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Geotechnical Laboratory
PO Box 4339
1570 Bear Creek Road
Oak Ridge TN 37830
865/482-6497

CERTIFICATE OF ANALYSIS

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

October 21, 2004
corrected

This is the Certificate of Analysis for the following samples:

Shaw Project ID:	Eberline - Hanford
Shaw Project Number:	100846.16000000
Client Sampling Authorization Form No.:	F03-025-163 - F03-025-163 <i>Daynes</i>
Client Sample Data Group:	H2708 <i>11/2/04</i>
Date Received by Lab:	September 10, 2004
Number of Samples:	One (1)
Sample Type:	Soil

I. Introduction/Case Narrative

One soil sample was received by the Shaw Geotechnical Laboratory on September 10, 2004. The sample was submitted for determination of bulk density and sieve analysis. The sample number received was B19443.

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

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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)*, 2004. Shaw Environmental and infrastructure, Standard Operating Procedures.

Moisture Content of Soil and Rock.....	ASTM D 2216
Bulk Density of Soils	EM 1110-2-1906
Particle-size Analysis of Soils	ASTM D 422

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.

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Shaw Project Name: Eberline Hanford
Shaw Project No. 100846.16000000
SAF No. F04-025-163
SDG No. H2708

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- Certified and trained personnel - all technicians are certified by the National Institute for Certification of Engineering Technicians (NICET) in geotechnical soil testing, and 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

None.

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Appendix A
Sample Cross-Reference List

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SAMPLE NUMBER CROSS-REFERENCE LIST

LAB SAMPLE NO.	CLIENT SAMPLE NO.	MATRIX
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BC0442	B19443	Soil
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Appendix B
Sample Test Results

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**PARTICLE-SIZE DISTRIBUTION
 ASTM D 422**

Project Name Eberline Hanford
 Project No. 100846.16000000

Field Sample No. B19443
 Lab Sample No. BC0442

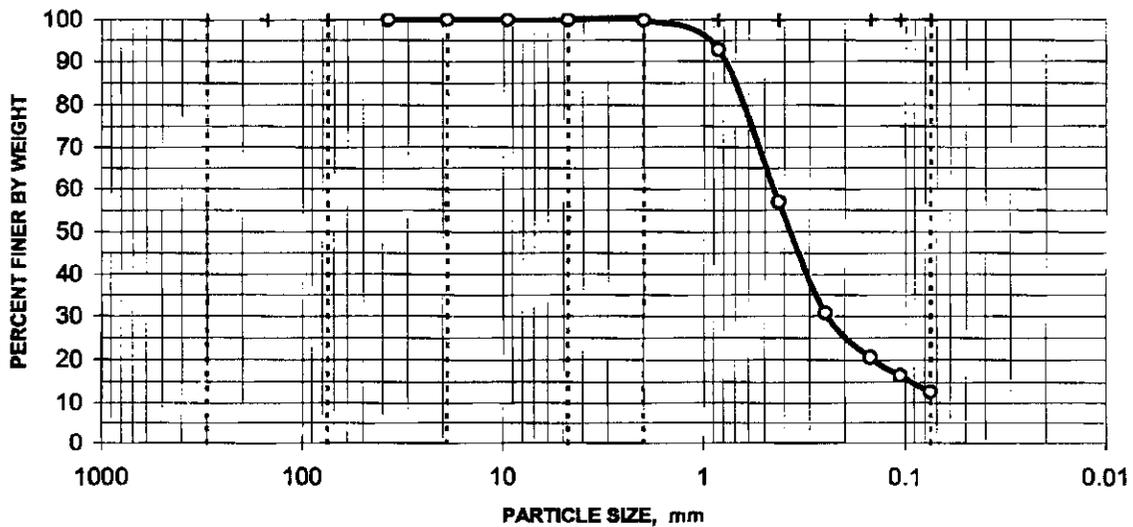
Moisture Content = 3.7%
 based on dry sample weight

