



# **Final Status Survey Final Report Phase VI**

**Appendix A4  
Survey Unit Release Record  
9506-0000, North Site Grounds  
(Non-Protected Area)**

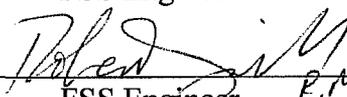
**February 2007**



CYAPCO  
FINAL STATUS SURVEY RELEASE RECORD  
NORTH SITE GROUNDS (NON-PROTECTED AREA)  
SURVEY UNIT 9506-0000

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**1. SURVEY UNIT DESCRIPTION**

Survey Unit 9506-0000, North Site Grounds (Non-Protected Area)/Emergency Operations Facility (EOF), is designated as Final Status Survey (FSS) Class 3 and consists of approximately eleven thousand two hundred forty four square meters 11,244 m<sup>2</sup> (2.77 acres) of open land area located approximately 0.08 miles from the reference coordinate system benchmark used at the Haddam Neck Plant (HNP) (see Attachment 1, Figure 1). The North Site Grounds survey unit is bounded as follows: on the west by the Survey Unit 9512-0000; Survey Unit 9504-0000 is to the east; Survey Unit 9514-0000 is to the south and the property boundary bounds this unit to the north (called north as oriented with the north to south flow of the Connecticut River). The Storm Water Retention Pond, Survey Unit 9508-0000, is located in the interior of the survey area. The survey unit is comprised of predominately flat open land area. The survey unit slopes from north to south, in the direction of the pond. The area around the pond is densely populated with trees and small brush.

The EOF building is located within the survey unit. Several sea land storage containers are located in the northern portion of the survey unit. These sea land storage containers are used for storage and preparation of FSS samples and miscellaneous materials. The EOF structure will remain on-site and several underground structures will be abandoned in place (i.e. a septic system; two (2) electric/telephone duct banks; a well water storage tank; and several storm water culverts associated with the bypass road). Radiological surveys will be performed to confirm that the components or structures will meet all applicable unrestricted release criteria (reference CY memo CY-06-093 and License Termination Plan (LTP) Section 2.3.3.1.2.7).

The reference coordinates associated with this survey area are E005 through E011 by S039 through S052 (refer to LTP Section 5.4.4, Figure 5-2). The reference coordinates provide the maximum dimensions of a rectangle containing this survey unit. Some areas contained in this rectangle may not be part of this survey unit. The boundary of the survey unit was defined using a Global Positioning System (GPS) based on the Connecticut State Plane System North American Datum (NAD) 1927.

**2. CLASSIFICATION BASIS**

The survey unit was classified in accordance with Procedure RPM 5.1-10, "*Survey Unit Classification.*" The historical information, scoping analyses and characterization results provided sufficient data to designate Survey Unit 9506-0000 as Class 3 in May 2006.

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The "Classification Basis Summary" conducted for this survey unit consisted of:

- a) A review of the 10CFR50.75 (g) (1) database,
- b) A review of the "Initial Characterization Report" and the "Historical Site Assessment (HSA) Supplement,"
- c) Historic and current survey records review,
- d) Visual inspections and a "walk-down."

A review of the 10CFR50.75 (g) (1) database report identified one (1) significant radiological event that may have impacted this survey area.

In March 1980, Plant Incident Report (PIR) 80-37 reported the discovery of several areas of elevated activity throughout the site. The investigation into the incident concluded that the elevated activity was most likely ejected from the Primary Vent Stack as a result of operational events in 1979. In all cases, the areas of elevated activity were removed upon discovery.

A review of the historical documents included the "Results of Scoping Survey", (performed during late 1997) and the "Historical Site Assessment" which provided no additional information.

A review of the "Initial and Supplemental Characterization Reports" as well as the previous "Classification Basis Summaries" provided no additional information pertinent to the classification.

Characterization was performed in June 2006 to obtain data of sufficient quality for Final Status Survey (FSS) planning purposes. This sampling was performed under Survey Sampling Work Plan (SSWP) 06-06-006. Nine (9) soil samples were evaluated overall. All of the samples were analyzed on-site using gamma spectroscopy. A Hard-to-Detect (HTD) analysis was conducted on one (1) of the nine (9) samples. Statistical quantities (mean, median and standard deviation) from the 2006 characterization survey are provided in Table 1).

**Table 1 – Basic Statistical Quantities for Cs-137 from the Characterization Survey**

<b>Parameter</b>	<b>Cs-137 (pCi/g)</b>
Minimum Value:	1.07E-02
Maximum Value:	1.32E-01
Mean:	5.94E-02
Median:	4.45E-02
Standard Deviation:	3.95E-02

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The FSS Engineer performed a visual inspection and walk-down during September 2006 to assess the physical condition of the survey unit, evaluate access points and travel paths and identify potentially hazardous conditions.

The final designation was Class 3 based on historical information and the characterization survey data which provided sufficient data to conclude that FSS sample results will be a fraction of the Operational DCGL of nineteen (19) mrem/yr.

**3. DATA QUALITY OBJECTIVES (DQO)**

FSS design and planning is based on the Data Quality Objective (DQO) process as described by the LTP, Procedure RPM 5.1-11, "*Preparation of Final Status Survey Plan*," and the "*Multi-Agency Radiation Survey and Site Investigation Manual*" (MARSSIM). A summary of the main features of the DQO process is provided herein.

The DQO process incorporates hypothesis testing and probabilistic sampling distributions to control decision errors during data analysis. Hypothesis testing is a process based on the scientific method that compares a baseline condition to an alternate condition. The baseline condition is defined as the null hypothesis. Hypothesis testing rests on the premise that the null hypothesis is true and that sufficient evidence must be provided for rejection. In designing the survey plan, the underlying assumption, or null hypothesis was that residual activity in the survey unit exceeded the release criteria. Rejection of the null hypothesis would satisfy the release criteria objective of the FSS. Probabilistic sampling is a preferred method to select a sample so that each item in the population being studied has a known likelihood of being included in the sample. Probabilistic sampling may include simple random sampling where every sample has the same chance of being included, or systematic random sampling where samples are arranged in some order and a random starting point is selected.

The primary objective of the Final Status Survey Plan (FSSP) was to demonstrate that the level of residual radioactivity in Survey Unit 9506-0000 did not exceed the release criteria specified in the LTP and that the potential dose from residual radioactivity is As Low As Reasonably Achievable (ALARA).

A fundamental precursor to survey design is to establish a relationship between the release criteria and some measurable quantity. This is done through the development of Derived Concentration Guideline Levels (DCGLs). The DCGLs represent average levels of radioactivity above background levels and are presented in terms of surface or mass activity concentrations. Chapter 6 of the LTP describes in detail the modeling used to develop the DCGLs for soil (called Base Case Soil DCGL), existing groundwater radioactivity and for future groundwater radioactivity that will be contributed by building foundations and footings.

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The DCGLs presented in Chapter 6 of the LTP were developed for exposures from three (3) components, that is, residual radioactivity in soil, existing groundwater radioactivity, and future groundwater radioactivity from the burial of concrete foundations or footings from site buildings containing residual radioactivity. Equation 1 shows the mathematical relationship between the three (3) components and the total dose.

**Equation 1:**

$$H_{\text{Total}} = H_{\text{Soil (sediment)}} + H_{\text{Existing GW}} + H_{\text{Future GW}}$$

The total dose under the LTP criteria is twenty-five (25) mrem/yr Total Effective Dose Equivalent (TEDE) from all three (3) components. The allowable total dose under the Connecticut Department of Environmental Protection (CTDEP) radiological remediation standard for Connecticut Yankee (CY) is nineteen (19) mrem/yr TEDE. To satisfy both the LTP and CY CTDEP criteria, the dose from soil must be reduced when using the existing and future groundwater dose values discussed above (reference CY memo ISC 06-024).

This survey unit is not affected by existing groundwater radioactive contamination (reference CY memo ISC 06-024). Therefore the dose contribution from existing groundwater is zero (0) mrem/yr TEDE.

This survey unit is not considered impacted by future groundwater radioactive contamination, as there are no contaminated concrete foundations or footings remaining within the groundwater saturated zone in the area (reference CY memo ISC 06-024). Therefore, the dose contribution from future groundwater is zero (0) mrem/yr TEDE.

**Equation 2:**

$$19 \text{ mrem/yr}_{\text{Total}} = 19 \text{ mrem/yr}_{\text{Soil}} + 0 \text{ mrem/yr}_{\text{Existing GW}} + 0 \text{ mrem/yr}_{\text{Future GW}}$$

The allowable dose for soil in this survey unit is nineteen (19) mrem/yr TEDE as shown by Equation 2 above. The concentration of residual radioactivity resulting in nineteen (19) mrem/yr TEDE is designated as the Operational DCGL(s), and has been established for the radionuclides of concern as provided in Table 2.

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**Table 2 – Radionuclide Specific Base Case Soil DCGLs, Operational DCGLs and Required Minimum Detectable Concentrations**

Radionuclide <sup>(1)</sup>	Base Case Soil DCGL (pCi/g) <sup>(2)</sup>	Operational DCGL (pCi/g) <sup>(3)</sup>	Required MDC (pCi/g) <sup>(4)</sup>
<b>H-3</b>	4.12E+02	3.13E+02	1.65E+01
<b>C-14</b>	5.66E+00	4.30E+00	2.26E-01
Mn-54	1.74E+01	1.32E+01	6.96E-01
<b>Fe-55</b>	2.74E+04	2.08E+04	1.10E+03
Co-60	3.81E+00	2.90E+00	1.52E-01
<b>Ni-63</b>	7.23E+02	5.49E+02	2.89E+01
<b>Sr-90</b>	1.55E+00	1.18E+00	6.20E-02
Nb-94	7.12E+00	5.41E+00	2.85E-01
<b>Tc-99</b>	1.26E+01	9.58E+00	5.04E-01
Ag-108m	7.14E+00	5.43E+00	2.86E-01
Cs-134	4.67E+00	3.55E+00	1.87E-01
Cs-137	7.91E+00	6.01E+00	3.16E-01
Eu-152	1.01E+01	7.68E+00	4.04E-01
Eu-154	9.29E+00	7.06E+00	3.72E-01
Eu-155	3.92E+02	2.98E+02	1.57E+01
<b>Pu-238</b>	2.96E+01	2.25E+01	1.18E+00
<b>Pu-239/240</b>	2.67E+01	2.03E+01	1.07E+00
<b>Pu-241</b>	8.70E+02	6.61E+02	3.48E+01
Am-241 <sup>(5)</sup>	2.58E+01	1.96E+01	1.03E+00
<b>Cm-243/244</b>	2.90E+01	2.20E+01	1.16E+00

- (1) **Bold** indicates those radionuclides considered to be Hard to Detect (HTD)
- (2) The Base Case Soil DCGLs for soil are specified by the LTP in Chapter 6 and are equivalent to twenty-five (25) mrem/yr TEDE
- (3) The Operational DCGL is equivalent to nineteen (19) mrem/yr TEDE
- (4) The required MDC is equivalent to one (1) mrem/yr TEDE
- (5) Americium-241 can be analyzed by gamma and alpha spectroscopy and is considered to be Easy to Detect (ETD). The preferred result is the alpha spectroscopy's when both analyses are performed.

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Another important facet of the DQO process is to identify the radionuclides of concern and determine the concentration variability. Characterization was performed in June of 2006 as discussed in Section 2. Cs-137 was found to be the only radionuclide of concern. The basic statistical quantities (i.e., mean, standard deviation, median) for Cs-137 are provided in Table 1.

Laboratory DQOs and analysis results were to be reported as actual calculated results. Results reported as less than Minimum Detectable Concentration (<MDC) would not be accepted for FSS. Sample report summaries were to include unique sample identification, analytical method, radionuclide, result, and uncertainty of two (2) standard deviations, laboratory data qualifiers, units, and the required and observed MDC.

**4. SURVEY DESIGN**

The level of effort associated with planning a survey is based on the complexity of the survey and nature of the hazards. Guidance for preparing FSS plans is provided in Procedure RPM 5.1-11, "*Preparation of Final Status Survey Plans*". The FSSP uses an integrated sample design that combines scanning surveys and sampling which can be either random or biased.

The dose for soil, used in this survey area to demonstrate compliance with the LTP criteria, is nineteen (19) mrem/yr TEDE, as discussed in Section 3 of this Release Record.

The DQO process determined that Cs-137 was the radionuclide of concern in Survey Unit 9506-0000 (refer to Section 3). Other radionuclides that were positively identified in concentrations greater than the screening criteria during the performance of this FSS would be evaluated to ensure adequate survey design.

The Elevated Measurement Comparison (EMC) did not apply to this survey unit since the survey unit is a Class 3 and discrete, elevated areas of contamination were not expected.

The Sign Test was selected as the non-parametric statistical test to demonstrate that the null hypothesis was rejected. The use of the Sign Test did not require the selection or use of a background reference area, which simplified survey design and implementation. In addition, this approach was conservative since it included background Cs-137 as part of the sample set.

The number of soil samples for FSS was determined in accordance with Procedure RPM 5.1-12, "*Determination of the Number of Samples for Final Status Survey*." The Lower Bound of the Gray Region (LBGR) was set in accordance with Procedure RPM 5.1-11, "*Preparation of Final Status Survey Plans*" to 5.93 pCi/g Cs-137 to maintain the relative shift ( $\Delta/\sigma$ ) in the range of 1 and 3. The resulting relative shift was 2. A Prospective Power Curve was generated using COMPASS, a software package developed under the

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sponsorship of the United States Nuclear Regulatory Commission (USNRC) for implementation of MARSSIM in support of the decommissioning license termination rule (10 CFR 20, Subpart E). The result of the COMPASS computer run showed adequate power for the survey design. This indicates that the survey area has a high probability of rejecting the null hypothesis, assuming that the characterization data are representative of the FSS results. Survey design specified fifteen (15) soil samples for non-parametric statistical testing.

The locations of the soil samples were determined using Visual Sample Plan (VSP) in accordance with Procedure RPM 5.1-14, *"Identifying, and Marking Surface Sample Locations for Final Status Survey."* Visual Sample Plan was created by Pacific Northwest National Laboratory (PNNL) for the United States Department of Energy. A random location was selected for sample design, which is appropriate for a Class 3 area.

Sample locations were identified using AutoCAD-LT, commercially available plotting software package with coordinates consistent with the Connecticut State Plane System. These coordinates were integrated with a GPS to locate sample locations in the field. Sample Measurement Locations for the design are listed with the GPS coordinates in Table 3.

The sample location designations of Table 3 are not sequential due to changes made at the south boundary of Survey Unit 9506-0000. The locations of three (3) of the fifteen (15) samples to be used for non-parametric-statistical testing were absorbed into Survey Unit 9514-0000.

**Table 3 - Sample Measurement Locations with Associated GPS Coordinates**

<b>Designation</b>	<b>Northing</b>	<b>Easting</b>
9506-0000-001F	237323.22	667804.71
9506-0000-002F	237275.35	667476.34
9506-0000-005F	237280.19	667447.67
9506-0000-006F	237379.09	667478.38
9506-0000-007F	237381.92	667579.77
9506-0000-008F	237443.22	667343.70
9506-0000-009F	237467.97	667347.74
9506-0000-010F	237516.94	667278.90
9506-0000-011F	237647.15	667369.52
9506-0000-012F	237613.06	667372.78
9506-0000-013F	237325.85	667829.02

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**Table 3 - (continued)**

<b>Designation</b>	<b>Northing</b>	<b>Easting</b>
9506-0000-014F	237328.22	667446.36
9506-0000-018F	237336.62	667793.84
9506-0000-019F	237289.89	667471.53
9506-0000-020F	237161.20	667500.97

Sample locations 9506-0000-003F, 9506-0000-004F, and 9506-0000-015F were absorbed into Survey Unit 9514-0000. Three (3) new sample locations, 9506-0000-018F, 9506-0000-019F and 9506-0000-020F were determined using VSP in accordance with Procedure RPM 5.1-14, *"Identifying, and Marking Surface Sample Locations for Final Status Survey."*

Judgmental or biased sampling was included as a feature of this survey design to account for any anomalies potentially identified in the field. Sample numbers 9506-0000-016F and 9506-0000-017F identify the biased sample locations that were selected for this survey unit.

Although Procedure RPM 5.1-11, *"Preparation of Final Status Survey Plans"* only specified that 5% of the samples be selected for HTD analysis, two (2) soil samples or 13% of the samples collected for non-parametric testing were analyzed for HTDs, exceeding the required percentage. The two (2) samples that were tested, were randomly selected for HTD radionuclide analyses using the Microsoft Excel "RANDBETWEEN" function. Each sample was sent off-site for a full suite analysis of the HTD radionuclides specified in Table 2.

The implementation of survey specific quality control measures as referenced by Procedure RPM 5.1-24, *"Split Sample Assessment for Final Status Survey,"* included the collection of two (2) soil samples for "split sample" analysis by the off-site laboratory. These locations were selected randomly using the Microsoft Excel "RAND" function. The number of quality control samples exceeded the 5% requirement.

The LTP specifies that scanning will be performed along with random and judgmental measurements (samples) for a Class 3 survey unit. Approximately 10% of this survey unit was scanned. Scanning was biased to areas where contamination was previously located and remediated in 1980 (PIR 80-37). Table 4 provides a synopsis of the survey design.

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**Table 4 – Synopsis of the Survey Design <sup>(1)</sup>**

Feature	Design Criteria	Basis
Survey Unit Land Area	11,244 m <sup>2</sup>	Based on AutoCAD-LT and Visual Sample Plan calculations
Number of Measurements	17 (15) non-parametric statistical testing samples (2) biased samples	Type 1 and Type 2 errors were 0.05, sigma was 0.039 pCi/g Cs-137 the LBGR was adjusted to 5.93 pCi/g Cs-137 to maintain Relative Shift in the range of 1 and 3.
Grid Spacing	NA	Based on random sampling
Operational DCGL	6.01 pCi/g Cs-137	To achieve 19 mrem/yr TEDE <sup>(1)</sup> to demonstrate compliance with Equation 2 of this Release Record
Scan Coverage	Approximately 10% of the area	The LTP specifies judgmental coverage for Class 3 Survey Unit
Soil Investigation Level	6.01 pCi/g Cs-137	The Operational DCGL meets the LTP criteria for a Class 3 survey unit

(1) The allowable dose for soil in this survey unit is nineteen (19) mrem/yr TEDE as the bounding dose from existing and future groundwater has been established based on field data (reference CY memo ISC 06-024.)

**5. SURVEY IMPLEMENTATION**

Final Status Survey field activities were conducted under Work Plan and Inspection Record (WP&IR) 2006-0038. The WP&IR package included a detailed FSSP, job safety analysis, job planning checklist and related procedures for reference. Daily briefings were conducted to discuss the expectations for job performance and the safety aspects of the survey. The "Daily Survey Journal" was used to document field activities and other information pertaining to the FSS.

Initially six (6) scan areas were established that constituted approximately 10% of the surface area of the Survey Unit 9506-0000. In January 2007, two (2) scan areas were absorbed into Survey Unit 9514-0000. One (1) additional scan area was established in the redrawn survey unit. The total number of scan areas was five (5) and the total area scanned remained approximately 10% of the surface area. Grid lines, one (1) meter wide, were established in each of the five (5) scan areas. Background was established at

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the beginning of each grid line, prior to scanning, using an Eberline E-600 with a SPA-3 sodium iodide detector. The E-600 was operated in the rate-meter mode and used with the audio response.

Fifteen (15) soil samples were collected and packaged in accordance with Haddam Neck Plant (HNP) Procedure RPM 5.1-3, "Collection of Sample Media for Final Status Survey" and FSS design.

Samples were controlled, transported, stored, and transferred to the off-site laboratory using Chain-of-Custody (COC) protocol in accordance with Procedure RPM 5.1-5, "Chain of Custody for Final Status Survey Samples."

Initially two (2) samples, 9506-0000-004F and 9506-0000-013F, were selected, at random for HTD radionuclide analysis by the off-site laboratory. Sample 9506-0000-004F was absorbed into Survey Unit 9514-0000. Sample 9506-0000-019F was randomly selected to replace sample 9506-0000-004F.

Two (2) biased soil samples 9506-0000-016F and 9506-0000-017F were collected to be analyzed by the offsite laboratory for gamma spectroscopy.

The implementation of survey specific quality control measures included the collection of two (2) split samples at locations 9506-0000-002F and 9506-0000-008F for "split sample" analysis by the off-site laboratory.

## 6. SURVEY RESULTS

All field survey activities were conducted in November 2006 and January 2007.

The scan areas were scanned in accordance with the FSSP in November 2006 and January 2007. There were no areas of elevated activity identified during the scanning process. Table 5 provides an overview of sample scan locations.

