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Geotechnical Laboratory
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CERTIFICATE OF ANALYSIS

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

February 2, 2005

This is the Certificate of Analysis for the following samples:

Shaw Project ID:	Eberline - Hanford
Shaw Project Number:	100846.48000000
Client Sample Data Group:	H2912
Date Received by Lab:	December 28, 2004
Number of Samples:	Two (2)
Sample Type:	Soil

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I. Introduction/Case Narrative

Two soil samples were received by the Shaw Geotechnical Laboratory on December 28, 2004. The samples were submitted for determination of moisture content, bulk density, and sieve analysis. The sample numbers received was B19970 and B19971.

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.
- 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.

Appendix A
Sample Cross-Reference List

Page 4 of 11
February 2, 2005
Stephen Trent
Fluor Hanford, Inc.
Shaw Project Name: Eberline Hanford
Shaw Project No. 100846.48000000
SDG No. H2912

**Shaw Geotechnical
Laboratory
Oak Ridge TN
(865) 482-6497**

SAMPLE NUMBER CROSS-REFERENCE LIST

LAB SAMPLE NO.	CLIENT SAMPLE NO.	MATRIX
BC0515	B19970	Soil
BC0516	B19971	Soil

00000005

Appendix B
Sample Test Results

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**PARTICLE-SIZE DISTRIBUTION
 ASTM D 422**

Project Name Eberline Hanford

Field Sample No. B19970

Project No. 100846.48000000

Lab Sample No. BC0515

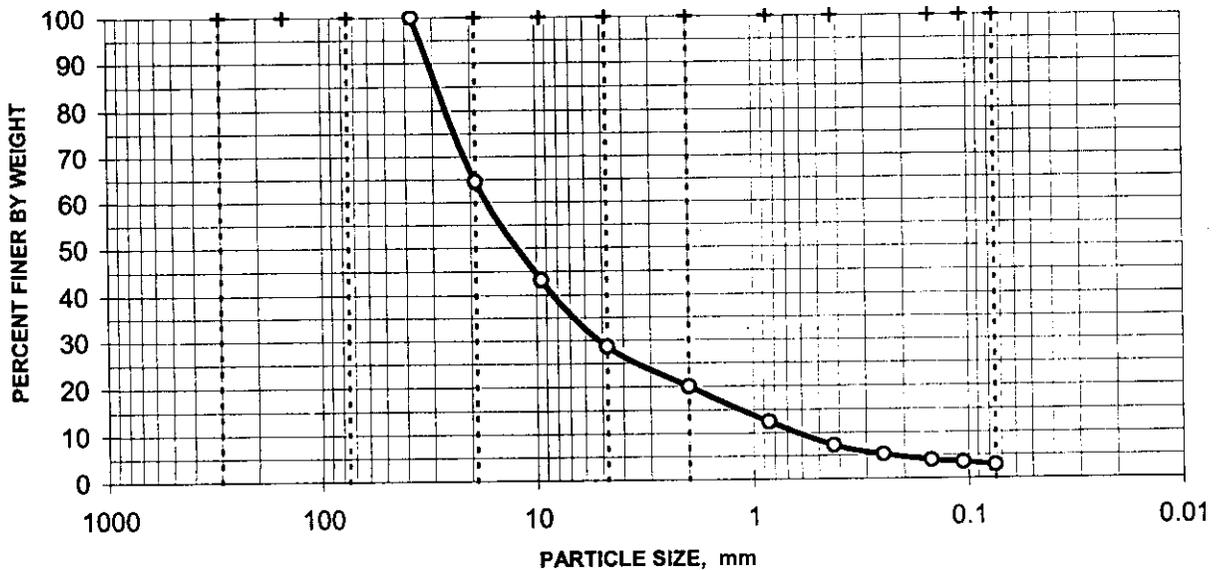
Moisture Content = 2.9%
 based on dry sample weight

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	64.5%
	0.375"	9.500	43.2%
	#4	4.750	28.7%
	#10	2.000	20.0%

F I N E	Sieve No.	Diameter mm	Percent Finer
	#20	0.850	12.4%
	#40	0.425	7.3%
	#60	0.250	5.2%
	#100	0.149	3.9%
	#140	0.106	3.4%
	#200	0.075	2.8%

