RJ LEE GROUP
DELIVERING SCIENTIFIC RESOLUTION

May 9, 2019

CH2M HILL Plateau Remediation Company (Geotech)
825 Jadwin Avenue
Richland, WA 99354
Attn.: L.C. Sumner

Subject: Geotechnical Laboratory Testing Services, Data Deliverable for SDG # W904017, Rev. 0

Enclosed is the final report on geotechnical analyses performed by RJ Lee Group for Sample Delivery Group number (SDG #) W904017.

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

The CHPRC sample, in COC # F19-027-023, has been assigned a RJLG Geotechnical Lab Sample number per the below table.

CHPRC Sample #	SDG #	Geotechnical Lab Sample #	Date Processed
B3P2L7	W904017	W904017	05/07/2019

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.

5/9/2019

Robert White L.G. Date
Licensed Geologist, Columbia Basin Analytical Laboratories

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

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REPORT OF LABORATORY TESTING

Report to:	CH2M Hill Plateau Remediation Company (Geotech) LC Summer 825 Jadwin Avenue Richland, WA 99352 (509) 376-6427	**Date:**	**5/2/2019** **Sample Delivery Group No.:** F19-027 **Sample Authorization No.:** 303492
Project:	300-FF-5 Uranium Sequestration Post-Injection Boreholes - Soil	**Project No.:**	F19-027-023
Report of:	Grain Size Analysis - Hydrometer (ASTM D422)	**Lab Technician:**	Veronika Vazquez

Items Received:
One sample was provided to us containing soil material obtained by you, the client.
Test performed:

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 mechnical grain size analyses and hydrometer testing are plotted on the attached Figure (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	Percent Passing by Sieve Size											
		3-in.	1½-in.	¾-in.	⅜-in.	No. 4	No. 10	No. 20	No. 40	No. 60	No. 100	No. 140	No. 200
B3P2L7	W904017	100	69.6	55.9	44.3	36.9	26.3	17.6	13.2	9.1	6.9	5.9	5.3

SHEET 1 OF 3 REVIEWED BY: 5/9/2019

RJ LEE GROUP
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REPORT OF LABORATORY TESTING

Report to:	CH2M Hill Plateau Remediation Company (Geotech) LC Summer 825 Jadwin Avenue Richland, WA 99352 (509) 376-6427	**Date:**	5/2/2019
		Sample Delivery Group No.:	F19-027
		Sample Authorization No.:	303492
Project:	300-FF-5 Uranium Sequestration Post-Injection Boreholes - Soi	**Project No.:**	F19-027-023
Report of:	Grain Size Analysis - Hydrometer (ASTM D422)	**Lab Technician:**	Veronika Vazquez

Particle/Grain Size Analysis - Hydrometer (ASTM D422):
See page 1 of 3

LABORATORY TEST RESULTS

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

Laboratory Sample Number	Hydrometer Readings													
	2 min		5min		15 min		30 min		60 min		250 min		1440 min	
	Dia. (mm)	Finer (%)	Dia. (mm)	Finer (%)	Dia. (mm)	Finer (%)	Dia. (mm)	Finer (%)	Dia. (mm)	Finer (%)	Dia. (mm)	Finer (%)	Dia. (mm)	Finer (%)
W904017	0.04	3.1	0.02	2.7	0.01	1.9	0.009	1.6	0.0068	1.2	0.00335	1.0	0.0014	0.8