**Table 5 - Scan Results for Sample Measurement Locations**

<b>Sample Measurement Location</b>	<b>Highest Logged Reading (kcpm)</b>	<b>Action Level <sup>(1)</sup> (kcpm)</b>	<b>&gt; Action Level <sup>(2)</sup></b>
1	5.55	6.43	NO
2	5.84	7.20	NO
5	6.84	7.89	NO
6	5.12	7.96	NO
7	6.92	8.25	NO
8	7.00	8.17	NO
9	6.28	7.38	NO
10	6.11	7.40	NO

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**Table 5 - (continued)**

Sample Measurement Location	Highest Logged Reading (kcpm)	Action Level <sup>(1)</sup> (kcpm)	> Action Level <sup>(2)</sup>
11	9.38	9.57	NO
12	8.68	10.8	NO
13	5.63	6.46	NO
14	7.07	8.15	NO
18	5.16	6.55	NO
19	6.25	7.37	NO
20	5.84	6.38	NO

- (1) The action level is based on a measurement above ambient background in accordance with the FSS plan
- (2) The FSS plan requires movement of the sample measurement location to the area within the one (1) meter radius yielding the response above the action level
- (3) Sample locations #'s 3, 4, and 15 were absorbed into Survey Unit 9514-0000.

The scan areas, that comprised approximately 10% of the total surface area for the survey unit, were scanned for elevated radiation levels. Table 6 provides an overview of the scan area survey. Scan results are provided in Attachment 2.

**Table 6- Scan Area Results**

Scan Area	Range of Logged Reading (kcpm)	Highest Logged Reading (kcpm)	Range of Action Level <sup>(1)</sup> (kcpm)	>Action Level <sup>(2)</sup>
1,4-7	5.16 - 8.37	8.37	6.48 - 9.94	NO

- (1) The action level is based on a measurement above ambient background in accordance with the FSS plan
- (2) Scan areas #'s 2 and 3 were absorbed into Survey Unit 9514-0000. Scan area 7 was established to replace them.

The off-site laboratory employed for the radiological analyses of samples was General Engineering Laboratories (GEL) – Charleston, South Carolina. The laboratory analyzed the fifteen (15) samples taken for non-parametric statistical testing and the associated duplicates using gamma spectroscopy. Gamma spectroscopy analysis was performed to the required MDC. Gamma spectroscopy results identified some radionuclides meeting the acceptance criteria for detection (i.e., a result greater than two (2) standard deviations

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uncertainty). All could be de-selected or excluded using the 5% and 10% rule described in Section 4.

Cesium-137 was identified in twelve (12) of the fifteen (15) samples. None of the samples exceeded the Operational DCGL. Gamma spectroscopy sample analysis did not require further investigation. A summary of the sample results is provided in Table 7.

**Table 7 - Summary of Soil Sample Results**

Sample Number	Cs-137 pCi/g	Fraction of the Operational DCGL <sup>(1)</sup>
9506-0000-001F	1.82E-01	0.030
9506-0000-002F	8.15E-02	0.013
9506-0000-005F	1.63E-01	0.027
9506-0000-006F	5.09E-02	0.008
9506-0000-007F	4.72E-02	0.008
9506-0000-008F	5.52E-02	0.009
9506-0000-009F	6.37E-02	0.011
9506-0000-010F	4.98E-02	0.008
9506-0000-011F	-2.11E-02	-0.003
9506-0000-012F	2.53E-02	0.004
9506-0000-013F	2.52E-01	0.042
9506-0000-014F	4.40E-02	0.007
9506-0000-018F	1.76E-01	0.029
9506-0000-019F	6.12E-02	0.010
9506-0000-020F	1.31E-01	0.022

(1) The Operational DCGLs from Table 2 is 6.01 pCi/g for Cs-137 to achieve nineteen (19) mrem/yr TEDE.

The off-site laboratory also processed two (2) samples for HTD analyses as required by the sample plan. The requested analyses included alpha spectroscopy, gas proportional counting, and liquid scintillation depending on the radionuclide and the measurement method. Gamma spectroscopy results identified some radionuclides meeting the acceptance criteria for detection (i.e., a result greater than two (2) standard deviations uncertainty). All could be de-selected or excluded using the 5% and 10% rule described in Section 4. All analyses met the required MDC.

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Two (2) biased sample were collected at locations selected by FSS Supervision based on professional judgment and observation. Gamma spectroscopy analysis was performed by the off-site laboratory to the required MDC. The samples were a very small fraction of the Operational DCGL. No further action or investigations were required. A summary of the sample results is provided in Table 8.

**Table 8 – Biased Sample Results**

Sample Number	Cs-137 pCi/g	Fraction of the Operational DCGL <sup>(1)</sup>
95060000-016F	1.90E-01	0.032
95060000-017F	3.91E-02	0.006

(1) The Operational DCGLs from Table 2 is 6.01 pCi/g for Cs-137 to achieve a TEDE of nineteen (19) mrem/yr.

**7. QUALITY CONTROL**

The off-site laboratory processed the split samples and performed gamma spectroscopy analysis. The data was evaluated using USNRC acceptance criteria specified in Inspection Procedure 84750 as detailed in HNP Procedure RPM 5.1-24, "*Split Sample Assessment for Final Status Survey.*" There was acceptable agreement between the field split results for both of the "split sample" pairs tested.

The sample analysis vendor, General Engineering Laboratories (GEL) – Charleston, South Carolina, maintains quality control and quality assurance plans as part of normal operation. Refer to Attachment 2 for data and data quality analysis results.

**8. INVESTIGATIONS AND RESULTS**

Sample investigation levels were not exceeded for this unit. Consequently, no investigations were performed.

**9. REMEDIATION AND RESULTS**

Historically, no radiological remedial action as described by MARSSIM Section 5.4 was performed in this survey unit prior to or as a result of the FSS. Health Physics TSD BCY-HP-0078, "*ALARA Evaluation of Soil Remediation in Support of Final Status Survey,*" determined that remediation beyond that required to meet the release criteria to be unnecessary and that the remaining residual radioactivity in soil was ALARA.

NORTH SITE GROUNDS (NON-PROTECTED AREA)/EOF  
SURVEY UNIT 9506-0000

RELEASE RECORD

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**10. CHANGES FROM THE FINAL STATUS SURVEY PLAN**

Addendum #1 was drafted to address sample location, 9506-0000-013F that was underwater at the time the FSSP was initiated. The addendum was not used due to receding water. Sample location 9506-0000-013F was taken at its original randomly selected location.

Addendum #2 was drafted to address the change in the south boundary of Survey Unit 9506-0000, the locations of three (3) of the fifteen (15) samples that were used for non-parametric statistical testing and two (2) scan areas were absorbed into Survey Unit 9514-0000 and a new scan area was established. Approximately eight hundred seventy six square meters (876 m<sup>2</sup>) of the survey unit were absorbed by Survey Unit 9514-0000

**11. DATA QUALITY ASSESSMENT (DQA)**

The DQO sample design and data were reviewed in accordance with Procedure RPM 5.1-23, "Data Quality Assessment," for completeness and consistency. The sampling design had adequate power as indicated by the Retrospective Power Curve. The Sign Test was performed on the data and compared to the original assumptions of the DQOs. The Sign Test shows that the survey unit passes FSS.

Documentation was complete and legible. Surveys and sample collection were consistent with the DQOs and were sufficient to ensure that the survey unit was properly designated as Class 3.

The preliminary data review consisted of calculating basic statistical quantities (e.g., mean, median, standard deviation). See Table 9.

**Table 9 – Basic Statistical Quantities for Cs-137 from the Final Status Survey**

	<b>Cs-137 pCi/g</b>
DCGL <sub>op</sub> :	6.01E+00
Minimum Value:	-2.11E-02
Maximum Value:	2.52E-01
Mean:	7.99E-02
Median:	5.52E-02
Standard Deviation:	7.11E-02

NORTH SITE GROUNDS (NON-PROTECTED AREA)/EOF  
SURVEY UNIT 9506-0000

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The sample standard deviation was slightly more than the value used for the survey design. This is represented by the shift in the retrospective power curve as shown in Attachment 2f. This would indicate a change to the original LBGR to maintain the number of samples at fifteen (15) to meet the Operational DCGL. However, the value of LBGR is less of a critical issue as the survey unit has passed the statistical test, and the mean and median values are well below the Operational DCGL. Also, the retrospective power curve shows that a sufficient number of samples were collected to achieve the desired power. Therefore, the survey unit meets the release criteria with adequate power as required by the DQOs.

The range of the data was about 2.81 standard deviations. The difference between the mean and median was 38.6% of the standard deviation which indicates some skewness in the data. The data was represented graphically through posting plots, a frequency plot, and a quantile plot. The frequency plot shows some positive skewness as confirmed by the calculated skew of 1.21.

All data, assessments, and graphical representations are provided in Attachment 2.

**12. ANOMALIES**

No anomalies were noted in the performance of this FSS.

**13. CONCLUSION**

Survey Unit 9506-0000 has met the final DQOs of the FSS. The ALARA criteria for soils as specified in Chapter 4 of the LTP were achieved. Elevated Measurement Comparison and remediation were not required.

The sample data passed the Sign Test. The null hypothesis was rejected. Graphical representation of data indicates some positive skewness that is probably due to the differences in terrain and the collection of runoff. The Retrospective Power Curve generated using COMPASS shows adequate power was achieved. The survey unit was properly designated as Class 3.

The dose contribution from soil is 0.253 mrem/yr TEDE based on the average concentration of the samples used for non-parametric statistical sampling.

This survey unit is not affected by existing groundwater (reference CY memo ISC 06-024). The dose contribution from existing groundwater is zero (0) mrem/yr TEDE.

This survey unit is not considered impacted by future groundwater radioactive contamination, as there are no radioactive concrete foundations or footings containing residual radioactive material within the groundwater saturated zone in the area (reference CY memo ISC 06-024). The dose contribution from future groundwater, the third dose component, is therefore zero (0) mrem/yr TEDE.

NORTH SITE GROUNDS (NON-PROTECTED AREA)/EOF  
SURVEY UNIT 9506-0000

RELEASE RECORD

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The average total dose from residual radioactivity in this survey unit is 0.253 mrem/yr TEDE.

**14. ATTACHMENTS**

14.1 Attachment 1 – Figures

14.2 Attachment 2 – Scan Results

14.3 Attachment 3 – Laboratory Results

14.4 Attachment 4 – DQA Results

NORTH SITE GROUNDS (NON-PROTECTED AREA)/EOF  
SURVEY UNIT 9506-0000

RELEASE RECORD

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**ATTACHMENT 1 (FIGURES)**



Figure 1



Connecticut Yankee Atomic Power Company  
 Site Map With Reference To Survey Unit 9506-0000

Date	By
February 2007	ALH

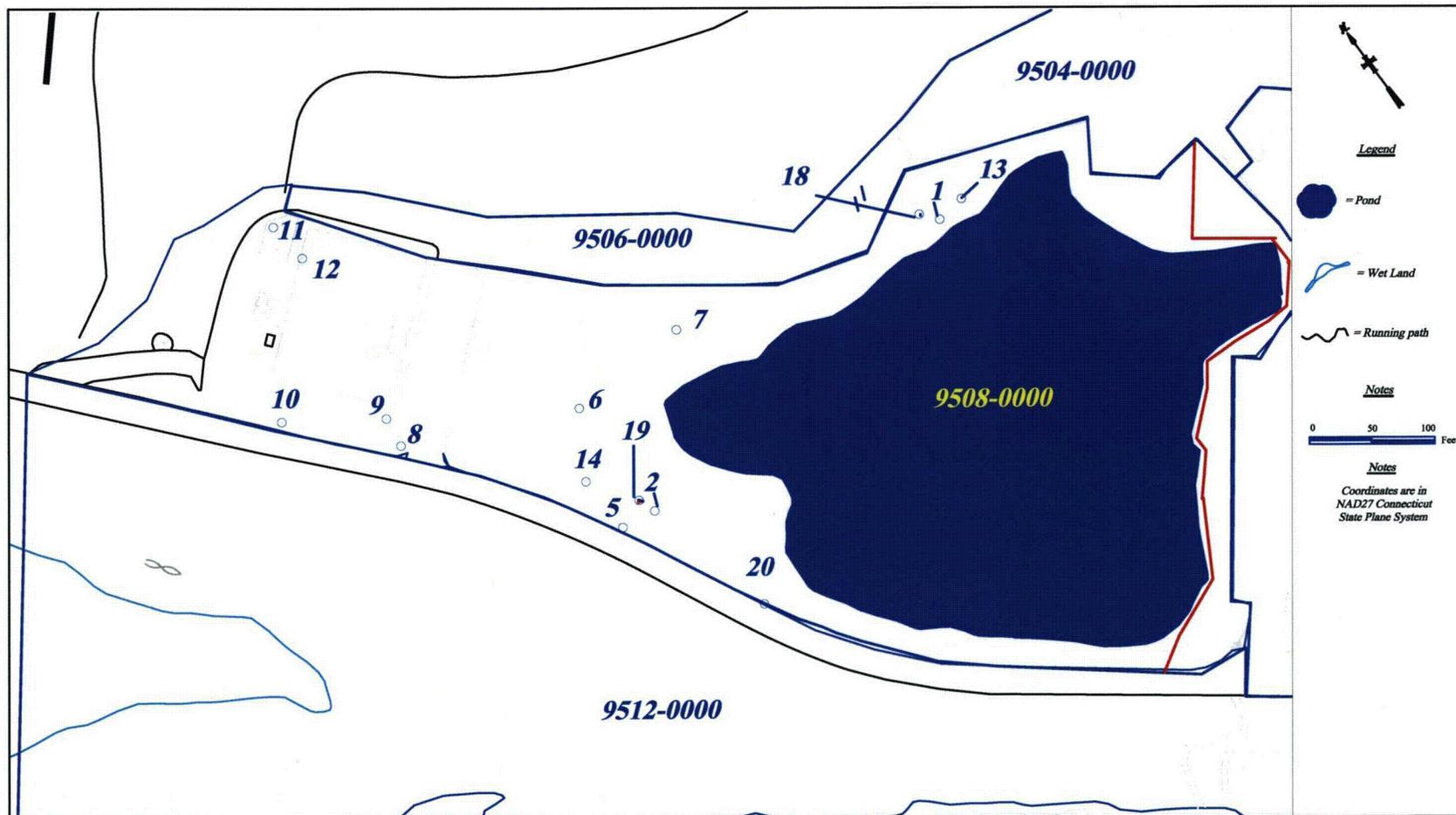


Figure 2

Connecticut Yankee Atomic Power Company  
9506-0000 Sample Locations

Date: January 2007

Revision: 0

Created by: A. Hammond

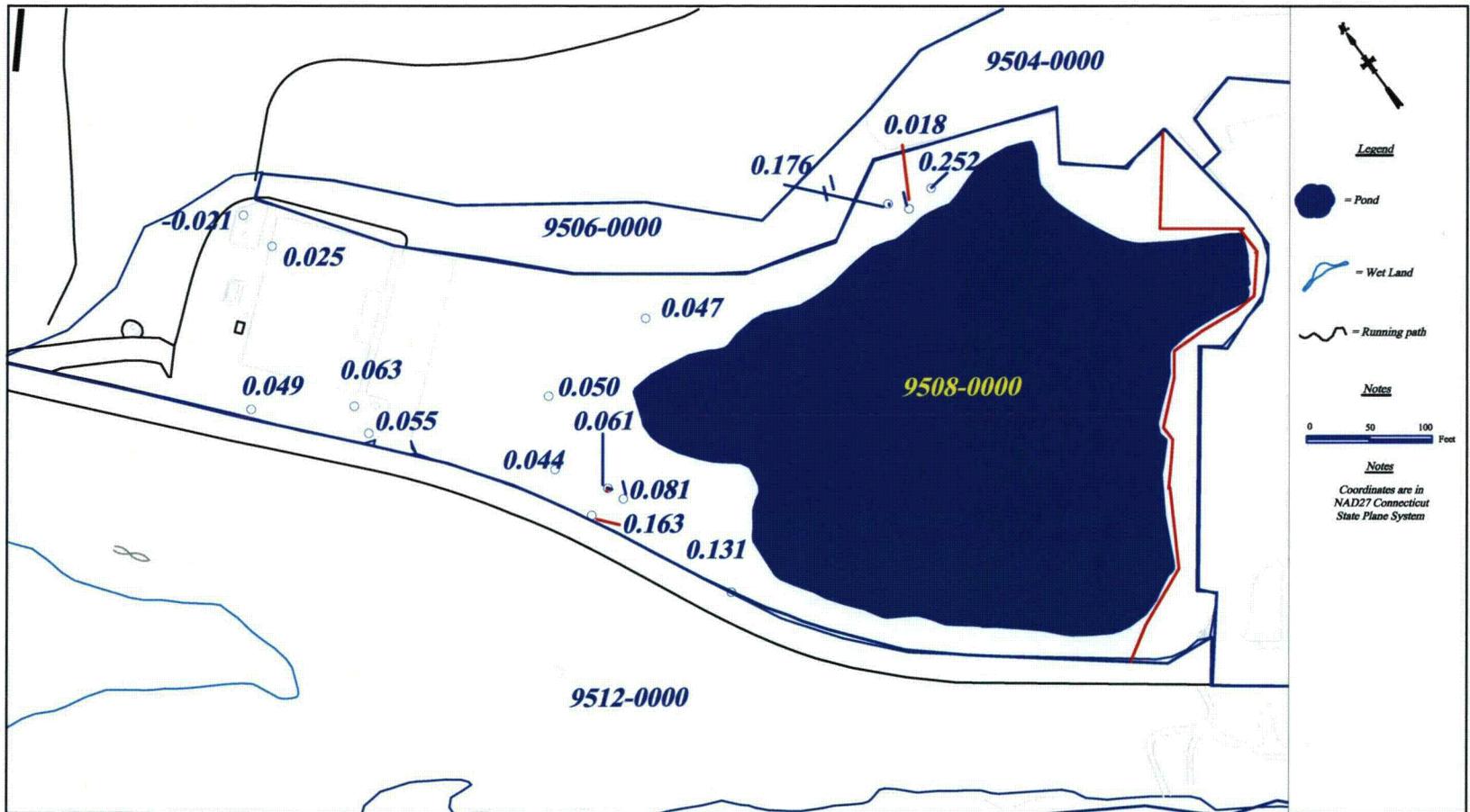
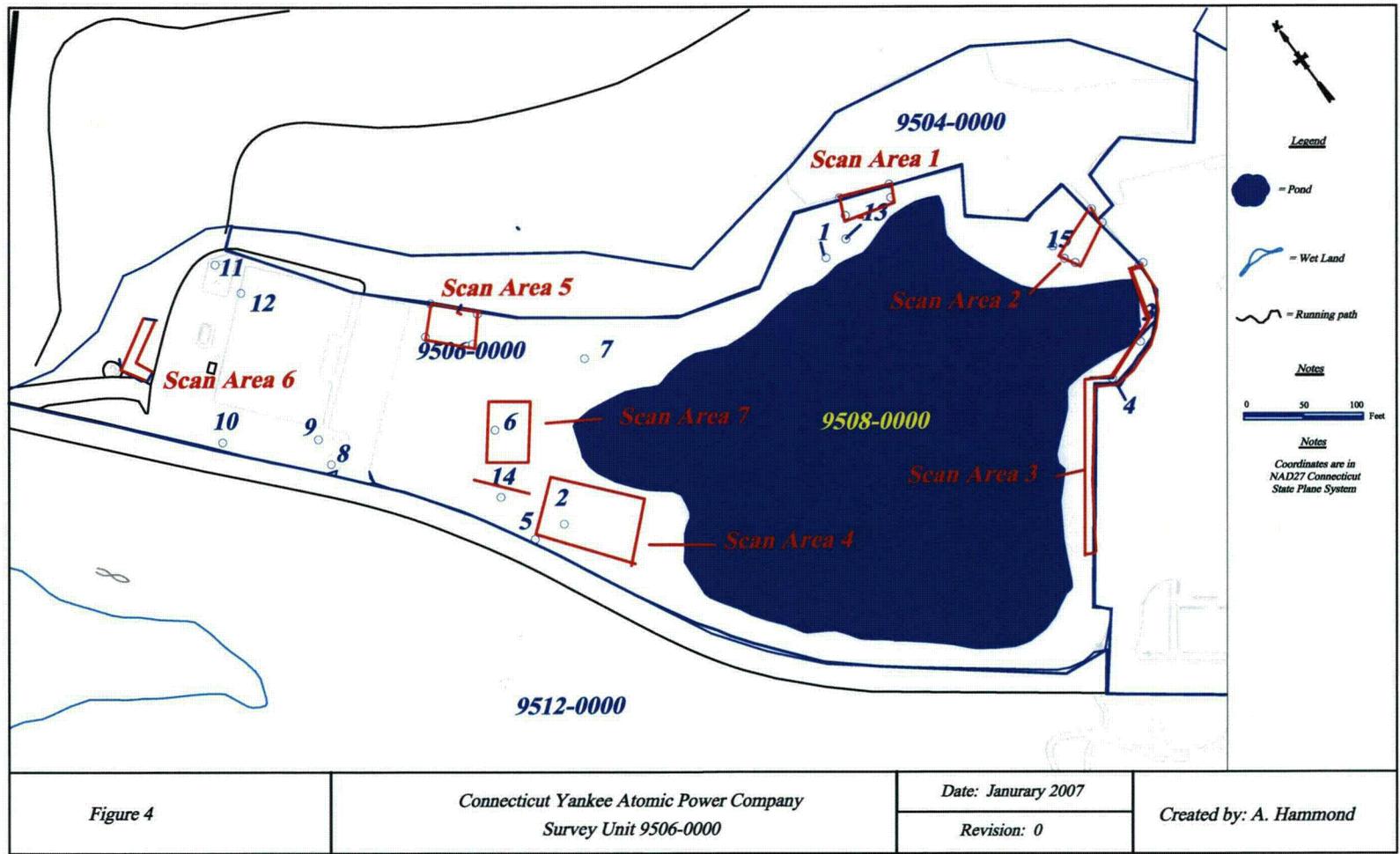


