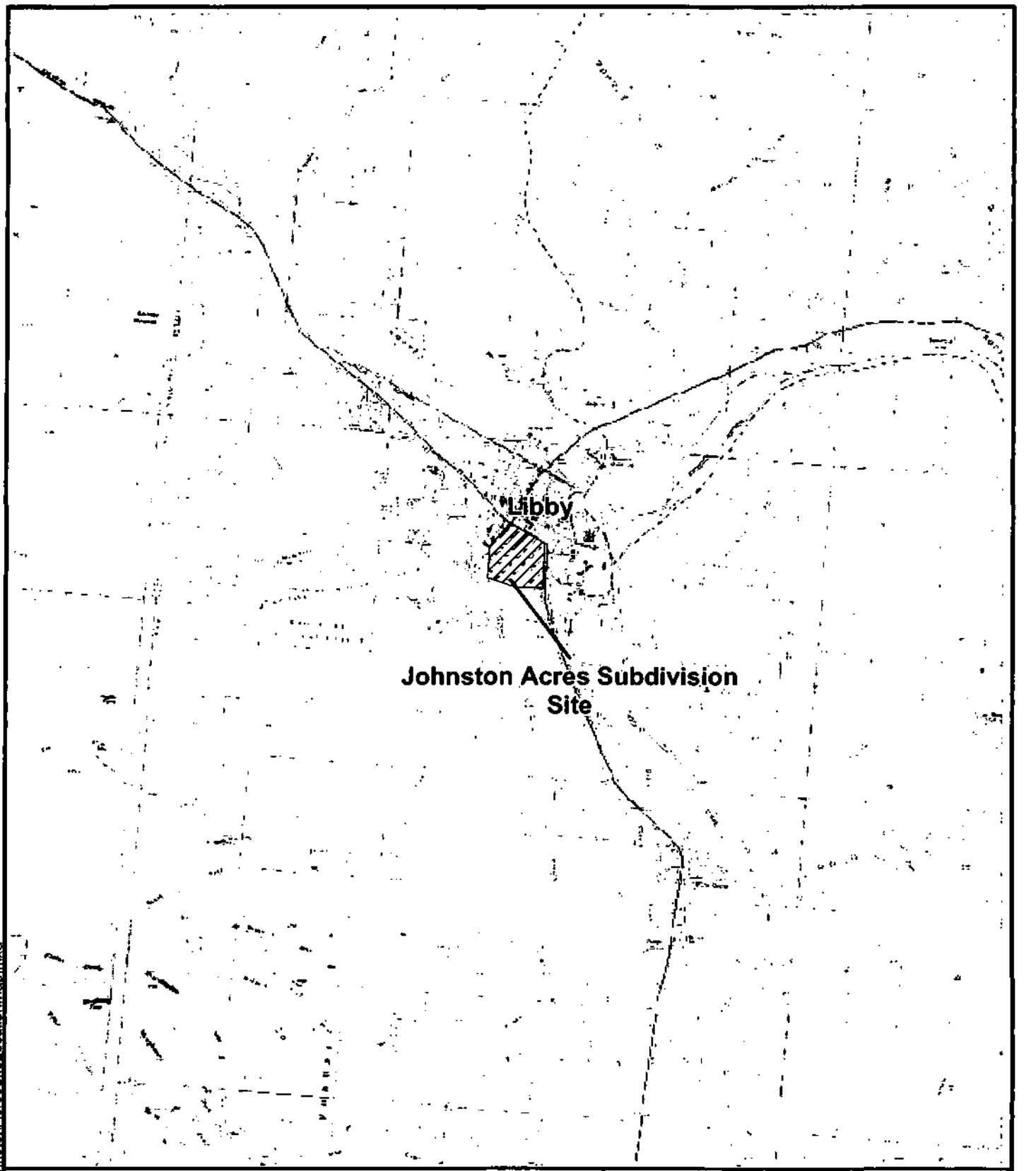
Section 4
References

CDM. 2005. Johnston Acres Field Investigation Memo. January.

Massachusetts Department of Environmental Protection. 2004. Method for the Determination of Extractable Petroleum Hydrocarbons. (Rev. 1.1). May.

SRC. 2003. Analysis of Asbestos Fibers in Soil by Polarized Light Microscopy. SRC-LIBBY-03 (Rev. 0). March 3, 2003.

Figures



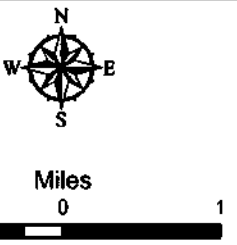


Figure 1

Site Location
Johnston Acres Subdivision
Libby, Montana

CDM

Map Filename: figure1-1JohnstonAcresSiteLocationMap.mxd

Color Map(s)

The following pages contain color that does not appear in the scanned images.

To view the actual images, please contact the Superfund Records Center at (303) 312-6473.

Map File Name: 050415_JohnstonAcresFigure2-1.mxd 04/20/05

Legend

- Sampling Locations
- Terrace (with Slope Direction)
- Hillside (with Slope Direction)
- Stream Bed
- Raised Area
- Area of Concern (AOC) Boundary

N
W E
S

Feet
0 500 1,000 2,000
1 inch equals 1,250 feet

Figure 2

Sampling Locations Locations for January 2005
Sampling Event
Johnston Acres

CDM

Appendix A
Field Investigation Memo

CDM

Memorandum

To: *Jim Christiansen, EPA Region 8 Remedial Project Manager*

From: *Jeff Montera, CDM Project Manager*

Date: *January 7, 2005*

Subject: *Johnston Acres Field Investigation*

The City of Libby is currently bidding a civil works project within the Johnston Acres subdivision to replace aging water lines and transfer residential properties from septic to city sewer. Information gathered, both verbal and visual, during the contaminant screening study (CSS) indicates that waste rock material from the Libby Vermiculite Mine may have been brought into the area as fill material prior to development of the subdivision. The purpose of this memorandum is to describe the field activities required to assess if waste rock material exists within the Johnston Acres subdivision, and if so, where the waste rock material is located. EPA will be able to use this information to proactively work with the City of Libby on its upcoming civil works project.

Study Area and Sample Locations

The study area for the City's Johnston Acres sewer and water project is generally delimited as follows: Main Avenue (N/S) to the west, West Oak Street (E/W) to the north, Louisiana Avenue (N/S) to the east, and West Cedar Street (E/W) to the south (Figure 1).

To determine the best approach for investigating this area, CDM considered three potential outcomes of the proposed field investigation as follows:

- No waste rock material is found anywhere within the subdivision
- Waste rock material is found everywhere within the subdivision
- Waste rock material is found only in certain areas of the subdivision

In order to collect the information required to determine either of the first two outcomes (i.e., the majority of the samples had waste rock material or did not have waste rock material), CDM chose to use a sampling grid at approximate 300-feet intervals, with samples collected primarily along City right-of-ways (where the majority of the City's work will be conducted). However, if waste rock material was determined to be present only in certain parts of the study area, the above-described sampling grid most likely would not provide enough

information to determine the lateral extent of contamination within these areas. Therefore, CDM sought to determine if any areas within the subdivision could be identified as areas in which fill material had been imported based on their topographic or morphologic characteristics (i.e., raised areas, terraces, etc.). This information would allow for more targeted sampling in areas that had a higher probability of having been constructed from waste rock material, thus limiting the number of samples required to identify the lateral extent of waste rock material within these areas.

On December 1, 2004, a CDM field geologist drove through the study area and documented areas that appeared to have been constructed from fill material. Four areas were noted during the visual inspection: a raised area on the western edge of the subdivision and three terraced areas on the southern edge of the subdivision (Figure 1). CDM utilized this information to select sampling points within and proximate to the four documented areas to determine if these areas were constructed from waste rock material, and if so, what the lateral extent of waste rock within these areas is.

Methods and Procedures

A total of 44 sampling locations were selected within the Johnston Acres subdivision where the City's excavation work is planned to take place (Figure 1). Sample locations were determined using the approach as previously described. Thirteen yard and 31 street samples were identified. Yard samples are located within private property boundaries. Street samples are located within the city street boundary. Exact sampling locations will be determined in the field. CDM will work with EPA's onsite representative during the investigation to determine if additional cores are required to establish the extent of contamination. In addition, CDM will coordinate with City representatives and property owners to obtain access to all proposed sampling locations prior to conducting the investigation.

A direct push technology (DPT) rig will be used to complete 15 foot continuous boreholes at each sampling point (Figure 1). This depth was chosen based on the maximum depth of excavation outlined in the City's information for bid (13 feet). If native soil is encountered before advancing to 15 feet, drilling will stop. However, each borehole will advance to a minimum of 6 feet below ground surface.

A core log (Figure 2) will be completed for each boring location. Information such as depth, stratigraphy (i.e., road base, fill material, native soil, etc.), and description will be recorded for each core. The presence or absence of waste rock material will be determined visually by CDM's onsite geologist. Visual classification of soils containing Libby Vermiculite Mine products or waste will be based on the presence of mineral and rock fragments derived from the mine, as determined by the onsite geologist. The products/waste materials include, but

are not limited to, vermiculite, the Libby amphibole suite, biotite, hydrobiotite, pyroxenes, and syenite.

At least one soil sample will be collected from each core. Vermiculite layers and native soil layers will not be sampled. Rather, samples will be biased to waste rock layers. If waste rock is not observed throughout the profile, a sample will be collected from the entire core.

Once all samples are collected, core logs will be reviewed to determine how samples will be submitted to the laboratory for analysis.

Please feel free to contact me at 720-264-1116 with any questions you may have regarding this matter.

Sincerely,

Appendix B
Core Logs

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-25-05
Hole No. JA-026	Rig: DT6610 Track Rig	End Date: 1-25-05
Logged by: Ben Shoup	Total Depth: 10 ft	Driller: Zack Beck
Weather: Overcast, 25°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-6"		6"			- Asphalt
6"-14					- Road base
14-68"			14-68" 65%		- Sand + chip fill with some pebbles (moderate staining + odor)
		68"			
68"-120			68-120" 60%		- Native (sand with pebbles + cobbles) stream deposits

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-25-05
Hole No. JA-01B	Rig: DT6610 Track Rig	End Date: 1-25-05
Logged by: Ben Shoup	Total Depth: 5 ft	Driller: Zack Back
Weather: Overcast 40° F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-6		6		CS-20029	- Asphalt
6-11					- Road base
11-29					- Rock chip + sand fill (staining & odor)
			70%		
		29			
29-60					- Native sand + pebbles

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-25-05
Hole No. JA-027	Rig: DT6610 Track Rig	End Date: 1-25-05
Logged by: Ben Shoup	Total Depth: 15 ft	Driller: Zack Beck
Weather: Overcast, 28°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-6		6"			- Asphalt
6-135			0-60: 40%	CS-20027	- Sand, pebble, + chip fill material with some cobbles (extensive staining + odor)
			60-120: 65%		
		155"			
135-150			120-150: 90%		- Cobbles + sand fining down to sand then to silty clay (Native)
					* 5 ft of casing was lost in this hole -- a new hole had to be drilled

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-26-05
Hole No. JA-017	Rig: DT6610 Track Rig	End Date: 1-26-05
Logged by: Ben Shoup	Total Depth: 5 ft	Driller: Zack Beck

Weather: Overcast, Foggy, 24°F

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-6		6			- Asphalt
6-13					- Road base
13-26		26	50%		- Sandy fill with extreme odor + staining
26-60					- Native (sand + cobbles)

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-25-05
Hole No. JA-029	Rig: DT6610 Track Rig	End Date: 1-25-05
Logged by: Ben Shoup	Total Depth: 10 ft	Driller: Zack Cook
Weather: Overcast 28°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-6		6			-Asphalt
6-11					-Road base
11-42		42	0-42 75%	0-42	-fill, chips + sand + pebbles
42-120			42-120 80%		-Native (sand fining down to silty clay)

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-25-05
Hole No. JA-043	Rig: DT6610 Track Rig	End Date: 1-25-05
Logged by: Ben Shoup	Total Depth: 5' 2"	Driller: Zack Beck
Weather: Overcast, 25°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-4		0			- Topsoil
4-39					- Sandy fill
				CS-2	
		39	2-Ft: 93%		
39-60					- Native stream deposits (sand, silt + cobbles)