SHEET 2 OF 3 REVIEWED BY: 5/9/2019

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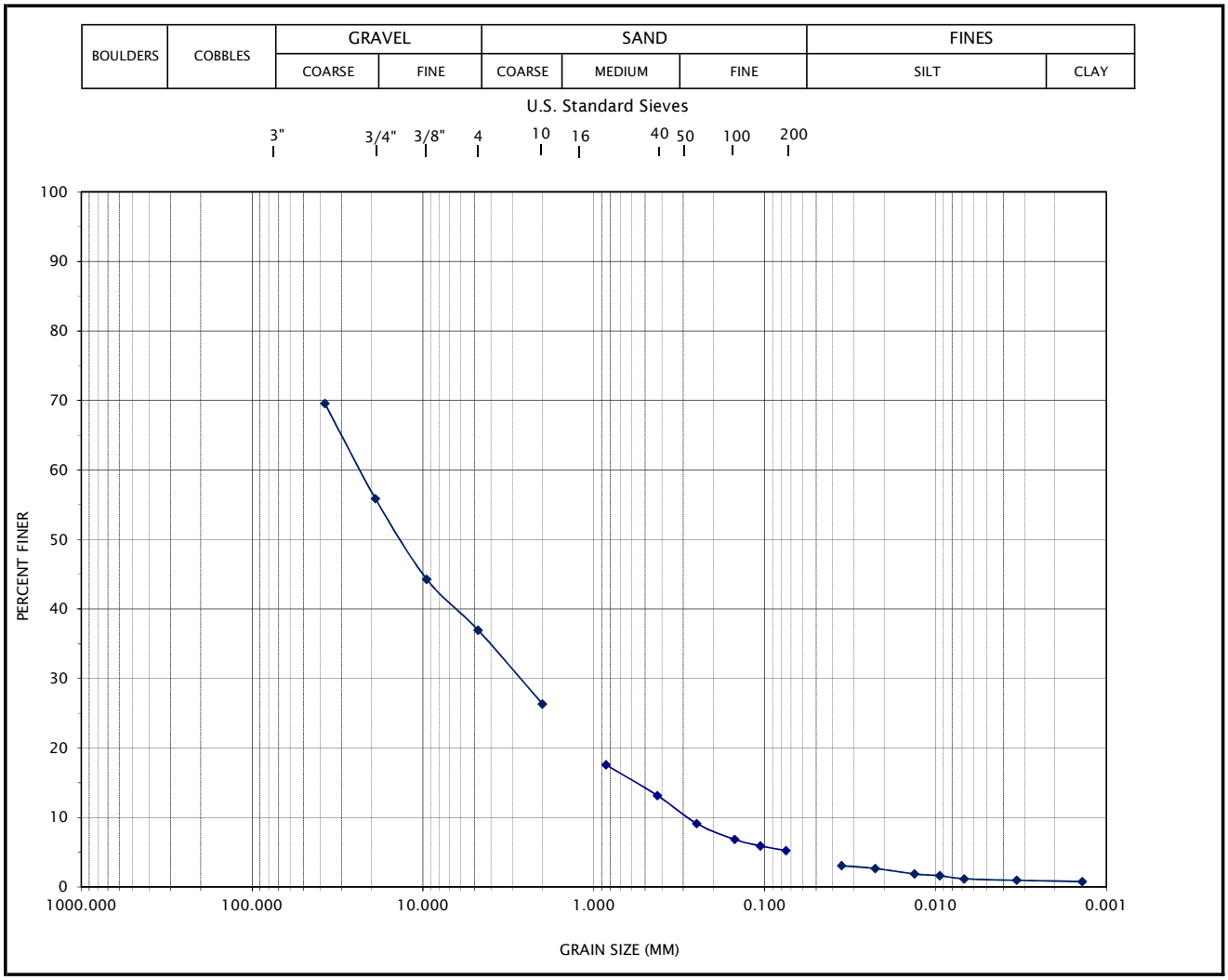
MECHANICAL GRAINSIZE ANALYSIS - HYDROMETER

Testing Method: ASTM D422

Project Name: 300-FF-5 Uranium Sequestration Post-Injection Boreholes - So
Project Number: F19-027-023
Sample Location: C9729-PT2 I-01
Sample Depth: 20.0-22.5
Sample Descripion: B3P2L7

Work Order ID: W904017
Lab Tech: Veronika Vazquez
Date Completed: 5/2/2019



PARTICLE-SIZE (MM)

KEY	SAMPLE NUMBER	MOISTURE CONTENT (PERCENT)	D60 (MM)	D50 (MM)	D30 (MM)	D10 (MM)	D5 (MM)	GRAVEL (PERCENT)	SAND (PERCENT)	FINES (PERCENT)
*	B3P2L7	4.2	25.0	15.0	2.7	0.28	0.075	63.10	31.60	5.30

