

April 16, 2015

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 # WA311220140002, 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 #) WA311220140002.

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 # WA311220140002, has been assigned a PBS Geotechnical Lab Sample number per the below table.

CHPRC Sample #	SDG #	Geotechnical Lab Sample #
B2YRK7	WA311220140002	H-0021

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.



April 16, 2015

Dr. Heinz Huber
Laboratory Manager, Columbia Basin Analytical Laboratories

Date

If you have any questions, please feel free to contact us at 509-545-4989 or email at hhuber@rjleegroup.com.

Attachment 1

PBS Geotechnical laboratory Testing Results, SDG # WA311220140002,
dated March 18, 2015

April 16, 2015



Engineering +
Environmental

March 18, 2015

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. WA311220140002
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 WA311220140002.

We performed the following test:

- 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 test was performed in general accordance with the above-mentioned ASTM Standards, except for the following cases:

- **Hydraulic Conductivity – Constant Head (ASTM D2434):** The sample was not tested in a permeameter cylinder appropriately sized based on the maximum particle size of the soil due to the lack of adequate sample volumes provided. The test was performed in the closest appropriately sized cylinder available for the volume of sample provided, per the direction of RJ Lee and CHPRC.

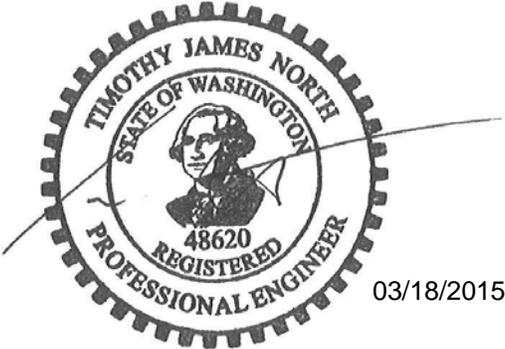
400 Bradley Boulevard, Suite 300, Richland, WA 99352
509.942.1600 Main
866.727.0140 Fax
www.pbsenv.com

April 16, 2015

Mr. Larry Lockrem
Re: Geotechnical Laboratory Testing Results – WA311220140002
March 18, 2015
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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.



Timothy J. North, P.E.
Project Geotechnical Engineer

A handwritten signature in black ink, appearing to read "N.A. Bowles".

Nathan A. Bowles, P.E.
Senior Engineer/Operations Manager

TN/NB

Attachments: Report of Laboratory Testing – Hydraulic Conductivity – Constant Head
Chain of Custody

REPORT OF LABORATORY TESTING

Report to: CH2M-Hill - Plateau Remediation 2420 Stevens Center Place P.O. Box 1600 Richland, WA 99352	Date: 3/18/2015 Sample Delivery Group No.: WA311220140002 Sample Authorization No.: F13-046
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Project: CHPRC Laboratory	Project No.: 63797.000
Report of: Hydraulic Conductivity - Constant Head (ASTM D2434)	Lab Tech: B. Russell

Items Received:

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

Hydraulic Conductivity - Constant Head (ASTM D2434).

The hydraulic conductivity of the representative soil was determined in the laboratory using the above referenced samples. The samples were prepared for the permeameter and all the required measures were taken. Air was evacuated from the samples and were then saturated with low mineral content water. The manometer system was attached and a stable head condition was attained. The quantity of flow, water temperature, water head and time were measured. This was repeated, if necessary, to establish an accurate region of laminar flow with velocity.

LABORATORY TEST RESULTS

Hydraulic Conductivity - Constant Head (ASTM D2434)

Customer Sample Number	Laboratory Sample Number	Date of Analysis	Quantity of flow discharged (cm ³)	Dist. between manometers, L (cm)	Specimen area, A (cm ²)	Total discharge time, t (sec)	Head dif. betw. manometers, h (cm)	Avg. Hydraulic Conductivity, k (cm/s)
B2YRK7	H-0021	2/4/2015	263	7.62	45.843	300	67.7	2.30E-03

COLLECTOR
J.R. Aguilera/CHPRC

COMPANY CONTACT
TODAK, D

TELEPHONE NO.
376-6427

PROJECT COORDINATOR
TODAK, D

PRICE CODE 8H

SAMPLING LOCATION
C8294, 1-006

PROJECT DESIGNATION
100-KR-4 Long Term & Interim Action Monitoring - Soil

SAF NO.
F13-046

AIR QUALITY

METHOD OF SHIPMENT
GOVERNMENT VEHICLE

ICE CHEST NO.

FIELD LOGBOOK NO.

ACTUAL SAMPLE DEPTH
113' 3"

COA
300085

BILL OF LADING/AIR BILL NO.

ORIGINAL

SHIPPED TO
RJ EE - GEOTECHNICAL

PRESERVATION
None

HOLDING TIME
6 Months

TYPE OF CONTAINER
Split Spoon Liner

NO. OF CONTAINER(S)
1

VOLUME
1000g

MATRIX*
A=Air
DL=Drum
Liquids
DS=Drum
Solids
L=Liquid
O=Oil
S=Soil
SF=Sediment
T=Tissue
V=Vegetation
W=Water
WF=Wipe
X=Other

SPECIAL HANDLING AND/OR STORAGE

SAMPLE ANALYSIS
SEE ITEM (1) IN SPECIAL INSTRUCTIONS

POSSIBLE SAMPLE HAZARDS/ REMARKS
*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.

TRVL-14-188

WA311220140002

SAMPLE NO.
B2YRK7

MATRIX*
SOIL

SAMPLE DATE
12-23-14

SAMPLE TIME
0815

17-6027

L

April 16, 2015

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	TRVL-14-188	
J.R. Aguilera/CHPRC	12-23-14 0900	SSu # 1	12-23-14 0900	(1) D2434 PERMEABILITY: COMMON; D5084 HYDRAULIC CONDUCTIVITY: COMMON;	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
F.M. Hall/CHPRC	DEC 31 2014 0815	F.M. Hall/CHPRC	DEC 31 2014 1100		
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	TITLE	DATE/TIME		
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME		

TRVL-14-188

April 16, 2015



Geotechnical Laboratory Sample Receipt

Date/Time Received: 12/31/14 11:00

SDG#: WA311220140002

Work Order Number: 300085

SAF# F13-046-075

Shipping Container Identification: GWS-032

- 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 4c
- 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 # F13-046-075

Comments: _____

Sample Custodian/Laboratory Christina Lopez Date: 12/31/14

Telephoned to: _____ On _____ by _____ 7 of 7