



**CDW CONSULTANTS, INC.**  
CIVIL & ENVIRONMENTAL ENGINEERS

PRINCIPALS & ASSOCIATES

Yee Cho, PE, LSP  
Kathleen Campbell, PE, LSP, LEED AP  
Jack Goodhall, PE

April 2, 2011

Ms. Lisa-Pecora Ryan  
OMR Architects, Inc.  
543 Massachusetts Avenue  
Acton, MA 01720

**RE: Supplemental Soil Testing in Landfill Area**  
Concord-Carlisle Regional High School  
500 Walden Street  
Concord, MA  
CDW Project #1234.30

Dear Ms. Pecora-Ryan:

CDW Consultants, Inc. (CDW) is pleased to present a summary of supplemental soil sampling and analysis at the Concord-Carlisle Regional High School (CCHS) in Concord, MA (Figure 1 in Attachment A). The purpose of this study was to identify the potential presence of landfill related wastes in areas of proposed underground utilities. The soil data was compared with applicable regulatory standards in the Massachusetts Contingency Plan (MCP).

**Summary of Previous Investigations in Landfill Area**

CDW completed a Phase II – Limited Subsurface Investigation report dated October 24, 2011. Several test borings were completed at the High School based on the findings of a Phase I Site Assessment. Three (3) borings were completed in the approximate area of the former landfill. Observations during those borings indicated visual and/or analytical evidence of the landfill in two of the three boring locations (B1 and B8). Copper was identified at concentrations exceeding the applicable MCP Reportable Concentration (RC).

Based on elevated concentrations of metals in boring B8, an additional investigation was completed in that area consisting of 4 borings (B8-5, B8-6, B8-7, and B8-MW-1) with one of the borings completed as a groundwater monitoring well. Visual evidence of the landfill was observed in three of the borings including dark soils with ash, glass, metal and brick. Several additional metals were identified in soils from 0-12 feet at concentrations exceeding applicable RCs. These include cadmium, chromium, nickel, and lead. Lead was identified in three of the five borings in that area at concentrations above RCs. Groundwater sampling for soluble metals indicated two metals detected, however, these metals were below the applicable RC for GW-1 classified groundwater.

The Site was reported to the DEP on February 6, 2012 due to concentrations of cadmium, chromium, lead, copper and nickel exceeding applicable RCs.

Evidence of the former landfill was observed during a geotechnical investigation by Nobis



Engineering, Inc. in December 2011. Visual evidence including dark soils, ash, brick, glass, plastic, ceramic and metal were observed in three borings in the eastern parking lot at depths of 5-18 feet in one boring and from 5-9 feet (total depth of boring) in two borings. CDW was not on site during that investigation. For comparison, data tables are included in Attachment B.

### **Supplemental Subsurface Investigation in Landfill Area**

On March 16, 2012, CDW completed a supplemental field sampling program of soil located within proposed areas for utilities and subsurface drainage structures. A total of 24 borings (P-1 through P-24) were advanced with a Geoprobe 6620 track-mounted drill rig by the direct push drilling method. Soil samples were obtained continuously in five foot long disposable plastic sleeves, and classified on-site. All down-hole drilling tools were decontaminated with a soap and water solution between borings. Drilling was completed by CDW's subcontractor Technical Drilling Services, Inc. (TDS) of Sterling, MA.

The borings were advanced within the historical mapped footprint of the approximated landfill in areas of proposed subsurface utilities and an athletic field. Soil samples were collected and classified in 2.5 foot increments. Eleven (11) of the borings (area of proposed detention basin and pond, to the north of the existing school building, and near the Walden Street entrance) were advanced to 10 feet below grade. The remaining 13 borings were advanced to 5 feet below grade.

Soils encountered during drilling were fill materials of varying color throughout most borings with some native sands. Evidence of the former landfill was observed primarily in the area of the proposed detention basin in the student and faculty parking lots east of the school building. There was a marked difference between landfill soils which were dark brown and black and regular fill or native soils that were light brown and tan. Darker soils with ash, brick, glass, metal and wood were observed at depths from approximately 4 feet to the final depth of the borings at 10 feet in this area. Soils in other portions of the Site were observed to be predominantly tan fine-coarse sands with some gravel. Groundwater was not encountered during drilling. Bedrock was not observed during drilling. Attachment C presents the soil boring logs.

### **Soil Screening and Laboratory Samples**

CDW used a photoionization detector (PID) to field-screen soil samples for the presence of volatile organic compounds (VOCs) using the headspace method. The PID is an instrument used to quantify VOCs and has a detection limit of 1 part per million (ppm).

The field-screening results indicated levels of VOCs ranging from non-detect to 27.5 parts per million by volume in the samples screened. It should be noted that no olfactory evidence of VOCs was noted in the samples that exhibited readings above background, and these readings may be a result of moisture/condensation within the unit due to relatively wet weather conditions during sampling and/or organics in the samples. The PID headspace analysis results are summarized in Table 2 in Attachment B.

CDW collected and submitted one soil sample from each boring for laboratory analysis for total lead. Eight samples were analyzed for PP13 metals and four samples were analyzed for Extractable Petroleum Hydrocarbons (EPH) by the DEP Method. CDW collected one field soil sample duplicate



from P-6/S-2 for EPH and PP13 and one field soil sample duplicate from P-16/S-2 for total lead for QA/QC purposes. The soil samples were preserved by refrigeration and were delivered to the laboratory accompanied by an appropriate chain-of-custody record. CDW's subcontractor, Spectrum Analytical, Inc. (Spectrum), completed the laboratory sample analyses.

## **Soil Analytical Results**

### Proposed Underground Detention Basin and Settling Pond Area

Seven (7) borings (P-4 through P-10) were completed in this area and six soil samples were collected for laboratory analysis. Landfill soils were observed at depths of approximately 4 to at least 10 feet below grade in all borings except P-10. Lead was detected at elevated concentrations in three of the samples at depths between 4 and 7.5 feet. Ash appeared to be layered with lighter soils in boring P-5. Significantly elevated concentrations of lead were detected between approximately 4 and 7.5 feet in boring P-8 at concentrations ranging from 15,200 to 35,600 ppm. Arsenic, a metal that was not previously detected above RCs, was detected at a concentration exceeding the applicable RC in boring B-8, and will require notification to DEP.

### Proposed Drain Line Areas

Fourteen (14) borings (P-1 through P-3 and P14 through P-24) were completed in these areas and 14 soil samples were submitted for laboratory analysis. Borings P-14, P-15, P19 and P20 were completed to 10 feet and the remainder were completed to 5 feet below grade. Except for the 4 foot depth in boring P-18, there was no visual or laboratory evidence of landfill materials to the final boring depths.

### Proposed Athletic Field Area

Three (3) borings (P-11 through P13) were completed to a depth of 5 feet in this area and three samples were submitted for laboratory analysis. There was no visual or laboratory evidence of landfill materials in the samples collected to a depth of five (5) feet in this area.

## **Conclusions**

Supplemental analysis of soil in a former historic landfill area was performed at the Concord-Carlisle Regional High School in Concord, MA. The investigation was performed to evaluate the potential presence of landfill soils in areas of proposed subsurface utilities, subsurface structures, and athletic fields. The soil borings were advanced in the specific areas of proposed utility excavations and to represent final depths of those excavations. The investigation verified a portion of the former landfill, however, the full lateral extent of the landfill has not been delineated.

Evidence of landfill soils were observed at depths of 4 feet or greater, and primarily in borings P-4 through P-9 in the area of the proposed detention basin and pond. Evidence of the landfill was not observed in any of the shallow (5 foot) borings, except for P-18 at a depth of 4 feet. Based on observations at depth and laboratory results, borings P-19 through P-24 and P-14 and P-15 located north of the building, in the courtyard and near the Walden Street entrance appear to be outside of the landfill footprint. Based on previous boring observations, landfill soils likely exist below 4 feet



in most or all of the boring locations east of the school building (student parking lot, field and grassy areas adjacent to building).

The identification of lead at significant concentrations warrants the delineation of confirmed boundaries of the former landfill as a preliminary measure to reduce risk and achieve regulatory closure.

### **Recommendations**

Based on the above, CDW recommends the following:

- Based on elevated concentrations of metals in the area of proposed detention basin and settling pond, CDW recommends that these structures be relocated outside of the estimated landfill footprint.
- CDW recommends a more detailed soil investigation to delineate the boundaries of the landfill.
- Prior to any future subsurface excavations for shallow utilities within the landfill footprint, CDW recommends that a Soil Management Plan be implemented to establish procedures to be followed if landfill soils are encountered.
- Arsenic was detected as an additional compound in one boring at a concentration exceeding the applicable MCP RC. Notification to DEP is required within 120 days of knowledge of this condition.
- Additional obligations exist for assessment and/or response actions under the Massachusetts Contingency Plan. If regulatory closure cannot be achieved within one year of reporting, a Phase I/Tier Classification will be required by DEP one year after reporting, or February 6, 2013.