Notes

Reviewed By: _____ Date: 5/9/2019

RJ LEE GROUP
DELIVERING SCIENTIFIC RESOLUTION

REPORT OF LABORATORY TESTING

Report to:	CH2M Hill Plateau Remediation Company (Geotech) LC Summer 825 Jadwin Avenue Richland, WA 99352 (509) 376-6427	**Date:**	5/7/2019
		Sample Delivery Group No.:	F19-027
		Sample Authorization No.:	303492
Project:	300-FF-5 Uranium Sequestration Post-Injection Boreholes - Soil	**Project No.:**	F19-027-023
Report of:	Soil Density (ASTM D2937-10)	**Lab Technician:**	Veronika Vazquez

Items Received:
One sample was provided to us containing soil material obtained by you, the client.
Test performed:

Standard Test Method for Density of Soil by the Drive-Cylinder Method (ASTM D2937-10)
This test method covers the determination of in-place density of soil. The test method involves obtaining a relatively intact soil sample by driving a thin-walled cylinder and the subsequent activities for the determination of in-place density. This test method is limited to the procedures necessary for obtaining specimens suitable for determining the in-place density and water content of certain soils. (Soil Density)

LABORATORY TEST RESULTS

Standard Test Method for Density of Soil by the Drive-Cylinder Method (ASTM D2937-10)

Customer Sample Number	Laboratory Sample Number	Volume (ft^3)	Wet WT. of Sample (g)	Wet Density (pcf)	WT. of Water (g)	WT. of Dry Soil (g)	Water Content (%)	Dry Density (pcf)	
B3P2L7	W904017	0.0128	589.95	101.4	72.2	1436.1	5.0	96.5	

REVIEWED BY: 5/9/2019 SHEET 1 of 1

W904017

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F19-027-023	PAGE 1 OF 1
COLLECTOR Malcom Chunn CHPRC	**COMPANY CONTACT** SUMNER, LC	**TELEPHONE NO.** 376-3922	**PROJECT COORDINATOR** SUMNER, LC	**REQUIRED TAT** 30 Days	
SAMPLING LOCATION C9729-PT2 I-01	**PROJECT DESIGNATION** 300-FF-5 Uranium Sequestration Post-Injection Boreholes - Soil		**SAF NO.** F19-027	**ORIGINAL**	
ICE CHEST NO. N/A	**FIELD LOGBOOK NO.** HNF-N- 64/5-13 PG 55	**ACTUAL SAMPLE DEPTH** 20-22.5	**PURCHASE ORDER/CHARGE CODE** 303492	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE	
SHIPPED TO RJ LEE - GEOTECHNICAL	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A	17	

MATRIX*
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

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

B3P4D2

SPECIAL HANDLING AND/OR STORAGE
N/A

PRESERVATION	None
HOLDING TIME	None
TYPE OF CONTAINER	Wide Mouth - P
NO. OF CONTAINER(S)	1
VOLUME	1L
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	FILTERED	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B3P2L7	N/A	SOIL	MAR 25 2019	0933	V

May 9 2019

CHAIN OF POSSESSION

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Malcom Chunn CHPRC	MAR 25 2019 1235	Jeff Lucas /CHPRC	MAR 25 2019 1235
Jeff Lucas /CHPRC	MAR 25 2019 1450	SSU-1	MAR 25 2019 1450
SSU-1	MAR 28 2019 0745	Jeff Lucas /CHPRC	MAR 28 2019 0745
Jeff Lucas /CHPRC	MAR 28 2019 0940	RSLC	MAR 28 2019 0940

SPECIAL INSTRUCTIONS
TRVL-19-082
(1) D422_PARTICLE SIZE (Dry Sieve): COMMON {Percent passing 1.5 inch sieve, Percent passing 3 inch sieve, Percent passing 3/4 inch sieve, Percent passing 3/8 inch sieve, Percent passing No. 10 sieve, Percent passing No. 100 sieve, Percent passing No. 140 sieve, Percent passing No. 20 sieve, Percent passing No. 200 sieve, Percent passing No. 4 sieve, Percent passing No. 40 sieve}; D2937_ DENSITY: COMMON {Bulk density - dry, Bulk density - wet};

FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 3/19/2019

FSR ID = FSR77483

TRVL NUM = TRVL-19-082

A-6003-618 (REV 3)

Rev. 0

6 of 6

W904017