Figure 3	Connecticut Yankee Atomic Power Company 9506-0000 Final Status Survey Cesium-137 Posting Plot		Date: January 2007	Created by: A. Hammond
			Revision: 0	



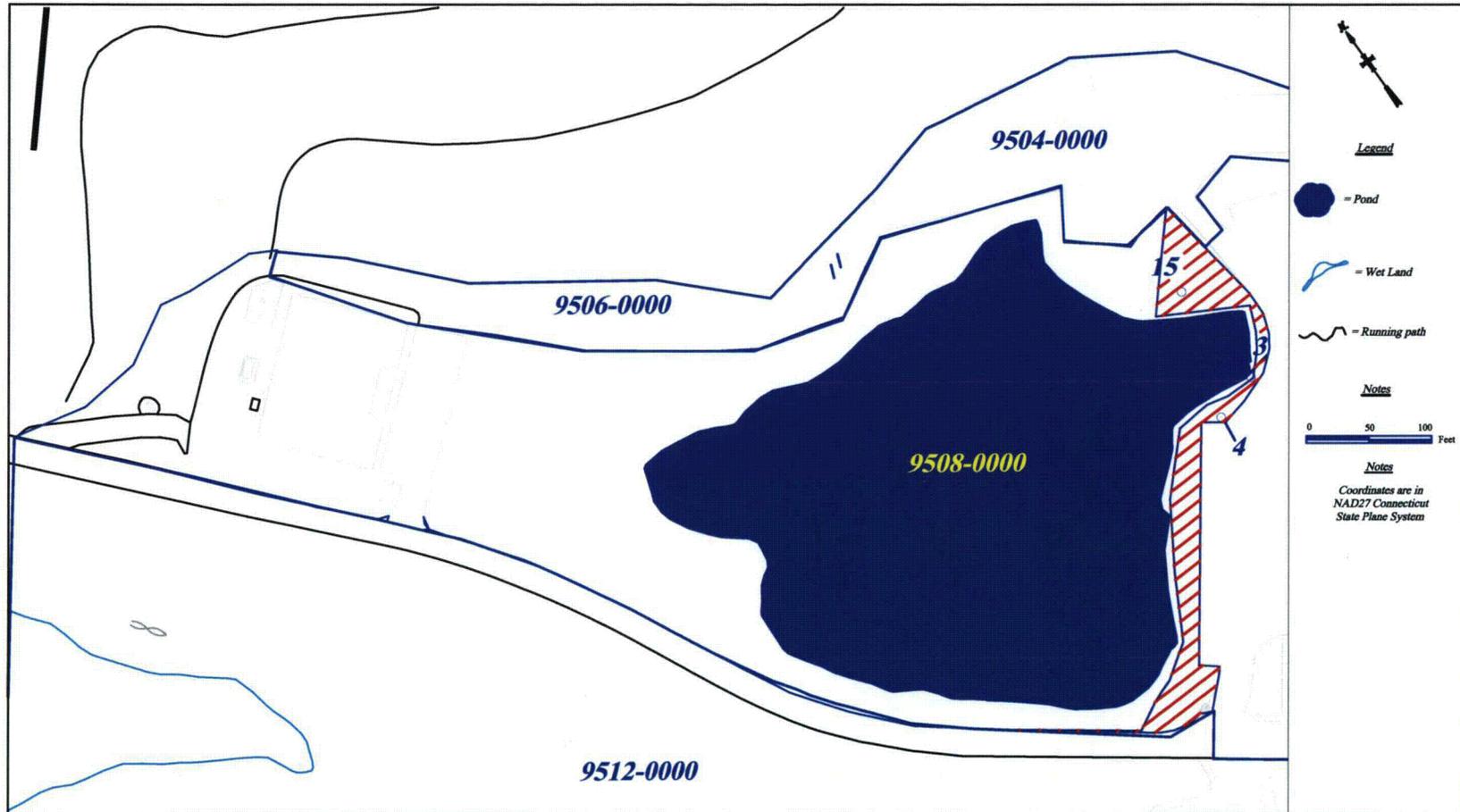


Figure 5

Connecticut Yankee Atomic Power Company  
 9506-0000 Area Absorbed into Survey Unit 9514-0000

Date: January 2007

Revision: 0

Created by: A. Hammond

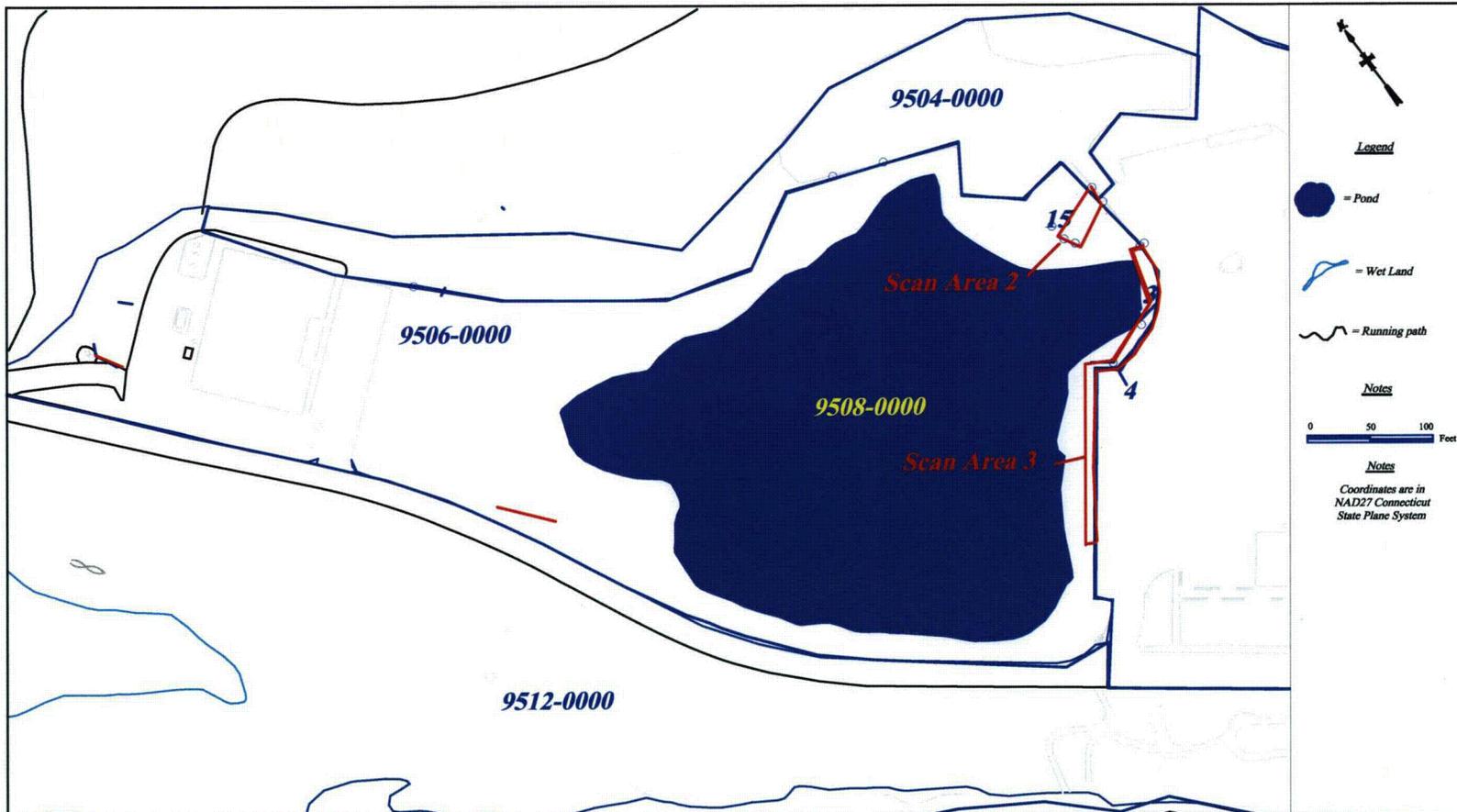


Figure 6

Connecticut Yankee Atomic Power Company  
 9506-0000 Scan Areas 2 and 3 Absorbed into Survey Unit 9514-0000

Date: January 2007

Revision: 0

Created by: A. Hammond

NORTH SITE GROUNDS (NON-PROTECTED AREA)/EOF  
SURVEY UNIT 9506-0000

RELEASE RECORD

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## **ATTACHMENT 2 (SCAN RESULTS)**

# Survey Release Record Sample Location Scan Results

## Survey Unit 9506-0000

<u>Sample Name</u>	<u>Background (cpm)</u>	<u>Action Level (cpm)</u>	<u>Results (cpm)</u>	<u>Above AL</u>	<u>Log Date</u>	<u>Log Time</u>	<u>E600 S/N</u>	<u>Probe S/N</u>
9506-00-SL-00-01-0	5.38E+03	6.43E+03	5.55E+03		11/10/2006	8:05:00	1111	1004
9506-00-SL-00-02-0	6.09E+03	7.20E+03	5.84E+03		11/10/2006	7:41:00	1111	1004
9506-00-SL-00-05-0	6.72E+03	7.89E+03	6.84E+03		11/10/2006	7:33:00	1111	1004
9506-00-SL-00-06-0	6.78E+03	7.96E+03	5.12E+03		11/9/2006	10:48:00	1107	1003
9506-00-SL-00-07-0	7.05E+03	8.25E+03	6.92E+03		11/13/2006	8:02:00	1116	1006
9506-00-SL-00-08-0	6.98E+03	8.17E+03	7.00E+03		11/9/2006	13:34:00	1107	1003
9506-00-SL-00-09-0	6.25E+03	7.38E+03	6.28E+03		11/9/2006	13:46:00	1107	1003
9506-00-SL-00-10-0	6.27E+03	7.40E+03	6.11E+03		11/9/2006	13:55:00	1107	1003
9506-00-SL-00-11-0	8.27E+03	9.57E+03	9.38E+03		11/9/2006	14:07:00	1107	1003
9506-00-SL-00-12-0	9.37E+03	1.08E+04	8.68E+03		11/9/2006	14:19:00	1107	1003
9506-00-SL-00-13-0	5.41E+03	6.46E+03	5.63E+03		11/13/2006	13:19:00	1116	1006
9506-00-SL-00-14-0	6.96E+03	8.15E+03	7.07E+03		11/9/2006	10:57:00	1107	1003
9506-00-SL-00-18-0	5.49E+03	6.55E+03	5.16E+03		1/11/2007	9:51:00	1112	1013
9506-00-SL-00-19-0	6.24E+03	7.37E+03	6.25E+03		1/11/2007	8:21:00	1112	1013
9506-00-SL-00-20-0	5.34E+03	6.38E+03	5.84E+03		1/11/2007	13:59:00	1112	1013

# Survey Release Record Scan Area Results

## Survey Unit 9506-0000

### 9506-0000 SCAN AREA 1

<u>Sample Name</u>	<u>Background (cpm)</u>	<u>Action Level (cpm)</u>	<u>Results (cpm)</u>	<u>Above AL</u>	<u>Log Date</u>	<u>Log Time</u>	<u>E600 S/N</u>	<u>Probe S/N</u>
9506-00-SC-01-01-0	6.96E+03	8.15E+03	6.50E+03		11/10/2006	8:05:00	1111	1004
9506-00-SC-01-02-0	6.18E+03	7.30E+03	5.45E+03		11/10/2006	7:41:00	1111	1004
9506-00-SC-01-03-0	7.06E+03	8.26E+03	5.89E+03		11/10/2006	12:54:00	1111	1004
9506-00-SC-01-04-0	6.52E+03	7.67E+03	6.00E+03		11/10/2006	13:03:00	1111	1004

### 9506-0000 SCAN AREA 4

9506-00-SC-04-01-0	7.30E+03	8.52E+03	6.42E+03		11/10/2006	12:58:00	1111	1004
9506-00-SC-04-02-0	7.69E+03	8.94E+03	7.00E+03		11/10/2006	12:59:00	1111	1004
9506-00-SC-04-03-0	7.39E+03	8.62E+03	7.08E+03		11/10/2006	13:01:00	1111	1004
9506-00-SC-04-04-0	6.04E+03	7.15E+03	6.40E+03		11/10/2006	13:03:00	1111	1004
9506-00-SC-04-05-0	7.19E+03	8.40E+03	6.71E+03		11/10/2006	13:06:00	1111	1004

### 9506-0000 SCAN AREA 5

9506-00-SC-05-01-0	8.84E+03	1.02E+04	7.73E+03		11/10/2006	13:17:00	1111	1004
9506-00-SC-05-02-0	7.23E+03	8.44E+03	7.33E+03		11/10/2006	13:19:00	1111	1004
9506-00-SC-05-03-0	7.94E+03	9.21E+03	7.27E+03		11/10/2006	13:23:00	1111	1004
9506-00-SC-05-04-0	8.15E+03	9.44E+03	7.72E+03		11/10/2006	13:24:00	1111	1004
9506-00-SC-05-05-0	8.42E+03	9.73E+03	8.37E+03		11/10/2006	13:27:00	1111	1004
9506-00-SC-05-06-0	8.61E+03	9.94E+03	7.37E+03		11/10/2006	13:28:00	1111	1004
9506-00-SC-05-07-0	7.85E+03	9.12E+03	7.20E+03		11/10/2006	13:30:00	1111	1004
9506-00-SC-05-08-0	7.51E+03	8.75E+03	7.17E+03		11/10/2006	13:31:00	1111	1004

### 9506-0000 SCAN AREA 6

9506-00-SC-06-01-0	6.72E+03	7.89E+03	7.25E+03		11/13/2006	8:12:00	1116	1006
9506-00-SC-06-02-0	6.28E+03	7.41E+03	6.80E+03		11/13/2006	8:14:00	1116	1006
9506-00-SC-06-03-0	5.43E+03	6.48E+03	5.59E+03		11/13/2006	8:16:00	1116	1006
9506-00-SC-06-04-0	5.95E+03	7.05E+03	6.62E+03		11/13/2006	8:18:00	1116	1006

### 9506-0000 SCAN AREA 7

9506-00-SC-07-01-0	7.56E+03	8.80E+03	7.53E+03		11/13/2006	8:12:00	1117	1008
9506-00-SC-07-02-0	8.18E+03	9.47E+03	8.46E+03		1/11/2007	8:15:00	1117	1008
9506-00-SC-07-03-0	7.18E+03	8.39E+03	7.90E+03		1/11/2007	8:19:00	1117	1008

# Survey Release Record Scan Area Results

## Survey Unit 9506-0000

9506-00-SC-07-04-0	7.58E+03	8.82E+03	7.56E+03	1/11/2007	8:22:00	1117	1008
9506-00-SC-07-05-0	7.08E+03	8.28E+03	6.86E+03	1/11/2007	8:26:00	1117	1008
9506-00-SC-07-06-0	7.02E+03	8.22E+03	6.62E+03	1/11/2007	8:29:00	1117	1008
9506-00-SC-07-07-0	6.57E+03	7.73E+03	6.66E+03	1/11/2007	10:01:00	1117	1008
9506-00-SC-07-08-0	6.85E+03	8.03E+03	6.90E+03	1/11/2007	10:04:00	1117	1008
9506-00-SC-07-09-0	6.43E+03	7.58E+03	6.41E+03	1/11/2007	10:06:00	1117	1008
9506-00-SC-07-10-0	6.79E+03	7.97E+03	6.62E+03	1/11/2007	10:09:00	1117	1008
9506-00-SC-07-11-0	7.06E+03	8.26E+03	7.28E+03	1/11/2007	10:12:00	1117	1008
9506-00-SC-07-12-0	7.11E+03	8.31E+03	6.82E+03	1/11/2007	10:14:00	1117	1008
9506-00-SC-07-13-0	6.83E+03	8.01E+03	6.56E+03	1/11/2007	10:17:00	1117	1008
9506-00-SC-07-14-0	6.51E+03	7.66E+03	6.57E+03	1/11/2007	10:20:00	1117	1008
9506-00-SC-07-15-0	6.70E+03	7.87E+03	7.14E+03	1/11/2007	10:22:00	1117	1008

NORTH SITE GROUNDS (NON-PROTECTED AREA)/EOF  
SURVEY UNIT 9506-0000

RELEASE RECORD

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**ATTACHMENT 3  
(LABORATORY DATA)**

# **General Narrative**

**General Narrative  
for  
Connecticut Yankee Atomic Power Co.  
Work Order: 176227  
SDG: MSR#06-1479**

**November 21, 2006**

**Laboratory Identification:**

General Engineering Laboratories, LLC  
2040 Savage Road  
Charleston, South Carolina 29407  
(843) 556-8171

**Summary**

**Sample receipt**

The samples arrived at General Engineering Laboratories, LLC, Charleston, South Carolina on November 16, 2006 for analysis. Shipping container temperatures were checked, documented, and within specifications. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage.

**Sample Identification** The laboratory received the following samples:

<b><u>Laboratory Identification</u></b>	<b><u>Sample Description</u></b>
176227001	9506-0000-001F
176227002	9506-0000-002F
176227003	9506-0000-002FS
176227004	9506-0000-003F
176227005	9506-0000-004F
176227006	9506-0000-005F
176227007	9506-0000-006F
176227008	9506-0000-007F
176227009	9506-0000-008F
176227010	9506-0000-008FS
176227011	9506-0000-009F
176227012	9506-0000-010F
176227013	9506-0000-011F
176227014	9506-0000-012F
176227015	9506-0000-013F
176227016	9506-0000-014F
176227017	9506-0000-015F
176227018	9506-0000-016F
176227019	9506-0000-017F

**Items of Note**

There are no items to note.

**Case Narrative**

Sample analyses were conducted using methodology as outlined in General Engineering Laboratories (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

**Analytical Request**

Seventeen soil samples were analyzed for FSSGAM. Two soil samples were analyzed for FSSALL.

**Data Package**

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, Data Review Qualifier Definitions, and data from the following fractions: Radiochemistry.