### **Limitations**

The results of the testing are preliminary and indicative of conditions at the time of sampling. The findings of soil sample analysis do not represent all volumes of soil that could be generated, or all contaminants that could be found, during this project. CDW recommends that additional soil testing be performed during excavation of surplus soils to meet the sampling requirements of the ultimate soil disposal destination. If visual evidence of contaminants or subsurface structures is noted during future construction, contractors should contact an environmental professional to determine whether additional measures will be required to identify or mitigate soil or groundwater contamination.



Very truly yours,

CDW CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read "Brian J. Miller".

Brian J. Miller, LSP  
Project Manager

CDW CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read "Kathleen Campbell".

Kathleen Campbell, PE, LSP, LEED AP  
Vice President

Attachment A: Figures

Figure 1 – Site Location Map

Figure 2 – Site Plan with Sampling Locations

Attachment B: Tables

Table 1 - PID Headspace Screening Results – January 12, 2012

Table 2 - PID Headspace Screening Results – March 16, 2012

Table 3 - Soil Analytical Results – PP13 Metals – January 12, 2012

Table 4 - Soil Analytical Results – Total Lead – March 16, 2012

Table 5 - Soil Analytical Results – PP13 Metals and EPH – March 16, 2012

Table 6 – Groundwater Analytical Results – Soluble PP13 Metals - January 16, 2012

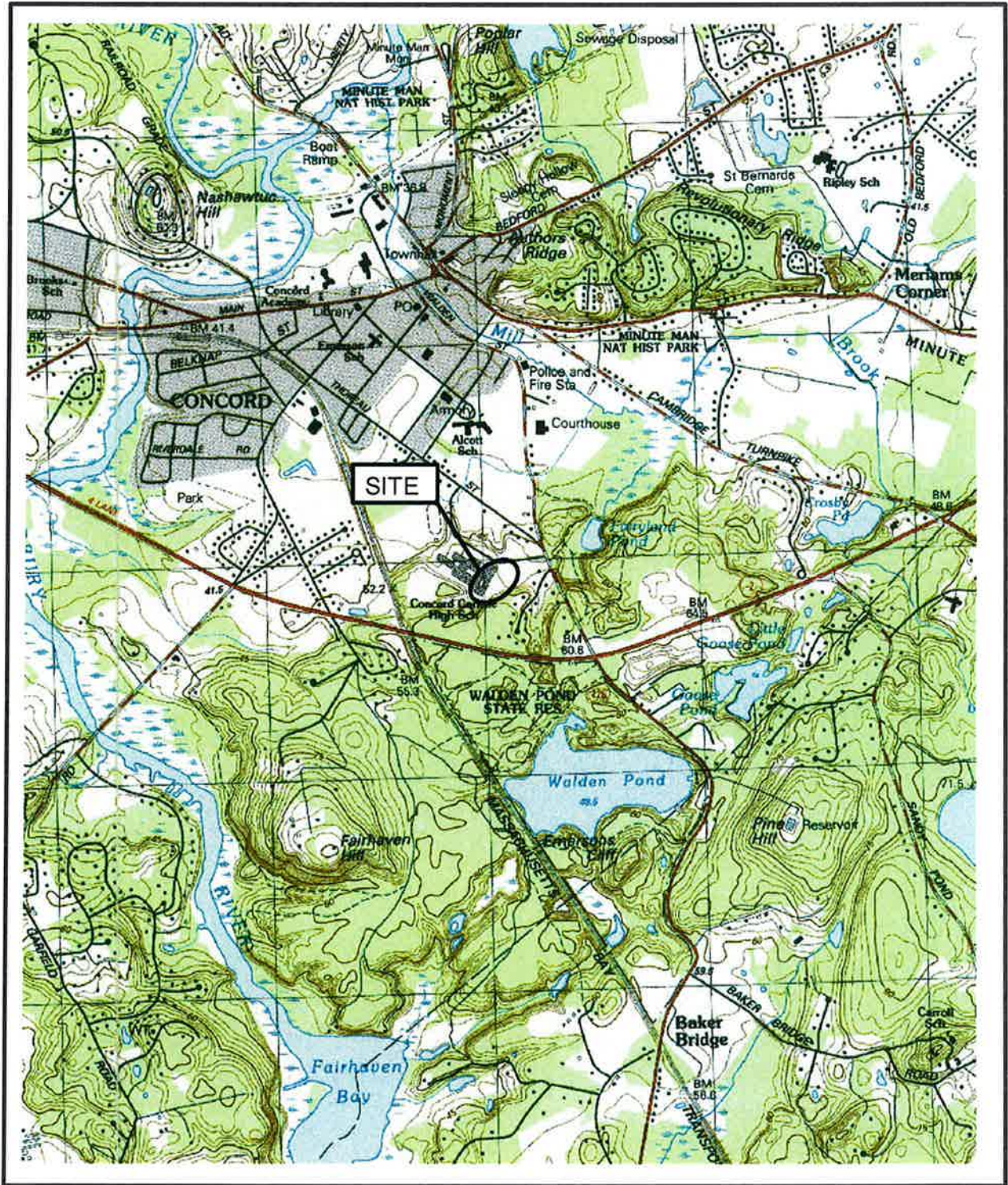
Attachment C: Soil Boring Logs

Attachment D: Laboratory Reports & Chain of Custody Records

**ATTACHMENT A**

**FIGURES**





CDW CONSULTANTS, INC.

SITE LOCATION MAP

Former Landfill Area

Concord Carlsisle High School, Concord, MA



SOURCE: MA Geographic Information System

PROJECT NO.: 1234.3  
 APPROX. SCALE: 1:25,000

FIGURE 1





**FIGURE 2**  
**SITE PLAN WITH SAMPLING LOCATIONS**  
**CONCORD CARLISLE HIGH SCHOOL**  
**CONCORD, MA**  
 March 26, 2012

DATA PROVIDED BY THE MASSACHUSETTS STATE PLANT SAMPLING DIVISION



IMAGE SOURCE: MAGIS 2008 ORTHOPHOTO



**ATTACHMENT B**  
**TABLES**

<b>TABLE 1</b> <b>Soil Headspace Screening Results</b> <b>Concord Carlisle High School</b> <b>January 12, 2012</b>		
<b>Sample ID</b>	<b>Depth</b>	<b>PPMV</b>
B8/MW-1/S-1*	0-2'	0.0
B8/MW-1/S-2	5-7'	0.0
B8/MW-1/S-3*	10-12'	0.0
B8/MW-1/S-4	15-17'	0.0
B8/MW-1/S-5	20-22'	0.0
B8/MW-1/S-6	25-27'	0.0
B8-5/S-1	0-2'	0.0
B8-5/S-2*	5-7'	0.0
B8-5/S-3	10-12'	0.0
B8-5/S-4	15-17'	0.0
B8-6/S-1*	0-2'	0.0
B8-6/S-2*	5-7'	0.0
B8-6/S-3	10-12'	0.0
B8-6/S-4	15-17'	0.0
B8-7/S-1	0-2'	0.0
B8-7/S-2*	5-7'	0.0
B8-7/S-3	10-12'	0.0
B8-7/S-4	15-17'	0.0

\* = Sample submitted to lab for analysis.

PPMV = Parts Per Million By Volume

**TABLE 2**  
**Soil Headspace Screening Results**  
**Concord Carlisle High School**  
**March 16, 2012**

<b>Sample ID</b>	<b>Depth</b>	<b>PPMV</b>
P-1/S-1	0 - 2.5'	0.1
P-1/S-2	2.5 - 5'	0.2
P-2/S-1	0 - 2.5'	0.0
P-2/S-2	2.5 - 5'	0.1
P-3/S-1	0 - 2.5'	0.1
P-3/S-2	2.5 - 5'	0.1
P-4/S-1	0 - 2.5'	0.0
P-4/S-2	2.5 - 5'	0.1
P-4/S-3	5 - 7.5'	0.1
P-4/S-4	7.5 - 10'	0.0
P-5/S-1	0 - 2.5'	0.2
P-5/S-2	2.5 - 5'	0.2
P-5/S-3	5 - 7.5'	0.3
P-5/S-4	7.5 - 10'	0.1
P-6/S-1	0 - 2.5'	0.1
P-6/S-2	2.5 - 5'	0.5
P-6/S-3	5 - 10'	0.4
P-7/S-1	0 - 2.5'	0.3
P-7/S-2	2.5 - 5'	0.1
P-7/S-3	5 - 7.5'	0.2
P-7/S-4	7.5 - 10'	0.2
P-8/S-1	0 - 2.5'	0.4
P-8/S-2	2.5 - 5'	0.2
P-8/S-3	5 - 10'	0.4
P-9/S-1	0 - 2.5'	0.1
P-9/S-2	2.5 - 5'	0.1
P-9/S-3	5 - 7.5'	0.3
P-9/S-4	7.5 - 10'	0.5
P-10/S-1	0 - 2.5'	0.3
P-10/S-2	2.5 - 5'	0.5
P-10/S-3	5 - 7.5'	2.1
P-10/S-4	7.5 - 10'	0.1
P-11/S-1	0 - 2.5'	0.1
P-11/S-2	2.5 - 5'	0.4
P-12/S-1	0 - 2.5'	0.4
P-12/S-2	2.5 - 5'	0.3
P-13/S-1	0 - 2.5'	0.3
P-13/S-2	2.5 - 5'	0.2
P-14/S-1	0 - 2.5'	0.2
P-14/S-2	2.5 - 5'	0.3
P-14/S-3	5 - 7.5'	0.4
P-14/S-4	7.5 - 10'	0.3
P-15/S-1	0 - 2.5'	0.2
P-15/S-2	2.5 - 5'	0.2
P-15/S-3	5 - 7.5'	0.3
P-15/S-4	7.5 - 10'	0.3
P-16/S-1	0 - 2.5'	1.0
P-16/S-2	2.5 - 5'	0.9
P-17/S-1	0 - 2.5'	7.9



