

June 17, 2016

CH2M HILL Plateau Remediation Company  
2420 Stevens Center Place  
P.O. Box 1600  
Richland, WA 99352  
Attn.: Tracey A. Burch

**Subject: Geotechnical Laboratory Testing Services, Data Deliverable for SDG # W605103, 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 #) W605103.

**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 # W605103, has been assigned a PBS Geotechnical Lab Sample number per the below table.

<b>CHPRC Sample #</b>	<b>SDG #</b>	<b>Geotechnical Lab Sample #</b>
B354K2	W605103	H-0061

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.



Rich Westberg  
Laboratory Director, Columbia Basin Analytical Laboratories

06/17/2016

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 # W605103,  
dated June 17, 2016



Engineering + Environmental

June 14, 2016

RJ Lee Group, Inc.  
Attn: Mr. Larry Lockrem  
Columbia Basin Analytical Laboratories  
2710 North 20th Avenue  
Pasco, Washington 93301

Re: Geotechnical Laboratory Testing Results  
Sample Delivery Group No. W605103  
PBS Project No. 63737.000

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 W605103.

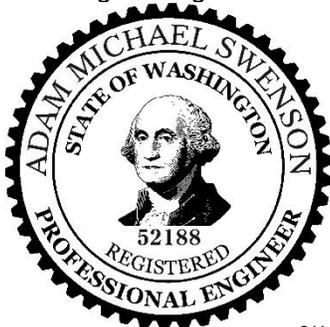
We performed the following tests:

- Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass (ASTM D2216)
- Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

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.



6/14/2016

Adam M. Swenson, P.E.  
Project Geotechnical Engineer

AS/rg

Attachments: Report of Laboratory Testing – Density by Drive Cylinder and Moisture Contents  
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 99352	<b>Date:</b> 6/14/2016 <b>Sample Delivery Group No.:</b> W605103 <b>Sample Authorization No.:</b> F15-028
---	---

<b>Project:</b> CHPRC Laboratory	<b>Project No.:</b> 63797.000
<b>Report of:</b> Density by Drive Cylinder (ASTM D2937) Moisture Content (ASTM D2216)	<b>Lab Technician:</b> A. Jaimes

**Items Received:**

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

Density by Drive Cylinder (ASTM D2937).

The dry densities (dry unit weight) of representative soils were determined in the laboratory using the relatively undisturbed soil samples. The dimensions of the specimen were carefully measured, the volume calculated, and the specimen weighed. A representative sample was obtained from the specimen, weighed, and placed in the oven to dry. After oven drying, the representative sample was reweighed and the water content calculated. The dry density was then computed. The results of tests are included in the table below.

Moisture Content (ASTM D2216).

Natural moisture content determinations were made on the samples of the fine-grained soils (that is, silts, clays, and silty sands). The natural moisture content is defined as the ratio of the weight of water to dry weight of soil, expressed as a percentage.

**LABORATORY TEST RESULTS**
**Density by Drive Cylinder (ASTM D2937)**
**Moisture Content (ASTM D2216)**

Customer Sample Number	Laboratory Sample Number	Wet Density (lbs/ft <sup>3</sup> )	Water Content (%)	Dry Density (lbs/ft <sup>3</sup> )
B354K2	H-0061	140.8	3.0	136.7

CH2M Hill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

<b>COLLECTOR</b> J.R. Aguilar/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> C9414, 200-WA-1 #7	<b>PROJECT DESIGNATION</b> 200-WA-1 Opportunistic sampling - soil	<b>FIELD LOGBOOK NO.</b> HDF-2-645-3/72	<b>ACTUAL SAMPLE DEPTH</b> 261.3 - 261.8'	<b>SAF NO.</b> F16-028	<b>AIR QUALITY</b> <input type="checkbox"/>
<b>ICE CHEST NO.</b>	<b>OFFSITE PROPERTY NO.</b>	<b>ACTUAL SAMPLE DEPTH</b>	<b>COA</b> 300192	<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>		

<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/JATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	<b>PRESERVATION</b> None	<b>HOLDING TIME</b> None	<b>TYPE OF CONTAINER</b> Split Spoon Liner	<b>NO. OF CONTAINER(S)</b> 1	<b>VOLUME</b> 1000g	<b>SAMPLE ANALYSIS</b> SEE ITEM (1) IN SPECIAL INSTRUCTIONS
<b>SAMPLE NO.</b> B354K2	<b>MATRIX*</b> SOIL	<b>SAMPLE DATE</b> 05-17-16	<b>SAMPLE TIME</b> 0825	<b>DATE/TIME</b> MAY 17 2016 0925	<b>DATE/TIME</b> MAY 17 2016 0925	<b>DATE/TIME</b> MAY 17 2016 0925	<b>DATE/TIME</b> MAY 17 2016 0925

**CHAIN OF POSSESSION**

**SIGN/ PRINT NAMES**

**SPECIAL INSTRUCTIONS**

Liner B to be submitted intact for geotechnical analysis with end caps taped to prevent loss or infiltration of moisture  
(1) D2216\_MOISTURE CONTENT: COMMON {Percent moisture (dry sample), Percent moisture (wet sample)}; D2937\_DENSITY: COMMON {Bulk density - dry, Bulk density - wet};

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
J.R. Aguilar/CHPRC	MAY 17 2016 0925	Troy Bacon/CHPRC	MAY 17 2016 0925
Troy Bacon/CHPRC	MAY 17 2016 0912	J.R. Aguilar/CHPRC	MAY 17 2016 0912
SSU #1	MAY 23 2016 1250	L.D. Wall/CHPRC	MAY 23 2016 1250
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

**LABORATORY SECTION** RECEIVED BY \_\_\_\_\_ DATE/TIME \_\_\_\_\_

**FINAL SAMPLE DISPOSITION** DISPOSAL METHOD \_\_\_\_\_ DATE/TIME \_\_\_\_\_

PRINTED ON 5/17/2016 FSR ID = FSR28199 TRVL NUM = TRVL-16-059 A-6003-618 (REV 2)



### Geotechnical Laboratory Sample Receipt

Date Time Received 5/23/16 1500

SDG# W605103

Work Order Number: 300192

SAF# F16-028-014

Shipping Container Identification: NA

- 1. Custody Seals on shipping container intact? Yes  No
- 2. Custody Seals dated and signed? Yes  No
- 3. Chain-of-Custody record present? Yes  No
- 4. Cooler temperature NA

5. Vermiculite/packing materials is Wet  Dry

6. Number of samples in shipping container: 1

7. Samples have:

- tape  hazard labels
- custody seals  appropriate sample labels

8. Samples are:

in good condition for the geotechnical tests required  leaking/desiccated  
 broken or disaggregated

9. Were any anomalies identified in sample receipt? Yes  No

10. Description of anomalies (include sample numbers):

11. Rad Screen Performed: \_\_\_\_\_

12. Chain of Custody # F16-028

Comments: \_\_\_\_\_

Sample Custodian/Laboratory: JRice / RJ Lee Group Date: 5/23/16

Telephoned to: \_\_\_\_\_ On \_\_\_\_\_ by \_\_\_\_\_