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 hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

  
Cheryl Jones  
Project Manager

**List of current GEL Certifications as of 21 November 2006**

<b>State</b>	<b>Certification</b>
Alaska	UST-062
Arizona	AZ0668
Arkansas	88-0651
CLIA	42D0904046
California	01151CA
Colorado	GenEngLabs
Connecticut	PH-0169
Dept. of Navy	NFESC 413
EPA	WG-15J
Florida/NELAP	E87156
Georgia	E87156 (FL/NELAP)
Hawaii	N/A
Idaho	N/A
Illinois	200029
Indiana	C-SC-01
Kansas	E-10332
Kentucky	90129
Louisiana	03046
Maryland	270
Massachusetts	M-SC012
Michigan	9903
Nevada	SC12
New Jersey	SC002
New Mexico	FL NELAP E87156
New York	11501
North Carolina	233
North Carolina Drinking W	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania	68-00485
South Carolina	10120001/10585001/10120002
Tennessee	02934
Texas	TX213-2006A
Texas NELAP	T104704235-06-TX
U.S. Dept. of Agriculture	S-52597
US Army Corps of Engineer	N/A
Utah	8037697376 GEL
Vermont	VT87156
Virginia	00151
Washington	C1641

**Chain of Custody  
and  
Supporting  
Documentation**



**Connecticut Yankee Atomic Power Company**

362 Injun Hollow Road, East Hampton, CT 06424  
860-267-2556

**Chain of Custody Form**

No. 2006-00665

Project Name: Haddam Neck Decommissioning			Media Code	Sample Type Code	Container Size- & Type Code	Analyses Requested					Lab Use Only			
Contact Name & Phone: Jack McCarthy 860-267-2556 Ext. 3924						FSSGAM	FSSALL						Comments:	
Analytical Lab (Name, City, State) General Engineering Laboratories 2040 Savage Road. Charleston SC. 29407 843 556 8171. Attn. Cheryl Jones													176227%	
Priority: <input type="checkbox"/> 30 D. <input checked="" type="checkbox"/> 14 D. <input type="checkbox"/> 7 D:													Comment, Preservation	
Sample Designation	Date	Time												
9506-0000-009F	11/9/06	1354	TS	G	BP	X					RDL's: H-3: 3.0 pCi/g			
9506-0000-010F	11/9/06	1358	TS	G	BP	X					RDL's: H-3: 3.0 pCi/g			
9506-0000-011F	11/9/06	1420	TS	G	BP	X					RDL's: H-3: 3.0 pCi/g			
9506-0000-012F	11/9/06	1425	TS	G	BP	X					RDL's: H-3: 3.0 pCi/g			
9506-0000-013F	11/13/06	1320	TS	G	BP		X				RDL's: H-3: 3.0 pCi/g			
9506-0000-014F	11/9/06	1056	TS	G	BP	X					RDL's: H-3: 3.0 pCi/g			
9506-0000-015F	11/9/06	1130	TS	G	BP	X					RDL's: H-3: 3.0 pCi/g			
9506-0000-016F	11/9/06	1125	TS	G	BP	X					RDL's: H-3: 3.0 pCi/g			
9506-0000-017F	11/10/06	0825	TS	G	BP	X					RDL's: H-3: 3.0 pCi/g			
NOTES: PO #: 002332 MSR #: 06-1479 SSWP# NA <input checked="" type="checkbox"/> LTP QA <input type="checkbox"/> Radwaste QA <input type="checkbox"/> Non QA <u>WEIGHTS</u> 50 lbs										Samples Shipped Via: <input checked="" type="checkbox"/> Fed Ex <input type="checkbox"/> UPS <input type="checkbox"/> Hand <input type="checkbox"/> Other		Internal Container Temp.: 18 Deg. C Custody Sealed? Y <input checked="" type="checkbox"/> N <input type="checkbox"/> Custody Seal Intact? Y <input checked="" type="checkbox"/> N <input type="checkbox"/>		
1) Relinquished By <i>[Signature]</i>			Date/Time 11/15/06 @ 1330			2) Received By <i>[Signature]</i>			Date/Time 11/16/06 9:45			Bill of Lading #		
3) Relinquished By			Date/Time			4) Received By			Date/Time					

**Subject:** RE: Sample ID Issue  
**From:** "Arthur L. Hammond" <Hammond@CYAPCO.com>  
**Date:** Thu, 16 Nov 2006 15:19:28 -0500  
**To:** "ama01354" <amanda.rasco@gel.com>

Amanda,

The sample ID should read 9506-0000-009F.

Thank you,

Arthur

-----Original Message-----  
From: ama01354 [<mailto:amanda.rasco@gel.com>]  
Sent: Thursday, November 16, 2006 1:52 PM  
To: Arthur L. Hammond  
Cc: Cheryl Jones  
Subject: Sample ID Issue

Arthur,

From the samples we received today from MSR#06-1479, sample ID # 9506-0000-009F reads 9506-0000-009 (without an F) on the sample container. Please verify that sample ID should read 9506-0000-009F.

Thank You,  
Amanda Rasco

-----  
Amanda J. Rasco  
Project Manager Assistant  
General Engineering Laboratories, LLC  
2040 Savage Road  
Charleston, SC (USA) 29407  
Direct: 843.769.7376 x 4297  
Main: 843.556.8171  
Fax: 843.766.1178  
E-mail: [Amanda.Rasco@gel.com](mailto:Amanda.Rasco@gel.com)  
Web: [www.gel.com](http://www.gel.com)

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Figure 1. Sample Check-in List

Date/Time Received: 11/16/06 9:45

SDG#: MSR#06-1479

Work Order Number: 1762271

Shipping Container ID: 90116687810 Chain of Custody # 2006-00-664

- 1. Custody Seals on shipping container intact? Yes  No
- 2. Custody Seals dated and signed? Yes  No
- 3. Chain-of-Custody record present? Yes  No
- 4. Cooler temperature 18°
- 5. Vermiculite/packing materials is: Wet  Dry
- 6. Number of samples in shipping container: 10
- 7. Sample holding times exceeded? Yes  No

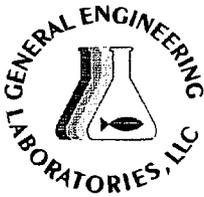
8. Samples have:	
<input checked="" type="checkbox"/> tape	<input type="checkbox"/> hazard labels
<input type="checkbox"/> custody seals	<input type="checkbox"/> appropriate sample labels
9. Samples are:	
<input checked="" type="checkbox"/> in good condition	<input type="checkbox"/> leaking
<input type="checkbox"/> broken	<input type="checkbox"/> have air bubbles

10. Were any anomalies identified in sample receipt? Yes  No

11. Description of anomalies (include sample numbers): \_\_\_\_\_

Sample Custodian/Laboratory: Gause Date: 11/16/06

Telephoned to: \_\_\_\_\_ On \_\_\_\_\_ By \_\_\_\_\_



# SAMPLE RECEIPT & REVIEW FORM

PM use only

Client: <u>Yonkee</u>	SDG/ARCOC/Work Order: <u>176227</u>
Date Received: <u>11/16/06</u>	PM(A) Review (ensure non-conforming items are resolved prior to signing): <u>[Signature]</u>
Received By: <u>[Signature]</u>	

#	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?				Circle Applicable: seals broken    damaged container    leaking container    other (describe)
2	Samples requiring cold preservation within (4 +/- 2 C)? Record preservation method.				Circle Coolant #    ice bags    blue ice    dry ice    none    other describe)
3	Chain of custody documents included with shipment?				
4	Sample containers intact and sealed?				Circle Applicable: seals broken    damaged container    leaking container    other (describe)
5	Samples requiring chemical preservation at proper pH?				Sample ID's, containers affected and observed pH:
6	VOA vials free of headspace (defined as < 6mm bubble)?				Sample ID's and containers affected:
7	Are Encore containers present? (If yes, immediately deliver to VOA laboratory)				
8	Samples received within holding time?				id's and tests affected:
9	Sample ID's on COC match ID's on bottles?				Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?				Sample ID's affected:
11	Number of containers received match number indicated on COC?				Sample ID's affected:
12	COC form is properly signed in relinquished/received sections?				
14	Air Bill , Tracking #'s, & Additional Comments				<u>COC# 2006-00664</u>

#	Suspected Hazard Information	Non-Regulated	Regulated	High Level	RSO RAD Receipt # _____ *If > x2 area background is observed on samples identified as "non-regulated/non-radioactive", contact the Radiation Safety group for further investigation.
A	Radiological Classification?	✓			Maximum Counts Observed*: <u>75 CPM</u>
B	PCB Regulated?	✓			
C	Shipped as DOT Hazardous Material? If yes, contact Waste Manager or ESH Manager.	✓			Hazard Class Shipped: UN#:
D	Regulated as a Foreign Soil?				

PM (or PMA) review of Hazard classification: ✓ Initials [Signature] Date: 11/16/06

Figure 1. Sample Check-in List

Date/Time Received: 11/16/06 . 9:45  
SDG#: MSR# 06-1479  
Work Order Number: 1762271  
Shipping Container ID: 1901 1668 7821 Chain of Custody #: 2006-00665

- 1. Custody Seals on shipping container intact? Yes  No
- 2. Custody Seals dated and signed? Yes  No
- 3. Chain-of-Custody record present? Yes  No
- 4. Cooler temperature 18°
- 5. Vermiculite/packing materials is: Wet  Dry
- 6. Number of samples in shipping container: 9
- 7. Sample holding times exceeded? Yes  No

8. Samples have:	
<input checked="" type="checkbox"/> tape	<input type="checkbox"/> hazard labels
<input type="checkbox"/> custody seals	<input type="checkbox"/> appropriate sample labels
9. Samples are:	
<input checked="" type="checkbox"/> in good condition	<input type="checkbox"/> leaking
<input type="checkbox"/> broken	<input type="checkbox"/> have air bubbles

10. Were any anomalies identified in sample receipt? Yes  No

11. Description of anomalies (include sample numbers):  
9506 - 0000 - 009 no F on end

Sample Custodian/Laboratory: Chause Date: 11/16/06

Telephoned to: \_\_\_\_\_ On \_\_\_\_\_ By \_\_\_\_\_



# SAMPLE RECEIPT & REVIEW FORM

PM use only

Client: <u>Yonkers</u>	SDG/ARCOC/Work Order: <u>176227</u>
Date Received: <u>11/16/06</u>	PM(A) Review (ensure non-conforming items are resolved prior to signing): <i>[Signature]</i>
Received By:	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?				Circle Applicable: seals broken damaged container leaking container other (describe)
2 Samples requiring cold preservation within (4 +/- 2 C)? Record preservation method.				Circle Coolant # ice bags blue ice dry ice none other describe)
3 Chain of custody documents included with shipment?				
4 Sample containers intact and sealed?				Circle Applicable: seals broken damaged container leaking container other (describe)
5 Samples requiring chemical preservation at proper pH?				Sample ID's, containers affected and observed pH:
6 VOA vials free of headspace (defined as < 6mm bubble)?				Sample ID's and containers affected:
7 Are Encore containers present? (If yes, immediately deliver to VOA laboratory)				
8 Samples received within holding time?				Id's and tests affected:
9 Sample ID's on COC match ID's on bottles?				Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?				Sample ID's affected:
11 Number of containers received match number indicated on COC?				Sample ID's affected:
12 COC form is properly signed in relinquished/received sections?				

14	Air Bill, Tracking #'s, & Additional Comments	<u>COC # 2006-00665</u>
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Suspected Hazard Information	Non-Regulated	Regulated	High Level	RSO RAD Receipt # _____ *If > x2 area background is observed on samples identified as "non-regulated/non-radioactive", contact the Radiation Safety group for further investigation.
A Radiological Classification?	✓			Maximum Counts Observed*: <u>50CPM</u>
B PCB Regulated?	✓			
C Shipped as DOT Hazardous Material? If yes, contact Waste Manager or ESH Manager.	✓			Hazard Class Shipped: UN#:
D Regulated as a Foreign Soil?				

PM (or PMA) review of Hazard classification: ✓ Initials CAJ Date: 11/16/06

Web: [www.gel.com](http://www.gel.com)

The information contained in this message is confidential and is intended only for the use of the individual or firm of record. If you are not the intended recipient and have received this message in error, you are asked not to copy or distribute any of the pages that follow. Please notify the sender immediately by telephone or email if you have received this communication in error and destroy the contents that do not pertain to your business with The GEL Group, INC.

<b>Re: Sample ID Issue</b>	<b>Content-Type:</b> message/rfc822
	<b>Content-Encoding:</b> 7bit

# **Data Review Qualifier Definitions**

## Data Review Qualifier Definitions

Qualifier	Explanation
*	A quality control analyte recovery is outside of specified acceptance criteria
**	Analyte is a surrogate compound
<	Result is less than value reported
>	Result is greater than value reported
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
A	The TIC is a suspected aldol-condensation product
B	Target analyte was detected in the associated blank
B	Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL
BD	Results are either below the MDC or tracer recovery is low
C	Analyte has been confirmed by GC/MS analysis
D	Results are reported from a diluted aliquot of the sample
d	5-day BOD-The 2:1 depletion requirement was not met for this sample
E	Organics-Concentration of the target analyte exceeds the instrument calibration range
E	Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
H	Analytical holding time was exceeded
h	Preparation or preservation holding time was exceeded
J	Value is estimated
N	Metals-The Matrix spike sample recovery is not within specified control limits
N	Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
N/A	Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
ND	Analyte concentration is not detected above the reporting limit
UI	Gamma Spectroscopy-Uncertain identification
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	QC Samples were not spiked with this compound
Z	Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.

# RADIOLOGICAL ANALYSIS

**Radiochemistry Case Narrative  
Connecticut Yankee Atomic Power Co. (YANK)  
Work Order 176227**

**Method/Analysis Information**

**Product:** Alphaspec Am241, Cm, Solid ALL FSS  
**Analytical Method:** DOE EML HASL-300, Am-05-RC Modified  
**Prep Method:** Ash Soil Prep  
**Dry Soil Prep GL-RAD-A-021 Method:** Dry Soil Prep  
**Analytical Batch Number:** 589568  
**Prep Batch Number:** 589087  
**Dry Soil Prep GL-RAD-A-021 Batch Number:** 589083

<b>Sample ID</b>	<b>Client ID</b>
176227005	9506-0000-004F
176227015	9506-0000-013F
1201231904	Method Blank (MB)
1201231905	176227005(9506-0000-004F) Sample Duplicate (DUP)
1201231906	176227005(9506-0000-004F) Matrix Spike (MS)
1201231907	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 14.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 176227005 (9506-0000-004F).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Miscellaneous Information:**

**NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Manual Integration**

No manual integrations were performed on data in this batch.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** Alphaspec Pu, Solid-ALL FSS  
**Analytical Method:** DOE EML HASL-300, Pu-11-RC Modified  
**Prep Method:** Ash Soil Prep  
**Dry Soil Prep GL-RAD-A-021 Method:** Dry Soil Prep  
**Analytical Batch Number:** 589569  
**Prep Batch Number:** 589087  
**Dry Soil Prep GL-RAD-A-021 Batch Number:** 589083

<b>Sample ID</b>	<b>Client ID</b>
176227005	9506-0000-004F
176227015	9506-0000-013F
1201231908	Method Blank (MB)
1201231909	176227005(9506-0000-004F) Sample Duplicate (DUP)
1201231910	176227005(9506-0000-004F) Matrix Spike (MS)
1201231911	Laboratory Control Sample (LCS)

#### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 14.

#### **Calibration Information:**

##### **Calibration Information**

All initial and continuing calibration requirements have been met.

##### **Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

##### **Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

#### **Quality Control (QC) Information:**

##### **Blank Information**

The blank volume is representative of the sample volume in this batch.

##### **Designated QC**

The following sample was used for QC: 176227005 (9506-0000-004F).

##### **QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Miscellaneous Information:**

**NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Manual Integration**

No manual integrations were performed on data in this batch.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

<b>Product:</b>	<b>Liquid Scint Pu241, Solid-ALL FSS</b>
Analytical Method:	DOE EML HASL-300, Pu-11-RC Modified
Prep Method:	Ash Soil Prep
Dry Soil Prep GL-RAD-A-021 Method:	Dry Soil Prep
Analytical Batch Number:	589570
Prep Batch Number:	589087
Dry Soil Prep GL-RAD-A-021 Batch Number:	589083

<b>Sample ID</b>	<b>Client ID</b>
176227005	9506-0000-004F
176227015	9506-0000-013F
1201231912	Method Blank (MB)
1201231913	176227005(9506-0000-004F) Sample Duplicate (DUP)
1201231914	176227005(9506-0000-004F) Matrix Spike (MS)
1201231915	Laboratory Control Sample (LCS)

### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-035 REV# 8.

### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

#### **Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

### **Quality Control (QC) Information:**

#### **Blank Information**

The blank volume is representative of the sample volume in this batch.

#### **Designated QC**

The following sample was used for QC: 176227005 (9506-0000-004F).

#### **QC Information**

All of the QC samples met the required acceptance limits.

### **Technical Information:**

#### **Holding Time**

All sample procedures for this sample set were performed within the required holding time.

#### **Preparation Information**

All preparation criteria have been met for these analyses.

#### **Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

### **Miscellaneous Information:**

#### **NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from

referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Manual Integration**

No manual integrations were performed on data in this batch.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

<b>Product:</b>	<b>Gamma,Solid-FSS GAM &amp; ALL FSS 226 Ingrowth Waived</b>
Analytical Method:	EML HASL 300, 4.5.2.3
Prep Method:	Dry Soil Prep
Analytical Batch Number:	589209
Prep Batch Number:	589083

<b>Sample ID</b>	<b>Client ID</b>
176227001	9506-0000-001F
176227002	9506-0000-002F
176227003	9506-0000-002FS
176227004	9506-0000-003F
176227005	9506-0000-004F
176227006	9506-0000-005F
176227007	9506-0000-006F
176227008	9506-0000-007F
176227009	9506-0000-008F
176227010	9506-0000-008FS
176227011	9506-0000-009F
176227012	9506-0000-010F
176227013	9506-0000-011F
176227014	9506-0000-012F
176227015	9506-0000-013F
176227016	9506-0000-014F
176227017	9506-0000-015F
176227018	9506-0000-016F
176227019	9506-0000-017F
1201231039	Method Blank (MB)
1201231040	176227001(9506-0000-001F) Sample Duplicate (DUP)
1201231041	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 REV# 13.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 176227001 (9506-0000-001F).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Miscellaneous Information:**

**NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier information**

<b>Qualifier</b>	<b>Reason</b>	<b>Analyte</b>	<b>Sample</b>
UI	Data rejected due to high counting uncertainty.	Bismuth-212	176227012 176227015
UI	Data rejected due to high peak-width.	Cesium-134	176227012
UI	Data rejected due to low abundance.	Actinium-228	1201231039
		Cesium-134	176227006 176227009 176227010 176227013 176227014 176227019 1201231040
UI	Data rejected due to no valid peak.	Potassium-40	1201231039

**Method/Analysis Information**

**Product:** GFPC, Sr90, solid - 0.025 pCi/g  
**Analytical Method:** EPA 905.0 Modified  
**Prep Method:** Ash Soil Prep  
**Dry Soil Prep GL-RAD-A-021 Method:** Dry Soil Prep  
**Analytical Batch Number:** 589170  
**Prep Batch Number:** 589087  
**Dry Soil Prep GL-RAD-A-021 Batch Number:** 589083

<b>Sample ID</b>	<b>Client ID</b>
176227005	9506-0000-004F
176227015	9506-0000-013F
1201230916	Method Blank (MB)
1201230917	176227005(9506-0000-004F) Sample Duplicate (DUP)
1201230918	176227005(9506-0000-004F) Matrix Spike (MS)
1201230919	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-004 REV# 10.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 176227005 (9506-0000-004F).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

Samples 176227005 (9506-0000-004F) and 176227015 (9506-0000-013F) were recounted due to a negative result greater than three times the error.

**Chemical Recoveries**

All chemical recoveries meet the required acceptance limits for this sample set.

**Miscellaneous Information:**

**NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** Liquid Scint Tc99, Solid-ALL FSS  
**Analytical Method:** DOE EML HASL-300, Tc-02-RC Modified  
**Analytical Batch Number:** 589096

<b>Sample ID</b>	<b>Client ID</b>
176227005	9506-0000-004F
176227015	9506-0000-013F
1201230758	Method Blank (MB)
1201230759	176227005(9506-0000-004F) Sample Duplicate (DUP)
1201230760	176227005(9506-0000-004F) Matrix Spike (MS)
1201230761	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-005 REV# 13.

**Calibration Information:****Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:****Blank Information**

The blank volume is representative of the sample volumes in this batch.

**Designated QC**

The following sample was used for QC: 176227005 (9506-0000-004F).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:****Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

The batch was recounted due to low matrix spike recovery.

**Miscellaneous Information:****NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. The following NCR was generated for this SDG: NCR 385910 was generated due to Container scanning event for custody missed. 1. The analyst did not scan the samples 176227005 and 176227015 into the batch prior to analysis, however the samples did remain in their custody at all times. 1. The error has been corrected and the analyst has been instructed on the proper scanning procedures. Reporting results.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

<b>Product:</b>	<b>Liquid Scint Fe55, Solid-ALL FSS</b>
Analytical Method:	DOE RESL Fe-1, Modified
Prep Method:	Ash Soil Prep
Dry Soil Prep GL-RAD-A-021 Method:	Dry Soil Prep
Analytical Batch Number:	589223
Prep Batch Number:	589087
Dry Soil Prep GL-RAD-A-021 Batch Number:	589083

<b>Sample ID</b>	<b>Client ID</b>
176227005	9506-0000-004F
176227015	9506-0000-013F
1201231091	Method Blank (MB)
1201231092	176227005(9506-0000-004F) Sample Duplicate (DUP)
1201231093	176227005(9506-0000-004F) Matrix Spike (MS)
1201231094	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-040 REV# 3.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 176227005 (9506-0000-004F).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:****Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Miscellaneous Information:****NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

<b>Product:</b>	<b>Liquid Scint Ni63, Solid-ALL FSS</b>
Analytical Method:	DOE RESL Ni-1, Modified
Prep Method:	Ash Soil Prep
Dry Soil Prep GL-RAD-A-021 Method:	Dry Soil Prep
Analytical Batch Number:	589224
Prep Batch Number:	589087
Dry Soil Prep GL-RAD-A-021 Batch Number:	589083

<b>Sample ID</b>	<b>Client ID</b>
176227005	9506-0000-004F
176227015	9506-0000-013F
1201231095	Method Blank (MB)
1201231096	176227005(9506-0000-004F) Sample Duplicate (DUP)
1201231097	176227005(9506-0000-004F) Matrix Spike (MS)
1201231098	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-022 REV# 8.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 176227005 (9506-0000-004F).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Miscellaneous Information:**

**NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from

referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** LSC, Tritium Dist, Solid - 3 pCi/g  
**Analytical Method:** EPA 906.0 Modified  
**Analytical Batch Number:** 589090

<b>Sample ID</b>	<b>Client ID</b>
176227005	9506-0000-004F
176227015	9506-0000-013F
1201230745	Method Blank (MB)
1201230746	176227005(9506-0000-004F) Sample Duplicate (DUP)
1201230747	176227005(9506-0000-004F) Matrix Spike (MS)
1201230748	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-002 REV# 13.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 176227005 (9506-0000-004F).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

The batch was recounted due to a low Matrix spike recovery.