<b>TABLE 2</b> <b>Soil Headspace Screening Results</b> <b>Concord Carlisle High School</b> <b>March 16, 2012</b>		
<b>Sample ID</b>	<b>Depth</b>	<b>PPMV</b>
P-17/S-2	2.5 - 5'	1.4
P-18/S-1	0 - 2.5'	27.5
P-18/S-2	2.5 - 5'	0.7
P-19/S-1	0 - 2.5'	0.9
P-19/S-2	2.5 - 5'	0.7
P-19/S-3	5 - 7.5'	1.0
P-19/S-4	7.5 - 10'	1.6
P-20/S-1	0 - 2.5'	1.1
P-20/S-2	2.5 - 5'	0.6
P-20/S-3	5 - 7.5'	1.5
P-20/S-4	7.5 - 10'	0.9
P-21/S-1	0 - 2.5'	7.0
P-21/S-2	2.5 - 5'	5.8
P-22/S-1	0 - 2.5'	6.4
P-22/S-2	2.5 - 5'	5.1
P-23/S-1	0 - 2.5'	6.3
P-23/S-2	2.5 - 5'	4.3
P-24/S-1	0 - 2.5'	4.0
P-24/S-2	2.5 - 5'	2.9

PPMV = Parts Per Million By Volume

**TABLE 3**  
**Soil Analytical Results - PP13 Metals (PPM)**  
**Concord Carlisle High School**  
**January 12, 2012**

Sample ID	B8-MW-1/S-1 (0-2')	B8-MW-1/S-3 (10-12')	B8-5/S-2 (5-7')	B8-6/S-1* (0-2')	B8-6/S-2 (5-7')	B8-7/S-2 (5-7')	Method 1 Standards S-1/GW-1	Method 1 Standards 2/GW-1
Arsenic	-	15.4	-	-	-	-	20	20
Cadmium	-	13.4	-	-	-	-	2	30
Chromium	-	76.8	-	-	-	-	30	200
Copper	58.1	426	16.4	28.7	79.9	98.2	NS	NS
Mercury	-	1.68	-	-	-	-	20	30
Nickel	-	38.8	-	-	-	-	20	700
Lead	1660	1360	20.3	32.4	5680	545	300	300
Zinc	247	2140	42.8	42.7	314	89.6	2,500	3,000

PPM = Parts Per Million

\* = Duplicate sample collected from this location

Shaded = Exceed MCP Method 1 Standard

**TABLE 4**  
**Soil Analytical Results - Total Lead (PPM)**  
**Concord-Carlisle HS, Concord, MA**  
**March 16, 2012**

<b>Sample ID</b>	<b>Landfill Soil</b>	<b>Depth</b>	<b>Total Lead</b>
P-1/S-2	N	2.5 - 5'	18.8
P-2/S-2	N	2.5 - 5'	6.3
P-3/S-2	Y	5 - 7.5'	13.3
P-4/S-3	Y	5 - 7.5'	190
P-5/S-2	Y	2.5 - 5'	12.4
P-6/S-3	Y	5 - 7.5'	276
P-7/S-2	Y	2.5 - 5'	<b>753</b>
P-10/S-1	N	0 - 2.5'	4.91
P-11/S-1	N	0 - 2.5'	10
P-12/S-2	N	2.5 - 5'	14.4
P-13/S-1	N	0 - 2.5'	12.1
P-14/S-3	N	5 - 7.5'	15.8
P-15/S-3	N	5 - 7.5'	3.49
P-16/S-2*	N	2.5 - 5'	38.4
P-17/S-1	N	0 - 2.5'	13.4
P-18/S-2	Y	2.5 - 5'	43.6
P-19/S-3	N	5 - 7.5'	5.13
P-20/S-3	N	5 - 7.5'	9.94
P-21/S-2	N	2.5 - 5'	4.31
P-22/S-1	N	0 - 2.5'	23.3
P-23/S-2	N	2.5 - 5'	6.08
P-24/S-2	N	2.5 - 5'	4.95
<b>Method 1 S-1/GW-1 and GW-2 Standard</b>			<b>300</b>

\* = DUP collected here

Shaded = Exceeds Method 1 Standard



TABLE 5

Soil Analytical Results - PP13 Metals and EPH (PPM)  
Concord Carlisle High School  
March 16, 2012

Sample ID (depth)	P-4/S-2 (2.5 - 5')	P-6/S-2* (2.5 - 5')	P-8/S-2 (2.5 - 5')	P-8/S-3 (5 - 7.5')	P-9/S-2 (2.5 - 5')	P-9/S-3 (5 - 7.5')	P-13/S-2 (2.5 - 5')	P-18/S-1 (0 - 2.5')	Reportable Concentrations S-1	Method 1 Standards S-1/GW- 1	Method 1 Standards S-2/GW-1
<b>Metals</b>											
Arsenic	5.75	7.26	10.3	(29)	4.83	6.92	6.69	7.06	20	20	20
Cadmium	1.06	0.969	2.47	4.22	<0.498	<0.508	<0.542	<0.546	2	2	30
Chromium	15.9	16	23.8	40.1	20.3	24.7	16.9	14.8	30	30	200
Copper	59	30.3	194	376	10.6	15	10.6	12	1,000	NS	NS
Mercury	2.09	0.153	0.0351	<0.0364	0.29	<0.0313	0.0432	0.0675	20	20	30
Nickel	20.2	9.06	16.9	31.2	13.7	13.7	8	8.07	20	20	700
Lead	958	517	35,600	15,200	29.8	11.3	36.8	23	300	300	300
Zinc	503	338	1,380	1,120	33.8	29.3	21.7	38.8	2,500	2,500	3,000
<b>EPH</b>											
C9-C18 Aliphatics	< 11.6	< 11.4	-	< 11.6	< 101	-	-	-	1,000	1,000	3,000
C19-C36 Aliphatics	< 11.6	45.2	-	< 11.6	216	-	-	-	3,000	3,000	5,000
C11-C22 Aromatics	< 11.6	45.9	-	< 11.6	108	-	-	-	1,000	1,000	1,000
<b>PAHs</b>											
Phenanthrene	< 0.386	1.11	-	< 0.387	< 1.69	-	-	-	10	10	10
Fluoranthene	< 0.386	2.4	-	< 0.387	< 1.69	-	-	-	1,000	1,000	3,000
Pyrene	< 0.386	2.09	-	< 0.387	< 1.69	-	-	-	1,000	1,000	3,000
Benzo(a)anthracene	< 0.386	0.95	-	< 0.387	< 1.69	-	-	-	7	7	40
Chrysene	< 0.386	1.23	-	< 0.387	< 1.69	-	-	-	70	70	400
Benzo(b)fluoranthene	< 0.386	0.773	-	< 0.387	< 1.69	-	-	-	7	7	40
Benzo(k)fluoranthene	< 0.386	0.78	-	< 0.387	< 1.69	-	-	-	70	70	400
Benzo(a)pyrene	< 0.386	0.695	-	< 0.387	< 1.69	-	-	-	2	2	4
Indeno(1,2,3-cd)pyrene	< 0.386	0.434	-	< 0.387	< 1.69	-	-	-	7	7	40
Benzo(g,h,i)perylene	< 0.386	0.559	-	< 0.387	< 1.69	-	-	-	1,000	1,000	3,000

