



Shaw Environmental & Infrastructure, Inc.

RECEIVED JUNE 30, 2009

REVISION 1

Geotechnical Laboratory
1570 Bear Creek Road
Kingston TN 37763
(865) 482-6497

CERTIFICATE OF ANALYSIS

Stephen Trent
Fluor Hanford, Inc.
825 Jadwin Avenue
Richland, Washington 99352

November 14, 2008

This is the Certificate of Analysis for the following samples:

Shaw Project ID:	Eberline - Hanford
Shaw Project Number:	100846.8300000
Client SDG Number:	H3832
Date Received by Lab:	September 9, 2008
Number of Samples:	One (1)
Sample Type:	Soil

I. Introduction/Case Narrative

One soil sample was received by the Shaw Geotechnical Laboratory on September 9, 2008. The samples were submitted for determination of moisture content, bulk density, and sieve analysis. The sample number received was B1VJ73.

Please see Appendix A, Sample Number Cross Reference List; Appendix B, Analysis Results; and Appendix C, Chain-of-Custody/Sample Receipt Records.

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Reviewed and Approved:

Ralph Cole
Laboratory Manager, Geotechnical Services

II. Analytical Results/Methodology

REFERENCES: United States Army Corps of Engineers (USACE), Engineer Manual 1110-2-1906, *Laboratory Soils Testing*, appendix II, 1970; United States Environmental Protection Agency, SW846, *Test Methods for Examining Solid Waste, Physical/Chemical Methods*, 3rd ed., Nov 1986 (EPA SW-846). Annual Book of ASTM Standards, Section 4, Construction, Volume 04.08, *Soil and Rock (I)*, and Volume 04.09, *Soil and Rock (II)*, 2008. Shaw Environmental and infrastructure, Standard Operating Procedures.

Moisture Content of Soil and Rock **ASTM D 2216**
Particle-Size Distribution of Soils **ASTM D 422**
Unit Weight **USACE EM 1110-2-1906 app. II**

III. Quality Control

Quality control checks such as duplicates and spikes (QC samples), are not normally applicable to geotechnical testing. This is due largely to the inability of obtaining samples with known characteristics, the heterogenous nature of the samples, and quality control procedures built-in to the analytical method.

QC measures to ensure accuracy and precision of test results include the following:

- 100% verification of all numerical results - raw data entries, transcriptions and calculations entered by lab technicians are checked, recalculated and verified. Most data calculations are performed by computer programs.
- Data validation through test reasonableness - summaries of all test results for individual reports are reviewed to determine the overall reasonableness of data and to determine the presence of any data that may be considered outliers.
- Quality control procedures are built into most standardized geotechnical procedures. For example, liquid limit and plastic limit analyses call for re-analyses and specify acceptance criteria.
- Routine instrument calibration - instruments, gauges and equipment used in testing are calibrated on a routine basis. All instrument calibration follows ASTM or manufacturer guidelines.
- Maintenance of all past calibration records - calibration records and certification documents of all instruments, gauges and equipment are updated routinely and maintained in the Quality Control Coordinators Quality/Operations files.

-
- Certified and trained personnel - all technicians are trained in the application of standard laboratory procedures for geotechnical analyses as well as the quality assurance measures implemented by Shaw.
 - Quantitative analyses frequently used in geotechnical/physical testing programs do not use QC tools common to wet chemistry or radiochemistry laboratories. Measures not employed in the analysis of samples reported in this report include: laboratory control samples (LCS), blanks, matrix spikes (MS), duplicate analyses, dilutions, digestions, correction factors, surrogate sample analyses, detection limit determinations, control charts, and/or tentatively identified compounds (TICs).

IV. Data Qualification

A separate sample container was submitted for moisture determination. The entire contents of the sample container was used to determine the moisture content of the sample. An aliquot of this sample was not used. The moisture content of the sieve analysis sample is given on the sieve results sheet.

Appendix A
Sample Cross-Reference List

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June 29, 2009 (corrected)
Stephen Trent
Fluor Hanford, Inc.
Shaw Project Name: Eberline Hanford
Shaw Project No. 100846.83000000
SDG No. H3832

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SAMPLE NUMBER CROSS-REFERENCE LIST