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-25-05
Hole No. JA-031	Rig: DT6610 Track Rig	End Date: 1-25-05
Logged by: Ben Shoup	Total Depth: 10 ft	Driller: Zack Rock
Weather: Overcast, 28°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-6"		6"			-Asphalt
6"-18"					-Road base
18-65		65"	0-65 50%	65-120 33%	-Oxidized sandy-silt fill with pebbles + cobbles
65-120			65-120 70%		-Native stream deposits (sand + pebbles + cobbles)

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-25-05
Hole No. JA-040	Rig: DT6610 Track Rig	End Date: 1-25-05
Logged by: Ben Shoup	Total Depth: 10 ft	Driller: Zack Beck
Weather: Overcast, Foggy, 27°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-4		0"			- Topsoil
4-11			65%		- Sand fill
11-17			0-60"	0-60"	- Peat (organic soil)
17-66"		66"			- Silty-sand, oxidized, contains some pebbles (fill)
66"-120			70% 66"-120"		- Native (stream deposits) cobbles, sand, organics

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-24-07
Hole No. JA-039	Rig: DT6610 Track Rig	End Date: 1-24-07
Logged by: Ben Shoup	Total Depth: 10 ft	Driller: Zack Beck
Weather: Foggy, Overcast, 35°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-7"		0"			- Topsoil
7"-16"				CS-2001	- Silty Clay cap layer
16"-30"			60%		- Stained + oxidized pebbly sand
30"-65"					- silty - sand with pebbles (fill material)
65"-120		65"			- Sandy with pebbles + cobbles (Native)

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-24-05
Hole No. JA-019	Rig: DT6610 Track Rig	End Date: 1-24-05
Logged by: Ben Shoup	Total Depth: 5'	Driller: Zack Gock
Weather: Overcast, 35°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-5"		5"			- Asphalt
5-14"					- Road base + chip
				CS-R005	- Sand + chip fill
14-24"			85%		
					- Sand + Pebbles (Native)
24"-60"					
		60"			

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-24-05
Hole No. JA-012	Rig: DT6610 Track Rig	End Date: 1-24-05
Logged by: Ben Shoup	Total Depth: 10 ft	Driller: Zack Beck
Weather: Overcast, 39°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-6"		6"			- Asphalt
6"-12"					- Road base
12-95			0-95 65%	0-1 2001	- Pebbles + cobble with sand.
		95"			
95-120			95-120 80%		- Sand + pebbles (native)

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-24-05
Hole No. JA-011	Rig: DT6610 Track Rig	End Date: 1-24-05
Logged by: Ben Shoup	Total Depth: 5 ft	Driller: Zack Black
Weather: Overcast, 35°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-6"		6"			- Asphalt
6"-22"				CS-2001	- Road base (chips + pebbles)
22"-60"			75%		- Sand + pebbles - cobbles (native)
		60"			

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-24-05
Hole No. JA-032	Rig: DT6610 Track Rig	End Date: 1-24-05
Logged by: Ben Shoup	Total Depth: 10 ft.	Driller: Zack, Rock
Weather: Overcast, 35°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0"-4"		0"	85%	03-3002	- Topsoil (contains LV)
4"-15"		15"	0-15"		- Sandy mud / clay
15"-52"					- Pebbly - Cobbly sand fill material
52-120			0"-130" 100%	03-26017	- Sand grading to pebbles + cobbles (native)
		120			

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-24-05
Hole No. JA-020	Rig: DT6610 Track Rig	End Date: 1-24-05
Logged by: Ben Shoup	Total Depth: 10 ft	Driller: Zack Beck
Weather: Overcast, 37°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-5"		5"			- Asphalt
5"-14"					- Road base
14"-19"			60%		- Sand
19"-70"				CJ-2002	- Sand chip (rock) fill
		70"			
70"-120"			70%		- Native sand + pebbles (stream deposits)

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-24-05
Hole No. ~~[illegible]~~ JA-04	Rig: DT6610 Track Rig	End Date: 1-24-05
Logged by: Ben Shoup	Total Depth: 5 ft.	Driller: Zack Rook
Weather: Overcast, 42°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0"-7"		0"			- Topsoil
7"-60"				JA-04	-Silty Clay (native)
			95%		
		60"			

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-24-05
Hole No. JA-021	Rig: DT6610 Track Rig	End Date: 1-24-05
Logged by: Ben Shoup	Total Depth: 5'	Driller: Zack Rook
Weather: Overcast, 40°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-6		6"			- Asphalt
6-14					- Road base
14-30					- Sandy backfill
			80%		
30-60					- Silty sand (native)
		60"			

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-24-05
Hole No. JA-022	Rig: DT6610 Track Rig	End Date: 1-24-05
Logged by: Ben Shoup	Total Depth: 5'	Driller: Zack Beck
Weather: Overcast, 40°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-6		6'	↑	↑	- Asphalt
6-60			65%	65-Bag	- Silt (native)
		60"			

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-24-05
Hole No. JA-041	Rig: DT6610 Track Rig	End Date: 1-24-05
Logged by: Ben Shoup	Total Depth: 10 ft.	Driller: Zack Beck
Weather: Overcast, misty, 40°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-8		0"			- Topsoil
8-12					- Sandy fill
12-64			0-60 70%	0-60 11000-SD	- Silty-pebbly sand fill
64-120			60-120 90%		- Glacial silt (native)
		120"			

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-24-05
Hole No. JA-023	Rig: DT6610 Track Rig	End Date: 1-24-05
Logged by: Ben Shoup	Total Depth: 5'	Driller: Zack Back
Weather: Foggy, Misty, 40°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0'-6"		6"			- Asphalt
6"-33"					- Pebbly sand backfill
			80%	CS-20010	
33"-60"					- Native silt
		60"			

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-24-05
Hole No. JA-024	Rig: DT6610 Track Rig	End Date: 1-24-05
Logged by: Ben Shoup	Total Depth: 10 ft	Driller: Zack Beck
Weather: Foggy, Mist., 40°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-6"		6"			- Asphalt
6"-18"					- Chip seal base
18"-24"			0-60%		- Road base
24"-65"				0-120"	- sand, pebbles, clay-silt back fill
65"-120"		120"	60"-120" 70%		- Native

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-24-05
Hole No. JA - 030	Rig: DT6610 Track Rig	End Date: 1-24-05
Logged by: Ben Shoup	Total Depth: 10 ft.	Driller: Zack Beck
Weather: foggy, misting, 40°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-6		6"			- Asphalt
6-17					- Road base
			75%		
17"-120"			60%		- Glacial silt (native)
			100%		
		120"			

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-24-05
Hole No. JA-025	Rig: DT6610 Track Rig	End Date: 1-24-05
Logged by: Ben Shoup	Total Depth: 15 ft.	Driller: Rock Beck
Weather: Foggy, misting, 40°F		

(in) Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-5		5"	100%		- Asphalt
5-18			0-60"	CS-2000	- Road base
18-60					- Pebbly sand fill
			75%		
60-120			60"-120" 95%		- Sandy gravel Native
120-180			120"-180" 100%		- Glacial silt
		180"			

15 x 12
12

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-26-05
Hole No. JA-035	Rig: DT6610 Track Rig	End Date: 1-26-05
Logged by: Ben Shoup	Total Depth: 5' ft	Driller: Zack Rock
Weather: Partly Cloudy, 43°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-4		0		C.	-Topsoil
4-12		12	55%	2005-15	-Sandy pebble till
12-60					-Native (laminated sand, silt and down to cobbly sand.)

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-26-05
Hole No. JA-016	Rig: DT6610 Track Rig	End Date: 1-26-05
Logged by: Ben Shoup	Total Depth: 5 ft	Driller: Zack Reck
Weather: Partly Cloudy, 43°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-6		6		CS-20050	-Asphalt
6-14		14			- Chips, pebbles, + sand fill
14-60			60%		- Native (stream deposits)

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-26-05
Hole No. JA-015	Rig: DT6610 Track Rig	End Date: 1-26-05
Logged by: Ben Shoup	Total Depth: 10 ft	Driller: Zack Beck
Weather: Overcast, 41°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-4		4			- Asphalt
4-10					- Chip, pebble + sand fill (old gravel road)
10-32		32	0-60" 40%		- Massive sand with organics (fill?)
32-120			60"-120" 60%		- Cobbles + sand down to silty clay (Native)

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-26-05
Hole No. TA-057	Rig: DT6610 Track Rig	End Date: 1-26-05
Logged by: Ben Shoup	Total Depth: 5 ft	Driller: Zack Beck
Weather: Overcast, 40°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-6		6			-Asphalt
6-13				05-3048	-Road base
13-18					- Chip, pebble, and sand fill
		18	60%		
18-60					-Native (cobble + sand)

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-25-05
Hole No. JA-003	Rig: DT6610 Track Rig	End Date: 1-26-05
Logged by: Ben Shoup	Total Depth: 5 ft	Driller: Zack Beck
Weather: Overcast, 34°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-4		4			-Asphalt
4-10		10			- Sand + chip fill
10-22			70%		-Native (laminated sand + silt with organics)
22-60					-Native (sand + cobbles)

CDM Federal Programs Corporation

Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-26-05
Hole No. JA-035	Rig: DT6610 Track Rig	End Date: 1-26-05
Logged by: Ben Shoup	Total Depth: 5 ft	Driller: Zack Rock
Weather: Overcast, 32°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-4		0		0.5-2.0	- Gravel
4-10		10		7.0-8.0	-- Pebbly sand fill
10-60			80%		-Native (laminated sand, silt down to cobbly sand)

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-26-05
Hole No. JA-002	Rig: DT6610 Track Rig	End Date: 1-26-05
Logged by: Ben Shoup	Total Depth: 5 ft	Driller: Zack Beck
Weather: Overcast, 33°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-6		6		JA-002-S1	-Asphalt
6-18		18			-Old gravel road
18-60			40%		-Native (sand to cobbles)

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-26-05
Hole No. JA-003	Rig: DT6610 Track Rig	End Date: 1-26-05
Logged by: Ben Shoup	Total Depth: 5 ft	Driller: Zack Beck
Weather: Overcast, 34°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-4		4		CS-20044	- Asphalt
4-10		10			- Road base (old gravel road)
10-34			65%		- Sandy silt with staining + odor (Native)
34-60					- Cobble + sand (Native)

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-26-05
Hole No. JA-001	Rig: DT6610 Track Rig	End Date: 1-26-05
Logged by: Ben Shoup	Total Depth: 54	Driller: Zack Beck
Weather: Overcast, 32°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-4		4			- Asphalt
4-10				C-001	-Road base (old gravel fill)
10-24					-Pebble, chip + sand fill
		24			
24-60			65%		-Native (laminated sand + silt with organics down to sand + cobbles)

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-26-05
Hole No. JA-004	Rig: DT6610 Track Rig	End Date: 1-26-05
Logged by: Ben Shoup	Total Depth:	Driller: Zack Beck
Weather: Overcast, 35°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-4		4		CB-2004	-Asphalt
4-10					- Road base
10-22					- Chip + sand fill
		22	90%		
22-60					-Native (cobbles + sand, laminated sand, silt, with organics)

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-26-05
Hole No. JA-005	Rig: DT6610 Track Rig	End Date: 1-26-05
Logged by: Ben Shoup	Total Depth: 5 ft	Driller: Zack Bock
Weather: Overcast, 35°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-2		0		JA-005-1	- Topsoil (Native)
2-10					- Laminated sand + silt with organics (Native)
		10	40%		
10-20					- Sand + cobbles (Native)

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-26-05
Hole No. JA-006	Rig: DT6610 Track Rig	End Date: 1-26-05
Logged by: Ben Shoup	Total Depth: 5' ft.	Driller: Zack Beck
Weather: Overcast, Foggy, 32°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-4		4			-Asphalt
4-6					-Road base
6-17					- Chips, pebbles + sand fill
		30	90%		- Laminated sand, silt with organics (Native)
17-30			90%		
30-60					- Native (cobbles + sand)

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-26-05
Hole No. JA-009	Rig: DT6610 Track Rig	End Date: 1-26-05
Logged by: Ben Shoup	Total Depth: 5.4	Driller: Zack Rock
Weather: Overcast, Foggy, 33°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-4		4			-Asphalt
4-8					-Road base
8-14				CS-2003	-Sand + pebble + chip fill
			70%		
14-18			100%		- Chip + sand fill
		18			
18-60					- Native, laminated sand + silt, organic rich