PPM = Parts Per Million

\* = Duplicate sample collected from this location

Shaded = Exceed MCP Method 1 Standard

O = new compound above Reportable Concentrations

<b>TABLE 6</b> <b>Groundwater Analytical Results - Soluble PP13 Metals (PPM)</b> <b>Concord Carlisle High School</b> <b>January 16, 2012</b>		
<b>Sample ID</b>	<b>B8-MW-1</b>	<b>Reportable Concentrations</b>
		<b>RCGW-1</b>
Silver	<0.005	0.007
Arsenic	<0.004	0.01
Beryllium	<0.002	0.004
Cadmium	<0.0025	0.004
Chromium	<0.005	0.1
Copper	<0.005	10
Mercury	<0.0002	0.002
Nickel	<0.005	0.1
Lead	<0.0075	0.01
Antimony	<0.006	0.006
Selenium	0.0226	0.05
Thallium	<0.005	0.002
Zinc	0.0124	0.9

PPM = Parts Per Million

**ATTACHMENT C**  
**SOIL BORING LOGS**



**TEST BORING LOG**

**CDW Consultants, Inc.**

Project No.: 1234.30  
 Total Depth: 5'  
 Date Started: 3/16/2012  
 Casing ID: \_\_\_\_\_  
 Remarks: Geoprobe 6620 DT

Client: Concord Carlisle H.S. BORING ID: P-1  
 Location: Concord, MA Logged By: Brian Miller  
 Completed: 3/16/2012 Contractor: TDS  
 Ground El. \_\_\_\_\_ Sheet #: \_\_\_\_\_

Depth (Feet)	Sample				PID Hdspace (ppm)	Sample Description	Well Diagram
	Type & Num.	Blows per 6 Inches	Depth Range	Recovery			
0							
-1	S-1	-	0-2.5'		0.1	Moist, dark brown to light brown FINE-MEDIUM SAND, some gravel and cobbles	
-2							
-3							
-4	S-2	-	2.5-5'	38"	0.2	Moist, dark brown to brown FINE-MEDIUM SAND, some cobbles	
-5						End of boring at 5'	
-6							
-7							
-8							
-9							
-10							
-11							
-12							
-13							
-14							
-15							
-16							
-17							
-18							
-19							
-20							
-21							
-22							
-23							
-24							
-25							
-26							
-27							
-28							
-29							
-30							

Groundwater Measurements				Summary	
Date	Time	Depth to Groundwater	Measuring Point	Overburden:	FINE-MEDIUM SAND
				Rock:	NA
				Well Depth:	NA
				Boring:	5'

**TEST BORING LOG**

**CDW Consultants, Inc.**

Project No.: 1234.30  
 Total Depth: 5'  
 Date Started: 3/16/2012  
 Casing ID: \_\_\_\_\_  
 Remarks: Geoprobe 6620 DT

Client: Concord Carlisle H.S. BORING ID: P-2  
 Location: Concord, MA Logged By: Brian Miller  
 Completed: 3/16/2012 Contractor: TDS  
 Ground El. \_\_\_\_\_ Sheet #: \_\_\_\_\_

Depth (Feet)	Sample				PID Hdspace (ppm)	Sample Description	Well Diagram
	Type & Num.	Blows per 6 Inches	Depth Range	Recovery			
0							
-1	S-1	-	0-2.5'		0	Moist, black/tan, FINE-MEDIUM SAND and gravel, over brown, FINE-MEDIUM SAND (loam)	
-2							
-3							
-4	S-2	-	2.5-5'	48"	0.1	Moist, tan, FINE SAND over dark brown/gray FINE-MEDIUM SAND	
-5						End of boring at 5'	
-6							
-7							
-8							
-9							
-10							
-11							
-12							
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-27							
-28							
-29							
-30							

Groundwater Measurements				Summary	
Date	Time	Depth to Groundwater	Measuring Point	Overburden:	FINE-MEDIUM SAND
				Rock:	NA
				Well Depth:	NA
				Boring:	5'

# TEST BORING LOG

CDW Consultants, Inc.

Project No.: 1234.30  
 Total Depth: 5'  
 Date Started: 3/16/2012  
 Casing ID: \_\_\_\_\_  
 Remarks: Geoprobe 6620 DT

Client: Concord Carlisle H.S. BORING ID: P-3  
 Location: Concord, MA Logged By: Brian Miller  
 Completed: 3/16/2012 Contractor: TDS  
 Ground El. \_\_\_\_\_ Sheet #: \_\_\_\_\_

Depth (Feet)	Sample				PID Hdspace (ppm)	Sample Description	Well Diagram
	Type & Num.	Blows per 6 Inches	Depth Range	Recovery			
0							
-1	S-1	-	0-2.5'		0.1	Moist, tan, FINE-MEDIUM SAND, little gravel	
-2							
-3							
-4	S-2	-	2.5-5'	48"	0.1	Moist, dark brown, FINE-MEDIUM SAND, little gravel, over tan/olive FINE-MEDIUM SAND (1" lens of ash at 4.5')	
-5						End of boring at 5'	
-6							
-7							
-8							
-9							
-10							
-11							
-12							
-13							
-14							
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-27							
-28							
-29							
-30							

Groundwater Measurements				Summary	
Date	Time	Depth to Groundwater	Measuring Point	Overburden:	FINE-MEDIUM SAND
				Rock:	NA
				Well Depth:	NA
				Boring:	5'



# TEST BORING LOG

CDW Consultants, Inc.

Project No.: 1234.30  
 Total Depth: 10'  
 Date Started: 3/16/2012  
 Casing ID: \_\_\_\_\_  
 Remarks: Geoprobe 6620 DT

Client: Concord Carlisle H.S. BORING ID: P-4  
 Location: Concord, MA Logged By: Brian Miller  
 Completed: 3/16/2012 Contractor: TDS  
 Ground El. \_\_\_\_\_ Sheet #: \_\_\_\_\_

Depth (Feet)	Sample				PID Hdspace (ppm)	Sample Description	Well Diagram
	Type & Num.	Blows per 6 Inches	Depth Range	Recovery			
0							
-1	S-1	-	0-2.5'		0	Moist, dark brown, over brown FINE-MEDIUM SAND, some gravel	
-2							
-3							
-4	S-2	-	2.5-5'	36"	0.1	Moist, orange, FINE-MEDIUM SAND, over ash fill	
-5							
-6	S-3	-	5-7.5'		0.1	Moist, tan, FINE-COARSE SAND, some small metal pieces	
-7							
-8							
-9	S-4	-	7.5-10'	30"	0	Moist, tan, FINE-COARSE SAND, over crushed brick, trace ash, some glass.	
-10						End of boring at 10'	
-11							
-12							
-13							
-14							
-15							
-16							
-17							
-18							
-19							
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-27							
-28							
-29							
-30							

Groundwater Measurements				Summary	
Date	Time	Depth to Groundwater	Measuring Point	Overburden:	FINE-MEDIUM SAND
				Rock:	NA
				Well Depth:	NA
				Boring:	10'

# TEST BORING LOG

CDW Consultants, Inc.

Project No.: 1234.30  
 Total Depth: 10'  
 Date Started: 3/16/2012  
 Casing ID: \_\_\_\_\_  
 Remarks: Geoprobe 6620 DT

Client: Concord Carlisle H.S. BORING ID: P-5  
 Location: Concord, MA Logged By: Brian Miller  
 Completed: 3/16/2012 Contractor: TDS  
 Ground El. \_\_\_\_\_ Sheet #: \_\_\_\_\_

Depth (Feet)	Sample				PID Hdspace (ppm)	Sample Description	Well Diagram
	Type & Num.	Blows per 6 Inches	Depth Range	Recovery			
0							
-1	S-1	-	0-2.5'		0.2	Moist, tan, FINE-COARSE SAND, some gravel	
-2							
-3							
-4	S-2	-	2.5-5'	36"	0.2	Moist, tan, FINE-COARSE SAND, over dark brown, FINE-COARSE SAND. Ash at 4'	
-5							
-6	S-3	-	5-7.5'		0.3	Moist, tan, FINE-COARSE SAND, over dark brown, FINE-COARSE SAND	
-7							
-8							
-9	S-4	-	7.5-10'	30"	0.1	Moist, tan, FINE-COARSE SAND, over dark brown, FINE-COARSE SAND	
-10						End of boring at 10'	
-11							
-12							
-13							
-14							
-15							
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-28							
-29							
-30							

Groundwater Measurements				Summary	
Date	Time	Depth to Groundwater	Measuring Point	Overburden:	FINE-COARSE SAND
				Rock:	NA
				Well Depth:	NA
				Boring:	10'

**TEST BORING LOG**

**CDW Consultants, Inc.**

Project No.: 1234.30  
 Total Depth: 10'  
 Date Started: 3/16/2012  
 Casing ID: \_\_\_\_\_  
 Remarks: Geoprobe 6620 DT

Client: Concord Carlisle H.S. BORING ID: P-6  
 Location: Concord, MA Logged By: Brian Miller  
 Completed: 3/16/2012 Contractor: TDS  
 Ground El. \_\_\_\_\_ Sheet #: \_\_\_\_\_

Depth (Feet)	Sample				PID Hdspace (ppm)	Sample Description	Well Diagram
	Type & Num.	Blows per 6 Inches	Depth Range	Recovery			
0							
-1	S-1	-	0-2.5'		0.1	Dry, dark brown, FINE-MEDIUM SAND and gravel over tan, FINE-COARSE SAND, some gravel	
-2							
-3							
-4	S-2	-	2.5-5'	36"	0.4	Moist, brown, FINE-MEDIUM SAND, little gravel over black fill ash at 4', some wood, glass, and trace brick	
-5							
-6							
-7	S-3	-	5-10'	15"	0.5	Moist, black/dark brown, FINE-MEDIUM SAND, wood, some gravel, leaves, and organic material	
-8							
-9							
-10							
-11						End of boring at 10'	
-12							
-13							
-14							
-15							
-16							
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-28							
-29							
-30							

Groundwater Measurements				Summary	
Date	Time	Depth to Groundwater	Measuring Point	Overburden:	FINE-MEDIUM SAND
				Rock:	NA
				Well Depth:	NA
				Boring:	10'

# TEST BORING LOG

CDW Consultants, Inc.

