



August 4, 2016

CH2M HILL Plateau Remediation Company  
 2420 Stevens Center Place  
 P.O. Box 1600  
 Richland, WA 99354  
 Attn.: Tracey A. Burch

**Subject: Geotechnical Laboratory Testing Services, Data Deliverable for SDG # W606106, Rev. 0**

Enclosed is the final report on geotechnical analyses performed by RJ Lee Group in conjunction with PBS Engineering and Environmental, Inc. (PBS) for Sample Delivery Group number (SDG #) W606106.

**General Set Comments**

RJ Lee Group received from CH2M-Hill Plateau Remediation Company (CHPRC) 1 sample to be tested for geotechnical analysis at the Columbia Basin Analytical Laboratories. There are no SIRs associated with this SDG.

The CHPRC sample, in SDG # W606106, has been assigned a PBS Geotechnical Lab Sample number per the below table.

CHPRC Sample #	SDG #	Geotechnical Lab Sample #	Date Processed
B35FW7	W606106	H-0082	07/19/2016

This project deliverable, provided in Attachment 1, contains the reports of the requested analytical results and a copy of the associated chain of custody for the sample listed above.

The analytical results provided in this deliverable relate only to the items tested. The sample was received in acceptable condition unless otherwise noted in the attached report(s).

I certify that this analytical report is in compliance with the Hanford SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the Laboratory Director or a designee as verified by the following signature.

08/04/2016

Richard Westberg  
 Laboratory Director, Columbia Basin Analytical Laboratories

Date

If you have any questions, please feel free to contact us at 509-545-4989 or email at [rwestberg@rjleegroup.com](mailto:rwestberg@rjleegroup.com).

## Attachment 1

PBS Geotechnical Laboratory Testing Results, SDG # W606106,  
dated August 4, 2016



Engineering +  
Environmental

August 1, 2016

RJ Lee Group, Inc.  
Attn: Mr. Larry Lockrem  
Columbia Basin Analytical Laboratories  
2710 North 20th Avenue  
Pasco, Washington 99301

Re: Geotechnical Laboratory Testing Results  
Sample Delivery Group No. W606106  
PBS Project No. 63797.000

Dear Mr. Lockrem:

In accordance with your request, PBS Engineering and Environmental Inc. (PBS) is providing you with the results of our recent geotechnical laboratory testing. Our services were provided in accordance with the request provided with Sample Delivery Group (SDG) number W606106.

We performed the following tests:

- Grain Size Analysis – Hydrometer (ASTM D422)
- Hydraulic Conductivity – Constant Head (ASTM D2434)

The appropriate permeability/hydraulic conductivity test (ASTM D2434 or D5084) was selected based on the texture characteristics of the sample received, per section 3.2.2 of the contract. The tests were performed in general accordance with the above-mentioned ASTM Standards.

We trust this letter meets your current needs. If you have any questions, or wish to further discuss our observations, conclusions, and recommendations, please contact us at 509.942.1600.

Sincerely,  
PBS Engineering and Environmental Inc.



Ryan White, P.E.  
Geotechnical Discipline Lead

RW/rg

Attachments: Report of Laboratory Testing – Grain-size Analysis  
Report of Laboratory Testing – Hydraulic Conductivity – Constant Head  
Chain of Custody

400 Bradley Boulevard, Suite 300, Richland, WA 99352  
509.942.1600 Main  
866.727.0140 Fax  
www.pbsenv.com



**REPORT OF LABORATORY TESTING**

<b>Report to:</b> CH2M-Hill - Plateau Remediation 2420 Stevens Center Place P.O. Box 1600 Richland, WA 99354	<b>Date:</b> 8/1/2016 <b>Sample Delivery Group No.:</b> W606106 <b>Sample Authorization No.:</b> F16-040
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<b>Project:</b> CHPRC Laboratory	<b>Project No.:</b> 63797.000
<b>Report of:</b> Grain Size Analysis - Hydrometer (ASTM D422)	<b>Lab Technician:</b> A. Jaimes

**Items Received:**

One sample was provided to us containing soil material obtained by you, the client.  
 We performed the following test:

Particle/Grain Size Analysis - Hydrometer (ASTM D422):

Mechanical Grain Size Analyses (wet sieve) were conducted on each of the soil samples to determine their grain size distribution. In addition, hydrometer tests were conducted on portions of the soil samples passing the No. 10 sieve. The results of the mechanical grain size analyses and hydrometer testing are plotted on the attached Figures (Particle Size Analysis Test Results - Hydrometer - Pages 1 through 3).