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-26-05
Hole No. JA-037	Rig: DT6610 Track Rig	End Date: 1-26-05
Logged by: Ben Shoup	Total Depth: 5 ft	Driller: Zack Beck
Weather: Overcast, Foggy, 33°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-2		0			- Topsoil
2-8				05-1003	- Sand + pebble till
8-24		24	65%	05-1003	- Native (laminated sandy silt with organics)
24-60					- Cobbles + sand

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-26-05
Hole No. TA-014	Rig: DT6610 Track Rig	End Date: 1-26-05
Logged by: Ben Shoup	Total Depth: 54	Driller: Zach Beck
Weather: Overcast, foggy, 24°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-4		4		CS-2007	-Asphalt
4-16					-Road base
		16	85%		
16-60					-Native (organic rich-laminated sandy silt)

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-25-05
Hole No. JA-028	Rig: DT6610 Track Rig	End Date: 1-25-05
Logged by: Ben Shoup	Total Depth: 5 ft.	Driller: Zack Bock
Weather: Overcast, Foggy, 39°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-6		6"			- Asphalt
6-14					- Road base
14-60		14"	85%		- Native, probably sand down to silty clay

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-25-05
Hole No. JA-036	Rig: DT6610 Track Rig	End Date: 1-25-05
Logged by: Ben Shoup	Total Depth: 10 ft	Driller: Zack Beck
Weather: Overcast, Foggy, 40°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-3		0			- Topsoil
3-15				65-100	- Sandy fill
15-65			60%		- Rock chip, pebble + sand fill
		65			
65-120			65%		- Native, cobbles, some sand
			120		

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-25-05
Hole No. JA-013	Rig: DT6610 Track Rig	End Date: 1-25-05
Logged by: Ben Shoup	Total Depth: 10 ft	Driller: Zach Rook
Weather: Overcast, 46°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-6		6			- Asphalt
6-16				CS-20033	- Road base (old gravel road)
16-66			55% 60"		- Rock chips, cobbles, sand fill
		66			
66-120			60"-120" 70%		- Native, cobbles + sand

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-25-05
Hole No. TA-024	Rig: DT6610 Track Rig	End Date: 1-25-05
Logged by: Ben Shoup	Total Depth: 10 Ft	Driller: Track Back
Weather: Overcast, 45°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-3		0			- Topsoil
3-14				CS-2003	- Organic rich silty sand
14-35			0-45%		- Oxidized pebbles, cobbles and sandy fill
		35			
35-120					- Coarse sand + pebbles and cobbles (native)
			60-120 60%		

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-25-05
Hole No. TA-010	Rig: DT6610 Track Rig	End Date: 1-25-05
Logged by: Ben Shoup	Total Depth: 5 ft.	Driller: Zack Beck
Weather: Overcast, 44°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-4		4		CS-20031	- Asphalt
4-10					- Pebbly road base
10-16					- Sandy gravel fill
		16	0-5' = 55%		
16-60					- Sandy Silt (native)

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-25-07
Hole No. TA-033	Rig: DT6610 Track Rig	End Date: 1-25-07
Logged by: Ben Shoup	Total Depth: 10 ft.	Driller: Zach Cook

Weather: Overcast, 42°F

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-7		0		0-25	-Gravel
7-11					- Sand fill
11-20			0-65 55%	25-30	- Loam, organic rich
20-65					- Rock chip + sandy-silt fill material
65-120		65	65-120 35%		-Native, cobbles, pebbles + sand.

CDM Federal Programs Corporation
Core Log

Project: Johnston Acres	Project No: 2603-029-201-JACRE	Start Date: 1-25-04
Hole No. JA-042	Rig: DT6610 Track Rig	End Date: 1-25-04
Logged by: Ben Shoup	Total Depth: 5 ft	Driller: Zach Beck
Weather: Overcast, 31°F		

Depth	Stratigraphy	Sample Interval	% Recovery	Sample ID	Description
0-9		0			- Topsoil
9-22					- Sandy fill
		22	60%		
22-60					- Native, sand + cobbles

Appendix C
Field Sample Data Sheets

Sheet No.: S- 000714

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR SOIL

Field Logbook No: 100319 Page No: 88 Sampling Date: 1-24-05

ddress: Johnston Acres (Owner) Tenant: City of Libby

Business Name: NA

Land Use: Residential School Commercial Mining Roadway (Other) Street)

Sampling Team: MACTEC (CDM) Other _____ Names: E. Strong

Data Item	Sample 1	Sample 2	Sample 3
Index ID	CS- 20007 1/24/05	CS- 20008 1/24/05	CS- 20009 1-24-05
Location ID	SP- 126366	SP- 126367	SP- 126368
Sample Group	Property →		
Location Description (circle)	Back yard Front yard Side yard Driveway (Other) JA-025	Back yard Front yard Side yard Driveway (Other) JA-030 1-24-05	Back yard Front yard Side yard Driveway (Other) JA-024
Category (circle)	(FS) FD of _____ Field Blank (lot or equipment)	(FS) FD of _____ Field Blank (lot or equipment)	(FS) FD of _____ Field Blank (lot or equipment)
Matrix Type (Surface soil unless other wise noted)	Surface Soil (Other) Subsurface	Surface Soil (Other) Subsurface	Surface Soil (Other) Subsurface
Type (circle) 1-29-05 ES	(Grab) ~~(Comp) # subsamples ____~~	(Grab) ~~(Comp) # subsamples ____~~	(Grab) ~~(Comp) # subsamples ____~~
Sample Time	0840	0910	0930
Top Depth (in.)	5"	6"	6"
Bottom Depth (in.)	180"	120"	120"
Field Comments Note if vermiculite is visible in sampled area	BD- NA Hole JA-025	BD- NA Hole JA-030	BD- NA Hole JA-024
Entered (LFO) ____	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____

For Field Team Completion (Provide Initials)	Completed by ES	QC by

vs 101503

Sheet No.: S- 000713

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR SOIL

Field Logbook No: 100319 Page No: 88 Sampling Date: 1-24-05

Address: Johnston Acres (Owner)/Tenant: City of Libby

Business Name: NA

Land Use: Residential School Commercial Mining Roadway (Other) (Streets)

Sampling Team: MACTEC (CDM) Other _____ Names: B. Shoup

Data Item	Sample 1	Sample 2	Sample 3
Index ID	1-24-05 CS- 20010	1-24-05 CS- 20011	1-24-05 CS- 20012
Location ID	BS SP- 126369	BS SP- 126370	BS SP- 126371
Sample Group	Property →		
Location Description (circle)	Back yard Front yard Side yard Driveway (Other) JA-023	Back yard Front yard Side yard Driveway (Other) JA-041	Back yard Front yard Side yard Driveway (Other) JA-022
Category (circle)	(FS) FD of _____ Field Blank (lot or equipment)	(FS) FD of _____ Field Blank (lot or equipment)	(FS) FD of _____ Field Blank (lot or equipment)
Matrix Type (Surface soil unless other wise noted)	Surface Soil (Other) Subsurface	Surface Soil (Other) Subsurface	Surface Soil (Other) Subsurface
Type (circle) BS 1-24-05	(Grab) ~~Comp # subsamples~~	(Grab) ~~Comp # subsamples~~	(Grab) ~~Comp # subsamples~~
Sample Time	1011	1050	1115
Top Depth (in.)	6"	0"	6"
Bottom Depth (in.)	60"	120"	60"
Field Comments Note if vermiculite is visible in sampled area	BD- NA JA-023	BD- NA JA-041	BD- NA JA-022
Entered (LFO) ____	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____

For Field Team Completion (Provide Initials)	Completed by BS	QC by

vs 101503

Sheet No.: S- 000716

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR SOIL

Field Logbook No: 100319 Page No: 88 Sampling Date: 01/24/05

Address: Johnston Acres Owner/Tenant: City of Libby

Business Name: NA

Land Use: Residential School Commercial Mining Roadway Other (Streets)

Sampling Team: MACTEC CDM Other _____ Names: B. Shoop

Data Item	Sample 1	Sample 2	Sample 3
Index ID	CS- 20013	CS- 20014	CS- 20015
Location ID	SP- 126372	SP- 126373	SP- 126374
Sample Group	Property	Property	Property
Location Description (circle)	Back yard Front yard Side yard Driveway Other JA-021	Back yard Front yard Side yard Driveway Other JA-044	Back yard Front yard Side yard Driveway Other JA-020
Category (circle)	ES FD of _____ Field Blank (lot or equipment)	ES FD of _____ Field Blank (lot or equipment)	ES FD of _____ Field Blank (lot or equipment)
Matrix Type (Surface soil unless other wise noted)	~~Surface Soil~~ Other Subsurface	~~Surface Soil~~ Other Subsurface	~~Surface Soil~~ Other Subsurface
Type (circle)	Grab ~~Comp. # subsamples~~ ____	Grab ~~Comp. # subsamples~~ ____	Grab ~~Comp. # subsamples~~ ____
Sample Time	1137	1156	1335
Top Depth (in.)	6"	0"	5"
Bottom Depth (in.)	60"	60"	70"
Field Comments Note if vermiculite is visible in sampled area	BD- NA JA-021	BD- NA JA-044	BD- NA JA-020
Entered (LFO) ____	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____

For Field Team Completion (Provide Initials)	Completed by PO	QC by

vs 101503

Sheet No. S- 000717

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR SOIL

Field Logbook No: 100319 Page No: 88 Sampling Date: 01/24/05

Address: Johnston Acres (Owner/Tenant: City of Libby

Business Name: NA

Land Use: Residential School Commercial Mining Roadway (Other (Streets)

Sampling Team: MACTEC (COM) Other _____ Names: B. Shomp

Data Item	Sample 1	Sample 2	Sample 3
Index ID	1-24-05 CS- 20016	1-24-05 CS- 20017	1-24-05 CS- 20018
Location ID	SP- 126375	SP- 126375	SP- 126376
Sample Group	Property	Property	Property
Location Description (circle)	Back yard Front yard Side yard Driveway (Other) JA-032	Back yard Front yard Side yard Driveway (Other) JA-032	Back yard Front yard Side yard Driveway (Other) JA-011
Category (circle)	(FS) FD of _____ Field Blank (lot or equipment)	(FS) FD of _____ Field Blank (lot or equipment)	(FS) FD of _____ Field Blank (lot or equipment)
Matrix Type (Surface soil unless other wise noted)	~~Surface Soil~~ (Other Subsurface)	~~Surface Soil~~ (Other Subsurface)	~~Surface Soil~~ (Other Subsurface)
Type (circle)	(Grab) ~~Comp. # subsamples ____~~	(Grab) ~~Comp. # subsamples ____~~	(Grab) ~~Comp. # subsamples ____~~
Sample Time	1350	1355	1425
Top Depth (in.)	0"	15"	6"
Bottom Depth (in.)	15"	120"	30"
Field Comments Note if vermiculite is visible in sampled area	BD- NA JA-032 Visible L.V.	BD- NA JA-032	BD- NA JA-011
Entered (LFO) ____	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____

For Field Team Completion (Provide Initials)	Completed by PO	QC by

vs 101503

Sheet No.: S- 000713

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR SOIL

Field Logbook No: 100319 Page No: 89 Sampling Date: 1-24-05

Address: Johnston Acres Owner/Tenant: City of Libby

Business Name: NA

Land Use: Residential School Commercial Mining Roadway Other (Streets)

Sampling Team: MACTEC CDM Other _____ Names: B. Shoop

Data Item	Sample 1	Sample 2	Sample 3
Index ID	1-24-05 CS- 20019	1-24-05 CS- 20020	1-24-05 CS- 20021
Location ID	SP- 126377	SP- 126378	SP- 126379
Sample Group	Property →		
Location Description (circle)	Back yard Front yard Side yard Driveway Other JA-012	Back yard Front yard Side yard Driveway Other JA-019	Back yard Front yard Side yard Driveway Other JA-039
Category (circle)	FS FD of _____ Field Blank (lot or equipment)	FS FD of _____ Field Blank (lot or equipment)	FS FD of _____ Field Blank (lot or equipment)
Matrix Type (Surface soil unless other wise noted)	Surface Soil Other Subsurface	Surface Soil Other Subsurface	Surface Soil Other Subsurface
Type (circle)	Grab ~~Comp # subsamples ____~~	Grab Comp # subsamples ____	Grab ~~Comp # subsamples ____~~
Sample Time	1530	1605	1638
Top Depth (in.)	6"	5"	0"
Bottom Depth (in.)	85"	60"	65"
Field Comments Note if vermiculite is visible in sampled area	BD- NA JA-012	BD- NA JA-019	BD- NA JA-039
Entered (LFO) ____	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____