Project No.: 1234.30  
 Total Depth: 10'  
 Date Started: 3/16/2012  
 Casing ID: \_\_\_\_\_  
 Remarks: Geoprobe 6620 DT

Client: Concord Carlisle H.S. BORING ID: P-7  
 Location: Concord, MA Logged By: Brian Miller  
 Completed: 3/16/2012 Contractor: TDS  
 Ground El. \_\_\_\_\_ Sheet #: \_\_\_\_\_

Depth (Feet)	Sample				PID Hdspace (ppm)	Sample Description	Well Diagram
	Type & Num.	Blows per 6 Inches	Depth Range	Recovery			
0							
-1	S-1	-	0-2.5'		0.3	Moist, tan, FINE-MEDIUM SAND, some gravel	
-2							
-3							
-4	S-2	-	2.5-5'	30"	0.1	Moist, dark brown, FINE-MEDIUM SAND, black ash fill at tip (wood fibers)	
-5							
-6	S-3	-	5-7.5'		0.2	Moist, black/dark brown, FINE-MEDIUM SAND, over, tan and brown, FINE-MEDIUM SAND	
-7							
-8							
-9	S-4	-	7.5-10'	24"	0.2	Moist, tan, FINE-COARSE SAND, some gravel	
-10							
-11						End of boring at 10'	
-12							
-13							
-14							
-15							
-16							
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-28							
-29							
-30							

Groundwater Measurements				Summary	
Date	Time	Depth to Groundwater	Measuring Point	Overburden:	FINE-MEDIUM SAND
				Rock:	NA
				Well Depth:	NA
				Boring:	10'



# TEST BORING LOG

CDW Consultants, Inc.

Project No.: 1234.30 Client: Concord Carlisle H.S. BORING ID: P-8  
 Total Depth: 10' Location: Concord, MA Logged By: Brian Miller  
 Date Started: 3/16/2012 Completed: 3/16/2012 Contractor: TDS  
 Casing ID: \_\_\_\_\_ Ground El. \_\_\_\_\_ Sheet #: \_\_\_\_\_  
 Remarks: Geoprobe 6620 DT

Depth (Feet)	Sample				PID Hdspace (ppm)	Sample Description	Well Diagram
	Type & Num.	Blows per 6 Inches	Depth Range	Recovery			
0							
-1	S-1	-	0-2.5'		0.4	Moist, tan/orange, FINE SAND, some gravel	
-2							
-3							
-4	S-2	-	2.5-5'	48"	0.2	Moist, tan/orange, FINE SAND, some gravel, over, black/orange fill at tip, coal, and ash	
-5							
-6							
-7	S-3	-	5-10'	13"	0.4	Moist-wet, ASH, BRICK, and GLASS, over tan, FINE-MEDIUM SAND, gravel (ash and coal mixed in)	
-8							
-9							
-10							
-11						End of boring at 10'	
-12							
-13							
-14							
-15							
-16							
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-28							
-29							
-30							

Groundwater Measurements				Summary	
Date	Time	Depth to Groundwater	Measuring Point	Overburden:	FINE SAND
				Rock:	NA
				Well Depth:	NA
				Boring:	10'

# TEST BORING LOG

CDW Consultants, Inc.

Project No.: 1234.30  
 Total Depth: 10'  
 Date Started: 3/16/2012  
 Casing ID: \_\_\_\_\_  
 Remarks: Geoprobe 6620 DT

Client: Concord Carlisle H.S. BORING ID: P-9  
 Location: Concord, MA Logged By: Brian Miller  
 Completed: 3/16/2012 Contractor: TDS  
 Ground El. \_\_\_\_\_ Sheet #: \_\_\_\_\_

Depth (Feet)	Sample				PID Hdspace (ppm)	Sample Description	Well Diagram
	Type & Num.	Blows per 6 Inches	Depth Range	Recovery			
0							
-1	S-1	-	0-2.5'		0.1	Moist, tan, FINE-MEDIUM SAND, little gravel, layered ash	
-2							
-3							
-4	S-2	-	2.5-5'	48"	0.1	Moist, tan, FINE-MEDIUM SAND, little gravel, layered ash, over black ash	
-5							
-6	S-3	-	5-7.5'		0.3	Moist, black ash, over tan/orange FINE-MEDIUM SAND	
-7							
-8							
-9	S-4	-	7.5-10'	36"	0.5	Moist, tan/orange, FINE-MEDIUM SAND, over black ash	
-10							
-11						End of boring at 10'	
-12							
-13							
-14							
-15							
-16							
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-30							

Groundwater Measurements				Summary	
Date	Time	Depth to Groundwater	Measuring Point	Overburden:	FINE-MEDIUM SAND
				Rock:	NA
				Well Depth:	NA
				Boring:	10'

**TEST BORING LOG**

**CDW Consultants, Inc.**

Project No.: 1234.30  
 Total Depth: 10'  
 Date Started: 3/16/2012  
 Casing ID: \_\_\_\_\_  
 Remarks: Geoprobe 6620 DT

Client: Concord Carlisle H.S. BORING ID: P-10  
 Location: Concord, MA Logged By: Brian Miller  
 Completed: 3/16/2012 Contractor: TDS  
 Ground El. \_\_\_\_\_ Sheet #: \_\_\_\_\_

Depth (Feet)	Sample				PID Hdspace (ppm)	Sample Description	Well Diagram
	Type & Num.	Blows per 6 Inches	Depth Range	Recovery			
0							
-1	S-1	-	0-2.5'		0.3	Moist, dark brown loam, over tan/orange, FINE-MEDIUM SAND, little gravel	
-2							
-3							
-4	S-2	-	2.5-5'	48"	0.5	Moist, tan/orange, FINE-MEDIUM SAND, little gravel	
-5							
-6	S-3	-	5-7.5'		2.1	Moist, tan/orange, FINE-MEDIUM SAND, little gravel	
-7							
-8							
-9	S-4	-	7.5-10'	52"	0.1	Moist, tan/orange, FINE-MEDIUM SAND, little gravel	
-10							
-11						End of boring at 10'	
-12							
-13							
-14							
-15							
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-29							
-30							

Groundwater Measurements				Summary	
Date	Time	Depth to Groundwater	Measuring Point	Overburden:	FINE-MEDIUM SAND
				Rock:	NA
				Well Depth:	NA
				Boring:	10'

# TEST BORING LOG

CDW Consultants, Inc.

Project No.: 1234.30  
 Total Depth: 5'  
 Date Started: 3/16/2012  
 Casing ID: \_\_\_\_\_  
 Remarks: Geoprobe 6620 DT

Client: Concord Carlisle H.S. BORING ID: P-11  
 Location: Concord, MA Logged By: Brian Miller  
 Completed: 3/16/2012 Contractor: TDS  
 Ground El. \_\_\_\_\_ Sheet #: \_\_\_\_\_

Depth (Feet)	Sample				PID Hdspace (ppm)	Sample Description	Well Diagram
	Type & Num.	Blows per 6 Inches	Depth Range	Recovery			
0							
-1	S-1	-	0-2.5'		0.1	Moist, gray GRAVEL (base), some sand, over dark brown, FINE-MEDIUM SAND	
-2							
-3							
-4	S-2	-	2.5-5'	27"	0.4	Moist, dark brown to brown FINE-MEDIUM SAND, over tan/orange FINE-COARSE SAND, some gravel	
-5						End of boring at 5'	
-6							
-7							
-8							
-9							
-10							
-11							
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-28							
-29							
-30							

Groundwater Measurements				Summary	
Date	Time	Depth to Groundwater	Measuring Point	Overburden:	FINE-MEDIUM SAND
				Rock:	NA
				Well Depth:	NA
				Boring:	5'

**TEST BORING LOG**

**CDW Consultants, Inc.**

Project No.: 1234.30  
 Total Depth: 5'  
 Date Started: 3/16/2012  
 Casing ID: \_\_\_\_\_  
 Remarks: Geoprobe 6620 DT

Client: Concord Carlisle H.S. BORING ID: P-12  
 Location: Concord, MA Logged By: Brian Miller  
 Completed: 3/16/2012 Contractor: TDS  
 Ground El. \_\_\_\_\_ Sheet #: \_\_\_\_\_

Depth (Feet)	Sample				PID Hdspace (ppm)	Sample Description	Well Diagram
	Type & Num.	Blows per 6 Inches	Depth Range	Recovery			
0							
-1	S-1	-	0-2.5'		0.1	Moist, dark brown TOPSOIL (loam), over tan, FINE-MEDIUM SAND, little gravel	
-2							
-3							
-4	S-2	-	2.5-5'	27"	0.4	Moist, tan, FINE SAND, little gravel and cobbles	
-5							
-6						End of boring at 5'	
-7							
-8							
-9							
-10							
-11							
-12							
-13							
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-28							
-29							
-30							

Groundwater Measurements				Summary	
Date	Time	Depth to Groundwater	Measuring Point	Overburden:	FINE-MEDIUM SAND
				Rock:	NA
				Well Depth:	NA
				Boring:	5'

# TEST BORING LOG

CDW Consultants, Inc.