**Miscellaneous Information:**

**NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

<b>Product:</b>	<b>Liquid Scint C14, Solid All,FSS</b>
Analytical Method:	EPA EERF C-01 Modified
Analytical Batch Number:	589089

<b>Sample ID</b>	<b>Client ID</b>
176227005	9506-0000-004F
176227015	9506-0000-013F
1201230741	Method Blank (MB)
1201230742	176227005(9506-0000-004F) Sample Duplicate (DUP)
1201230743	176227005(9506-0000-004F) Matrix Spike (MS)
1201230744	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-003 REV# 8.

**Calibration Information:****Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:****Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 176227005 (9506-0000-004F).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:****Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Miscellaneous Information:****NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. The following NCR was generated for this SDG: NCR 384387 was generated due to Container scanning event for custody missed. 1. The analyst did not scan the samples 176227 005,015 into the batch prior to analysis, however the samples did remain in their custody at all times. 1. The error has been corrected and the analyst has been instructed on the proper scanning procedures.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier information**

Manual qualifiers were not required.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

Reviewer/Date: AL Tam O. Auser 11/22/06

**COMPANY - WIDE NONCONFORMANCE REPORT**

<b>Mo.Day Yr.</b> 17-NOV-06	<b>Division:</b> Radiochemistry	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> LSC	<b>Test / Method:</b> EPA EERF C-01 Modified	<b>Matrix Type:</b> Solid	<b>Client Code:</b> YANK
<b>Batch ID:</b> 589089	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 176227(MSR#06-1479)</b>			
<b>Application Issues:</b> Container scanning event for custody missed			
<b>Specification and Requirements</b>		<b>NRG Disposition:</b>	
<b>Nonconformance Description:</b>			
1. The analyst did not scan the samples 176227 005,015 into the batch prior to analysis, however the samples did remain in their custody at all times.		1. The error has been corrected and the analyst has been instructed on the proper scanning procedures.	

**Originator's Name:**  
 Amy Scott                      17-NOV-06

**Data Validator/Group Leader:**  
 Melanie Aycock                      17-NOV-06

**Quality Review:**

**Director:**

**COMPANY - WIDE NONCONFORMANCE REPORT**

<b>Mo.Day Yr.</b> 22-NOV-06	<b>Division:</b> Radiochemistry	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> LSC	<b>Test / Method:</b> DOE EML HASL-300, Tc-02-RC Modified	<b>Matrix Type:</b> Solid	<b>Client Code:</b> YANK
<b>Batch ID:</b> 589096	<b>Sample Numbers:</b> See Below		

**Potentially affected work order(s)(SDG): 176227(MSR#06-1479)**

**Application Issues:**

Container scanning event for custody missed

**Specification and Requirements  
 Nonconformance Description:**

1. The analyst did not scan the samples 176227005 and 176227015 into the batch prior to analysis, however the samples did remain in their custody at all times.

**NRG Disposition:**

1. The error has been corrected and the analyst has been instructed on the proper scanning procedures. Reporting results.

**Originator's Name:**

Melanie Aycock 22-NOV-06

**Data Validator/Group Leader:**

Heather Anderson 22-NOV-06

**Quality Review:**

**Director:**

# SAMPLE DATA SUMMARY

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis Report for

YANK001 Connecticut Yankee Atomic Power Co.

Client SDG: MSR#06-1479 GEL Work Order: 176227

**The Qualifiers in this report are defined as follows:**

- \* A quality control analyte recovery is outside of specified acceptance criteria
- \*\* Analyte is a surrogate compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- ND The analyte concentration is not detected above the detection limit.

The above sample is reported on a dry weight basis except where prohibited by the analytical procedure.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, LLC standard operating procedures. Please direct any questions to your Project Manager, Cheryl Jones.

*Aleah J. Croe*

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Reviewed by

**GENERAL ENGINEERING LABORATORIES, LLC**  
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

**Certificate of Analysis**

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID:	9506-0000-001F	Project:	YANK01204
Sample ID:	176227001	Client ID:	YANK001
Matrix:	TS	Vol. Recv.:	
Collect Date:	10-NOV-06		
Receive Date:	16-NOV-06		
Collector:	Client		
Moisture:	31.1%		

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.525	+/-0.210	0.0606	+/-0.210	0.133	pCi/g		MJH1	11/21/06	0551	589209	1
Americium-241	U	0.0255	+/-0.105	0.0844	+/-0.105	0.176	pCi/g						
Bismuth-212		0.496	+/-0.274	0.133	+/-0.274	0.287	pCi/g						
Bismuth-214		0.329	+/-0.0712	0.0386	+/-0.0712	0.0819	pCi/g						
Cesium-134	U	0.0173	+/-0.0243	0.0219	+/-0.0243	0.0471	pCi/g						
Cesium-137		0.182	+/-0.0473	0.0158	+/-0.0473	0.0344	pCi/g						
Cobalt-60	U	0.000215	+/-0.0196	0.0165	+/-0.0196	0.0375	pCi/g						
Europium-152	U	0.0228	+/-0.0508	0.0442	+/-0.0508	0.0938	pCi/g						
Europium-154	U	0.0472	+/-0.0668	0.0613	+/-0.0668	0.135	pCi/g						
Europium-155	U	0.0144	+/-0.0535	0.0496	+/-0.0535	0.103	pCi/g						
Lead-212		0.531	+/-0.0594	0.0262	+/-0.0594	0.0549	pCi/g						
Lead-214		0.396	+/-0.0891	0.0331	+/-0.0891	0.0701	pCi/g						
Manganese-54	U	0.0046	+/-0.0213	0.0181	+/-0.0213	0.0393	pCi/g						
Niobium-94	U8.600E-05		+/-0.0187	0.0159	+/-0.0187	0.0342	pCi/g						
Potassium-40		10.9	+/-0.895	0.181	+/-0.895	0.407	pCi/g						
Radium-226		0.329	+/-0.0712	0.0386	+/-0.0712	0.0819	pCi/g						
Silver-108m	U	-0.0144	+/-0.0165	0.0135	+/-0.0165	0.0291	pCi/g						
Thallium-208		0.164	+/-0.0416	0.0168	+/-0.0416	0.0362	pCi/g						

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	11/16/06	1050	589083

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3

**Notes:**

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported

**GENERAL ENGINEERING LABORATORIES, LLC**  
 2040 Savage Road Charleston SC 29407 – (843) 556-8171 – www.gel.com

**Certificate of Analysis**

Company : Connecticut Yankee Atomic Power  
 Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
 Contact: Mr. Jack McCarthy  
 Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-001F  
 Sample ID: 176227001

Project: YANK01204  
 Client ID: YANK001  
 Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
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- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 – (843) 556-8171 – www.gel.com

## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-002F  
Sample ID: 176227002  
Matrix: TS  
Collect Date: 10-NOV-06  
Receive Date: 16-NOV-06  
Collector: Client  
Moisture: 33.5%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.938	+/-0.267	0.0893	+/-0.267	0.199	pCi/g		MJH1	11/21/06	0552	589209	1
Americium-241	U	-0.018	+/-0.0431	0.0378	+/-0.0431	0.0784	pCi/g						
Bismuth-212		0.539	+/-0.484	0.201	+/-0.484	0.442	pCi/g						
Bismuth-214		0.717	+/-0.155	0.0477	+/-0.155	0.104	pCi/g						
Cesium-134	U	0.0451	+/-0.0369	0.0348	+/-0.0369	0.0756	pCi/g						
Cesium-137		0.0815	+/-0.0564	0.0353	+/-0.0564	0.0756	pCi/g						
Cobalt-60	U	0.00572	+/-0.034	0.0294	+/-0.034	0.0666	pCi/g						
Europium-152	U	0.000421	+/-0.0774	0.0679	+/-0.0774	0.145	pCi/g						
Europium-154	U	0.0463	+/-0.0913	0.0832	+/-0.0913	0.188	pCi/g						
Europium-155	U	0.104	+/-0.109	0.0593	+/-0.109	0.124	pCi/g						
Lead-212		0.882	+/-0.0958	0.0384	+/-0.0958	0.0808	pCi/g						
Lead-214		0.786	+/-0.131	0.0507	+/-0.131	0.108	pCi/g						
Manganese-54	U	0.00716	+/-0.0339	0.0287	+/-0.0339	0.0627	pCi/g						
Niobium-94	U	0.0318	+/-0.0243	0.0261	+/-0.0243	0.0568	pCi/g						
Potassium-40		9.65	+/-1.30	0.206	+/-1.30	0.492	pCi/g						
Radium-226		0.717	+/-0.155	0.0477	+/-0.155	0.104	pCi/g						
Silver-108m	U	0.0189	+/-0.0271	0.0248	+/-0.0271	0.0531	pCi/g						
Thallium-208		0.216	+/-0.0655	0.0277	+/-0.0655	0.0599	pCi/g						

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	11/16/06	1050	589083

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3

**Notes:**

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 – (843) 556-8171 – www.gel.com

## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-002F  
Sample ID: 176227002

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
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- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

# GENERAL ENGINEERING LABORATORIES, LLC

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-002FS  
Sample ID: 176227003  
Matrix: TS  
Collect Date: 10-NOV-06  
Receive Date: 16-NOV-06  
Collector: Client  
Moisture: 29.3%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.950	+/-0.268	0.125	+/-0.268	0.271	pCi/g		MJH1	11/21/06	0552	589209	1
Americium-241	U	0.0179	+/-0.0516	0.0446	+/-0.0516	0.0925	pCi/g						
Bismuth-212		0.746	+/-0.501	0.283	+/-0.501	0.605	pCi/g						
Bismuth-214		0.780	+/-0.171	0.0608	+/-0.171	0.130	pCi/g						
Cesium-134	U	0.0028	+/-0.045	0.0374	+/-0.045	0.0807	pCi/g						
Cesium-137		0.0941	+/-0.0551	0.0396	+/-0.0551	0.0842	pCi/g						
Cobalt-60	U	0.0351	+/-0.0423	0.0387	+/-0.0423	0.085	pCi/g						
Europium-152	U	0.0448	+/-0.0925	0.0796	+/-0.0925	0.168	pCi/g						
Europium-154	U	0.0218	+/-0.118	0.101	+/-0.118	0.222	pCi/g						
Europium-155	U	0.0962	+/-0.112	0.0751	+/-0.112	0.156	pCi/g						
Lead-212		0.802	+/-0.109	0.0587	+/-0.109	0.122	pCi/g						
Lead-214		0.812	+/-0.164	0.0562	+/-0.164	0.119	pCi/g						
Manganese-54	U	-0.0303	+/-0.0419	0.0319	+/-0.0419	0.0691	pCi/g						
Niobium-94	U	-0.0199	+/-0.0396	0.0317	+/-0.0396	0.0678	pCi/g						
Potassium-40		10.7	+/-1.27	0.253	+/-1.27	0.582	pCi/g						
Radium-226		0.780	+/-0.171	0.0608	+/-0.171	0.130	pCi/g						
Silver-108m	U	-0.00365	+/-0.0335	0.0291	+/-0.0335	0.0617	pCi/g						
Thallium-208		0.248	+/-0.0805	0.0328	+/-0.0805	0.070	pCi/g						

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	11/16/06	1050	589083

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3

**Notes:**

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported

**GENERAL ENGINEERING LABORATORIES, LLC**  
 2040 Savage Road Charleston SC 29407 – (843) 556-8171 – www.gel.com

**Certificate of Analysis**

Company : Connecticut Yankee Atomic Power  
 Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
 Contact: Mr. Jack McCarthy  
 Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-002FS  
 Sample ID: 176227003

Project: YANK01204  
 Client ID: YANK001  
 Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
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- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 – (843) 556-8171 – www.gel.com

## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-003F  
Sample ID: 176227004  
Matrix: TS  
Collect Date: 09-NOV-06  
Receive Date: 16-NOV-06  
Collector: Client  
Moisture: 16.3%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid - FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.886	+/-0.219	0.0898	+/-0.219	0.179	pCi/g		MJH1	11/21/06	0555	589209	1
Americium-241	U	0.00844	+/-0.0402	0.0312	+/-0.0402	0.0624	pCi/g						
Bismuth-212	U	0.300	+/-0.273	0.191	+/-0.273	0.382	pCi/g						
Bismuth-214		0.405	+/-0.122	0.0434	+/-0.122	0.0867	pCi/g						
Cesium-134	U	0.025	+/-0.0334	0.0306	+/-0.0334	0.0611	pCi/g						
Cesium-137		0.143	+/-0.0542	0.0256	+/-0.0542	0.0511	pCi/g						
Cobalt-60	U	0.0436	+/-0.036	0.0344	+/-0.036	0.0688	pCi/g						
Europium-152	U	0.00908	+/-0.0748	0.0565	+/-0.0748	0.113	pCi/g						
Europium-154	U	0.103	+/-0.109	0.100	+/-0.109	0.200	pCi/g						
Europium-155	U	0.0477	+/-0.0592	0.0522	+/-0.0592	0.104	pCi/g						
Lead-212		0.563	+/-0.0805	0.0324	+/-0.0805	0.0648	pCi/g						
Lead-214		0.429	+/-0.0939	0.0424	+/-0.0939	0.0848	pCi/g						
Manganese-54	U	0.0381	+/-0.0303	0.028	+/-0.0303	0.0559	pCi/g						
Niobium-94	U	-0.0188	+/-0.0275	0.0224	+/-0.0275	0.0448	pCi/g						
Potassium-40		10.6	+/-1.14	0.239	+/-1.14	0.477	pCi/g						
Radium-226		0.405	+/-0.122	0.0434	+/-0.122	0.0867	pCi/g						
Silver-108m	U	-0.00901	+/-0.0256	0.0212	+/-0.0256	0.0423	pCi/g						
Thallium-208		0.185	+/-0.0616	0.0227	+/-0.0616	0.0454	pCi/g						

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	11/16/06	1050	589083

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3

**Notes:**

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 – (843) 556-8171 – www.gel.com

## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-003F  
Sample ID: 176227004

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
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- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-004F  
Sample ID: 176227005  
Matrix: TS  
Collect Date: 09-NOV-06  
Receive Date: 16-NOV-06  
Collector: Client  
Moisture: 9.85%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Alpha Spec Analysis</b>													
<i>Alphaspec Am241, Cm, Solid ALL FSS</i>													
Americium-241	U	0.0532	+/-0.0844	0.0268	+/-0.0847	0.135	pCi/g		MXA	11/19/06	0732	589568	1
Curium-242	U	0.00	+/-0.0611	0.00	+/-0.0611	0.0845	pCi/g						
Curium-243/244	U	-0.00717	+/-0.0141	0.0268	+/-0.0141	0.135	pCi/g						
<i>Alphaspec Pu, Solid-ALL FSS</i>													
Plutonium-238	U	0.0186	+/-0.0741	0.0454	+/-0.0741	0.188	pCi/g		MXA	11/19/06	0732	589569	2
Plutonium-239/240	U	-0.0243	+/-0.0831	0.085	+/-0.0831	0.267	pCi/g						
<i>Liquid Scint Pu241, Solid-ALL FSS</i>													
Plutonium-241	U	-0.362	+/-6.41	5.40	+/-6.41	11.4	pCi/g		MXA	11/21/06	1044	589570	3
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma,Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.526	+/-0.121	0.0415	+/-0.121	0.0891	pCi/g		MJH1	11/21/06	0552	589209	4
Americium-241	U	-0.0405	+/-0.0881	0.0746	+/-0.0881	0.155	pCi/g						
Bismuth-212		0.346	+/-0.190	0.0942	+/-0.190	0.200	pCi/g						
Bismuth-214		0.454	+/-0.0646	0.0262	+/-0.0646	0.055	pCi/g						
Cesium-134	U	0.0307	+/-0.0226	0.0153	+/-0.0226	0.0324	pCi/g						
Cesium-137	U	0.0241	+/-0.0184	0.0121	+/-0.0184	0.0256	pCi/g						
Cobalt-60	U	-0.000174	+/-0.0136	0.0117	+/-0.0136	0.0257	pCi/g						
Europium-152	U	0.0039	+/-0.0373	0.0337	+/-0.0373	0.0705	pCi/g						
Europium-154	U	-0.0103	+/-0.0459	0.0331	+/-0.0459	0.0723	pCi/g						
Europium-155	U	0.0799	+/-0.0638	0.0398	+/-0.0638	0.0827	pCi/g						
Lead-212		0.508	+/-0.045	0.0198	+/-0.045	0.0412	pCi/g						
Lead-214		0.504	+/-0.0595	0.0214	+/-0.0595	0.045	pCi/g						
Manganese-54	U	0.00617	+/-0.0148	0.0132	+/-0.0148	0.0279	pCi/g						
Niobium-94	U	-0.00177	+/-0.0124	0.0109	+/-0.0124	0.0231	pCi/g						
Potassium-40		8.92	+/-0.598	0.104	+/-0.598	0.230	pCi/g						
Radium-226		0.454	+/-0.0646	0.0262	+/-0.0646	0.055	pCi/g						
Silver-108m	U	-0.00755	+/-0.0128	0.0108	+/-0.0128	0.0229	pCi/g						
Thallium-208		0.170	+/-0.0325	0.0125	+/-0.0325	0.0263	pCi/g						
<b>Rad Gas Flow Proportional Counting</b>													
<i>GFPC, Sr90, solid - 0.025 pCi/g</i>													
Strontium-90	U	-0.0138	+/-0.00986	0.00927	+/-0.00986	0.020	pCi/g		KSD1	11/22/06	1156	589170	5
<b>Rad Liquid Scintillation Analysis</b>													

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

Contact: East Hampton, Connecticut 06424  
Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-004F  
Sample ID: 176227005

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Liquid Scintillation Analysis</b>													
<i>LSC, Tritium Dist, Solid - 3 pCi/g</i>													
Tritium	U	1.09	+/-1.24	0.952	+/-1.24	2.08	pCi/g		DFA1	11/21/06	0933	589090	7
<i>Liquid Scint C14, Solid All,FSS</i>													
Carbon-14	U	-0.117	+/-0.114	0.0976	+/-0.114	0.199	pCi/g		AXD2	11/16/06	1728	589089	9
<i>Liquid Scint Fe55, Solid-ALL FSS</i>													
Iron-55	U	6.46	+/-33.1	24.6	+/-33.1	51.6	pCi/g		MXP1	11/21/06	0014	589223	10
<i>Liquid Scint Ni63, Solid-ALL FSS</i>													
Nickel-63	U	-0.892	+/-4.43	3.74	+/-4.43	7.73	pCi/g		MXP1	11/20/06	1918	589224	11
<i>Liquid Scint Tc99, Solid-ALL FSS</i>													
Technetium-99		0.599	+/-0.253	0.195	+/-0.253	0.403	pCi/g		KXR1	11/21/06	1252	589096	12

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	11/16/06	1050	589083

**The following Analytical Methods were performed**

Method	Description
1	DOE EML HASL-300, Am-05-RC Modified
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, Pu-11-RC Modified
4	EML HASL 300, 4.5.2.3
5	EPA 905.0 Modified
6	EPA 905.0 Modified
7	EPA 906.0 Modified
8	EPA 906.0 Modified
9	EPA BERF C-01 Modified
10	DOE RESL Fe-1, Modified
11	DOE RESL Ni-1, Modified
12	DOE EML HASL-300, Tc-02-RC Modified
13	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits
Americium-243	Alphaspec Am241, Cm, Solid ALL	93	(15%-125%)
Plutonium-242	Alphaspec Pu, Solid-ALL FSS	81	(15%-125%)

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424

Contact: Mr. Jack McCarthy

Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-004F  
Sample ID: 176227005

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time Batch	Mtd
Plutonium-241		Liquid Scint Pu241, Solid-ALL FS			97		(25%-125%)					
Strontium-90		GFPC, Sr90, solid - 0.025 pCi/g			62		(25%-125%)					
Carrier/Tracer Recovery		GFPC, Sr90, solid - 0.025 pCi/g			62		(25%-125%)					
Iron-55		Liquid Scint Fe55, Solid-ALL FS			70		(15%-125%)					
Nickel-63		Liquid Scint Ni63, Solid-ALL FS			89		(25%-125%)					
Carrier/Tracer Recovery		Liquid Scint Ni63, Solid-ALL FS			89		(25%-125%)					
Technetium-99		Liquid Scint Tc99, Solid-ALL FS			84		(15%-125%)					
Carrier/Tracer Recovery		Liquid Scint Tc99, Solid-ALL FS			84		(15%-125%)					

### Notes:

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
  - < Result is less than value reported
  - > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
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- The above sample is reported on a dry weight basis.