For Field Team Completion (Provide Initials)	Completed by	QC by

vs 101503

Sheet No.: S- 000713

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR SOIL

Field Logbook No: 100319 Page No: 90 Sampling Date: 1-25-05

Address: Johnston Acres Owner/Tenant: City of Libby

Business Name:

Land Use: Residential School Commercial Mining Roadway Other (Streets)

Sampling Team: MACTEC CDM Other _____ Names: E Shoup

Data Item	Sample 1	Sample 2	Sample 3
Index ID	1-25-05 CS- 20022	1-25-05 CS- 20023	1-25-05 CS- 20024
Location ID	1-25 SP- 126380	1-25 SP- 126521	1-25 SP- 126522
Sample Group	Property		
Location Description (circle)	Back yard Front yard Side yard Driveway Other JA-040	Back yard Front yard Side yard Driveway Other JA-031	Back yard Front yard Side yard Driveway Other JA-026
Category (circle)	~~FSS~~ FD of _____ Field Blank (lot or equipment)	~~ES~~ FD of _____ Field Blank (lot or equipment)	~~ES~~ FD of _____ Field Blank (lot or equipment)
Matrix Type (Surface soil unless other wise noted)	Surface Soil Other Subsurface	Surface Soil Other Subsurface	Surface Soil Other Subsurface
Type (circle) BS 1-27-05	Grab ~~Comp # subsamples~~ ____	Grab ~~Comp # subsamples~~ ____	Grab ~~Comp # subsamples~~ ____
Sample Time	0845	0917	0935
Top Depth (in.)	0"	6"	6"
Bottom Depth (in.)	66"	65"	62"
Field Comments Note if vermiculite is visible in sampled area	BD- NA JA-040	BD- NA JA-031	BD- NA JA-026
Entered (LFO) ____	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____

For Field Team Completion (Provide Initials)	Completed by BS	QC by

vs 101503

Sheet No.: S- 000720

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR SOIL

Field Logbook No: 100319 Page No: 90 Sampling Date: 1-25-05

ddress: Johnston Acres Owner/Tenant: City of Libby

Business Name:

Land Use: Residential School Commercial Mining Roadway Other (Streets)

Sampling Team: MACTEC CDM Other Names: B. Shoop

Data Item	Sample 1	Sample 2	Sample 3
Index ID	1-25-05 CS- 20025	1-25-05 CS- 20026	1-25-05 CS- 20027
Location ID	BS SP- 126523	BS SP- 126524	BS SP- 126525
Sample Group	Property →		
Location Description (circle)	Back yard Front yard Side yard Driveway Other JA-043	Back yard Front yard Side yard Driveway Other JA-029	Back yard Front yard Side yard Driveway Other JA-027
Category (circle)	FS FD of Field Blank (lot or equipment)	FS FD of Field Blank (lot or equipment)	FS FD of Field Blank (lot or equipment)
Matrix Type (Surface soil unless other wise noted)	Surface Soil Other Subsurface	Surface Soil Other	Surface Soil Other
Type (circle) BS 1-31-05	Grab ~~Comp # subsamples~~	Grab ~~Comp # subsamples~~	Grab ~~Comp # subsamples~~
Sample Time	0945	1020	1205
Top Depth (in.)	0"	6"	6"
Bottom Depth (in.)	38"	42"	135"
Field Comments Note if vermiculite is visible in sampled area	BD- NA JA-043	BD- NA JA-029	BD- NA JA-027 CS-20027 also sent for Analytical Analysis as CS-20082 on 2/17/05 FSDS S-000598 gb 3/21/05
Entered (LFO) JP	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____

For Field Team Completion (Provide Initials)	Completed by BS	QC by gk

vs 101503

Sheet No.: S- 000721

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR SOIL

Field Logbook No: 100319 Page No: 90 Sampling Date: 1-25-05

Address: Johnston Acres Owner/Tenant: City of Libby

Business Name: NA

Land Use: Residential School Commercial Mining Roadway Other (Streets)

Sampling Team: MACTEC CDM Other _____ Names: B. Shoup

Data Item	Sample 1	Sample 2	Sample 3
Index ID	1-25-5 CS- 20028	1-25-5 CS- 20029	1-25-5 CS- 20030
Location ID	BS SP- 126526	BS SP- 126527	BS SP- 126528
Sample Group	Property →		
Location Description (circle)	Back yard Front yard Side yard Driveway Other JA-042	Back yard Front yard Side yard Driveway Other JA-018	Back yard Front yard Side yard Driveway Other JA-033
Category (circle)	FS FD of _____ Field Blank (lot or equipment)	FS FD of _____ Field Blank (lot or equipment)	FS FD of _____ Field Blank (lot or equipment)
Matrix Type (Surface soil unless other wise noted)	Surface Soil Other Subsurface	Surface Soil ~~Other~~	Surface Soil ~~Other~~ →
Type (circle)	Grab BS 1-25-05 ~~Comp. # subsamples~~ ____	Grab ~~Comp. # subsamples~~ ____	Grab ~~Comp. # subsamples~~ ____
Sample Time	1350	1408	1435
Top Depth (in.)	0"	6"	0"
Bottom Depth (in.)	22"	27"	65"
Field Comments Note if vermiculite is visible in sampled area	BD- NA JA-042	BD- NA JA-018	BD- NA JA-033
Entered (LFO) ____	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____

For Field Team Completion (Provide Initials)	Completed by BS	QC by

vs 101503

Sheet No.: S- 000722

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR SOIL

Field Logbook No: 100319 Page No: 90 Sampling Date: 1-25-05

Address: Johnston Acres (Owner) Tenant: City of Libby

Business Name: NA

Land Use: Residential School Commercial Mining Roadway (Other) (Streets)

Sampling Team: MACTEC (CDM) Other _____ Names: B. Shango

Data Item	Sample 1	Sample 2	Sample 3
Index ID	1-25-05 CS- 20031	1-25-05 CS- 20032	1-25-05 CS- 20033
Location ID	SP- 126529	SP- 126530	SP- 126531
Sample Group	Property →		
Location Description (circle)	Back yard Front yard Side yard Driveway (Other) JA -010	Back yard Front yard Side yard Driveway (Other) JA ~~013~~ 034 1/25/05	Back yard Front yard Side yard Driveway (Other) JA-013
Category (circle)	(FS) FD of _____ Field Blank (lot or equipment)	(FS) FD of _____ Field Blank (lot or equipment)	(FS) FD of _____ Field Blank (lot or equipment)
Matrix Type (Surface soil unless other wise noted)	Surface Soil (Other) Subsurface →	Surface Soil Other _____	Surface Soil Other _____
Type (circle)	(Grab) ~~Comp. # subsamples~~ ____	(Grab) ~~Comp. # subsamples~~ ____	(Grab) ~~Comp. # subsamples~~ ____
Sample Time	1448	1509	1540
Top Depth (in.)	4"	0"	0"
Bottom Depth (in.)	16"	35"	66"
Field Comments Note if vermiculite is visible in sampled area	BD- NA JA -010	BD- NA JA ~~013~~ 034 CS 1/25/05	BD- NA JA-013
Entered (LFO) ____	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____

For Field Team Completion (Provide Initials)	Completed by BS	QC by

vs 101503

Sheet No.: S- 000723

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR SOIL

Field Logbook No: 100319 Page No: 90-91 Sampling Date: 1-25-05

ddress: Johnston Acres Owner/Tenant: City of Libby

Business Name: NA

Land Use: Residential School Commercial Mining Roadway Other (Streets)

Sampling Team: MACTEC CDM Other _____ Names: R. Shoup

Data Item	Sample 1	Sample 2	Sample 3
Index ID	1-25-05 CS- 20034	1-25-05 CS- 20035	1-26-05 CS- 20036
Location ID	SP- 126532	SP- 126533	SP- 126534
Sample Group	Property →		
Location Description (circle)	Back yard Front yard Side yard Driveway Other JA-036	Back yard Front yard Side yard Driveway Other JA-028	Back yard Front yard Side yard Driveway Other JA-017
Category (circle)	FS FD of _____ Field Blank (lot or equipment)	FS FD of _____ Field Blank (lot or equipment)	FS FD of _____ Field Blank (lot or equipment)
Matrix Type (Surface soil unless otherwise noted)	Surface Soil Other Subsurface	Surface Soil Other _____	Surface Soil Other _____
Type (circle)	Grab ~~Comp # subsamples~~ _____	Grab ~~Comp~~ # subsamples _____	Grab ~~Comp.~~ # subsamples _____
Sample Time	1558	1623	0845
Top Depth (in.)	0"	6"	6"
Bottom Depth (in.)	65"	14"	26"
Field Comments Note if vermiculite is visible in sampled area	BD- NA JA-036	BD- NA JA-028	BD- NA JA-017 CS-20036 also sent for Analytical Suite Analysis on 2/17/05 as CS-20083 FSDS S-000598 3/31/05
Entered (LFO)	Volpe: Entered _____ Validated _____	Volpe: Entered _____ Validated _____	Volpe: Entered _____ Validated _____

For Field Team Completion (Provide Initials)	Completed by	QC by

vs 101503

Sheet No.: S- 000722

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR SOIL

Field Logbook No: 100319 Page No: 91 Sampling Date: 1-26-05

Address: Johnston Acres Owner/Tenant: City of Libby

Business Name: NA

Land Use: Residential School Commercial Mining Roadway Other (Streets)

Sampling Team: MACTEC CDM Other _____ Names: B. Shoop

Data Item	Sample 1	Sample 2	Sample 3
Index ID	1-26-05 CS- 20037	1-26-05 CS- 20038	1-26-05 CS- 20039
Location ID	SP- 126535	SP- 126536	SP- 126537
Sample Group	Property →		
Location Description (circle)	Back yard Front yard Side yard Driveway Other JA -014	Back yard Front yard Side yard Driveway Other JA-037	Back yard Front yard Side yard Driveway Other JA-099
Category (circle)	FS FD of _____ Field Blank (lot or equipment)	FS FD of _____ Field Blank (lot or equipment)	FS FD of _____ Field Blank (lot or equipment)
Matrix Type (Surface soil unless other wise noted)	Surface Soil Other Subsurface	Surface Soil Other	Surface Soil Other
Type (circle)	Grab ~~Comp. # subsamples~~	Grab ~~Comp. # subsamples~~	Grab ~~Comp. # subsamples~~
Sample Time	0858	0915	0935
Top Depth (in.)	4"	0"	4"
Bottom Depth (in.)	16"	24"	18"
Field Comments Note if vermiculite is visible in sampled area	BD- NA JA -014	BD- NA JA -037	BD- NA JA -099
Entered (LFO) ____	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____

For Field Team Completion (Provide Initials)	Completed by BS	QC by

vs 101503

Sheet No.: S- 000723

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR SOIL

Field Logbook No: 100319 Page No: 91 Sampling Date: 1-26-05

ddress: Johnston Acres (Owner) Tenant: City of Libby

Business Name: NA

Land Use: Residential School Commercial Mining Roadway (Other) (Streets)

Sampling Team: MACTEC (CDM) Other _____ Names: B. Shoup

Data Item	Sample 1	Sample 2	Sample 3
Index ID	1-26-05 CS- 20040	1-26-05 CS- 20041	1-26-05 CS- 20042
Location ID	BS SP- 126538	BS SP- 126539	BS SP- 126540
Sample Group	Property →		
Location Description (circle)	Back yard Front yard Side yard Driveway (Other) JA-006	Back yard Front yard Side yard Driveway (Other) JA-005	Back yard Front yard Side yard Driveway (Other) JA-004
Category (circle)	(FS) FD of _____ Field Blank (lot or equipment)	(FS) FD of _____ Field Blank (lot or equipment)	(FS) FD of _____ Field Blank (lot or equipment)
Matrix Type (Surface soil unless other wise noted)	Surface Soil (Other) Subsurface	Surface Soil Other →	Surface Soil Other →
Type (circle)	(Grab) ~~Comp. # subsamples ____~~	(Grab) ~~Comp. # subsamples ____~~	(Grab) ~~Comp. # subsamples ____~~
Sample Time	0948	1002	1012
Top Depth (in.)	4"	0"	4"
Bottom Depth (in.)	30"	10"	22"
Field Comments Note if vermiculite is visible in sampled area	BD- NA JA-006	BD- NA JA-005	BD- NA JA-004
Entered (LFO) ____	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____