DISTRIBUTION CURVE



71.3% Gravel

25.8% Sand

2.8% Silt/Clay

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**PARTICLE-SIZE DISTRIBUTION
 ASTM D 422**

Project Name Eberline Hanford

Field Sample No. B19971

Project No. 100846.48000000

Lab Sample No. BC0516

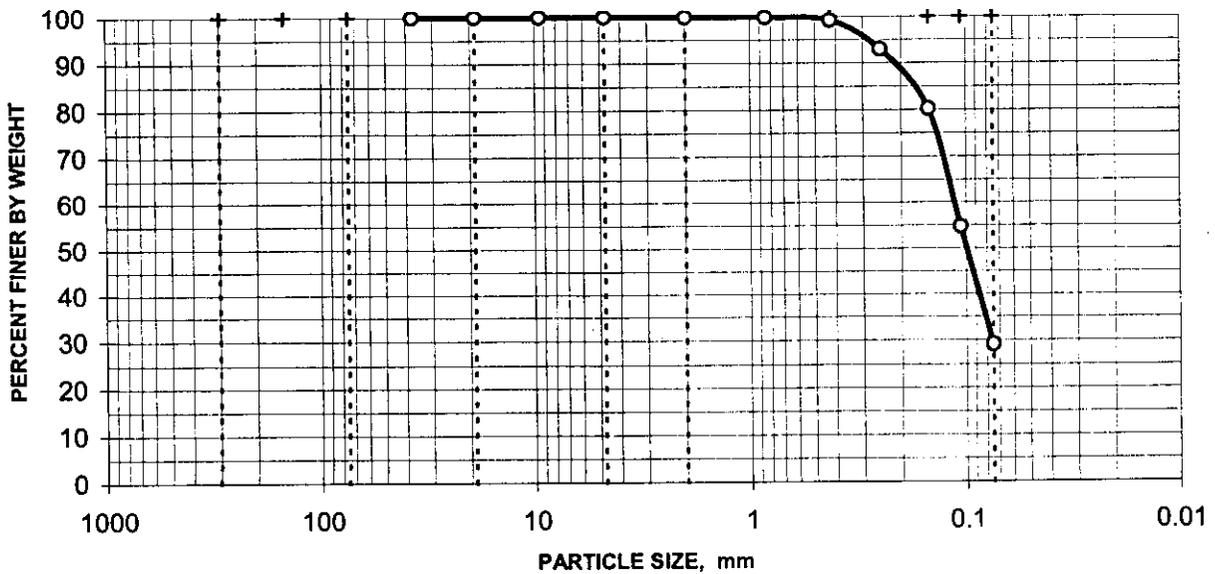
Moisture Content = 13.4%
 based on dry sample weight

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	100.0%

F I N E	Sieve No.	Diameter mm	Percent Finer
	#20	0.850	99.9%
	#40	0.425	99.1%
	#60	0.250	92.9%
	#100	0.149	80.2%
	#140	0.106	54.7%
	#200	0.075	29.1%

DISTRIBUTION CURVE



0.0% Gravel

70.9% Sand

29.1% Silt/Clay

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

COLLECTOR Pope/Pfister/Tyra/Wilberg	COMPANY CONTACT CS Cearlock	TELEPHONE NO. 372-9638	PROJECT COORDINATOR TRENT, SJ	PRICE CODE 8N	DATA TURNAROUND 45 Days / 45 Days
SAMPLING LOCATION 216-U-3; 35FT-37.5FT	PROJECT DESIGNATION 200-MW-1 Characterization Sampling and Analysis - Soil		SAF NO. F04-015	AIR QUALITY <input type="checkbox"/>	

ICE CHEST NO. GRP-03-009	FIELD LOGBOOK NO. HNF-N-386 1	COA 119144ES10	METHOD OF SHIPMENT Federal Express		
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SHIPPED TO Shaw Group	OFFSITE PROPERTY NO. PTR 14598	BILL OF LADING/AIR BILL NO. PTR 14598
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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 SDG# H2912	PRESERVATION	None	None											
		TYPE OF CONTAINER	Moisture Resistant Cont	Liner											
		NO. OF CONTAINER(S)	1	1											
		VOLUME	200g	1000g											
SPECIAL HANDLING AND/OR STORAGE Radioactive Tie To: B19953		SAMPLE ANALYSIS	Moisture Content - D2216;	SEE ITEM (1) IN SPECIAL INSTRUCTIONS											