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-005F  
Sample ID: 176227006  
Matrix: TS  
Collect Date: 10-NOV-06  
Receive Date: 16-NOV-06  
Collector: Client  
Moisture: 16.4%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid - FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.719	+/-0.111	0.050	+/-0.111	0.106	pCi/g		MJH1	11/21/06	0713	589209	1
Americium-241	U	0.0769	+/-0.0627	0.0557	+/-0.0627	0.115	pCi/g						
Bismuth-212		0.321	+/-0.219	0.106	+/-0.219	0.224	pCi/g						
Bismuth-214		0.579	+/-0.0756	0.0261	+/-0.0756	0.0547	pCi/g						
Cesium-134	UI	0.00	+/-0.0229	0.0182	+/-0.0229	0.038	pCi/g						
Cesium-137		0.163	+/-0.0294	0.0154	+/-0.0294	0.0323	pCi/g						
Cobalt-60	U-0.000332		+/-0.0162	0.0139	+/-0.0162	0.0298	pCi/g						
Europium-152	U	-0.0293	+/-0.0431	0.0361	+/-0.0431	0.0751	pCi/g						
Europium-154	U	0.0178	+/-0.0456	0.0405	+/-0.0456	0.0867	pCi/g						
Europium-155	U	0.0666	+/-0.0645	0.0426	+/-0.0645	0.0877	pCi/g						
Lead-212		0.715	+/-0.0505	0.0228	+/-0.0505	0.0471	pCi/g						
Lead-214		0.690	+/-0.0762	0.0267	+/-0.0762	0.0556	pCi/g						
Manganese-54	U	0.0208	+/-0.0245	0.0105	+/-0.0245	0.0225	pCi/g						
Niobium-94	U	-0.00268	+/-0.0152	0.0128	+/-0.0152	0.0268	pCi/g						
Potassium-40		12.0	+/-0.718	0.116	+/-0.718	0.252	pCi/g						
Radium-226		0.579	+/-0.0756	0.0261	+/-0.0756	0.0547	pCi/g						
Silver-108m	U	0.00572	+/-0.0134	0.0123	+/-0.0134	0.0256	pCi/g						
Thallium-208		0.230	+/-0.0306	0.0137	+/-0.0306	0.0287	pCi/g						

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	11/16/06	1050	589083

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3

**Notes:**

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424

Contact: Mr. Jack McCarthy

Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-005F  
Sample ID: 176227006

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
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- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
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- The above sample is reported on a dry weight basis.

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-006F  
Sample ID: 176227007  
Matrix: TS  
Collect Date: 09-NOV-06  
Receive Date: 16-NOV-06  
Collector: Client  
Moisture: 17.3%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.580	+/-0.182	0.106	+/-0.182	0.228	pCi/g		MJH1	11/21/06	0815	589209	1
Americium-241	U	-0.0348	+/-0.0409	0.035	+/-0.0409	0.0728	pCi/g						
Bismuth-212		0.517	+/-0.411	0.218	+/-0.411	0.467	pCi/g						
Bismuth-214		0.579	+/-0.122	0.0506	+/-0.122	0.108	pCi/g						
Cesium-134	U	0.0239	+/-0.042	0.035	+/-0.042	0.0747	pCi/g						
Cesium-137	U	0.0509	+/-0.0594	0.026	+/-0.0594	0.056	pCi/g						
Cobalt-60	U	0.00356	+/-0.033	0.0281	+/-0.033	0.0623	pCi/g						
Europium-152	U	-0.0356	+/-0.0719	0.059	+/-0.0719	0.125	pCi/g						
Europium-154	U	-0.0584	+/-0.100	0.0786	+/-0.100	0.174	pCi/g						
Europium-155	U	0.054	+/-0.0658	0.0589	+/-0.0658	0.123	pCi/g						
Lead-212		0.500	+/-0.0938	0.0498	+/-0.0938	0.103	pCi/g						
Lead-214		0.558	+/-0.131	0.0439	+/-0.131	0.0933	pCi/g						
Manganese-54	U	0.015	+/-0.0359	0.0312	+/-0.0359	0.0666	pCi/g						
Niobium-94	U	0.0391	+/-0.0455	0.0266	+/-0.0455	0.0567	pCi/g						
Potassium-40		10.1	+/-1.14	0.238	+/-1.14	0.536	pCi/g						
Radium-226		0.579	+/-0.122	0.0506	+/-0.122	0.108	pCi/g						
Silver-108m	U	0.0102	+/-0.026	0.0239	+/-0.026	0.0507	pCi/g						
Thallium-208		0.180	+/-0.0693	0.0248	+/-0.0693	0.0533	pCi/g						

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	11/16/06	1050	589083

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3

**Notes:**

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-006F  
Sample ID: 176227007

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
-----------	-----------	--------	-------------	----	-----	-----	-------	----	---------	------	------	-------	-----

- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
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  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-007F  
Sample ID: 176227008  
Matrix: TS  
Collect Date: 13-NOV-06  
Receive Date: 16-NOV-06  
Collector: Client  
Moisture: 23.2%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.969	+/-0.216	0.085	+/-0.216	0.170	pCi/g		MJH1	11/21/06	0857	589209	1
Americium-241	U	0.0013	+/-0.0431	0.034	+/-0.0431	0.0679	pCi/g						
Bismuth-212		0.701	+/-0.306	0.170	+/-0.306	0.339	pCi/g						
Bismuth-214		0.723	+/-0.138	0.0446	+/-0.138	0.0891	pCi/g						
Cesium-134	U	0.0485	+/-0.0578	0.0364	+/-0.0578	0.0727	pCi/g						
Cesium-137	U	0.0472	+/-0.0362	0.0307	+/-0.0362	0.0614	pCi/g						
Cobalt-60	U	0.0168	+/-0.0324	0.0289	+/-0.0324	0.0577	pCi/g						
Europium-152	U	0.102	+/-0.0903	0.0614	+/-0.0903	0.123	pCi/g						
Europium-154	U	-0.0507	+/-0.114	0.0911	+/-0.114	0.182	pCi/g						
Europium-155	U	0.051	+/-0.067	0.0524	+/-0.067	0.105	pCi/g						
Lead-212		0.822	+/-0.0995	0.0309	+/-0.0995	0.0617	pCi/g						
Lead-214		0.774	+/-0.133	0.0389	+/-0.133	0.0778	pCi/g						
Manganese-54	U	-0.00408	+/-0.0292	0.0249	+/-0.0292	0.0497	pCi/g						
Niobium-94	U	-0.00363	+/-0.027	0.0233	+/-0.027	0.0467	pCi/g						
Potassium-40		10.1	+/-1.04	0.194	+/-1.04	0.388	pCi/g						
Radium-226		0.723	+/-0.138	0.0446	+/-0.138	0.0891	pCi/g						
Silver-108m	U	-0.000972	+/-0.0241	0.0207	+/-0.0241	0.0414	pCi/g						
Thallium-208		0.314	+/-0.0658	0.0213	+/-0.0658	0.0425	pCi/g						

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	11/16/06	1050	589083

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3

Notes:

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 – (843) 556-8171 – www.gel.com

## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-007F  
Sample ID: 176227008

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time Batch	Mtd
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- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-008F  
Sample ID: 176227009  
Matrix: TS  
Collect Date: 09-NOV-06  
Receive Date: 16-NOV-06  
Collector: Client  
Moisture: 13.9%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid – FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.691	+/-0.106	0.0456	+/-0.106	0.0967	pCi/g		MJH1	11/21/06	1021	589209	1
Americium-241	U	-0.0398	+/-0.0536	0.0495	+/-0.0536	0.102	pCi/g						
Bismuth-212		0.387	+/-0.211	0.0916	+/-0.211	0.194	pCi/g						
Bismuth-214		0.469	+/-0.0614	0.0238	+/-0.0614	0.0499	pCi/g						
Cesium-134	UI	0.00	+/-0.023	0.016	+/-0.023	0.0337	pCi/g						
Cesium-137		0.0552	+/-0.022	0.013	+/-0.022	0.0273	pCi/g						
Cobalt-60	U	0.0102	+/-0.0154	0.014	+/-0.0154	0.0299	pCi/g						
Europium-152	U	-0.0337	+/-0.0402	0.0335	+/-0.0402	0.0699	pCi/g						
Europium-154	U	0.00291	+/-0.0453	0.0394	+/-0.0453	0.0842	pCi/g						
Europium-155	U	-0.0216	+/-0.0453	0.0403	+/-0.0453	0.0831	pCi/g						
Lead-212		0.625	+/-0.0463	0.0194	+/-0.0463	0.0402	pCi/g						
Lead-214		0.542	+/-0.0662	0.0243	+/-0.0662	0.0507	pCi/g						
Manganese-54	U	-0.00139	+/-0.0153	0.0133	+/-0.0153	0.028	pCi/g						
Niobium-94	U	0.00383	+/-0.0155	0.0117	+/-0.0155	0.0246	pCi/g						
Potassium-40		10.1	+/-0.580	0.110	+/-0.580	0.240	pCi/g						
Radium-226		0.469	+/-0.0614	0.0238	+/-0.0614	0.0499	pCi/g						
Silver-108m	U	-0.0248	+/-0.0128	0.0103	+/-0.0128	0.0217	pCi/g						
Thallium-208		0.197	+/-0.0319	0.012	+/-0.0319	0.0253	pCi/g						

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	11/16/06	1050	589083

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3

Notes:

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-008F  
Sample ID: 176227009

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time Batch	Mtd
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- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-008FS  
Sample ID: 176227010  
Matrix: TS  
Collect Date: 09-NOV-06  
Receive Date: 16-NOV-06  
Collector: Client  
Moisture: 13.5%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.564	+/-0.195	0.0805	+/-0.195	0.161	pCi/g		MJH1	11/21/06	1215	589209	1
Americium-241	U	0.016	+/-0.0378	0.0309	+/-0.0378	0.0617	pCi/g						
Bismuth-212		0.607	+/-0.340	0.163	+/-0.340	0.326	pCi/g						
Bismuth-214		0.576	+/-0.111	0.0377	+/-0.111	0.0754	pCi/g						
Cesium-134	UI	0.00	+/-0.0473	0.0324	+/-0.0473	0.0647	pCi/g						
Cesium-137		0.0891	+/-0.034	0.0244	+/-0.034	0.0488	pCi/g						
Cobalt-60	U	0.0173	+/-0.0312	0.0279	+/-0.0312	0.0558	pCi/g						
Europium-152	U	0.00431	+/-0.0709	0.0546	+/-0.0709	0.109	pCi/g						
Europium-154	U	-0.0812	+/-0.0959	0.0721	+/-0.0959	0.144	pCi/g						
Europium-155	U	0.0193	+/-0.0695	0.0494	+/-0.0695	0.0988	pCi/g						
Lead-212		0.653	+/-0.0814	0.0277	+/-0.0814	0.0553	pCi/g						
Lead-214		0.588	+/-0.0985	0.038	+/-0.0985	0.076	pCi/g						
Manganese-54	U	-0.0103	+/-0.0319	0.0228	+/-0.0319	0.0456	pCi/g						
Niobium-94	U	0.0106	+/-0.023	0.021	+/-0.023	0.0419	pCi/g						
Potassium-40		9.36	+/-1.03	0.233	+/-1.03	0.465	pCi/g						
Radium-226		0.576	+/-0.111	0.0377	+/-0.111	0.0754	pCi/g						
Silver-108m	U	-0.01	+/-0.0204	0.0171	+/-0.0204	0.0341	pCi/g						
Thallium-208		0.264	+/-0.0493	0.0196	+/-0.0493	0.0392	pCi/g						

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	11/16/06	1050	589083

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3

**Notes:**

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424

Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-008FS  
Sample ID: 176227010

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
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- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

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## Certificate of Analysis

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Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID:	9506-0000-009F	Project:	YANK01204
Sample ID:	176227011	Client ID:	YANK001
Matrix:	TS	Vol. Recv.:	
Collect Date:	09-NOV-06		
Receive Date:	16-NOV-06		
Collector:	Client		
Moisture:	19.4%		

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.850	+/-0.173	0.052	+/-0.173	0.104	pCi/g		MJH1	11/21/06	1230	589209	1
Americium-241	U	0.004	+/-0.0742	0.059	+/-0.0742	0.118	pCi/g						
Bismuth-212		0.681	+/-0.317	0.124	+/-0.317	0.248	pCi/g						
Bismuth-214		0.550	+/-0.0952	0.0306	+/-0.0952	0.0613	pCi/g						
Cesium-134	U	0.00462	+/-0.0226	0.0199	+/-0.0226	0.0399	pCi/g						
Cesium-137		0.0637	+/-0.0428	0.017	+/-0.0428	0.0339	pCi/g						
Cobalt-60	U	-0.0145	+/-0.0208	0.0158	+/-0.0208	0.0317	pCi/g						
Europium-152	U	0.00679	+/-0.0606	0.0467	+/-0.0606	0.0934	pCi/g						
Europium-154	U	0.000678	+/-0.0626	0.0527	+/-0.0626	0.105	pCi/g						
Europium-155	U	0.0059	+/-0.0564	0.0504	+/-0.0564	0.101	pCi/g						
Lead-212		0.711	+/-0.0933	0.0381	+/-0.0933	0.0762	pCi/g						
Lead-214		0.685	+/-0.0965	0.0331	+/-0.0965	0.0662	pCi/g						
Manganese-54	U	0.0089	+/-0.0199	0.0179	+/-0.0199	0.0357	pCi/g						
Niobium-94	U	0.0148	+/-0.0186	0.0172	+/-0.0186	0.0343	pCi/g						
Potassium-40		10.3	+/-1.07	0.182	+/-1.07	0.365	pCi/g						
Radium-226		0.550	+/-0.0952	0.0306	+/-0.0952	0.0613	pCi/g						
Silver-108m	U	-0.019	+/-0.0207	0.0151	+/-0.0207	0.0301	pCi/g						
Thallium-208		0.234	+/-0.0458	0.0171	+/-0.0458	0.0342	pCi/g						

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	11/16/06	1050	589083

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3

**Notes:**

The Qualifiers in this report are defined as follows :

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- < Result is less than value reported

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Address : 362 Injun Hollow Rd

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Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-009F  
Sample ID: 176227011

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time Batch	Mtd
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- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-010F  
Sample ID: 176227012  
Matrix: TS  
Collect Date: 09-NOV-06  
Receive Date: 16-NOV-06  
Collector: Client  
Moisture: 19%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid – FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.810	+/-0.137	0.0589	+/-0.137	0.127	pCi/g		MJH1	11/21/06	1246	589209	1
Americium-241	U	-0.0285	+/-0.127	0.0748	+/-0.127	0.154	pCi/g						
Bismuth-212	UI	0.00	+/-0.386	0.132	+/-0.386	0.282	pCi/g						
Bismuth-214		0.506	+/-0.0771	0.0306	+/-0.0771	0.0652	pCi/g						
Cesium-134	UI	0.00	+/-0.0314	0.0194	+/-0.0314	0.0417	pCi/g						
Cesium-137		0.0498	+/-0.0416	0.0174	+/-0.0416	0.0371	pCi/g						
Cobalt-60	U	-4.030E-05	+/-0.0213	0.0151	+/-0.0213	0.034	pCi/g						
Europium-152	U	-0.00589	+/-0.0598	0.0511	+/-0.0598	0.107	pCi/g						
Europium-154	U	-0.0365	+/-0.0701	0.045	+/-0.0701	0.100	pCi/g						
Europium-155	U	0.00705	+/-0.0569	0.0522	+/-0.0569	0.108	pCi/g						
Lead-212		0.611	+/-0.0528	0.0303	+/-0.0528	0.0627	pCi/g						
Lead-214		0.502	+/-0.0834	0.0341	+/-0.0834	0.0715	pCi/g						
Manganese-54	U	0.0108	+/-0.0209	0.0187	+/-0.0209	0.0399	pCi/g						
Niobium-94	U	0.00479	+/-0.0206	0.0155	+/-0.0206	0.0332	pCi/g						
Potassium-40		9.04	+/-0.751	0.169	+/-0.751	0.375	pCi/g						
Radium-226		0.506	+/-0.0771	0.0306	+/-0.0771	0.0652	pCi/g						
Silver-108m	U	0.00885	+/-0.0185	0.0162	+/-0.0185	0.0341	pCi/g						
Thallium-208		0.217	+/-0.0391	0.0184	+/-0.0391	0.0391	pCi/g						

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	11/16/06	1050	589083

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3

**Notes:**

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported

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## Certificate of Analysis

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Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-010F  
Sample ID: 176227012

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
-----------	-----------	--------	-------------	----	-----	-----	-------	----	---------	------	------	-------	-----

- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy--Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-011F  
Sample ID: 176227013  
Matrix: TS  
Collect Date: 09-NOV-06  
Receive Date: 16-NOV-06  
Collector: Client  
Moisture: 10.9%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid – FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		1.38	+/-0.230	0.0588	+/-0.230	0.125	pCi/g		MJH1	11/21/06	1247	589209	1
Americium-241	U	0.0298	+/-0.0628	0.0578	+/-0.0628	0.119	pCi/g						
Bismuth-212		1.00	+/-0.303	0.128	+/-0.303	0.271	pCi/g						
Bismuth-214		1.25	+/-0.153	0.0296	+/-0.153	0.0625	pCi/g						
Cesium-134	UI	0.00	+/-0.028	0.0235	+/-0.028	0.0492	pCi/g						
Cesium-137	U	-0.0211	+/-0.0184	0.0148	+/-0.0184	0.0315	pCi/g						
Cobalt-60	U	-0.007	+/-0.0223	0.0159	+/-0.0223	0.0349	pCi/g						
Europium-152	U	0.012	+/-0.0495	0.0439	+/-0.0495	0.0915	pCi/g						
Europium-154	U	0.0335	+/-0.0633	0.0573	+/-0.0633	0.123	pCi/g						
Europium-155	U	0.0447	+/-0.0574	0.0513	+/-0.0574	0.105	pCi/g						
Lead-212		1.23	+/-0.113	0.0252	+/-0.113	0.052	pCi/g						
Lead-214		1.47	+/-0.161	0.0288	+/-0.161	0.0603	pCi/g						
Manganese-54	U	0.0262	+/-0.0311	0.017	+/-0.0311	0.0361	pCi/g						
Niobium-94	U	0.0126	+/-0.0185	0.0169	+/-0.0185	0.0354	pCi/g						
Potassium-40		22.3	+/-1.71	0.140	+/-1.71	0.310	pCi/g						
Radium-226		1.25	+/-0.153	0.0296	+/-0.153	0.0625	pCi/g						
Silver-108m	U	0.00973	+/-0.0173	0.0153	+/-0.0173	0.032	pCi/g						
Thallium-208		0.374	+/-0.0577	0.0173	+/-0.0577	0.0364	pCi/g						

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	11/16/06	1050	589083

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3

**Notes:**

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 – (843) 556-8171 – www.gel.com

## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424

Contact: Mr. Jack McCarthy

Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-011F  
Sample ID: 176227013

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time Batch	Mtd
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- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 – (843) 556-8171 – www.gel.com

## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

Contact: East Hampton, Connecticut 06424  
Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-012F  
Sample ID: 176227014  
Matrix: TS  
Collect Date: 09-NOV-06  
Receive Date: 16-NOV-06  
Collector: Client  
Moisture: 14.6%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.896	+/-0.180	0.0531	+/-0.180	0.106	pCi/g		MJH1	11/21/06	1313	589209	1
Americium-241	U	0.0447	+/-0.0825	0.071	+/-0.0825	0.142	pCi/g						
Bismuth-212		0.725	+/-0.256	0.123	+/-0.256	0.247	pCi/g						
Bismuth-214		0.652	+/-0.113	0.0312	+/-0.113	0.0623	pCi/g						
Cesium-134	UI	0.00	+/-0.0304	0.0216	+/-0.0304	0.0432	pCi/g						
Cesium-137	U	0.0253	+/-0.0306	0.0153	+/-0.0306	0.0305	pCi/g						
Cobalt-60	U	-0.000688	+/-0.0194	0.0165	+/-0.0194	0.033	pCi/g						
Europium-152	U	-0.0413	+/-0.080	0.0473	+/-0.080	0.0945	pCi/g						
Europium-154	U	0.00592	+/-0.0654	0.0487	+/-0.0654	0.0973	pCi/g						
Europium-155	U	0.0232	+/-0.0577	0.0544	+/-0.0577	0.109	pCi/g						
Lead-212		0.803	+/-0.0872	0.0262	+/-0.0872	0.0524	pCi/g						
Lead-214		0.732	+/-0.111	0.0346	+/-0.111	0.0692	pCi/g						
Manganese-54	U	0.0278	+/-0.0228	0.0148	+/-0.0228	0.0295	pCi/g						
Niobium-94	U	0.00266	+/-0.0183	0.0158	+/-0.0183	0.0317	pCi/g						
Potassium-40		10.3	+/-0.930	0.124	+/-0.930	0.248	pCi/g						
Radium-226		0.652	+/-0.113	0.0312	+/-0.113	0.0623	pCi/g						
Silver-108m	U	-0.00139	+/-0.0171	0.0153	+/-0.0171	0.0305	pCi/g						
Thallium-208		0.238	+/-0.0426	0.0155	+/-0.0426	0.0309	pCi/g						