Project No.: 1234.30  
 Total Depth: 5'  
 Date Started: 3/16/2012  
 Casing ID: \_\_\_\_\_  
 Remarks: Geoprobe 6620 DT

Client: Concord Carlisle H.S. BORING ID: P-13  
 Location: Concord, MA Logged By: Brian Miller  
 Completed: 3/16/2012 Contractor: TDS  
 Ground El. \_\_\_\_\_ Sheet #: \_\_\_\_\_

Depth (Feet)	Sample				PID Hdspace (ppm)	Sample Description	Well Diagram
	Type & Num.	Blows per 6 Inches	Depth Range	Recovery			
0							
-1	S-1	-	0-2.5'		0.3	Moist, dark brown TOPSOIL (loam), over tan, FINE-MEDIUM SAND, little gravel	
-2							
-3							
-4	S-2	-	2.5-5'	35"	0.2	Moist, dark brown FINE-MEDIUM SAND, lense of clay	
-5							
-6						End of boring at 5'	
-7							
-8							
-9							
-10							
-11							
-12							
-13							
-14							
-15							
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-28							
-29							
-30							

Groundwater Measurements				Summary	
Date	Time	Depth to Groundwater	Measuring Point	Overburden:	FINE-MEDIUM SAND
				Rock:	NA
				Well Depth:	NA
				Boring:	5'



# TEST BORING LOG

CDW Consultants, Inc.

Project No.: 1234.30  
 Total Depth: 10'  
 Date Started: 3/16/2012  
 Casing ID: \_\_\_\_\_  
 Remarks: Geoprobe 6620 DT

Client: Concord Carlisle H.S. BORING ID: P-14  
 Location: Concord, MA Logged By: Brian Miller  
 Completed: 3/16/2012 Contractor: TDS  
 Ground El. \_\_\_\_\_ Sheet #: \_\_\_\_\_

Depth (Feet)	Sample				PID Hdspace (ppm)	Sample Description	Well Diagram
	Type & Num.	Blows per 6 Inches	Depth Range	Recovery			
0							
-1	S-1	-	0-2.5'		0.2	Moist, dark brown, FINE-MEDIUM SAND, and gravel over brown/tan, FINE-MEDIUM SAND, little gravel	
-2							
-3							
-4	S-2	-	2.5-5'	33"	0.3	Moist, tan/orange, FINE-MEDIUM SAND, and cobbles at 4'	
-5							
-6	S-3	-	5-7.5'		0.4	Moist, tan, FINE-COARSE SAND, and gravel	
-7							
-8							
-9	S-4	-	7.5-10'	31"	0.3	Moist, tan, FINE-COARSE SAND, and gravel	
-10							
-11						End of boring at 10'	
-12							
-13							
-14							
-15							
-16							
-17							
-18							
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-26							
-27							
-28							
-29							
-30							

Groundwater Measurements				Summary	
Date	Time	Depth to Groundwater	Measuring Point	Overburden:	FINE-MEDIUM SAND
				Rock:	NA
				Well Depth:	NA
				Boring:	10'

# TEST BORING LOG

CDW Consultants, Inc.

Project No.: 1234.30  
 Total Depth: 10'  
 Date Started: 3/16/2012  
 Casing ID:  
 Remarks: Geoprobe 6620 DT

Client: Concord Carlisle H.S. BORING ID: P-15  
 Location: Concord, MA Logged By: Brian Miller  
 Completed: 3/16/2012 Contractor: TDS  
 Ground El. Sheet #:

Depth (Feet)	Sample				PID Hdspace (ppm)	Sample Description	Well Diagram
	Type & Num.	Blows per 6 Inches	Depth Range	Recovery			
0							
-1	S-1	-	0-2.5'		0.2	Moist, dark brown, FINE-MEDIUM SAND, and gravel over tan/orange, FINE-MEDIUM SAND, and gravel	
-2							
-3							
-4							
-5							
-6	S-3	-	5-7.5'		0.2	Moist, tan/orange, FINE-COARSE SAND, little gravel	
-7							
-8							
-9	S-4	-	7.5-10'	48"	0.3	Moist, tan/orange, FINE-COARSE SAND, little gravel	
-10							
-11						End of boring at 10'	
-12							
-13							
-14							
-15							
-16							
-17							
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-28							
-29							
-30							

Groundwater Measurements				Summary	
Date	Time	Depth to Groundwater	Measuring Point	Overburden:	FINE-MEDIUM SAND
				Rock:	NA
				Well Depth:	NA
				Boring:	10'

# TEST BORING LOG

CDW Consultants, Inc.

Project No.: 1234.30  
 Total Depth: 5'  
 Date Started: 3/16/2012  
 Casing ID: \_\_\_\_\_  
 Remarks: Geoprobe 6620 DT

Client: Concord Carlisle H.S. BORING ID: P-16  
 Location: Concord, MA Logged By: Brian Miller  
 Completed: 3/16/2012 Contractor: TDS  
 Ground El. \_\_\_\_\_ Sheet #: \_\_\_\_\_

Depth (Feet)	Sample				PID Hdspace (ppm)	Sample Description	Well Diagram
	Type & Num.	Blows per 6 Inches	Depth Range	Recovery			
0							
-1	S-1	-	0-2.5'		1	Moist, brown, FINE-MEDIUM SAND, some gravel	
-2							
-3							
-4	S-2	-	2.5-5'	35"	0.9	Moist, tan, FINE-MEDIUM SAND	
-5							
-6						End of boring at 5'	
-7							
-8							
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-30							

Groundwater Measurements				Summary	
Date	Time	Depth to Groundwater	Measuring Point	Overburden:	FINE-MEDIUM SAND
				Rock:	NA
				Well Depth:	NA
				Boring:	5'

# TEST BORING LOG

CDW Consultants, Inc.

Project No.: 1234.30  
 Total Depth: 5'  
 Date Started: 3/16/2012  
 Casing ID: \_\_\_\_\_  
 Remarks: Geoprobe 6620 DT

Client: Concord Carlisle H.S. BORING ID: P-17  
 Location: Concord, MA Logged By: Brian Miller  
 Completed: 3/16/2012 Contractor: TDS  
 Ground El. \_\_\_\_\_ Sheet #: \_\_\_\_\_

Depth (Feet)	Sample				PID Hdspace (ppm)	Sample Description	Well Diagram
	Type & Num.	Blows per 6 Inches	Depth Range	Recovery			
0							
-1	S-1	-	0-2.5'		7.9	Moist topsoil, over tan/orange FINE SAND	
-2							
-3							
-4	S-2	-	2.5-5'	35"	1.4	Moist, tan, FINE-MEDIUM SAND, some cobbles and gravel.	
-5							
-6						End of boring at 5'	
-7							
-8							
-9							
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-30							

Groundwater Measurements				Summary	
Date	Time	Depth to Groundwater	Measuring Point	Overburden:	FINE-MEDIUM SAND
				Rock:	NA
				Well Depth:	NA
				Boring:	5'

**TEST BORING LOG**

**CDW Consultants, Inc.**

Project No.: 1234.30  
 Total Depth: 5'  
 Date Started: 3/16/2012  
 Casing ID: \_\_\_\_\_  
 Remarks: Geoprobe 6620 DT

Client: Concord Carlisle H.S. BORING ID: P-18  
 Location: Concord, MA Logged By: Brian Miller  
 Completed: 3/16/2012 Contractor: TDS  
 Ground El. \_\_\_\_\_ Sheet #: \_\_\_\_\_