For Field Team Completion (Provide Initials)	Completed by BS	QC by

vs 101503

Sheet No. S- ~~000726~~

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR SOIL

Field Logbook No: 100319 Page No: 91 Sampling Date: 1-26-05

Address: Johnston Acres Owner/Tenant: City of Libby

Business Name:

Land Use: Residential School Commercial Mining Roadway Other (Streets)

Sampling Team: MACTEC CDM Other _____ Names: B. Shoop

Data Item	Sample 1	Sample 2	Sample 3
Index ID	1-26-05 CS- 20043	1-26-05 CS- 20044	1-26-05 CS- 20045
Location ID	BS SP- 126541	BS SP- 126542	BS SP- 126543
Sample Group	Property →		
Location Description (circle)	Back yard Front yard Side yard Driveway Other JA-001	Back yard Front yard Side yard Driveway Other JA-003	Back yard Front yard Side yard Driveway Other JA-002
Category (circle)	FS FD of _____ Field Blank (lot or equipment)	FS FD of _____ Field Blank (lot or equipment)	FS FD of _____ Field Blank (lot or equipment)
Matrix Type (Surface soil unless other wise noted)	Surface Soil Other Subsurface	Surface Soil Other →	Surface Soil Other →
Type (circle) BS 1-29-05	Grab ~~Comp. # subsamples~~ _____	Grab Comp. # subsamples _____	Grab ~~Comp. # subsamples~~ _____
Sample Time	1030	1112	1127
Top Depth (in.)	4"	4"	6"
Bottom Depth (in.)	24"	10"	18"
Field Comments Note if vermiculite is visible in sampled area	BD- NA JA-001	BD- NA JA-003	BD- NA JA-002
Entered (LFO) _____	Volpe: Entered _____ Validated _____	Volpe: Entered _____ Validated _____	Volpe: Entered _____ Validated _____

For Field Team Completion (Provide Initials)	Completed by BS	QC by

vs 101503

Sheet No.: S- 000727

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR SOIL

Field Logbook No: 100319 Page No: 91 Sampling Date: 1-26-05

Address: Johnston Acres (Owner) Tenant: City of Libby

Business Name:

Land Use: Residential School Commercial Mining Roadway (Other) (Streets)

Sampling Team: MACTEC (CDM) Other _____ Names: B. Shoup

Data Item	Sample 1	Sample 2	Sample 3
Index ID	1-26-05 CS- 20046	1-26-05 CS- 20047	1-26-05 CS- 20048
Location ID	0.5 SP- 126544	0.5 SP- 126545	0.5 SP- 126546
Sample Group	Property →		
Location Description (circle)	Back yard Front yard Side yard Driveway (Other) JA-035	Back yard Front yard Side yard Driveway (Other) JA-008	Back yard Front yard Side yard Driveway (Other) JA-007
Category (circle)	(FS) FD of _____ Field Blank (lot or equipment)	(FS) FD of _____ Field Blank (lot or equipment)	(FS) FD of _____ Field Blank (lot or equipment)
Matrix Type (Surface soil unless other wise noted)	Surface Soil (Other) Subsurface	Surface Soil Other _____	Surface Soil Other _____
Type (circle)	(Grab) ~~Comp # subsamples~~ ____	(Grab) ~~Comp # subsamples~~ ____	(Grab) ~~Comp # subsamples~~ ____
Sample Time	1142	1158	1326
Top Depth (in.)	0"	4"	6"
Bottom Depth (in.)	10"	10"	18"
Field Comments Note if vermiculite is visible in sampled area	BD- N/A JA-035	BD- NA JA-008	BD- NA JA-007
Entered (LFO) ____	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____

For Field Team Completion (Provide Initials)	Completed by BS	QC by

vs 101503

Sheet No.: S- ~~000766~~

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR SOIL

Field Logbook No: 100319 Page No: 91 Sampling Date: 1-26-05

Address: Johnston Acres Owner/Tenant: City of Libby

Business Name: NA

Land Use: Residential School Commercial Mining Roadway Other (Streets)

Sampling Team: MACTEC CDM Other _____ Names: B. Stroup

Data Item	Sample 1	Sample 2	Sample 3
Index ID	1-26-05 CS- 20049	1-26-05 CS- 20050	1-26-05 CS- 20051
Location ID	BS SP- 126547	BS SP- 126548	BS SP- 126549
Sample Group	Property →		
Location Description (circle)	Back yard Front yard Side yard Driveway Other JA-015	Back yard Front yard Side yard Driveway Other JA-016	Back yard Front yard Side yard Driveway Other JA-038
Category (circle)	FS FD of _____ Field Blank (lot or equipment)	FS FD of _____ Field Blank (lot or equipment)	FS FD of _____ Field Blank (lot or equipment)
Matrix Type (Surface soil unless other wise noted)	Surface Soil Other Subsurface	Surface Soil ~~Other~~	Surface Soil ~~Other~~ →
Type (circle)	Grab ~~Comp # subsamples ____~~	Grab ~~Comp # subsamples ____~~	Grab ~~Comp # subsamples ____~~
Sample Time	1350	1405	1425
Top Depth (in.)	4"	6"	0"
Bottom Depth (in.)	32"	14"	12"
Field Comments Note if vermiculite is visible in sampled area	BD- NA JA-015	BD- NA JA-016	BD- NA JA-038
Entered (LFO) ____	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____

For Field Team Completion (Provide Initials)	Completed by BS	QC by

vs 101503

Sheet No.: S- 000598

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR SOIL

Field Logbook No: 100319 Page No: 93 Sampling Date: 2-17-05

Address: Johnston Acres (Owner) Tenant: City of Libby

Business Name:

Land Use: Residential School Commercial Mining Roadway (Other) Streets)

Sampling Team: MACTEC (CDM) Other _____ Names: B. Sharp

Data Item	Sample 1	Sample 2	Sample 3
Index ID	CS- 20082 ~~CS-20027~~ jb 3/31/05	CS- 20083 ~~CS-20036~~ jb 3/31/05	
Location ID	SP-126525	SP-126534	
Sample Group	Property →	→	
Location Description (circle)	Back yard Front yard Side yard Driveway Other JA-027	Back yard Front yard Side yard Driveway (Other) JA-017	Back yard Front yard Side yard Driveway Other
Category (circle)	(FS) FD of _____ Field Blank (lot or equipment)	(FS) FD of _____ Field Blank (lot or equipment)	FS FD of _____ Field Blank (lot or equipment)
Matrix Type (Surface soil unless otherwise noted)	Surface Soil (Other) Subsurface →	Surface Soil Other →	Surface Soil Other
Type (circle)	(Grab) Comp. # subsamples ____	(Grab) Comp. # subsamples ____	Grab Comp. # subsamples ____
Sample Time	1635	1637	
Top Depth (in.)	6	6	
Bottom Depth (in.)	135	26	
Field Comments Note if vermiculite is visible in sampled area	BD- NA Analytical Suite (Alpha Labs) →	BD- NA	BD-
Entered (LFO) jb	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____	Volpe: Entered ____ Validated ____

CS-20082 also sent for Asbestos Analysis as CS-20027 on 1/25/05 FSDS S-000720 jb 3/31/05

CS-20083 also sent for Asbestos Analysis as CS-20036 on 1-25-05 FSDS S-000723 jb 3/31/05

For Field Team Completion (Provide initials)	Completed by BS	QC by TS

vs 101503

Appendix D
Logbook Pages

[redacted] hn[redacted] H[redacted] [redacted]-2[redacted] [redacted] Jo[redacted]on [redacted]res[redacted] [redacted] 1-[redacted]05 [redacted]

US EPA Region 8 - Libby Asbestos

CDM Oversight - Ben Shoup

US EPA Region 8 - Libby Asbestos

0700 - Met with drillers @ CDM office to go over the plan and discuss work. Waited for U-Dig people from the City Water + Waste water department to show-up. They forgot about the meeting and did not arrive onsite until 0845. They were informed of what areas needed marking + they proceded to mark sites. Drilling commenced @ 0850 on Cedar Street. Sampling is recorded as follows on FSDS-000714

JA-025	JA-030	JA-024
CS-20007	CS-20008	CS-20009
SP-126366	SP-126367	SP-126368

FSDS-000715 includes the following samples:

JA-023	JA-041	JA-022
CS-20010	CS-20011	CS-20012
SP-126369	SP-126370	SP-126371

FSDS-000716 includes the following samples:

JA-021	JA-044	JA-020
CS-20013	CS-20014	CS-20015
SP-126372	SP-126373	SP-126374

FSDS-000717 includes the following samples:

JA-032	JA-032	JA-011
CS-20016	CS-20017	CS-20018
SP-126375	SP-126375	SP-126375

FSDS-000718 includes the following samples:

JA-012	JA-019	JA-039
CS-20019	CS-20020	CS-20021
SP-126377	SP-126378	SP-126379

Core logs were completed for each hole.

1648: Finished drilling for the day.

1730: Relinquish all samples to Patty Kari

BSU

1-24-05

Location Johnston Acres Date 1-25-05

Project Client US EPA Region 8 - Libby Asbestos

CDM Oversight: Ben Shoup

7:45 - Met with drillers @ CDM office and mobed to first drill site for the day. D. Repine aided in sample collection for todays work.

FSDS-000719 includes:

JA-040	JA-031	JA-026
CS-20022	CS-20023	CS-20024
SP-126380	SP-126~~39~~ 521	SP-126~~40~~ 522

FSDS-000720 includes:

JA-043	JA-029	JA-027
CS-20025	CS-20026	CS-20027
SP-126523	SP-126524	SP-126525

FSDS-000721 includes:

JA-042	JA-018	JA-033
CS-20028	CS-20029	CS-20030
SP-126526	SP-126527	SP-126528

FSDS-000722 includes:

JA-010	JA-034	JA-013
CS-20031	CS-20032	CS-20033
SP-126529	SP-126530	SP-126531

FSDS-000723 includes:

JA-036	JA-028	JA-017
CS-20034	CS-20035	CS-20036
SP-126532	SP-126533	SP-126534

1645: Finished drilling for the day.

1659: Relinquish samples to Patty Strong

Location Johnston Acres Date 1-26-05

Project Client US EPA Region 8 - Libby Asbestos

CDM Oversight - Ben Shoup

0630: B. Shoup prepared sample bags, data sheets + custody seals for today's work.

0745: Met drillers @ office to prepare for day.

FSDS-000724 includes:

JA-014	JA-037	JA-009
CS-20037	CS-20038	CS-20039
SP-126535	SP-126536	SP-126537

FSDS-000725 includes:

JA-006	JA-005	JA-004
CS-20040	CS-20041	CS-20042
SP-126538	SP-126539	SP-126540

FSDS-000726 includes:

JA-001	JA-003	JA-002
CS-20043	CS-20044	CS-20045
SP-126541	SP-126542	SP-126543

FSDS-000727 includes:

JA-035	JA-008	JA-007
CS-20046	CS-20047	CS-20048
SP-126544	SP-126545	SP-126546

FSDS-000728 includes:

JA-015	JA-016	JA-038
CS-20049	CS-20050	CS-20051
SP-126547	SP-126548	SP-126549

1500: Finished drilling. as 1-26-05

1535: Relinquish all samples to Patty Skari

Location Johnston Acres Date 2-17-05

Project / Client Libby Asbestos US EPA Region 8

1630: Met with Dave Cosgriff to collect analytical suite sample splits from 2 JA samples. Samples for analytical suite are on FSDS-000598 and include CS-20027 and CS-20036.