**LABORATORY TEST RESULTS**

**Particle Grain Size Analysis - Hydrometer (ASTM D422) - Sieve Portion**

Customer Sample Number	Laboratory Sample Number	Date of Analysis	Percent Passing by Sieve Size										
			3-in.	1½-in.	¾-in.	½-in.	No. 4	No. 10	No. 20	No. 40	No. 60	No. 100	No. 200
B35FW7	H-0082	7/19/2016	100.0	100.0	88.3	21.5	13.0	10.9	9.9	9.4	9.1	8.6	6.1





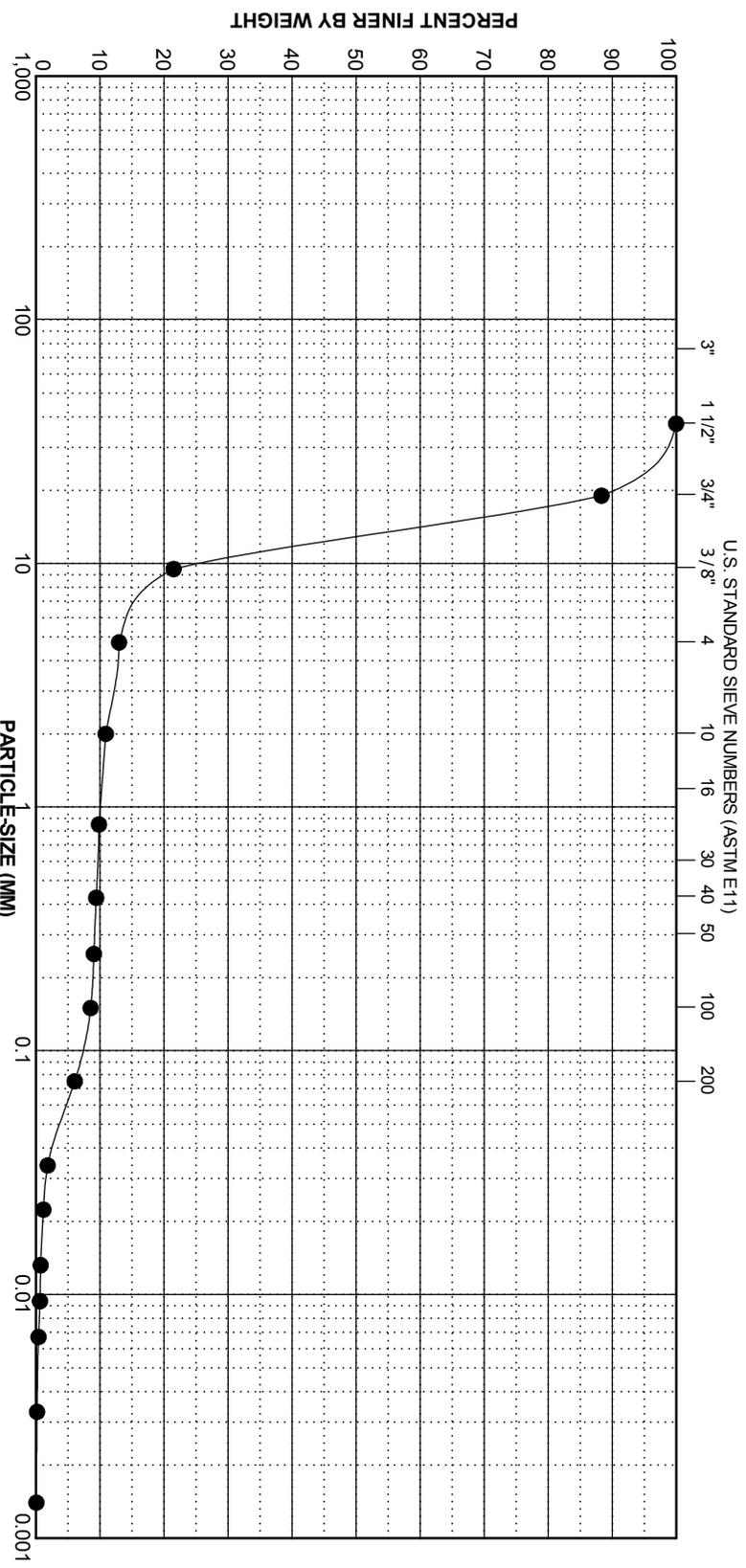
**PARTICLE-SIZE ANALYSIS TEST RESULTS**

CHPRC - GEOTECHNICAL LABORATORY

PBS PROJECT NUMBER:  
63797

TEST METHOD: ASTM C136

BOULDERS	COBBLES	GRAVEL				SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY		