Depth (Feet)	Sample				PID Hdspace (ppm)	Sample Description	Well Diagram
	Type & Num.	Blows per 6 Inches	Depth Range	Recovery			
0							
-1	S-1	-	0-2.5'		27.5	Moist, brown, FINE-MEDIUM SAND, some organic soil (LOAM) over tan, FINE-MEDIUM SAND	
-2							
-3							
-4	S-2	-	2.5-5'	36"	0.7	Moist, tan, FINE SAND, lenses of black ashes at 4'	
-5							
-6						End of boring at 5'	
-7							
-8							
-9							
-10							
-11							
-12							
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-30							

Groundwater Measurements				Summary	
Date	Time	Depth to Groundwater	Measuring Point	Overburden:	FINE-MEDIUM SAND
				Rock:	NA
				Well Depth:	NA
				Boring:	5'

**TEST BORING LOG**

**CDW Consultants, Inc.**

Project No.: 1234.30  
 Total Depth: 10'  
 Date Started: 3/16/2012  
 Casing ID: \_\_\_\_\_  
 Remarks: Geoprobe 6620 DT

Client: Concord Carlisle H.S. BORING ID: P-19  
 Location: Concord, MA Logged By: Brian Miller  
 Completed: 3/16/2012 Contractor: TDS  
 Ground El. \_\_\_\_\_ Sheet #: \_\_\_\_\_

Depth (Feet)	Sample				PID Hdspace (ppm)	Sample Description	Well Diagram
	Type & Num.	Blows per 6 Inches	Depth Range	Recovery			
0							
-1	S-1	-	0-2.5'		0.9	Moist, brown, FINE-MEDIUM SAND, some organic topsoil (loam)	
-2							
-3							
-4	S-2	-	2.5-5'	36"	0.7	Moist, tan/orange, FINE-MEDIUM SAND, some gravel	
-5							
-6	S-3	-	5-7.5'		1	Moist, tan, FINE-COARSE SAND, some gravel	
-7							
-8							
-9	S-4	-	7.5-10'	47"	1.6	Moist, tan, FINE-COARSE SAND, some gravel	
-10							
-11						End of boring at 10'	
-12							
-13							
-14							
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-30							

Groundwater Measurements				Summary	
Date	Time	Depth to Groundwater	Measuring Point	Overburden:	FINE-MEDIUM SAND
				Rock:	NA
				Well Depth:	NA
				Boring:	10'



# TEST BORING LOG

CDW Consultants, Inc.

Project No.: 1234.30  
 Total Depth: 10'  
 Date Started: 3/16/2012  
 Casing ID: \_\_\_\_\_  
 Remarks: Geoprobe 6620 DT

Client: Concord Carlisle H.S. BORING ID: P-20  
 Location: Concord, MA Logged By: Brian Miller  
 Completed: 3/16/2012 Contractor: TDS  
 Ground El. \_\_\_\_\_ Sheet #: \_\_\_\_\_

Depth (Feet)	Sample				PID Hdspace (ppm)	Sample Description	Well Diagram
	Type & Num.	Blows per 6 Inches	Depth Range	Recovery			
0							
-1	S-1	-	0-2.5'		1.1	Moist, dark brown topsoil, over tan, FINE-MEDIUM SAND, little gravel	
-2							
-3							
-4	S-2	-	2.5-5'	48"	0.6	Moist, tan, FINE-MEDIUM SAND, some gravel and cobbles	
-5							
-6	S-3	-	5-7.5'		1.5	Moist, tan, FINE-COARSE SAND, some gravel	
-7							
-8							
-9	S-4	-	7.5-10'	48"	0.9	Moist, tan, FINE-COARSE SAND, some gravel	
-10							
-11						End of boring at 10'	
-12							
-13							
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-29							
-30							

Groundwater Measurements				Summary	
Date	Time	Depth to Groundwater	Measuring Point	Overburden:	FINE-MEDIUM SAND
				Rock:	NA
				Well Depth:	NA
				Boring:	10'

# TEST BORING LOG

CDW Consultants, Inc.

Project No.: 1234.30  
 Total Depth: 5'  
 Date Started: 3/16/2012  
 Casing ID: \_\_\_\_\_  
 Remarks: Geoprobe 6620 DT

Client: Concord Carlisle H.S. BORING ID: P-21  
 Location: Concord, MA Logged By: Brian Miller  
 Completed: 3/16/2012 Contractor: TDS  
 Ground El. \_\_\_\_\_ Sheet #: \_\_\_\_\_

Depth (Feet)	Sample				PID Hdspace (ppm)	Sample Description	Well Diagram
	Type & Num.	Blows per 6 Inches	Depth Range	Recovery			
0							
-1	S-1	-	0-2.5'		7	Moist, tan, FINE-MEDIUM SAND, some gravel	
-2							
-3							
-4	S-2	-	2.5-5'	48"	5.8	Moist, tan, FINE-MEDIUM SAND, some gravel	
-5							
-6						End of boring at 5'	
-7							
-8							
-9							
-10							
-11							
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-29							
-30							

Groundwater Measurements				Summary	
Date	Time	Depth to Groundwater	Measuring Point	Overburden:	FINE-MEDIUM SAND
				Rock:	NA
				Well Depth:	NA
				Boring:	5'

# TEST BORING LOG

CDW Consultants, Inc.

Project No.: 1234.30  
 Total Depth: 5'  
 Date Started: 3/16/2012  
 Casing ID: \_\_\_\_\_  
 Remarks: Geoprobe 6620 DT

Client: Concord Carlisle H.S. BORING ID: P-22  
 Location: Concord, MA Logged By: Brian Miller  
 Completed: 3/16/2012 Contractor: TDS  
 Ground El. \_\_\_\_\_ Sheet #: \_\_\_\_\_

Depth (Feet)	Sample				PID Hdspace (ppm)	Sample Description	Well Diagram
	Type & Num.	Blows per 6 Inches	Depth Range	Recovery			
0							
-1	S-1	-	0-2.5'		6.4	Moist gray, FINE -MEDIUM SAND and GRAVEL sub-base	
-2						over tan, FINE-MEDIUM SAND, little gravel	
-3							
-4	S-2	-	2.5-5'	38"	3.1	Moist, tan, FINE-MEDIUM SAND, little gravel	
-5							
-6						End of boring at 5'	
-7							
-8							
-9							
-10							
-11							
-12							
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-28							
-29							
-30							

Groundwater Measurements				Summary	
Date	Time	Depth to Groundwater	Measuring Point	Overburden:	FINE-MEDIUM SAND
				Rock:	NA
				Well Depth:	NA
				Boring:	5'

# TEST BORING LOG

CDW Consultants, Inc.

Project No.: 1234.30  
 Total Depth: 5'  
 Date Started: 3/16/2012  
 Casing ID: \_\_\_\_\_  
 Remarks: Geoprobe 6620 DT

Client: Concord Carlisle H.S. BORING ID: P-23  
 Location: Concord, MA Logged By: Brian Miller  
 Completed: 3/16/2012 Contractor: TDS  
 Ground El. \_\_\_\_\_ Sheet #: \_\_\_\_\_

Depth (Feet)	Sample				PID Hdspace (ppm)	Sample Description	Well Diagram
	Type & Num.	Blows per 6 Inches	Depth Range	Recovery			
0							
-1	S-1	-	0-2.5'		6.5	Moist, tan/orange, FINE-MEDIUM SAND, little gravel	
-2							
-3							
-4	S-2	-	2.5-5'	32"	4.3	Moist, tan/orange, FINE-MEDIUM SAND, little gravel	
-5							
-6						End of boring at 5'	
-7							
-8							
-9							
-10							
-11							
-12							
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-27							
-28							
-29							
-30							

Groundwater Measurements				Summary	
Date	Time	Depth to Groundwater	Measuring Point	Overburden:	FINE-MEDIUM SAND
				Rock:	NA
				Well Depth:	NA
				Boring:	5'

**TEST BORING LOG**

**CDW Consultants, Inc.**

Project No.: 1234.30  
 Total Depth: 5'  
 Date Started: 3/16/2012  
 Casing ID: \_\_\_\_\_  
 Remarks: Geoprobe 6620 DT

Client: Concord Carlisle H.S. BORING ID: P-24  
 Location: Concord, MA Logged By: Brian Miller  
 Completed: 3/16/2012 Contractor: TDS  
 Ground El. \_\_\_\_\_ Sheet #: \_\_\_\_\_

Depth (Feet)	Sample				PID Hdspace (ppm)	Sample Description	Well Diagram
	Type & Num.	Blows per 6 Inches	Depth Range	Recovery			
0							
-1	S-1	-	0-2.5'		4	Moist, tan/orange, FINE-MEDIUM SAND	
-2							
-3							
-4	S-2	-	2.5-5'	34"	2.9	Moist, tan/orange, FINE-MEDIUM SAND	
-5							
-6						End of boring at 5'	
-7							
-8							
-9							
-10							
-11							
-12							
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-27							
-28							
-29							
-30							

Groundwater Measurements				Summary	
Date	Time	Depth to Groundwater	Measuring Point	Overburden:	FINE-MEDIUM SAND
				Rock:	NA
				Well Depth:	NA
				Boring:	5'

**ATTACHMENT D**

**LABORATORY REPORTS AND  
WELL CONSTRUCTION DIAGRAMS**

Report Date:  
26-Mar-12 15:55



- Final Report
- Re-Issued Report
- Revised Report

SPECTRUM ANALYTICAL, INC.