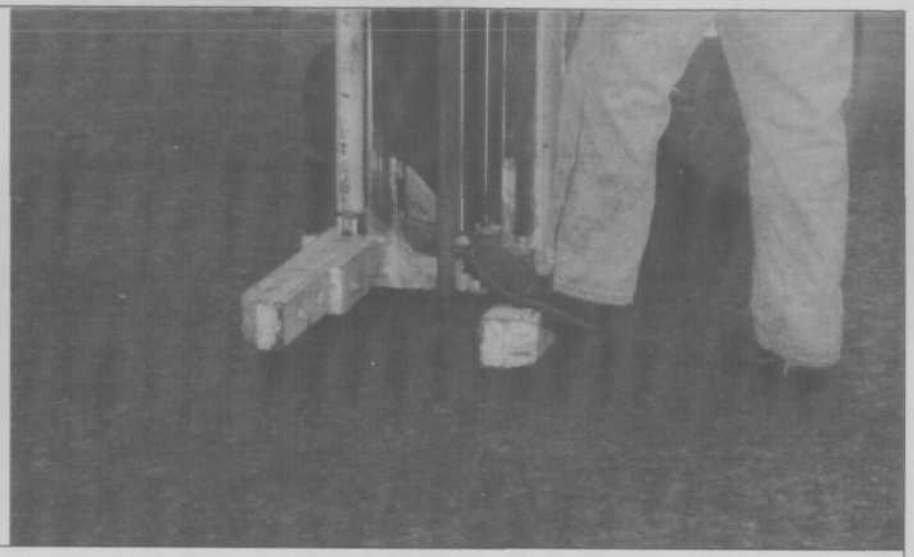
2-17-05

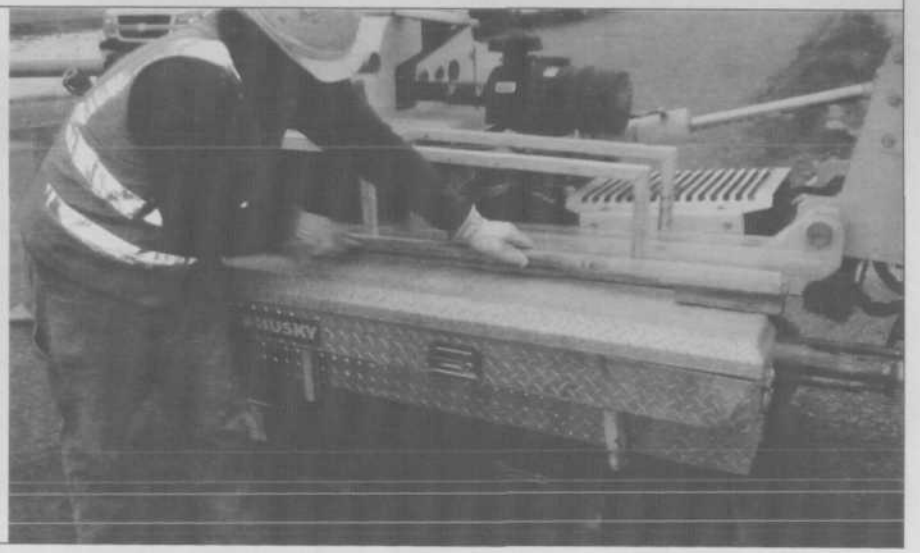
Appendix E
Photos Taken During the Johnston Acres Site Investigation, January 2005

Color Photo(s)

The following pages contain color that does not appear in the scanned images.

To view the actual images, please contact the Superfund Records Center at (303) 312-6473.




HUSKY

Appendix F
Analytical Results for Soil Samples Split and Sent for Analysis, February 2005

ALPHA ANALYTICAL LABORATORIES

Eight Walkup Drive
Westborough, Massachusetts 01581-1019
(508) 898-9220 www.alphalab.com

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

CERTIFICATE OF ANALYSIS

Client: Camp Dresser & McKee, Inc.

Laboratory Job Number: L0501766

Address: 1 Cambridge Place
50 Hampshire Street
Cambridge, MA 02139

Date Received: 22-FEB-2005

Attn: Ms. Anni Autio

Date Reported: 02-MAR-2005

Project Number: LIBBY2

Delivery Method: Fed Ex

Site: LIBBY SISTER SITE (DENVER, CO)

ALPHA SAMPLE NUMBER	CLIENT IDENTIFICATION	SAMPLE LOCATION
L0501766-01	CS-20027	DENVER, CO
L0501766-02	CS-20036	DENVER, CO

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized by: Scott McLean
This document electronically signed

ALPHA ANALYTICAL LABORATORIES
NARRATIVE REPORT

Laboratory Job Number: L0501766

Report Submission

This report replaces the report issued March 1, 2005. The report has been amended to include the results for all SemiVolatile Organics compounds.

At the authorization of the client, the samples were analyzed outside of the method required hold time.

Semi-Volatile Organics

L0501766-01 and -02 have elevated limits of detection due to the 5x dilutions required by the matrix interferences encountered during the extraction, concentration, and/or digestion of the samples.

The MS/MSD have a low % recovery for 2,4-Dinitrophenol and a high % recovery for 2,4-Dinitrotoluene.

EPH

L0501766-02 has elevated limits of detection due to the 5x dilutions required by the matrix interferences encountered during the extraction, concentration, and/or digestion of the sample.

The LCS/LCSD RPD's for C9-C18 Aliphatic range and Nonane are above the acceptance criteria for the method.

TPH DRO

L0501766-01 and -02 have elevated limits of detection due to the 25x dilutions required by the elevated concentrations of target compounds in the samples.

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0501766-01
CS-20027
Sample Matrix: SOIL

Date Collected: 24-JAN-2005 00:00
Date Received : 22-FEB-2005
Date Reported : 02-MAR-2005

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 1-Amber

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP	DATE ANAL	ID
Solids, Total	95.	%	0.10	30 2540G		0223 12:15	BT
SVOC's by GC/MS 8270				1 8270C	0228 17:30	0301 14:30	ML
Acenaphthene	ND	ug/kg	1800				
Benzidine	ND	ug/kg	18000				
1,2,4-Trichlorobenzene	ND	ug/kg	1800				
Hexachlorobenzene	ND	ug/kg	1800				
Bis(2-chloroethyl)ether	ND	ug/kg	1800				
1-Chloronaphthalene	ND	ug/kg	1800				
2-Chloronaphthalene	ND	ug/kg	2100				
1,2-Dichlorobenzene	ND	ug/kg	1800				
1,3-Dichlorobenzene	ND	ug/kg	1800				
1,4-Dichlorobenzene	ND	ug/kg	1800				
3,3'-Dichlorobenzidine	ND	ug/kg	18000				
2,4-Dinitrotoluene	ND	ug/kg	2100				
2,6-Dinitrotoluene	ND	ug/kg	1800				
Azobenzene	ND	ug/kg	1800				
Fluoranthene	ND	ug/kg	1800				
4-Chlorophenyl phenyl ether	ND	ug/kg	1800				
4-Bromophenyl phenyl ether	ND	ug/kg	1800				
Bis(2-chloroisopropyl)ether	ND	ug/kg	1800				
Bis(2-chloroethoxy)methane	ND	ug/kg	1800				
Hexachlorobutadiene	ND	ug/kg	3500				
Hexachlorocyclopentadiene	ND	ug/kg	3500				
Hexachloroethane	ND	ug/kg	1800				
Isophorone	ND	ug/kg	1800				
Naphthalene	ND	ug/kg	1800				
Nitrobenzene	ND	ug/kg	1800				
NDPA/DPA	ND	ug/kg	5300				
n-Nitrosodi-n-propylamine	ND	ug/kg	1800				
Bis(2-ethylhexyl)phthalate	ND	ug/kg	3500				
Butyl benzyl phthalate	ND	ug/kg	1800				
Di-n-butylphthalate	ND	ug/kg	1800				
Di-n-octylphthalate	ND	ug/kg	1800				
Diethyl phthalate	ND	ug/kg	1800				
Dimethyl phthalate	ND	ug/kg	1800				
Benzo(a)anthracene	ND	ug/kg	1800				
Benzo(a)pyrene	ND	ug/kg	1800				
Benzo(b)fluoranthene	ND	ug/kg	1800				

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L0501766-01
CS-20027

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATE PREP	DATE ANAL	ID
SVOC's by GC/MS 8270 continued				1	8270C	0228 17:30	0301 14:30	KL
Benzo(k)fluoranthene	ND	ug/kg	1800					
Chrysene	ND	ug/kg	1800					
Acenaphthylene	ND	ug/kg	1800					
Anthracene	ND	ug/kg	1800					
Benzo(ghi)perylene	ND	ug/kg	1800					
Fluorene	ND	ug/kg	1800					
Phenanthrene	ND	ug/kg	1800					
Dibenzo(a,h)anthracene	ND	ug/kg	1800					
Indeno(1,2,3-cd)pyrene	ND	ug/kg	1800					
Pyrene	ND	ug/kg	1800					
Benzo(e)pyrene	ND	ug/kg	1800					
Biphenyl	ND	ug/kg	1800					
Perylene	ND	ug/kg	1800					
Aniline	ND	ug/kg	3500					
4-Chloroaniline	ND	ug/kg	1800					
1-Methylnaphthalene	ND	ug/kg	1800					
2-Nitroaniline	ND	ug/kg	1800					
3-Nitroaniline	ND	ug/kg	1800					
4-Nitroaniline	ND	ug/kg	2400					
Dibenzofuran	ND	ug/kg	1800					
a,a-Dimethylphenethylamine	ND	ug/kg	18000					
Hexachloropropene	ND	ug/kg	3500					
Nitrosodi-n-butylamine	ND	ug/kg	3500					
2-Methylnaphthalene	ND	ug/kg	2800					
1,2,4,5-Tetrachlorobenzene	ND	ug/kg	7000					
Pentachlorobenzene	ND	ug/kg	7000					
a-Naphthylamine	ND	ug/kg	7000					
b-Naphthylamine	ND	ug/kg	7000					
Phenacetin	ND	ug/kg	3500					
Dimethoate	ND	ug/kg	7000					
4-Aminobiphenyl	ND	ug/kg	3500					
Pentachloronitrobenzene	ND	ug/kg	3500					
Isodrin	ND	ug/kg	3500					
p-Dimethylaminoazobenzene	ND	ug/kg	3500					
Chlorobenzilate	ND	ug/kg	7000					
3-Methylcholanthrene	ND	ug/kg	7000					
Ethyl Methanesulfonate	ND	ug/kg	5300					
Acetophenone	ND	ug/kg	7000					
Nitrosodipiperidine	ND	ug/kg	7000					
7,12-Dimethylbenz(a)anthracene	ND	ug/kg	3500					
n-Nitrosodimethylamine	ND	ug/kg	18000					
2,4,6-Trichlorophenol	ND	ug/kg	1800					
p-Chloro-m-cresol	ND	ug/kg	1800					
2-Chlorophenol	ND	ug/kg	2100					
2,4-Dichlorophenol	ND	ug/kg	3500					
2,4-Dimethylphenol	ND	ug/kg	3500					
2-Nitrophenol	ND	ug/kg	7000					
4-Nitrophenol	ND	ug/kg	3500					
2,4-Dinitrophenol	ND	ug/kg	7000					

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L0501766-01
CS-20027

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATE PREP	DATE ANAL	ID
SVOC's by GC/MS 8270 continued				1	8270C	0228 17:30	0301 14:30	KL
4,6-Dinitro-o-cresol	ND	ug/kg	7000					
Pentachlorophenol	ND	ug/kg	7000					
Phenol	ND	ug/kg	2400					
2-Methylphenol	ND	ug/kg	2100					
3-Methylphenol/4-Methylphenol	ND	ug/kg	2100					
2,4,5-Trichlorophenol	ND	ug/kg	1800					
2,6-Dichlorophenol	ND	ug/kg	3500					
Benzoic Acid	ND	ug/kg	18000					
Benzyl Alcohol	ND	ug/kg	3500					
Carbazole	ND	ug/kg	1800					
Surrogate(s)	Recovery		QC Criteria					
2-Fluorophenol	107.	%	25-120					
Phenol-d6	118.	%	10-120					
Nitrobenzene-d5	105.	%	23-120					
2-Fluorobiphenyl	101.	%	30-120					
2,4,6-Tribromophenol	106.	%	19-120					
4-Terphenyl-d14	103.	%	18-120					
Petroleum Hydrocarbons by GC-DRO				1	8015B(M)	0223 15:00	0226 14:36	MS
Diesel Range Organics	860000	ug/kg	660000					
Surrogate(s)	Recovery		QC Criteria					
o-Terphenyl	106.	%	40-140					

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L0501766-01
CS-20027

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP	DATE ANAL	ID
Extractable Petroleum Hydrocarbons				61 EPH-04-1	0228 09:45	0301 00:32	BN

Quality Control Information

Condition of sample received: Satisfactory
Sample temperature upon receipt: Received on Ice
Sample extraction method: Extracted Per the Method
Were all QA/QC procedures REQUIRED by the method followed? YES
Were all performance/acceptance standards for the required procedures achieved? YES
Were significant modifications made to the method as specified in Sect 11.3? NO
The normal acceptance range for the extraction surrogates, Chloro-octadecane and o-Terphenyl, is 40-140%.
The normal acceptance range for the fractionation surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, is 40-140%.