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	11/16/06	1050	589083

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3

Notes:

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-012F  
Sample ID: 176227014

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
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- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

# GENERAL ENGINEERING LABORATORIES, LLC

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-013F  
Sample ID: 176227015  
Matrix: TS  
Collect Date: 13-NOV-06  
Receive Date: 16-NOV-06  
Collector: Client  
Moisture: 24.1%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Alpha Spec Analysis</b>													
<i>Alphaspec Am241, Cm, Solid ALL FSS</i>													
Americium-241	U	0.0447	+/-0.0836	0.0371	+/-0.0838	0.153	pCi/g		MXA	11/19/06	0732	589568	1
Curium-242	U	-0.00721	+/-0.0141	0.027	+/-0.0142	0.135	pCi/g						
Curium-243/244	U	0.0304	+/-0.0856	0.0525	+/-0.0857	0.184	pCi/g						
<i>Alphaspec Pu, Solid-ALL FSS</i>													
Plutonium-238	U	-0.0365	+/-0.106	0.106	+/-0.106	0.300	pCi/g		MXA	11/19/06	0732	589569	2
Plutonium-239/240	U	-0.0548	+/-0.0406	0.0775	+/-0.041	0.243	pCi/g						
<i>Liquid Scint Pu241, Solid-ALL FSS</i>													
Plutonium-241	U	-1.68	+/-7.21	6.13	+/-7.21	12.9	pCi/g		MXA	11/21/06	1100	589570	3
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.528	+/-0.182	0.0694	+/-0.182	0.155	pCi/g		MJH1	11/21/06	1310	589209	4
Americium-241	U	0.00634	+/-0.031	0.0295	+/-0.031	0.0613	pCi/g						
Bismuth-212	UI	0.00	+/-0.454	0.156	+/-0.454	0.342	pCi/g						
Bismuth-214		0.277	+/-0.0916	0.0397	+/-0.0916	0.086	pCi/g						
Cesium-134	U	0.00491	+/-0.026	0.0234	+/-0.026	0.0513	pCi/g						
Cesium-137		0.252	+/-0.0553	0.0214	+/-0.0553	0.0466	pCi/g						
Cobalt-60	U	0.000673	+/-0.0268	0.0226	+/-0.0268	0.0512	pCi/g						
Europium-152	U	0.00973	+/-0.0569	0.0519	+/-0.0569	0.111	pCi/g						
Europium-154	U	0.0148	+/-0.088	0.0759	+/-0.088	0.168	pCi/g						
Europium-155	U	0.0101	+/-0.0541	0.0498	+/-0.0541	0.104	pCi/g						
Lead-212		0.433	+/-0.0781	0.0292	+/-0.0781	0.0615	pCi/g						
Lead-214		0.403	+/-0.0944	0.0311	+/-0.0944	0.0672	pCi/g						
Manganese-54	U	-0.00791	+/-0.0231	0.0195	+/-0.0231	0.0431	pCi/g						
Niobium-94	U	0.00024	+/-0.025	0.0212	+/-0.025	0.0458	pCi/g						
Potassium-40		10.8	+/-1.20	0.162	+/-1.20	0.384	pCi/g						
Radium-226		0.277	+/-0.0916	0.0397	+/-0.0916	0.086	pCi/g						
Silver-108m	U	-0.000112	+/-0.0185	0.0163	+/-0.0185	0.0354	pCi/g						
Thallium-208		0.164	+/-0.0564	0.0191	+/-0.0564	0.0416	pCi/g						
<b>Rad Gas Flow Proportional Counting</b>													
<i>GFPC, Sr90, solid - 0.025 pCi/g</i>													
Strontium-90	U	-0.00427	+/-0.00972	0.00845	+/-0.00972	0.0181	pCi/g		KSD1	11/21/06	1537	589170	5
<b>Rad Liquid Scintillation Analysis</b>													

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-013F  
Sample ID: 176227015

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Liquid Scintillation Analysis</b>													
<i>LSC, Tritium Dist, Solid – 3 pCi/g</i>													
Tritium	U	0.113	+/-1.10	0.917	+/-1.10	2.01	pCi/g		DFA1	11/21/06	0949	589090	7
<i>Liquid Scint C14, Solid All, FSS</i>													
Carbon-14	U	-0.0816	+/-0.110	0.0936	+/-0.110	0.191	pCi/g		AXD2	11/16/06	1830	589089	9
<i>Liquid Scint Fe55, Solid-ALL FSS</i>													
Iron-55	U	-13.2	+/-37.7	29.4	+/-37.7	61.8	pCi/g		MXP1	11/21/06	0030	589223	10
<i>Liquid Scint Ni63, Solid-ALL FSS</i>													
Nickel-63	U	-4.2	+/-5.44	4.69	+/-5.44	9.67	pCi/g		MXP1	11/20/06	2005	589224	11
<i>Liquid Scint Tc99, Solid-ALL FSS</i>													
Technetium-99		0.644	+/-0.258	0.199	+/-0.259	0.411	pCi/g		KXR1	11/21/06	1309	589096	12

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	11/16/06	1050	589083

**The following Analytical Methods were performed**

Method	Description
1	DOE EML HASL-300, Am-05-RC Modified
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, Pu-11-RC Modified
4	EML HASL 300, 4.5.2.3
5	EPA 905.0 Modified
6	EPA 905.0 Modified
7	EPA 906.0 Modified
8	EPA 906.0 Modified
9	EPA EERF C-01 Modified
10	DOE RESL Fe-1, Modified
11	DOE RESL Ni-1, Modified
12	DOE EML HASL-300, Tc-02-RC Modified
13	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits
Americium-243	Alphaspec Am241, Cm, Solid ALL	98	(15%-125%)
Plutonium-242	Alphaspec Pu, Solid-ALL FSS	88	(15%-125%)

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Address : 362 Injun Hollow Rd

                    East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-013F  
Sample ID: 176227015

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
Plutonium-241		Liquid Scint Pu241, Solid-ALL FS			85		(25%-125%)						
Strontium-90		GFPC, Sr90, solid - 0.025 pCi/g			69		(25%-125%)						
Carrier/Tracer Recovery		GFPC, Sr90, solid - 0.025 pCi/g			69		(25%-125%)						
Iron-55		Liquid Scint Fe55, Solid-ALL FS			55		(15%-125%)						
Nickel-63		Liquid Scint Ni63, Solid-ALL FS			83		(25%-125%)						
Carrier/Tracer Recovery		Liquid Scint Ni63, Solid-ALL FS			83		(25%-125%)						
Technetium-99		Liquid Scint Tc99, Solid-ALL FS			82		(15%-125%)						
Carrier/Tracer Recovery		Liquid Scint Tc99, Solid-ALL FS			82		(15%-125%)						

**Notes:**

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
  - < Result is less than value reported
  - > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-014F  
Sample ID: 176227016  
Matrix: TS  
Collect Date: 09-NOV-06  
Receive Date: 16-NOV-06  
Collector: Client  
Moisture: 18.6%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.644	+/-0.141	0.0614	+/-0.141	0.132	pCi/g		MJH1	11/21/06	1340	589209	1
Americium-241	U	0.0324	+/-0.093	0.085	+/-0.093	0.176	pCi/g						
Bismuth-212		0.296	+/-0.265	0.117	+/-0.265	0.252	pCi/g						
Bismuth-214		0.522	+/-0.0784	0.0294	+/-0.0784	0.0627	pCi/g						
Cesium-134	U	0.0338	+/-0.0333	0.0213	+/-0.0333	0.0452	pCi/g						
Cesium-137		0.044	+/-0.0233	0.0141	+/-0.0233	0.0305	pCi/g						
Cobalt-60	U	-0.0139	+/-0.0212	0.0165	+/-0.0212	0.0367	pCi/g						
Europium-152	U	-0.00353	+/-0.0503	0.0432	+/-0.0503	0.0909	pCi/g						
Europium-154	U	0.00397	+/-0.064	0.055	+/-0.064	0.120	pCi/g						
Europium-155	U	0.0881	+/-0.0841	0.048	+/-0.0841	0.0995	pCi/g						
Lead-212		0.703	+/-0.058	0.0251	+/-0.058	0.0523	pCi/g						
Lead-214		0.622	+/-0.0776	0.0287	+/-0.0776	0.0606	pCi/g						
Manganese-54	U	0.00396	+/-0.0195	0.0168	+/-0.0195	0.0361	pCi/g						
Niobium-94	U	0.00952	+/-0.0168	0.0152	+/-0.0168	0.0324	pCi/g						
Potassium-40		11.5	+/-0.887	0.145	+/-0.887	0.327	pCi/g						
Radium-226		0.522	+/-0.0784	0.0294	+/-0.0784	0.0627	pCi/g						
Silver-108m	U	0.00318	+/-0.0154	0.0142	+/-0.0154	0.0301	pCi/g						
Thallium-208		0.232	+/-0.0474	0.0155	+/-0.0474	0.033	pCi/g						

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	11/16/06	1050	589083

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3

**Notes:**

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424

Contact: Mr. Jack McCarthy

Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-014F  
Sample ID: 176227016

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtc
-----------	-----------	--------	-------------	----	-----	-----	-------	----	---------	------	------	-------	-----

- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-015F  
Sample ID: 176227017  
Matrix: TS  
Collect Date: 09-NOV-06  
Receive Date: 16-NOV-06  
Collector: Client  
Moisture: 15.4%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid – FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.545	+/-0.111	0.0403	+/-0.111	0.0865	pCi/g		MJH1	11/21/06	1341	589209	1
Americium-241	U	-0.0459	+/-0.089	0.069	+/-0.089	0.143	pCi/g						
Bismuth-212		0.597	+/-0.211	0.0815	+/-0.211	0.175	pCi/g						
Bismuth-214		0.294	+/-0.0574	0.0191	+/-0.0574	0.0408	pCi/g						
Cesium-134	U	0.0195	+/-0.0164	0.0145	+/-0.0164	0.0307	pCi/g						
Cesium-137	U	0.0202	+/-0.0297	0.0131	+/-0.0297	0.0277	pCi/g						
Cobalt-60	U	-0.0036	+/-0.0146	0.0123	+/-0.0146	0.0268	pCi/g						
Europium-152	U	-0.0332	+/-0.0368	0.0316	+/-0.0368	0.0663	pCi/g						
Europium-154	U	0.00178	+/-0.0458	0.0399	+/-0.0458	0.0857	pCi/g						
Europium-155	U	0.0256	+/-0.0426	0.0406	+/-0.0426	0.0842	pCi/g						
Lead-212		0.458	+/-0.0412	0.0197	+/-0.0412	0.041	pCi/g						
Lead-214		0.277	+/-0.0625	0.0237	+/-0.0625	0.0496	pCi/g						
Manganese-54	U	0.00265	+/-0.0159	0.0122	+/-0.0159	0.026	pCi/g						
Niobium-94	U	0.0071	+/-0.0127	0.0116	+/-0.0127	0.0246	pCi/g						
Potassium-40		12.1	+/-0.648	0.106	+/-0.648	0.233	pCi/g						
Radium-226		0.294	+/-0.0574	0.0191	+/-0.0574	0.0408	pCi/g						
Silver-108m	U-0.000366		+/-0.0128	0.0112	+/-0.0128	0.0236	pCi/g						
Thallium-208		0.158	+/-0.0305	0.0111	+/-0.0305	0.0236	pCi/g						

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	11/16/06	1050	589083

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3

**Notes:**

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 – (843) 556-8171 – www.gel.com

## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-015F  
Sample ID: 176227017

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
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- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424

Contact: Mr. Jack McCarthy

Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-016F  
Sample ID: 176227018  
Matrix: TS  
Collect Date: 09-NOV-06  
Receive Date: 16-NOV-06  
Collector: Client  
Moisture: 28.2%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid - FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.496	+/-0.102	0.0426	+/-0.102	0.0908	pCi/g		MJH1	11/21/06	1342	589209	1
Americium-241	U	-0.0788	+/-0.060	0.048	+/-0.060	0.099	pCi/g						
Bismuth-212		0.383	+/-0.185	0.0942	+/-0.185	0.199	pCi/g						
Bismuth-214	UI	0.00	+/-0.0603	0.0485	+/-0.0603	0.0993	pCi/g						
Cesium-134	U	0.0196	+/-0.0165	0.0155	+/-0.0165	0.0326	pCi/g						
Cesium-137		0.190	+/-0.0296	0.0122	+/-0.0296	0.0258	pCi/g						
Cobalt-60	U	0.00815	+/-0.0155	0.0139	+/-0.0155	0.0299	pCi/g						
Europium-152	U	-0.0168	+/-0.0374	0.0318	+/-0.0374	0.0664	pCi/g						
Europium-154	U	0.0442	+/-0.0467	0.0387	+/-0.0467	0.0829	pCi/g						
Europium-155	U	0.0521	+/-0.0709	0.0373	+/-0.0709	0.077	pCi/g						
Lead-212		0.476	+/-0.0405	0.0187	+/-0.0405	0.0387	pCi/g						
Lead-214		0.361	+/-0.055	0.023	+/-0.055	0.0481	pCi/g						
Manganese-54	U	-0.0121	+/-0.0147	0.0121	+/-0.0147	0.0257	pCi/g						
Niobium-94	U	-0.00146	+/-0.015	0.0109	+/-0.015	0.0231	pCi/g						
Potassium-40		11.1	+/-0.600	0.110	+/-0.600	0.241	pCi/g						
Radium-226		0.339	+/-0.0603	0.0255	+/-0.0603	0.0534	pCi/g						
Silver-108m	U	0.00264	+/-0.0127	0.0115	+/-0.0127	0.0241	pCi/g						
Thallium-208		0.141	+/-0.027	0.0116	+/-0.027	0.0245	pCi/g						

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	11/16/06	1050	589083

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3

**Notes:**

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-016F  
Sample ID: 176227018

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
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- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-017F  
Sample ID: 176227019  
Matrix: TS  
Collect Date: 10-NOV-06  
Receive Date: 16-NOV-06  
Collector: Client  
Moisture: 9.55%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.467	+/-0.0907	0.0254	+/-0.0907	0.0534	pCi/g		MJH1	11/21/06	1651	589209	1
Americium-241	U	0.0173	+/-0.0341	0.0292	+/-0.0341	0.0594	pCi/g						
Bismuth-212		0.348	+/-0.111	0.0635	+/-0.111	0.132	pCi/g						
Bismuth-214		0.376	+/-0.0497	0.0148	+/-0.0497	0.0308	pCi/g						
Cesium-134	UI	0.00	+/-0.0112	0.00987	+/-0.0112	0.0205	pCi/g						
Cesium-137		0.0391	+/-0.0141	0.00927	+/-0.0141	0.0192	pCi/g						
Cobalt-60	U	0.0107	+/-0.00953	0.00885	+/-0.00953	0.0187	pCi/g						
Europium-152	U	-0.00383	+/-0.0272	0.0216	+/-0.0272	0.0444	pCi/g						
Europium-154	U	-0.0141	+/-0.0286	0.024	+/-0.0286	0.0506	pCi/g						
Europium-155	U	0.0395	+/-0.0318	0.0249	+/-0.0318	0.0506	pCi/g						
Lead-212		0.426	+/-0.0414	0.0127	+/-0.0414	0.026	pCi/g						
Lead-214		0.450	+/-0.0526	0.0162	+/-0.0526	0.0332	pCi/g						
Manganese-54	U	0.00903	+/-0.0098	0.00788	+/-0.0098	0.0164	pCi/g						
Niobium-94	U	0.00515	+/-0.00873	0.00781	+/-0.00873	0.0162	pCi/g						
Potassium-40		8.83	+/-0.645	0.0655	+/-0.645	0.141	pCi/g						
Radium-226		0.376	+/-0.0497	0.0148	+/-0.0497	0.0308	pCi/g						
Silver-108m	U	-0.00338	+/-0.00814	0.00725	+/-0.00814	0.015	pCi/g						
Thallium-208		0.136	+/-0.0209	0.00871	+/-0.0209	0.018	pCi/g						

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	11/16/06	1050	589083

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3

**Notes:**

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
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Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 22, 2006

Client Sample ID: 9506-0000-017F  
Sample ID: 176227019

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
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- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
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  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
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**QUALITY  
CONTROL  
DATA**

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## QC Summary

Report Date: November 22, 2006

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Client : Connecticut Yankee Atomic Power  
362 Injun Hollow Rd

Contact: East Hampton, Connecticut  
Mr. Jack McCarthy

Workorder: 176227

Parmname	NOM	Sample	Qual	QC	Units	RPD %	REC %	Range	Anlst	Date	Time
<b>Rad Alpha Spec</b>											
Batch	589568										
QC1201231905	176227005 DUP										
Americium-241		U	0.0532	U	-0.0291	pCi/g	683	(0% - 100%)	MXA1	11/19/06	07:32
	Uncert:		+/-0.0844		+/-0.0578						
	TPU:		+/-0.0847		+/-0.058						
Curium-242		U	0.00	U	0.00	pCi/g	0	(0% - 100%)			
	Uncert:		+/-0.0611		+/-0.0604						
	TPU:		+/-0.0611		+/-0.0604						
Curium-243/244		U	-0.00717	U	-0.0142	pCi/g	66	(0% - 100%)			
	Uncert:		+/-0.0141		+/-0.0196						
	TPU:		+/-0.0141		+/-0.0197						
QC1201231907	LCS										
Americium-241	13.3				13.3	pCi/g		100 (75%-125%)			
	Uncert:				+/-1.25						
	TPU:				+/-2.19						
Curium-242				U	0.00	pCi/g					
	Uncert:				+/-0.0607						
	TPU:				+/-0.0607						
Curium-243/244	15.9				16.3	pCi/g		103 (75%-125%)			
	Uncert:				+/-1.39						
	TPU:				+/-2.60						
QC1201231904	MB										
Americium-241				U	0.115	pCi/g					
	Uncert:				+/-0.120						
	TPU:				+/-0.121						
Curium-242				U	-0.0146	pCi/g					
	Uncert:				+/-0.0203						
	TPU:				+/-0.0204						
Curium-243/244				U	0.00	pCi/g					
	Uncert:				+/-0.0592						
	TPU:				+/-0.0592						
QC1201231906	176227005 MS										
Americium-241	13.7	U	0.0532		15.5	pCi/g		113 (75%-125%)			
	Uncert:		+/-0.0844		+/-1.33						
	TPU:		+/-0.0847		+/-2.45						
Curium-242		U	0.00	U	0.031	pCi/g					
	Uncert:		+/-0.0611		+/-0.0608						
	TPU:		+/-0.0611		+/-0.0609						
Curium-243/244	16.5	U	-0.00717		17.6	pCi/g		107 (75%-125%)			
	Uncert:		+/-0.0141		+/-1.42						
	TPU:		+/-0.0141		+/-2.74						
Batch	589569										
QC1201231909	176227005 DUP										
Plutonium-238		U	0.0186	U	-0.0542	pCi/g	409	(0% - 100%)	MXA1	11/19/06	07:32

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## QC Summary

Workorder: 176227

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Rad Alpha Spec</b>											
Batch	589569										
Plutonium-239/240		Uncert:	+/-0.0741								
		TPU:	+/-0.0741								
	U		-0.0243	U	-0.0867	pCi/g	112	(0% - 100%)			
		Uncert:	+/-0.0831		+/-0.0491						
		TPU:	+/-0.0831		+/-0.0498						
QC1201231911	LCS										
Plutonium-238				U	0.143	pCi/g		(75%-125%)			
		Uncert:			+/-0.175						
		TPU:			+/-0.175						
Plutonium-239/240		12.3			11.4	pCi/g		93 (75%-125%)			
		Uncert:			+/-1.24						
		TPU:			+/-1.74						
QC1201231908	MB										
Plutonium-238				U	-0.015	pCi/g					
		Uncert:			+/-0.0208						
		TPU:			+/-0.0208						
Plutonium-239/240				U	0.0712	pCi/g					
		Uncert:			+/-0.109						
		TPU:			+/-0.109						
QC1201231910	176227005	MS									
Plutonium-238		U	0.0186	U	0.0749	pCi/g		(75%-125%)			
		Uncert:	+/-0.0741		+/-0.148						
		TPU:	+/-0.0741		+/-0.148						
Plutonium-239/240		12.7	U	-0.0243	12.8	pCi/g		101 (75%-125%)			
		Uncert:	+/-0.0831		+/-1.26						
		TPU:	+/-0.0831		+/-1.82						
Batch	589570										
QC1201231913	176227005	DUP									
Plutonium-241		U	-0.362	U	3.85	pCi/g	0	(0% - 100%)	MXA1	11/21/06	11:32
		Uncert:	+/-6.41		+/-7.21						
		TPU:	+/-6.41		+/-7.22						
QC1201231915	LCS										
Plutonium-241		143			124	pCi/g		87 (75%-125%)		11/21/06	12:04
		Uncert:			+/-12.5						
		TPU:			+/-17.9						
QC1201231912	MB										
Plutonium-241				U	-1.89	pCi/g				11/21/06	11:16
		Uncert:			+/-7.16						
		TPU:			+/-7.16						
QC1201231914	176227005	MS									
Plutonium-241		143	U	-0.362	129	pCi/g		90 (75%-125%)		11/21/06	11:48
		Uncert:	+/-6.41		+/-11.6						
		TPU:	+/-6.41		+/-17.3						
<b>Rad Gamma Spec</b>											
Batch	589209										
QC1201231040	176227001	DUP									
Actinium-228			0.525		0.561	pCi/g	7	(0% - 100%)	MJH1	11/21/06	16:52
		Uncert:	+/-0.210		+/-0.148						
					+/-0.148						