*Featuring*

HANIBAL TECHNOLOGY

**Laboratory Report**

CDW Consultants, Inc.  
40 Speen Street; Suite 301  
Framingham, MA 01701  
Attn: Brian Miller

Project: Concord Carlisle High School - Concord , MA  
Project #: 1234.30

<u>Laboratory ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Date Sampled</u>	<u>Date Received</u>
SB45605-01	P-1/S-2	Soil	16-Mar-12 08:10	19-Mar-12 16:45
SB45605-02	P-2/S-2	Soil	16-Mar-12 08:20	19-Mar-12 16:45
SB45605-03	P-3/S-2	Soil	16-Mar-12 08:45	19-Mar-12 16:45
SB45605-04	P-4/S-2	Soil	16-Mar-12 08:50	19-Mar-12 16:45
SB45605-05	P-4/S-3	Soil	16-Mar-12 08:55	19-Mar-12 16:45
SB45605-06	P-5/S-2	Soil	16-Mar-12 09:05	19-Mar-12 16:45
SB45605-07	P-6/S-2	Soil	16-Mar-12 09:30	19-Mar-12 16:45
SB45605-08	P-6/S-3	Soil	16-Mar-12 09:35	19-Mar-12 16:45
SB45605-09	P-7/S-2	Soil	16-Mar-12 09:45	19-Mar-12 16:45
SB45605-10	P-8/S-3	Soil	16-Mar-12 10:05	19-Mar-12 16:45
SB45605-11	P-9/S-2	Soil	16-Mar-12 10:10	19-Mar-12 16:45
SB45605-12	P-10/S-1	Soil	16-Mar-12 10:25	19-Mar-12 16:45
SB45605-13	P-11/S-1	Soil	16-Mar-12 10:45	19-Mar-12 16:45
SB45605-14	P-12/S-2	Soil	16-Mar-12 10:50	19-Mar-12 16:45
SB45605-15	P-13/S-1	Soil	16-Mar-12 11:00	19-Mar-12 16:45
SB45605-16	P-14/S-3	Soil	16-Mar-12 11:15	19-Mar-12 16:45
SB45605-17	P-15/S-3	Soil	16-Mar-12 11:25	19-Mar-12 16:45
SB45605-18	P-16/S-2	Soil	16-Mar-12 11:45	19-Mar-12 16:45
SB45605-19	P-17/S-1	Soil	16-Mar-12 11:55	19-Mar-12 16:45
SB45605-20	P-18/S-2	Soil	16-Mar-12 12:10	19-Mar-12 16:45
SB45605-21	P-19/S-3	Soil	16-Mar-12 12:12	19-Mar-12 16:45
SB45605-22	P-20/S-3	Soil	16-Mar-12 12:20	19-Mar-12 16:45
SB45605-23	P-21/S-2	Soil	16-Mar-12 14:10	19-Mar-12 16:45
SB45605-24	P-22/S-1	Soil	16-Mar-12 14:20	19-Mar-12 16:45
SB45605-25	P-23/S-2	Soil	16-Mar-12 14:28	19-Mar-12 16:45
SB45605-26	P-24/S-2	Soil	16-Mar-12 14:35	19-Mar-12 16:45
SB45605-27	Dup-1	Soil	16-Mar-12 00:00	19-Mar-12 16:45
SB45605-28	Dup-2	Soil	16-Mar-12 00:00	19-Mar-12 16:45
SB45605-29	P-8/S-2	Soil	16-Mar-12 10:00	19-Mar-12 16:45
SB45605-30	P-9/S-3	Soil	16-Mar-12 10:15	19-Mar-12 16:45
SB45605-31	P-13/S-2	Soil	16-Mar-12 11:00	19-Mar-12 16:45
SB45605-32	P-18/S-1	Soil	16-Mar-12 12:10	19-Mar-12 16:45



I attest that the information contained within the report has been reviewed for accuracy and checked against the quality control requirements for each method. These results relate only to the sample(s) as received.  
All applicable NELAC requirements have been met.

Massachusetts # M-MA138/MA1110  
Connecticut # PH-0777  
Florida # E87600/E87936  
Maine # MA138  
New Hampshire # 2538  
New Jersey # MA011/MA012  
New York # 11393/11840  
Pennsylvania # 68-04426/68-02924  
Rhode Island # 98  
USDA # S-51435



Authorized by:

Nicole Leja  
Laboratory Director

Spectrum Analytical holds certification in the State of Massachusetts for the analytes as indicated with an X in the "Cert." column within this report. Please note that the State of Massachusetts does not offer certification for all analytes. Please note that this report contains 56 pages of analytical data plus Chain of Custody document(s). When the Laboratory Report is indicated as revised, this report supersedes any previously dated reports for the laboratory ID(s) referenced above. Where this report identifies subcontracted analyses, copies of the subcontractor's test report are available upon request. This report may not be reproduced, except in full, without written approval from Spectrum Analytical, Inc.

*Spectrum Analytical, Inc. is a NELAC accredited laboratory organization and meets NELAC testing standards. Use of the NELAC logo however does not insure that Spectrum is currently accredited for the specific method or analyte indicated. Please refer to our "Quality" web page at [www.spectrum-analytical.com](http://www.spectrum-analytical.com) for a full listing of our current certifications and fields of accreditation. States in which Spectrum Analytical, Inc. holds NELAC certification are New York, New Hampshire, New Jersey and Florida. All analytical work for Volatile Organic and Air analysis are transferred to and conducted at our 830 Silver Street location (NY-11840, FL-E87936 and NJ-MA012).*

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*This laboratory report is not valid without an authorized signature on the cover page.*

The following outlines the condition of all EPH samples contained within this report upon laboratory receipt.

<b>Matrices</b>	Soil
<b>Containers</b>	✓ Satisfactory
<b>Aqueous Preservative</b>	✓ N/A                      pH $\leq$ 2                      pH $>$ 2                      pH adjusted to $<$ 2 in lab
<b>Temperature</b>	Received on ice                      Received at $4 \pm 2$ °C                      ✓ Other: 0.8°C

Were all QA/QC procedures followed as required by the EPH method? *Yes*

Were any significant modifications made to the EPH method as specified in Section 11.3? *No*

Were all performance/acceptance standards for required QA/QC procedures achieved? *Yes*

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

Authorized by:

Nicole Leja  
Laboratory Director

**MassDEP Analytical Protocol Certification Form**

<b>Laboratory Name:</b> Spectrum Analytical, Inc.			<b>Project #:</b> 1234.30			
<b>Project Location:</b> Concord Carlisle High School - Concord , MA			<b>RTN:</b>			
<b>This form provides certifications for the following data set:</b>			SB45605-01 through SB45605-32			
<b>Matrices:</b> Soil						
<b>CAM Protocol</b>						
8260 VOC CAM II A	<input checked="" type="checkbox"/> 7470/7471 Hg CAM III B	MassDEP VPH CAM IV A	8081 Pesticides CAM V B	7196 Hex Cr CAM VI B	MassDEP APH CAM IX A	
8270 SVOC CAM II B	7010 Metals CAM III C	<input checked="" type="checkbox"/> MassDEP EPH CAM IV B	8151 Herbicides CAM V C	8330 Explosives CAM VIII A	TO-15 VOC CAM IX B	
<input checked="" type="checkbox"/> 6010 Metals CAM III A	6020 Metals CAM III D	8082 PCB CAM V A	9012 Total Cyanide/PAC CAM VI A	9014 Total Cyanide/PAC CAM VI A	6860 Perchlorate CAM VIII B	
<i>Affirmative responses to questions A through F are required for "Presumptive Certainty" status</i>						
<b>A</b>	Were all samples received in a condition consistent with those described on the Chain of Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?				<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
<b>B</b>	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?				<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
<b>C</b>	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?				<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
<b>D</b>	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?				<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
<b>E</b>	a. VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?				<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
<b>F</b>	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to questions A through E)?				<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
<i>Responses to questions G, H and I below are required for "Presumptive Certainty" status</i>						
<b>G</b>	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?				<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>Data User Note: Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.</i>						
<b>H</b>	Were all QC performance standards specified in the CAM protocol(s) achieved?				<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<b>I</b>	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?				<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>All negative responses are addressed in a case narrative on the cover page of this report.</i>						
<i>I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.</i>						
Nicole Leja Laboratory Director Date: 3/26/2012						

*This laboratory report is not valid without an authorized signature on the cover page.*