C9-C18 Aliphatics	94.5	mg/kg	35.1
C19-C36 Aliphatics	512.	mg/kg	35.1
C11-C22 Aromatics, Unadjusted	848.	mg/kg	35.1
C11-C22 Aromatics, Adjusted	848.	mg/kg	35.1

Surrogate(s)	Recovery		QC Criteria
Chloro-Octadecane	60.0	%	40-140
o-Terphenyl	110.	%	40-140
2-Fluorobiphenyl	81.0	%	40-140
2-Bromonaphthalene	88.0	%	40-140

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0501766-02
CS-20036
Sample Matrix: SOIL

Date Collected: 24-JAN-2005 00:00
Date Received : 22-FEB-2005
Date Reported : 02-MAR-2005

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 1-Amber

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP	DATE ANAL	ID
Solids, Total	91.	%	0.10	30 2540G		0223 12:15	BT
SVOC's by GC/MS 8270				1 8270C	0228 17:30	0301 14:04	HL
Acenaphthene	ND	ug/kg	1800				
Benzidine	ND	ug/kg	18000				
1,2,4-Trichlorobenzene	ND	ug/kg	1800				
Hexachlorobenzene	ND	ug/kg	1800				
Bis(2-chloroethyl)ether	ND	ug/kg	1800				
1-Chloronaphthalene	ND	ug/kg	1800				
2-Chloronaphthalene	ND	ug/kg	2200				
1,2-Dichlorobenzene	ND	ug/kg	1800				
1,3-Dichlorobenzene	ND	ug/kg	1800				
1,4-Dichlorobenzene	ND	ug/kg	1800				
3,3'-Dichlorobenzidine	ND	ug/kg	18000				
2,4-Dinitrotoluene	ND	ug/kg	2200				
2,6-Dinitrotoluene	ND	ug/kg	1800				
Azobenzene	ND	ug/kg	1800				
Fluoranthene	ND	ug/kg	1800				
4-Chlorophenyl phenyl ether	ND	ug/kg	1800				
4-Bromophenyl phenyl ether	ND	ug/kg	1800				
Bis(2-chloroisopropyl)ether	ND	ug/kg	1800				
Bis(2-chloroethoxy)methane	ND	ug/kg	1800				
Hexachlorobutadiene	ND	ug/kg	3700				
Hexachlorocyclopentadiene	ND	ug/kg	3700				
Hexachloroethane	ND	ug/kg	1800				
Isophorone	ND	ug/kg	1800				
Naphthalene	ND	ug/kg	1800				
Nitrobenzene	ND	ug/kg	1800				
NDPA/DPA	ND	ug/kg	5500				
n-Nitrosodi-n-propylamine	ND	ug/kg	1800				
Bis(2-ethylhexyl)phthalate	ND	ug/kg	3700				
Butyl benzyl phthalate	ND	ug/kg	1800				
Di-n-butylphthalate	ND	ug/kg	1800				
Di-n-octylphthalate	ND	ug/kg	1800				
Diethyl phthalate	ND	ug/kg	1800				
Dimethyl phthalate	ND	ug/kg	1800				
Benzo(a)anthracene	ND	ug/kg	1800				
Benzo(a)pyrene	ND	ug/kg	1800				
Benzo(b)fluoranthene	ND	ug/kg	1800				

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L0501766-02
CS-20036

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP	DATE ANAL	ID
SVOC's by GC/MS 8270 continued				1 8270C	0228 17:30	0301 14:04	HL
Benzo(k)fluoranthene	ND	ug/kg	1800				
Chrysene	ND	ug/kg	1800				
Acenaphthylene	ND	ug/kg	1800				
Anthracene	ND	ug/kg	1800				
Benzo(ghi)perylene	ND	ug/kg	1800				
Fluorene	ND	ug/kg	1800				
Phenanthrene	ND	ug/kg	1800				
Dibenzo(a,h)anthracene	ND	ug/kg	1800				
Indeno(1,2,3-cd)pyrene	ND	ug/kg	1800				
Pyrene	ND	ug/kg	1800				
Benzo(e)pyrene	ND	ug/kg	1800				
Biphenyl	ND	ug/kg	1800				
Perylene	ND	ug/kg	1800				
Aniline	ND	ug/kg	3700				
4-Chloroaniline	ND	ug/kg	1800				
1-Methylnaphthalene	ND	ug/kg	1800				
2-Nitroaniline	ND	ug/kg	1800				
3-Nitroaniline	ND	ug/kg	1800				
4-Nitroaniline	ND	ug/kg	2600				
Dibenzofuran	ND	ug/kg	1800				
a,a-Dimethylphenethylamine	ND	ug/kg	18000				
Hexachloropropene	ND	ug/kg	3700				
Nitrosodi-n-butylamine	ND	ug/kg	3700				
2-Methylnaphthalene	ND	ug/kg	2900				
1,2,4,5-Tetrachlorobenzene	ND	ug/kg	7300				
Pentachlorobenzene	ND	ug/kg	7300				
a-Naphthylamine	ND	ug/kg	7300				
b-Naphthylamine	ND	ug/kg	7300				
Phenacetin	ND	ug/kg	3700				
Dimethoate	ND	ug/kg	7300				
4-Aminobiphenyl	ND	ug/kg	3700				
Pentachloronitrobenzene	ND	ug/kg	3700				
Isodrin	ND	ug/kg	3700				
p-Dimethylaminoazobenzene	ND	ug/kg	3700				
Chlorobenzilate	ND	ug/kg	7300				
3-Methylcholanthrene	ND	ug/kg	7300				
Ethyl Methanesulfonate	ND	ug/kg	5500				
Acetophenone	ND	ug/kg	7300				
Nitrosodipiperidine	ND	ug/kg	7300				
7,12-Dimethylbenz(a)anthracene	ND	ug/kg	3700				
n-Nitrosodimethylamine	ND	ug/kg	18000				
2,4,6-Trichlorophenol	ND	ug/kg	1800				
p-Chloro-m-cresol	ND	ug/kg	1800				
2-Chlorophenol	ND	ug/kg	2200				
2,4-Dichlorophenol	ND	ug/kg	3700				
2,4-Dimethylphenol	ND	ug/kg	3700				
2-Nitrophenol	ND	ug/kg	7300				
4-Nitrophenol	ND	ug/kg	3700				
2,4-Dinitrophenol	ND	ug/kg	7300				

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L0501766-02
CS-20036

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATE PREP	DATE ANAL	ID
SVOC's by GC/MS 8270 continued				1	8270C	0228 17:30	0301 14:04	HL
4,6-Dinitro-o-cresol	ND	ug/kg	7300					
Pentachlorophenol	ND	ug/kg	7300					
Phenol	ND	ug/kg	2600					
2-Methylphenol	ND	ug/kg	2200					
3-Methylphenol/4-Methylphenol	ND	ug/kg	2200					
2,4,5-Trichlorophenol	ND	ug/kg	1800					
2,6-Dichlorophenol	ND	ug/kg	3700					
Benzoic Acid	ND	ug/kg	18000					
Benzyl Alcohol	ND	ug/kg	3700					
Carbazole	ND	ug/kg	1800					
Surrogate(s)	Recovery		QC Criteria					
2-Fluorophenol	103.	%	25-120					
Phenol-d6	111.	%	10-120					
Nitrobenzene-d5	104.	%	23-120					
2-Fluorobiphenyl	100.	%	30-120					
2,4,6-Tribromophenol	110.	%	19-120					
4-Terphenyl-d14	103.	%	18-120					
Petroleum Hydrocarbons by GC-DRO				1	8015B(M)	0223 15:00	0226 13:31	MS
Diesel Range Organics	710000	ug/kg	690000					
Surrogate(s)	Recovery		QC Criteria					
o-Terphenyl	97.0	%	40-140					

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L0501766-02
CS-20036

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP	DATE ANAL	ID
Extractable Petroleum Hydrocarbons				61 EPH-04-1	0223 15:00	0225 22:54	LT

Quality Control Information

Condition of sample received: Satisfactory
Sample temperature upon receipt: Received on Ice
Sample extraction method: Extracted Per the Method
Were all QA/QC procedures REQUIRED by the method followed? YES
Were all performance/acceptance standards for the required procedures achieved? YES
Were significant modifications made to the method as specified in Sect 11.3? NO
The normal acceptance range for the extraction surrogates, Chloro-octadecane and o-Terphenyl, is 40-140%.
The normal acceptance range for the fractionation surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, is 40-140%.

C9-C18 Aliphatics	94.5	mg/kg	27.5
C19-C36 Aliphatics	65.2	mg/kg	27.5
C11-C22 Aromatics, Unadjusted	583.	mg/kg	27.5
C11-C22 Aromatics, Adjusted	583.	mg/kg	27.5

Surrogate(s)	Recovery		QC Criteria
Chloro-Octadecane	85.0	%	40-140
o-Terphenyl	93.0	%	40-140
2-Fluorobiphenyl	69.0	%	40-140
2-Bromonaphthalene	73.0	%	40-140

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH DUPLICATE ANALYSIS

Laboratory Job Number: L0501766

Parameter	Value 1	Value 2	Units	RPD	RPD Limits
Solids, Total for sample(s) 01-02 (L0501720-01, WG194866-1)					
Solids, Total	91.	91.	%	0	
Petroleum Hydrocarbons by GC-DRO for sample(s) 01-02 (L0501766-02, WG194891-3)					
Diesel Range Organics	710000	730000	ug/kg	3	40
Surrogate(s)	Recovery				QC Criteria
o-Terphenyl	97.0	104.	%	7	40-140

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH SPIKE ANALYSES

Laboratory Job Number: L0501766

Parameter	% Recovery	QC Criteria
SVOC's by GC/MS 8270 LCS for sample(s) 01-02 (WG195392-2)		
Acenaphthene	73	31-137
1,2,4-Trichlorobenzene	72	38-107
2-Chloronaphthalene	74	
1,2-Dichlorobenzene	64	
1,4-Dichlorobenzene	63	28-104
2,4-Dinitrotoluene	89	28-89
2,6-Dinitrotoluene	89	
Fluoranthene	92	
4-Chlorophenyl phenyl ether	78	
n-Nitrosodi-n-propylamine	57	41-126
Butyl benzyl phthalate	92	
Anthracene	53	
Pyrene	89	35-142
Hexachloropropene	78	
P-Chloro-M-Cresol	79	26-103
2-Chlorophenol	64	25-102
2-Nitrophenol	65	
4-Nitrophenol	78	11-114
2,4-Dinitrophenol	44	
Pentachlorophenol	95	17-109
Phenol	62	26-90
Surrogate(s)		
2-Fluorophenol	71	25-120
Phenol-d6	82	10-120
Nitrobenzene-d5	72	23-120
2-Fluorobiphenyl	79	30-120
2,4,6-Tribromophenol	99	19-120
4-Terphenyl-d14	95	18-120
Petroleum Hydrocarbons by GC-DRO LCS for sample(s) 01-02 (WG194891-2)		
Diesel Range Organics	88	40-140
Surrogate(s)		
o-Terphenyl	87	40-140

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH LCS/LCSD ANALYSIS

Laboratory Job Number: L0501766

Parameter	LCS %	LCSD %	RPD	RPD Limit	QC Limits
Extractable Petroleum Hydrocarbons for sample(s) 02 (WG194893-2, WG194893-3)					
C9-C18 Aliphatics	65	74	13	25	40-140
C19-C36 Aliphatics	76	84	10	25	40-140
C11-C22 Aromatics	71	75	5	25	40-140
Naphthalene	56	69	21	25	40-140
Acenaphthene	67	76	13	25	40-140
Anthracene	79	83	5	25	40-140
Pyrene	78	82	5	25	40-140
Chrysene	84	88	5	25	40-140
Nonane (C9)	64	76	17	25	30-140
Tetradecane (C14)	80	91	13	25	40-140
Nonadecane (C19)	85	95	11	25	40-140
Eicosane (C20)	86	96	11	25	40-140
Octacosane (C28)	79	87	10	25	40-140
Surrogate(s)					
Chloro-Octadecane	55	63	14		40-140
o-Terphenyl	78	83	6		40-140
2-Fluorobiphenyl	68	78	14		40-140
2-Bromonaphthalene	71	78	9		40-140
Extractable Petroleum Hydrocarbons for sample(s) 01 (WG195358-2, WG195358-3)					
C9-C18 Aliphatics	58	76	27	25	40-140
C19-C36 Aliphatics	66	82	22	25	40-140
C11-C22 Aromatics	66	71	7	25	40-140
Naphthalene	55	65	17	25	40-140
Acenaphthene	60	68	13	25	40-140
Anthracene	69	78	12	25	40-140
Pyrene	70	79	12	25	40-140
Chrysene	75	84	11	25	40-140
Nonane (C9)	60	82	31	25	30-140
Tetradecane (C14)	72	93	25	25	40-140
Nonadecane (C19)	74	95	25	25	40-140
Eicosane (C20)	75	96	25	25	40-140
Octacosane (C28)	69	84	20	25	40-140
Surrogate(s)					
Chloro-Octadecane	48	62	25		40-140
o-Terphenyl	69	83	18		40-140
2-Fluorobiphenyl	62	69	11		40-140
2-Bromonaphthalene	62	70	12		40-140