LAB SAMPLE NO.	CLIENT SAMPLE NO.	MATRIX
BC1431	B1VJ73	Soil

Appendix B
Data Results

**PARTICLE-SIZE DISTRIBUTION
 ASTM D 422**

Project Name Eberline Hanford

Field Sample No. B1VJ73

Project No. 100846.83000000

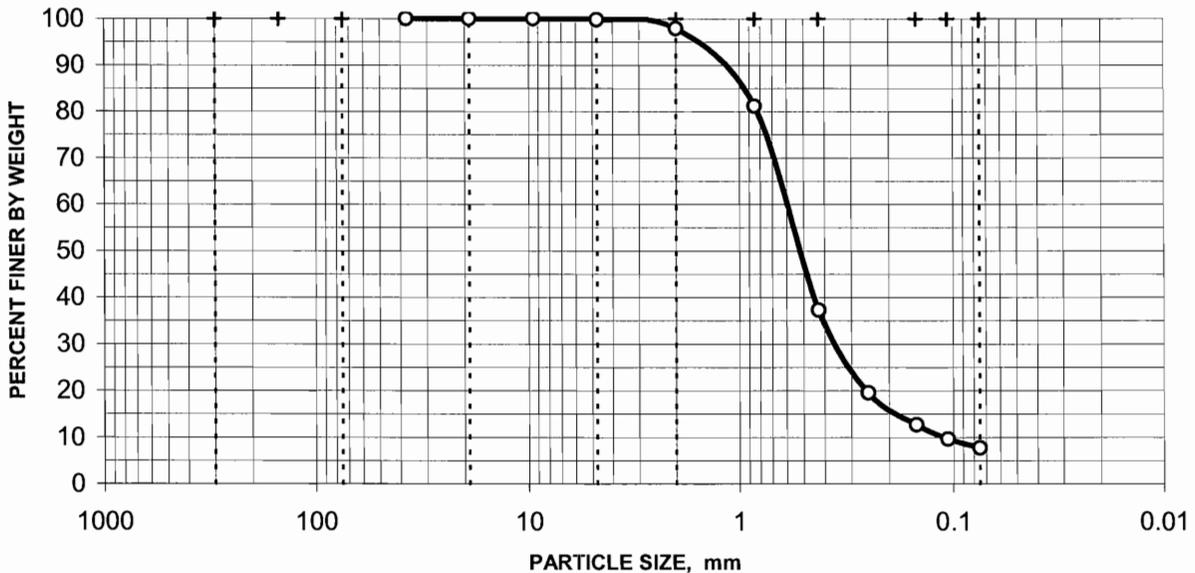
Lab Sample No. BC1431

SIEVE ANALYSIS

C O A R S E	Sieve No.	Diameter mm	Percent Finer
	3"	75.000	100.0%
	1.5"	37.500	100.0%
	0.75"	19.000	100.0%
	0.375"	9.500	100.0%
	#4	4.750	99.8%
	#10	2.000	97.9%

F I N E	Sieve No.	Diameter mm	Percent Finer
	#20	0.850	81.2%
	#40	0.425	37.3%
	#60	0.250	19.5%
	#100	0.149	12.7%
	#140	0.106	9.6%
	#200	0.075	7.7%

DISTRIBUTION CURVE



Appendix C
Chain of Custody Records

Fluor Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F08-126-035 REVISION 1 PAGE 1 OF 1		
COLLECTOR <i>Motlar</i>		COMPANY CONTACT TRENT, SJ		TELEPHONE NO. 373-5869	PROJECT COORDINATOR WIDRIG, DL		PRICE CODE 8N	DATA TURNAROUND 45 Days / 45 Days
SAMPLING LOCATION C6552, I-028		PROJECT DESIGNATION 216-A-5 Crib Characterization Sampling and Analysis - Soil			SAF NO. F08-126		AIR QUALITY <input type="checkbox"/>	
ICE CHEST NO. <i>GWO-06-3</i>		FIELD LOGBOOK NO. <i>HNF-N-585 2</i>		ACTUAL SAMPLE DEPTH <i>127.8' - 130.1'</i>		COA 123124ES10		METHOD OF SHIPMENT FEDERAL EXPRESS
SHIPPED TO Shaw Group		OFFSITE PROPERTY NO. SEE PTR			BILL OF LADING/AIR BILL NO. SEE PTR <i>H0070003</i>			
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 regulated for transportation per 49 CFR but are not releasable per DOE Order 5400.5 (1990/1993)		PRESERVATION None None					
			TYPE OF CONTAINER Split Spoon Liner Moisture Resistant Cont					
			NO. OF CONTAINER(S) 1 1					
			VOLUME 1000g 200g					
	SPECIAL HANDLING AND/OR STORAGE Radioactive Tie To: B1VJ15		SAMPLE ANALYSIS SEE ITEM (1) IN SPECIAL INSTRUCTIONS		Moisture Content - D2216;			
SAMPLE NO. B1VJ73		MATRIX* SOIL		SAMPLE DATE <i>8-4-08</i>		SAMPLE TIME <i>1410</i>		BC 1431
CHAIN OF POSSESSION			SIGN/ PRINT NAMES			SPECIAL INSTRUCTIONS		
RELINQUISHED BY/REMOVED FROM <i>J. Herrick J. Herrick</i>		DATE/TIME <i>8/4/08 1442</i>		RECEIVED BY/STORED IN <i>AS FR 061E</i>		DATE/TIME <i>8/4/08 1442</i>		** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
RELINQUISHED BY/REMOVED FROM <i>AS REXY</i>		DATE/TIME <i>8/2/8 0855</i>		RECEIVED BY/STORED IN <i>J. M. W. J. M. W.</i>		DATE/TIME <i>8/2/8-0855</i>		** Analytical batch QC must be run on a sample associated with this SAF. (1)Bulk Density - D2937; Particle Size (Dry Sieve) - D422;
RELINQUISHED BY/REMOVED FROM <i>J. M. W. J. M. W.</i>		DATE/TIME <i>8/2/8 0855</i>		RECEIVED BY/STORED IN <i>MO413 FRIDGE 1</i>		DATE/TIME <i>8/2/8-0855</i>		
RELINQUISHED BY/REMOVED FROM <i>MO413 FR 16</i>		DATE/TIME <i>9-8-8 0730</i>		RECEIVED BY/STORED IN <i>D Connolly D Connolly</i>		DATE/TIME <i>9-8-8 0730</i>		
RELINQUISHED BY/REMOVED FROM <i>D Connolly D Connolly</i>		DATE/TIME <i>9-8-8 1400</i>		RECEIVED BY/STORED IN <i>Fed Ex</i>		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 <i>Paul Blum</i>			TITLE <i>R50</i>		DATE/TIME <i>9-9-08 @1000</i>	
FINAL SAMPLE DISPOSITION		DISPOSAL METHOD			DISPOSED BY		DATE/TIME	