

**SAF-RC-074**  
**100-D/DR Burial Grounds & Remaining**  
**Sites – Soil In-Process**  
**FINAL DATA PACKAGE**

**COMPLETE COPY OF DATA PACKAGE TO:**

Kathy Wendt

H4-21

KW 8/31/10

INITIAL/DATE

**COMMENTS:**

**SDG K2222 SAF RC-074**

Rad only

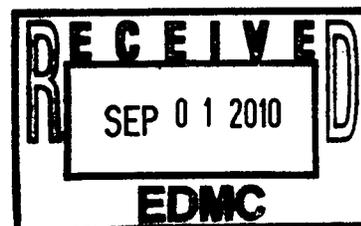
Chem only

Rad & Chem

Complete

Partial

**Waste Site: 1607-D-5 Septic System**



2011  
K2272



**Shaw**<sup>TM</sup>  
Shaw Environmental & Infrastructure

Geotechnical Laboratory  
304 Directors Drive  
Knoxville, TN 37923  
(865) 690-3211

## **CERTIFICATE OF ANALYSIS**

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Orlette Johnson  
Lionville Laboratory  
208 Welsh Pond Road  
Exton, PA 19341

August 23, 2010

This is the Certificate of Analysis for the following samples:

Shaw Project ID:	<b>Lionville</b>
Shaw Project Number:	<b>135594.01400000</b>
Date Received by Lab:	08/23/10
Number of Samples:	One (1)
Sample Type:	Soil

### I. Introduction/Case Narrative

One soil sample was received by the Shaw Geotechnical Laboratory on August 23, 2010. The sample was submitted for determination of standard proctor properties.

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

Reviewed and Approved:

R. Gregory Bennett  
Geotechnical Laboratory Manager, Technology Applications Group

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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)*, 2003.

Laboratory Determination of Water (Moisture) Content of Soil and Rock..... **ASTM D 2216**  
Compaction Characteristics of Soil Using Modified Effort..... **ASTM D 1557-09**

## 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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Report No.: LION0810017  
Orlette Johnson  
Client: Lionville  
Shaw Project Name: Lionville  
Shaw Project No. 135594.01400000

**Shaw**  
**Geotechnical Laboratory**  
**Knoxville, TN**  
**(865) 690-3211**

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- 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

None.

**Appendix A**  
**Sample Cross-Reference List**

Page 4 of 6  
Report No.: LION0810017  
Orlette Johnson  
Client: Lionville  
Shaw Project Name: Lionville  
Shaw Project No. 135594.01400000

**Shaw**  
**Geotechnical Laboratory**  
**Knoxville, TN**  
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SAMPLE NUMBER CROSS-REFERENCE LIST

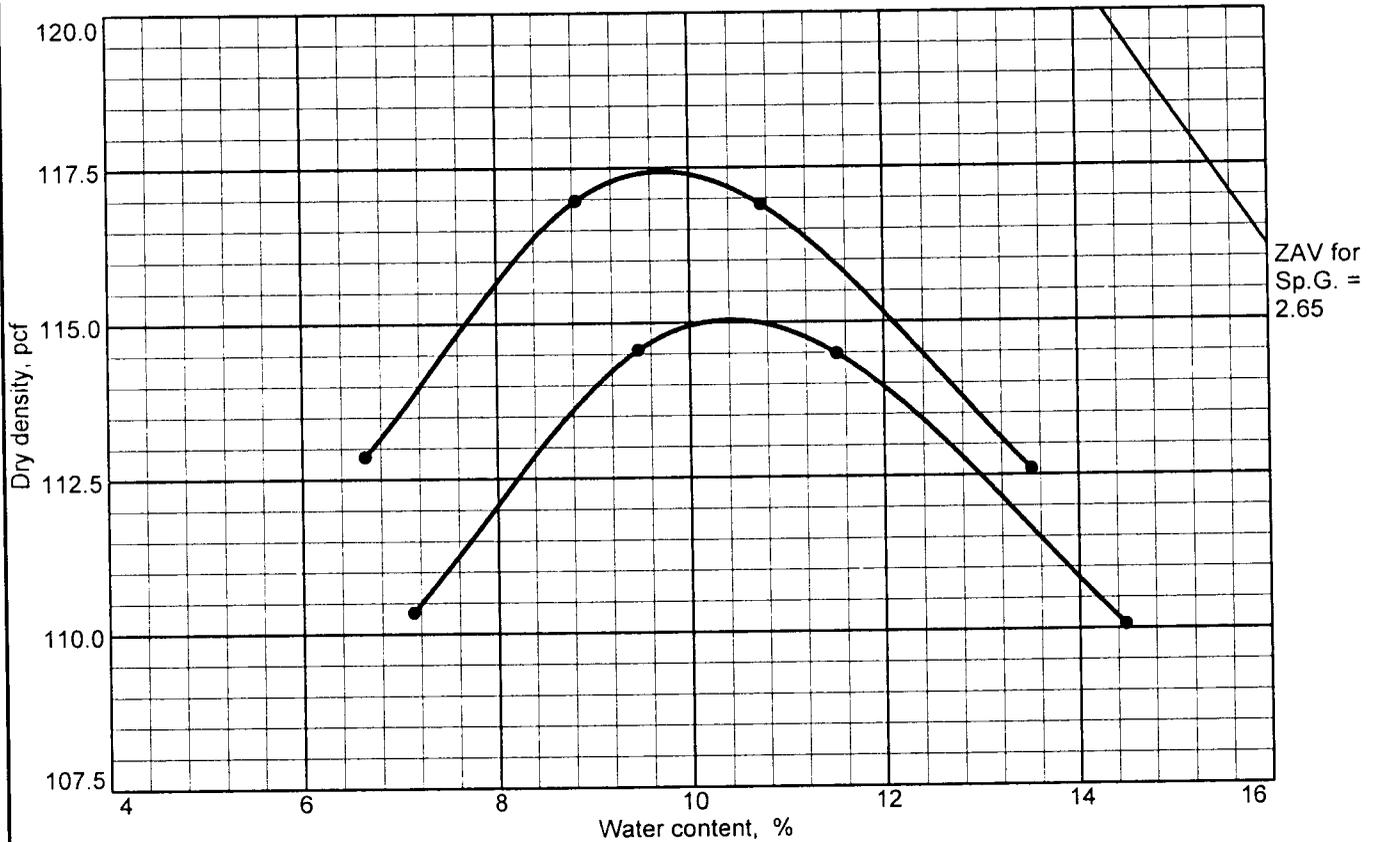
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LAB SAMPLE NO.	CLIENT SAMPLE NO.	MATRIX	DATE TESTED
SEK 4904	J1CON2	SOIL	08/23/2010

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**Appendix B**  
**Data Results**

### Standard Proctor Moisture/Density



Test specification: ASTM D 1557-91 Procedure A Modified  
 Oversize correction applied to each point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	sand		4.9	2.65			6.7	

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 117.4 pcf	115.0 pcf	
Optimum moisture = 9.7 %	10.4 %	

ETDC Project Name:	Remarks:
ETDC Project No.: 135594.01400000	
ETDC Sample No.: 4904	
Client Sample No.: J1C0N2	
Standard Proctor Moisture/Density	
<b>Shaw E&amp;I</b>	

Figure

**Appendix C**  
**Chain of Custody Records**