KEY	EXPLORATION NUMBER	SAMPLE NUMBER	SAMPLE DEPTH (FEET)	MOISTURE CONTENT (PERCENT)	D60 (MM)	D50 (MM)	D30 (MM)	D10 (MM)	D5 (MM)	GRAVEL (PERCENT)	SAND (PERCENT)	FINES (PERCENT)
●	H-082	B35FW7	98.0	9	14.2	12.8	10.4	0.9	0.06	87	7	6



<b>COLLECTOR</b> B.E. Briggs CHPRC	<b>COMPANY CONTACT</b> TODAK, D	<b>TELEPHONE NO.</b> 376-6427	<b>PROJECT COORDINATOR</b> TODAK, D	<b>PRICE CODE</b> 8H	<b>DATA TURNAROUND</b> 30 Days / 30 Days
<b>SAMPLING LOCATION</b> C9542, I-004	<b>PROJECT DESIGNATION</b> 100-HR-3 Long Term & Interim Action Monitoring - Soil	<b>FIELD LOGBOOK NO.</b> HNF-N-645-5	<b>ACTUAL SAMPLE DEPTH</b> 98'-100.5'	<b>SAF NO.</b> F16-040	<b>AIR QUALITY</b> <input type="checkbox"/>
<b>ICE CHEST NO.</b> N/A	<b>OFFSITE PROPERTY NO.</b> N/A	<b>COA</b> 300115	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	<b>ORIGINAL</b>	
<b>SHIPPED TO</b> RJ LEE - GEOTECHNICAL	<b>BILL OF LADING/AIR BILL NO.</b> N/A				

<b>MATRIX*</b> A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/DATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1. N/A	<b>PRESERVATION</b> None	<b>HOLDING TIME</b> 6 Months	<b>TYPE OF CONTAINER</b> Split Spoon Liner	<b>NO. OF CONTAINER(S)</b> 1	<b>VOLUME</b> 1000g	<b>SPECIAL HANDLING AND/OR STORAGE</b>	<b>SAMPLE ANALYSIS</b> SEE ITEM (1) IN SPECIAL INSTRUCTIONS
<b>SAMPLE NO.</b> B35FW7	<b>MATRIX*</b> SOIL	<b>SAMPLE DATE</b> JUN 16 2016	<b>SAMPLE TIME</b> 0830	<b>W606106</b>				

8/4/2016

LINER 'B'

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM CHPRC	DATE/TIME JUN 16 2016 0912	RECEIVED BY/STORED IN SSU-1	DATE/TIME JUN 16 2016 0912	** Laboratory shall perform the Particle Size (Dry Sieve) analysis to determine if they should proceed with Permeability by D2434 or Hydraulic Conductive by D5 (1) D2434 PERMEABILITY: COMMON; D422 PARTICLE SIZE (Dry Sieve); COMMON; D5084 HYDRAULIC CONDUCTIVITY: COMMON;	
RELINQUISHED BY/REMOVED FROM SSU-1	DATE/TIME JUN 20 2016 0755	RECEIVED BY/STORED IN Troy Bacon	DATE/TIME JUN 20 2016 0755		
RELINQUISHED BY/REMOVED FROM Troy Bacon	DATE/TIME JUN 20 2016 1005	RECEIVED BY/STORED IN RJ LEE	DATE/TIME JUN 20 2016 1005		
RELINQUISHED BY/REMOVED FROM CHPRC	DATE/TIME JUN 20 2016 1005	RECEIVED BY/STORED IN RJ LEE	DATE/TIME JUN 20 2016 1005		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
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RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		

<b>LABORATORY SECTION</b>	<b>RECEIVED BY</b>	<b>TITLE</b>	<b>DATE/TIME</b>
<b>FINAL SAMPLE DISPOSITION</b>	<b>DISPOSAL METHOD</b>	<b>DISPOSED BY</b>	<b>DATE/TIME</b>