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	100.0%
	#10	2.000	99.8%

F I N E	Sieve No.	Diameter mm	Percent Finer
	#20	0.850	92.8%
	#40	0.425	56.9%
	#60	0.250	30.7%
	#100	0.149	20.6%
	#140	0.106	16.5%
	#200	0.075	12.7%

DISTRIBUTION CURVE



0.0% Gravel

87.3% Sand

12.7% Silt/Clay

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Appendix C
Chain-of-Custody and Request-for-Analysis Records

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<u>DASH</u>	<u>SAMPLE IDENTIFICATION</u>	<u>STORED</u>	<u>TESTS</u>		
01A-S	B19443	SHAW	DISPOS	E331S	E333S E335S

<u>RELEASED BY</u>	<u>DATE</u>	<u>TRANSFERRED TO</u>	<u>DATE</u>	<u>RECEIVED BY</u>	<u>DATE</u>
<i>Jim Paros</i>	<i>9/8/04</i>	<i>Shaw</i>		<i>Don Shady / SHAW</i>	<i>9-10-04</i>

BC 0442

FLUOR Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F03-025-163	PAGE 1 OF 1
COLLECTOR Pope/Pfister/Hughes/Wiberg		COMPANY CONTACT TRENT, STEVE		TELEPHONE NO. 373-5689	PROJECT COORDINATOR TRENT, SJ	PRICE CODE 8N	DATA TURNAROUND 45 Days / 45 Days
SAMPLING LOCATION 216-S-20; 72-5R-73R 72'-74.5' 9/12/04		PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil			SAF NO. F03-025	AIR QUALITY <input type="checkbox"/>	
ICE CHEST NO. GPP-33-018		FIELD LOGBOOK NO. HNF-N-356 1	COA 119143ES10		METHOD OF SHIPMENT Federal Express		
SHIPPED TO Shaw Group		OFFSITE PROPERTY NO. 200 PTL 14050			BILL OF LADING/AIR-BILL NO. 200 PTL 14050		
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 N/A 11/23/04 Prod file to B19144 SDG# H2708	PRESERVATION	None	None			
		TYPE OF CONTAINER	Moisture Resistant Cont	Liner			
		NO. OF CONTAINER(S)	1	1			
		VOLUME	200ml	1000ml 2795g			
		SAMPLE ANALYSIS	Moisture Content - D2216;	SEE ITEM (1) IN SPECIAL INSTRUCTIONS			
SPECIAL HANDLING AND/OR STORAGE N/A							
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME				
B19443	SOIL	9-31-04	1400	Y	X	BC 0442	
CHAIN OF POSSESSION		SIGN/ PRINT NAMES			SPECIAL INSTRUCTIONS		
RELINQUISHED BY/REMOVED FROM Dana W. Salyer 9/16-3-20 DATE/TIME 9/15/04		RECEIVED BY/STORED IN Sally Frineth 110-026 DATE/TIME 8/31/04			(1) Particle Size (Dry Sieve) - D422; Bulk Density - D2937;		
RELINQUISHED BY/REMOVED FROM M. G. Bunker 9/2/04 DATE/TIME 08:30		RECEIVED BY/STORED IN M. G. Bunker 9/2/04 DATE/TIME 08:30					
RELINQUISHED BY/REMOVED FROM M. G. Bunker 9/2/04 DATE/TIME 08:30		RECEIVED BY/STORED IN L. G. EX DATE/TIME					
RELINQUISHED BY/REMOVED FROM Fred Eric 9/3/04 DATE/TIME		RECEIVED BY/STORED IN Fred Eric 9/3/04 DATE/TIME 12:30					
RELINQUISHED BY/REMOVED FROM Fred Eric 9/8/04 DATE/TIME 3:00		RECEIVED BY/STORED IN Fred Eric DATE/TIME					
RELINQUISHED BY/REMOVED FROM		RECEIVED BY/STORED IN					
RELINQUISHED BY/REMOVED FROM		RECEIVED BY/STORED IN					
LABORATORY SECTION	RECEIVED BY D. W. Salyer	TITLE SR. LAB TELH.			DATE/TIME 9-10-04 @ 1100		
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY			DATE/TIME		

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