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH MS/MSD ANALYSIS

Laboratory Job Number: L0501766

Parameter	MS %	MSD %	RPD	RPD Limit	MS/MSD Limits
SVOC's by GC/MS 8270 for sample(s) 01-02 (L0501766-02, WG195392-4)					
Acenaphthene	94	97	3	50	31-137
1,2,4-Trichlorobenzene	93	100	7	50	38-107
2-Chloronaphthalene	97	100	3	50	
1,2-Dichlorobenzene	91	96	5	50	
1,4-Dichlorobenzene	91	93	2	50	28-104
2,4-Dinitrotoluene	96	90	6	50	28-89
2,6-Dinitrotoluene	100	98	2	50	
Fluoranthene	98	110	12	50	
4-Chlorophenyl phenyl ether	97	100	3	50	
n-Nitrosodi-n-propylamine	79	85	7	50	41-126
Butyl benzyl phthalate	100	100	0	50	
Anthracene	59	60	2	50	
Pyrene	100	110	10	50	35-142
Hexachloropropene	86	76	12	50	
P-Chloro-M-Cresol	100	100	0	50	26-103
2-Chlorophenol	89	96	8	50	25-102
2-Nitrophenol	89	82	8	50	
4-Nitrophenol	100	89	12	50	11-114
2,4-Dinitrophenol	38	25	41	50	
Pentachlorophenol	89	68	27	50	17-109
Phenol	82	89	8	50	26-90
Surrogate(s)					
2-Fluorophenol	96	103	7		25-120
Phenol-d6	111	114	3		10-120
Nitrobenzene-d5	100	105	5		23-120
2-Fluorobiphenyl	101	104	3		30-120
2,4,6-Tribromophenol	114	120	5		19-120
4-Terphenyl-d14	98	103	5		18-120

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L0501766

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP	DATE ANAL	ID
Blank Analysis for sample(s) 01-02 (WG195392-1)							
SVOC's by GC/MS 8270				1 8270C	0228 17:30	0301 12:19	HL
Acenaphthene	ND	ug/kg	330				
Benzidine	ND	ug/kg	3300				
1,2,4-Trichlorobenzene	ND	ug/kg	330				
Hexachlorobenzene	ND	ug/kg	330				
Bis(2-chloroethyl)ether	ND	ug/kg	330				
1-Chloronaphthalene	ND	ug/kg	330				
2-Chloronaphthalene	ND	ug/kg	400				
1,2-Dichlorobenzene	ND	ug/kg	330				
1,3-Dichlorobenzene	ND	ug/kg	330				
1,4-Dichlorobenzene	ND	ug/kg	330				
3,3'-Dichlorobenzidine	ND	ug/kg	3300				
2,4-Dinitrotoluene	ND	ug/kg	400				
2,6-Dinitrotoluene	ND	ug/kg	330				
Azobenzene	ND	ug/kg	330				
Fluoranthene	ND	ug/kg	330				
4-Chlorophenyl phenyl ether	ND	ug/kg	330				
4-Bromophenyl phenyl ether	ND	ug/kg	330				
Bis(2-chloroisopropyl)ether	ND	ug/kg	330				
Bis(2-chloroethoxy)methane	ND	ug/kg	330				
Hexachlorobutadiene	ND	ug/kg	670				
Hexachlorocyclopentadiene	ND	ug/kg	670				
Hexachloroethane	ND	ug/kg	330				
Isophorone	ND	ug/kg	330				
Naphthalene	ND	ug/kg	330				
Nitrobenzene	ND	ug/kg	330				
NDPA/DPA	ND	ug/kg	1000				
n-Nitrosodi-n-propylamine	ND	ug/kg	330				
Bis(2-ethylhexyl)phthalate	ND	ug/kg	670				
Butyl benzyl phthalate	ND	ug/kg	330				
Di-n-butylphthalate	ND	ug/kg	330				
Di-n-octylphthalate	ND	ug/kg	330				
Diethyl phthalate	ND	ug/kg	330				
Dimethyl phthalate	ND	ug/kg	330				
Benzo(a)anthracene	ND	ug/kg	330				
Benzo(a)pyrene	ND	ug/kg	330				
Benzo(b)fluoranthene	ND	ug/kg	330				
Benzo(k)fluoranthene	ND	ug/kg	330				
Chrysene	ND	ug/kg	330				
Acenaphthylene	ND	ug/kg	330				
Anthracene	ND	ug/kg	330				
Benzo(ghi)perylene	ND	ug/kg	330				
Fluorene	ND	ug/kg	330				
Phenanthrene	ND	ug/kg	330				
Dibenzo(a,h)anthracene	ND	ug/kg	330				
Indeno(1,2,3-cd)pyrene	ND	ug/kg	330				
Pyrene	ND	ug/kg	330				

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L0501766

Continued

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP	DATE ANAL	ID
Blank Analysis for sample(s) 01-02 (WG195392-1)							
SVOC's by GC/MS 8270 continued				1 8270C	0228 17:30	0301 12:19	HL
Benzo(e)pyrene	ND	ug/kg	330				
Biphenyl	ND	ug/kg	330				
Perylene	ND	ug/kg	330				
Aniline	ND	ug/kg	670				
4-Chloroaniline	ND	ug/kg	330				
1-Methylnaphthalene	ND	ug/kg	330				
2-Nitroaniline	ND	ug/kg	330				
3-Nitroaniline	ND	ug/kg	330				
4-Nitroaniline	ND	ug/kg	470				
Dibenzofuran	ND	ug/kg	330				
a,a-Dimethylphenethylamine	ND	ug/kg	3300				
Hexachloropropene	ND	ug/kg	670				
Nitrosodi-n-butylamine	ND	ug/kg	670				
2-Methylnaphthalene	ND	ug/kg	530				
1,2,4,5-Tetrachlorobenzene	ND	ug/kg	1300				
Pentachlorobenzene	ND	ug/kg	1300				
a-Naphthylamine	ND	ug/kg	1300				
b-Naphthylamine	ND	ug/kg	1300				
Phenacetin	ND	ug/kg	670				
Dimethoate	ND	ug/kg	1300				
4-Aminobiphenyl	ND	ug/kg	670				
Pentachloronitrobenzene	ND	ug/kg	670				
Isodrin	ND	ug/kg	670				
p-Dimethylaminoazobenzene	ND	ug/kg	670				
Chlorobenzilate	ND	ug/kg	1300				
3-Methylcholanthrene	ND	ug/kg	1300				
Ethyl Methanesulfonate	ND	ug/kg	1000				
Acetophenone	ND	ug/kg	1300				
Nitrosodipiperidine	ND	ug/kg	1300				
7,12-Dimethylbenz(a)anthracene	ND	ug/kg	670				
n-Nitrosodimethylamine	ND	ug/kg	3300				
2,4,6-Trichlorophenol	ND	ug/kg	330				
p-Chloro-m-cresol	ND	ug/kg	330				
2-Chlorophenol	ND	ug/kg	400				
2,4-Dichlorophenol	ND	ug/kg	670				
2,4-Dimethylphenol	ND	ug/kg	670				
2-Nitrophenol	ND	ug/kg	1300				
4-Nitrophenol	ND	ug/kg	670				
2,4-Dinitrophenol	ND	ug/kg	1300				
4,6-Dinitro-o-cresol	ND	ug/kg	1300				
Pentachlorophenol	ND	ug/kg	1300				
Phenol	ND	ug/kg	470				
2-Methylphenol	ND	ug/kg	400				
3-Methylphenol/4-Methylphenol	ND	ug/kg	400				
2,4,5-Trichlorophenol	ND	ug/kg	330				
2,6-Dichlorophenol	ND	ug/kg	670				

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH BLANK ANALYSIS

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Continued

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP	DATE ANAL	ID
Blank Analysis for sample(s) 01-02 (WG195392-1)							
SVOC's by GC/MS 8270 continued				1 8270C	0228 17:30	0301 12:19	HL
Benzoic Acid	ND	ug/kg	3300				
Benzyl Alcohol	ND	ug/kg	670				
Carbazole	ND	ug/kg	330				
Pyridine	ND	ug/kg	3300				
2-Picoline	ND	ug/kg	1300				
Pronamide	ND	ug/kg	1300				
Methyl methanesulfonate	ND	ug/kg	1300				
Surrogate(s)	Recovery		QC Criteria				
2-Fluorophenol	86.0	%	25-120				
Phenol-d6	95.0	%	10-120				
Nitrobenzene-d5	87.0	%	23-120				
2-Fluorobiphenyl	81.0	%	30-120				
2,4,6-Tribromophenol	86.0	%	19-120				
4-Terphenyl-d14	91.0	%	18-120				
Blank Analysis for sample(s) 01-02 (WG194891-1)							
Petroleum Hydrocarbons by GC-DRO				1 8015B(M)	0223 15:00	0226 07:08	MS
Diesel Range Organics	ND	ug/kg	25000				
Surrogate(s)	Recovery		QC Criteria				
o-Terphenyl	84.0	%	40-140				
Blank Analysis for sample(s) 02 (WG194893-1)							
Extractable Petroleum Hydrocarbons				61 EPH-04-1	0223 15:00	0225 19:17	LT
C9-C18 Aliphatics	ND	mg/kg	5.00				
C19-C36 Aliphatics	ND	mg/kg	5.00				
C11-C22 Aromatics, Unadjusted	ND	mg/kg	5.00				
C11-C22 Aromatics, Adjusted	ND	mg/kg	5.00				
Surrogate(s)	Recovery		QC Criteria				
Chloro-Octadecane	59.0	%	40-140				
o-Terphenyl	74.0	%	40-140				
2-Fluorobiphenyl	72.0	%	40-140				
2-Bromonaphthalene	72.0	%	40-140				
Blank Analysis for sample(s) 01 (WG195358-1)							
Extractable Petroleum Hydrocarbons				61 EPH-04-1	0228 09:45	0228 17:19	BN
C9-C18 Aliphatics	ND	mg/kg	6.67				
C19-C36 Aliphatics	ND	mg/kg	6.67				
C11-C22 Aromatics, Unadjusted	ND	mg/kg	6.67				
C11-C22 Aromatics, Adjusted	ND	mg/kg	6.67				
Surrogate(s)	Recovery		QC Criteria				
Chloro-Octadecane	70.0	%	40-140				
o-Terphenyl	73.0	%	40-140				

ALPHA ANALYTICAL LABORATORIES
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PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP	DATE ANAL	ID
Blank Analysis for sample(s) 01 (WG195358-1)							
Extractable Petroleum Hydrocarbons continued				61 EPH-04-1	0228 09:45	0228 17:19	BN
2-Fluorobiphenyl	75.0	%	40-140				
2-Bromonaphthalene	74.0	%	40-140				

REFERENCES

1. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IIIA, 1997.

30. Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WPCF. 18th Edition. 1992.

61. Method for the Determination of Extractable Petroleum Hydrocarbons (EPH). Massachusetts Department of Environmental Protection, DEA/ORS/BWSC. May 2004, Revision 1.1.

GLOSSARY OF TERMS AND SYMBOLS

REF	Reference number in which test method may be found.
METHOD	Method number by which analysis was performed.
ID	Initials of the analyst.
ND	Not detected in comparison to the reported detection limit.
NI	Not Ignitable.
ug/cart	Micrograms per Cartridge.

LIMITATION OF LIABILITIES

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