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME											
B19970	SOIL	12/14/04	0700	X	X									
BC 0515														

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM R. Pfister/Pfister	DATE/TIME 12-14-04 0900	RECEIVED BY/STORED IN mo-02L ERW/T
RELINQUISHED BY/REMOVED FROM Mo-02L Refry #1	DATE/TIME 12/16/04 1045	RECEIVED BY/STORED IN Greg Thomas Greg Thomas
RELINQUISHED BY/REMOVED FROM Greg Thomas Greg Thomas	DATE/TIME 12/16/04 1045	RECEIVED BY/STORED IN Fed Ex
RELINQUISHED BY/REMOVED FROM Fed Ex	DATE/TIME 12/20/04 10:00	RECEIVED BY/STORED IN John Shaw
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN

(1) Bulk Density - D2937; Particle Size (Dry Sieve) - D422;

LABORATORY SECTION	RECEIVED BY John Shaw	DATE/TIME 12/28/04 @ 1030	TITLE
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

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COLLECTOR Pope/Pfister/Tyra/Wlberg	COMPANY CONTACT CS Cearlock	TELEPHONE NO. 372-9638	PROJECT COORDINATOR TRENT, SJ	PRICE CODE 8N	DATA TURNAROUND 45 Days / 45 Days
SAMPLING LOCATION 216-U-3; 97.5FT-100FT	PROJECT DESIGNATION 200-MW-1 Characterization Sampling and Analysis - Soil		SAF NO. F04-015	AIR QUALITY <input type="checkbox"/>	

ICE CHEST NO. ERC-02-406	FIELD LOGBOOK NO. HNF-N-386 1	COA 119144ES10	METHOD OF SHIPMENT Federal Express		
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SHIPPED TO Shaw Group	OFFSITE PROPERTY NO. See PTR 14598	BILL OF LADING/AIR BTL NO. See PTR 14598			
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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 SDA# H2912 SPECIAL HANDLING AND/OR STORAGE Radioactive Tie To: B19955- MAB B19954 12/16/04	PRESERVATION	None	None							
		TYPE OF CONTAINER	Moisture Resistant Cont	Liner							
		NO. OF CONTAINER(S)	1	1							
		VOLUME	200g	1000g							
		SAMPLE ANALYSIS	Moisture Content - D2216;	SEE ITEM (1) IN SPECIAL INSTRUCTIONS							

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME							
B19971	SOIL	12-16-04	0900	X	X					
BC 0516										

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	(1)Bulk Density - D2937; Particle Size (Dry Sieve) - D422;	
R. PFISTER / [Signature]	12/16/04 1030	MO-026 ERN #	12/16/04 1030		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
MO-026 [Signature]	12/16/04 1105	M.H. Burch / M.L. Burch	12/16/04 1105		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
M.H. Burch / M.L. Burch	12/16/04 1105	LED CA			
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
Fed Ex	12/20/04 10:20	[Signature]	12/20/04 9:20		
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 [Signature] SHAW 12/28/09 @ 1030	TITLE	DATE/TIME
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FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME
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SDG # H2912
Kberline Srvcas

CHAIN OF CUSTODY

ORD # R4-12-215

12/21/04 14:23:43

WORK ID: SAF# F04-015 SDG H2912

RCVD: 12/20/04 DUE: 02/03/05

KEEP: 02/03/06 DISP: S

DASH	SAMPLE IDENTIFICATION	STORED	TESTS
01A-S	B19970	ION	DISPOS E331S E333S E335S
*****	BC 0515	*****	*****
02A-S	B19971	ION	DISPOS E331S E333S E335S
*****	BC 0516	*****	*****

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
<i>Jan [Signature]</i>	<i>12/22/04</i>	<i>Shaw</i>	<i>12/24/04</i>	<i>[Signature]</i>	<i>12/28/04</i>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____