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## QC Summary

Workorder: 176227

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anist	Date	Time
Rad Gamma Spec											
Batch	589209										
Americium-241		TPU:	+/-0.210								
	U	0.0255	U	-0.00697	pCi/g	351		(0% - 100%)			
		Uncert:	+/-0.105								
		TPU:	+/-0.105								
Bismuth-212		0.496		0.628	pCi/g	23		(0% - 100%)			
		Uncert:	+/-0.274								
		TPU:	+/-0.274								
Bismuth-214		0.329		0.367	pCi/g	11		(0% - 100%)			
		Uncert:	+/-0.0712								
		TPU:	+/-0.0712								
Cesium-134	U	0.0173	UI	0.00	pCi/g	84		(0% - 100%)			
		Uncert:	+/-0.0243								
		TPU:	+/-0.0243								
Cesium-137		0.182		0.175	pCi/g	4		(0% - 100%)			
		Uncert:	+/-0.0473								
		TPU:	+/-0.0473								
Cobalt-60	U	0.000215	U	0.00436	pCi/g	181		(0% - 100%)			
		Uncert:	+/-0.0196								
		TPU:	+/-0.0196								
Europium-152	U	0.0228	U	0.0173	pCi/g	28		(0% - 100%)			
		Uncert:	+/-0.0508								
		TPU:	+/-0.0508								
Europium-154	U	0.0472	U	-0.0264	pCi/g	707		(0% - 100%)			
		Uncert:	+/-0.0668								
		TPU:	+/-0.0668								
Europium-155	U	0.0144	U	-0.0105	pCi/g	1250		(0% - 100%)			
		Uncert:	+/-0.0535								
		TPU:	+/-0.0535								
Lead-212		0.531		0.505	pCi/g	5		(0% - 20%)			
		Uncert:	+/-0.0594								
		TPU:	+/-0.0594								
Lead-214		0.396		0.402	pCi/g	1		(0% - 100%)			
		Uncert:	+/-0.0891								
		TPU:	+/-0.0891								
Manganese-54	U	0.0046	U	0.0146	pCi/g	104		(0% - 100%)			
		Uncert:	+/-0.0213								
		TPU:	+/-0.0213								
Niobium-94	U	8.600E-05	U	0.00643	pCi/g	195		(0% - 100%)			
		Uncert:	+/-0.0187								
		TPU:	+/-0.0187								
Potassium-40		10.9		10.6	pCi/g	3		(0% - 20%)			
		Uncert:	+/-0.895								
		TPU:	+/-0.895								
Radium-226		0.329		0.367	pCi/g	11		(0% - 100%)			
		Uncert:	+/-0.0712								
		TPU:	+/-0.0712								
Silver-108m	U	-0.0144	U	-0.00132	pCi/g	166		(0% - 100%)			
		Uncert:	+/-0.0165								

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## QC Summary

Workorder: 176227

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Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Rad Gamma Spec</b>										
Batch	589209									
Thallium-208	TPU: 0.164	+/-0.0165	+/-0.0131	pCi/g	3		(0% - 100%)			
	Uncert: +/-0.0416		0.169							
	TPU: +/-0.0416		+/-0.0345							
QC1201231041 LCS Actinium-228			U 0.0925	pCi/g					11/22/06	05:55
	Uncert: +/-0.558									
Americium-241	23.4		25.0	pCi/g		107	(75%-125%)			
	TPU: +/-1.47									
Bismuth-212			U 0.905	pCi/g						
	Uncert: +/-0.898									
Bismuth-214			U -0.0608	pCi/g						
	TPU: +/-0.898									
	Uncert: +/-0.208									
Cesium-134			U 0.152	pCi/g						
	TPU: +/-0.182									
Cesium-137	9.53		9.64	pCi/g		101	(75%-125%)			
	TPU: +/-0.468									
	Uncert: +/-0.468									
Cobalt-60	14.1		15.2	pCi/g		108	(75%-125%)			
	TPU: +/-0.655									
	Uncert: +/-0.655									
Europium-152			U -0.378	pCi/g						
	TPU: +/-0.270									
	Uncert: +/-0.270									
Europium-154			U 0.184	pCi/g						
	TPU: +/-0.271									
	Uncert: +/-0.271									
Europium-155			U 0.106	pCi/g						
	TPU: +/-0.262									
	Uncert: +/-0.262									
Lead-212			U -0.0422	pCi/g						
	TPU: +/-0.146									
	Uncert: +/-0.146									
Lead-214			U 0.0574	pCi/g						
	TPU: +/-0.201									
	Uncert: +/-0.201									
Manganese-54			U 0.000745	pCi/g						
	TPU: +/-0.147									
	Uncert: +/-0.147									
Niobium-94			U 0.00757	pCi/g						
	TPU: +/-0.108									
	Uncert: +/-0.108									
Potassium-40			U 0.202	pCi/g						

# GENERAL ENGINEERING LABORATORIES, LLC

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## QC Summary

Workorder: 176227

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Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Rad Gamma Spec</b>										
Batch	589209									
	Uncert:									
	TPU:									
Radium-226		U	-0.0608	pCi/g			(75%-125%)			
	Uncert:		+/-0.208							
	TPU:		+/-0.208							
Silver-108m		U	0.0127	pCi/g						
	Uncert:		+/-0.101							
	TPU:		+/-0.101							
Thallium-208		U	0.0344	pCi/g						
	Uncert:		+/-0.107							
	TPU:		+/-0.107							
QC1201231039	MB									
Actinium-228		UI	0.00	pCi/g					11/21/06	16:51
	Uncert:		+/-0.0444							
	TPU:		+/-0.0444							
Americium-241		U	0.0088	pCi/g						
	Uncert:		+/-0.0249							
	TPU:		+/-0.0249							
Bismuth-212		U	0.0393	pCi/g						
	Uncert:		+/-0.0516							
	TPU:		+/-0.0516							
Bismuth-214		U	0.0131	pCi/g						
	Uncert:		+/-0.0143							
	TPU:		+/-0.0143							
Cesium-134		U	0.00793	pCi/g						
	Uncert:		+/-0.00644							
	TPU:		+/-0.00644							
Cesium-137		U	0.00227	pCi/g						
	Uncert:		+/-0.0094							
	TPU:		+/-0.0094							
Cobalt-60		U	0.00133	pCi/g						
	Uncert:		+/-0.0067							
	TPU:		+/-0.0067							
Europium-152		U	0.0139	pCi/g						
	Uncert:		+/-0.0187							
	TPU:		+/-0.0187							
Europium-154		U	0.0021	pCi/g						
	Uncert:		+/-0.0189							
	TPU:		+/-0.0189							
Europium-155		U	0.0205	pCi/g						
	Uncert:		+/-0.0337							
	TPU:		+/-0.0337							
Lead-212		U	0.0164	pCi/g						
	Uncert:		+/-0.011							
	TPU:		+/-0.011							
Lead-214		U	0.0113	pCi/g						
	Uncert:		+/-0.0134							
	TPU:		+/-0.0134							

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**QC Summary**

Workorder: 176227

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Rad Gamma Spec</b>											
Batch	589209										
Manganese-54				U	-0.00534						
	Uncert:				+/-0.00617						
	TPU:				+/-0.00617						
Niobium-94				U	-0.0015						
	Uncert:				+/-0.00599						
	TPU:				+/-0.00599						
Potassium-40				UI	0.00						
	Uncert:				+/-0.103						
	TPU:				+/-0.103						
Radium-226				U	0.0131						
	Uncert:				+/-0.0143						
	TPU:				+/-0.0143						
Silver-108m				U	0.000137						
	Uncert:				+/-0.00602						
	TPU:				+/-0.00602						
Thallium-208				U	0.00592						
	Uncert:				+/-0.0124						
	TPU:				+/-0.0124						
<b>Rad Gas Flow</b>											
Batch	589170										
QC1201230917	176227005 DUP										
Strontium-90		U	-0.0138	U	-0.00325		0	(0% - 100%)	KSD1	11/20/06	21:36
	Uncert:		+/-0.00986		+/-0.00844						
	TPU:		+/-0.00986		+/-0.00844						
QC1201230919	LCS										
Strontium-90	1.13				1.14			101	(75%-125%)	11/20/06	13:05
	Uncert:				+/-0.122						
	TPU:				+/-0.128						
QC1201230916	MB										
Strontium-90				U	-0.0089					11/20/06	20:47
	Uncert:				+/-0.0081						
	TPU:				+/-0.0081						
QC1201230918	176227005 MS										
Strontium-90	4.34	U	-0.0138		4.12			95	(75%-125%)	11/20/06	13:05
	Uncert:		+/-0.00986		+/-0.479						
	TPU:		+/-0.00986		+/-0.488						
<b>Rad Liquid Scintillation</b>											
Batch	589089										
QC1201230742	176227005 DUP										
Carbon-14		U	-0.117	U	-0.00212		0	(0% - 100%)	AXD2	11/16/06	20:35
	Uncert:		+/-0.114		+/-0.114						
	TPU:		+/-0.114		+/-0.114						
QC1201230744	LCS										
Carbon-14	6.81				6.62			97	(75%-125%)	11/16/06	22:40
	Uncert:				+/-0.205						
	TPU:				+/-0.230						
QC1201230741	MB										
Carbon-14				U	-0.0935					11/16/06	19:32

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## QC Summary

Workorder: 176227

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Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
<b>Rad Liquid Scintillation</b>									
Batch	589089								
			Uncert:						+/-0.110
			TPU:						+/-0.110
QC1201230743	176227005 MS								
Carbon-14		6.91 U	-0.117		6.80	pCi/g	98 (75%-125%)		11/16/06 21:37
			Uncert:		+/-0.114				+/-0.209
			TPU:		+/-0.114				+/-0.234
Batch	589090								
QC1201230746	176227005 DUP								
Tritium		U	1.09 U		1.25	pCi/g	0 (0% - 100%) DFA1		11/21/06 10:22
			Uncert:		+/-1.24				+/-1.30
			TPU:		+/-1.24				+/-1.30
QC1201230748	LCS								
Tritium		10.6			9.83	pCi/g	92 (75%-125%)		11/21/06 10:55
			Uncert:		+/-1.87				+/-1.87
			TPU:		+/-1.88				+/-1.88
QC1201230745	MB								
Tritium				U	1.04	pCi/g			11/21/06 10:06
			Uncert:		+/-1.19				+/-1.19
			TPU:		+/-1.19				+/-1.19
QC1201230747	176227005 MS								
Tritium		10.9 U	1.09		8.26	pCi/g	76 (75%-125%)		11/21/06 10:38
			Uncert:		+/-1.24				+/-1.78
			TPU:		+/-1.24				+/-1.79
Batch	589096								
QC1201230759	176227005 DUP								
Technetium-99			0.599		0.437	pCi/g	31 (0% - 100%) KXR1		11/21/06 13:41
			Uncert:		+/-0.253				+/-0.228
			TPU:		+/-0.253				+/-0.228
QC1201230761	LCS								
Technetium-99		12.7			12.8	pCi/g	101 (75%-125%)		11/21/06 14:14
			Uncert:		+/-0.482				+/-0.563
			TPU:		+/-0.563				+/-0.563
QC1201230758	MB								
Technetium-99				U	0.0526	pCi/g			11/21/06 13:25
			Uncert:		+/-0.197				+/-0.197
			TPU:		+/-0.197				+/-0.197
QC1201230760	176227005 MS								
Technetium-99		12.6	0.599		11.6	pCi/g	87 (75%-125%)		11/21/06 13:58
			Uncert:		+/-0.253				+/-0.493
			TPU:		+/-0.253				+/-0.559
Batch	589223								
QC1201231092	176227005 DUP								
Iron-55		U	6.46 U		-1.65	pCi/g	0 (0% - 100%) MXP1		11/21/06 01:02
			Uncert:		+/-33.1				+/-37.7
			TPU:		+/-33.1				+/-37.7
QC1201231094	LCS								
Iron-55		625			620	pCi/g	99 (75%-125%)		11/21/06 01:35
			Uncert:		+/-51.9				+/-51.9
			TPU:		+/-78.0				+/-78.0

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## QC Summary

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Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Rad Liquid Scintillation</b>										
Batch	589223									
QC1201231091	MB									
Iron-55		U	-17.1	pCi/g					11/21/06	00:46
			Uncert: +/-30.2							
			TPU: +/-30.2							
QC1201231093	176227005 MS									
Iron-55	644	U	6.46	668	pCi/g	104	(75%-125%)		11/21/06	01:19
			Uncert: +/-33.1	+/-58.9						
			TPU: +/-33.1	+/-91.6						
Batch	589224									
QC1201231096	176227005 DUP									
Nickel-63		U	-0.892	U	1.23	0	(0% - 100%) MXP1		11/20/06	21:38
			Uncert: +/-4.43	+/-4.99						
			TPU: +/-4.43	+/-4.99						
QC1201231098	LCS									
Nickel-63	511			456	pCi/g	89	(75%-125%)		11/20/06	23:11
			Uncert: +/-12.4							
			TPU: +/-20.0							
QC1201231095	MB									
Nickel-63		U	-1.52	pCi/g					11/20/06	20:51
			Uncert: +/-4.17							
			TPU: +/-4.17							
QC1201231097	176227005 MS									
Nickel-63	566	U	-0.892	520	pCi/g	92	(75%-125%)		11/20/06	22:24
			Uncert: +/-4.43	+/-13.9						
			TPU: +/-4.43	+/-23.3						

**Notes:**

The Qualifiers in this report are defined as follows:

- \* A quality control analyte recovery is outside of specified acceptance criteria
  - < Result is less than value reported
  - > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy--Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
- RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL.

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## QC Summary

Workorder: 176227

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<u>Parmname</u>	<u>NOM</u>	<u>Sample Qual</u>	<u>QC</u>	<u>Units</u>	<u>RPD%</u>	<u>REC%</u>	<u>Range</u>	<u>Anlst</u>	<u>Date</u>	<u>Time</u>
-----------------	------------	--------------------	-----------	--------------	-------------	-------------	--------------	--------------	-------------	-------------

h Preparation or preservation holding time was exceeded

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.

\*\* Indicates analyte is a surrogate compound.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

# **General Narrative**

**General Narrative  
for  
Connecticut Yankee Atomic Power Co.  
Work Order: 178968  
SDG: MSR#07-0037**

**January 15, 2007**

**Laboratory Identification:**

GEL Laboratories LLC  
2040 Savage Road  
Charleston, South Carolina 29407  
(843) 556-8171

**Summary**

**Sample receipt**

The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on January 12, 2007 for analysis. Shipping container temperatures were checked, documented, and within specifications. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage.

**Sample Identification** The laboratory received the following samples:

<b><u>Laboratory Identification</u></b>	<b><u>Sample Description</u></b>
178968001	9506-0000-018F
178968002	9506-0000-019F
178968003	9506-0000-020F

**Items of Note**

There are no items to note.

**Case Narrative**

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

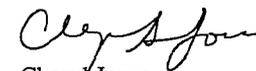
**Analytical Request**

Two soil samples were analyzed for FSSGAM. One soil sample was analyzed for FSSALL.

**Data Package**

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, Data Review Qualifier Definitions, and data from the following fractions: Radiochemistry.

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 hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.



Cheryl Jones  
Project Manager

**List of current GEL Certifications as of 15 January 2007**

<b>State</b>	<b>Certification</b>
Alaska	UST-062
Arizona	AZ0668
Arkansas	88-0651
CLIA	42D0904046
California	01151CA
Colorado	GenEngLabs
Connecticut	PH-0169
Dept. of Navy	NFESC 413
EPA	WG-15J
Florida/NELAP	E87156
Georgia	E87156 (FL/NELAP)
Hawaii	N/A
Idaho	N/A
Illinois	200029
Indiana	C-SC-01
Kansas	E-10332
Kentucky	90129
Louisiana	03046
Maryland	270
Massachusetts	M-SC012
Michigan	9903
Nevada	SC12
New Jersey	SC002
New Mexico	FL NELAP E87156
New York	11501
North Carolina	233
North Carolina Drinking W	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania	68-00485
South Carolina	10120001/10585001/10120002
Tennessee	02934
Texas	TX213-2006A
Texas NELAP	T104704235-06-TX
U.S. Dept. of Agriculture	S-52597
US Army Corps of Engineer	N/A
Utah	8037697376 GEL
Vermont	VT87156
Virginia	00151
Washington	C1641

**Chain of Custody  
and  
Supporting  
Documentation**

**Connecticut Yankee Atomic Power Company**

**Chain of Custody Form**

No. 2007-00015

362 Injun Hollow Road, East Hampton, CT 06424  
860-267-2556

Project Name: Haddam Neck Decommissioning			Media Code	Sample Type Code	Container Size & Type Code	Analyses Requested						Lab Use Only		
Contact Name & Phone: Jack McCarthy 860-267-3924						FSSGAM	FSSALL						Comments:	
Analytical Lab (Name, City, State): General Engineering Laboratories 2040 Savage Road Charleston, SC 29407 ATT: Cheryl Jones (843-556-8171)													178968 /	
Priority: <input type="checkbox"/> 30 D. <input type="checkbox"/> 15 D. <input checked="" type="checkbox"/> 7 D. Other:													Comment, Preservation	Lab Sample ID
Sample Designation	Date	Time												
9506-0000-018F	01-11-07	0950	TS	G	BP	X								
9506-0000-019F	01-11-07	0820	TS	G	BP		X							
9506-0000-020F	01-11-07	0840	TS	G	BP	X								
NOTES: PO #: 002332    MSR #: 07-0037 <input checked="" type="checkbox"/> LTP QA <input type="checkbox"/> Radwaste QA <input type="checkbox"/> Non QA										Samples Shipped Via: <input checked="" type="checkbox"/> Fed Ex <input type="checkbox"/> UPS <input type="checkbox"/> Hand  <input type="checkbox"/> Other		Internal Container Temp.: 16° Deg. C  Custody Sealed? Y <input checked="" type="checkbox"/> N <input type="checkbox"/>  Custody Seal Intact?  Y <input checked="" type="checkbox"/> N <input type="checkbox"/>		
1) Relinquished By <i>[Signature]</i>			Date/Time 1/11/07 1330			2) Received By <i>[Signature]</i>			Date/Time 1/12/07 9:30			7912 0779 2644 Bill of Lading #		
3) Relinquished By			Date/Time			4) Received By			Date/Time					
5) Relinquished By			Date/Time			6) Received By			Date/Time					

Figure 1. Sample Check-in List

Date/Time Received: 9:30 1/12/07

SDG#: MSR # 07-0037

Work Order Number: 178968

Shipping Container ID: 7912 0779 2644 Chain of Custody # 2007-00015

- 1. Custody Seals on shipping container intact? Yes  No
- 2. Custody Seals dated and signed? Yes  No
- 3. Chain-of-Custody record present? Yes  No
- 4. Cooler temperature 16°
- 5. Vermiculite/packing materials is: Wet  Dry
- 6. Number of samples in shipping container: 3
- 7. Sample holding times exceeded? Yes  No

8. Samples have:	
<input checked="" type="checkbox"/> tape	<input type="checkbox"/> hazard labels
<input type="checkbox"/> custody seals	<input type="checkbox"/> appropriate sample labels
9. Samples are:	
<input checked="" type="checkbox"/> in good condition	<input type="checkbox"/> leaking
<input type="checkbox"/> broken	<input type="checkbox"/> have air bubbles

10. Were any anomalies identified in sample receipt? Yes  No

11. Description of anomalies (include sample numbers): \_\_\_\_\_

Sample Custodian/Laboratory: Chause Date: 1/12/07

Telephoned to: \_\_\_\_\_ On \_\_\_\_\_ By \_\_\_\_\_

le

# **Data Review Qualifier Definitions**

## Data Review Qualifier Definitions

Qualifier	Explanation
*	A quality control analyte recovery is outside of specified acceptance criteria
**	Analyte is a surrogate compound
<	Result is less than value reported
>	Result is greater than value reported
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
A	The TIC is a suspected aldol-condensation product
B	Target analyte was detected in the associated blank
B	Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL
BD	Results are either below the MDC or tracer recovery is low
C	Analyte has been confirmed by GC/MS analysis
D	Results are reported from a diluted aliquot of the sample
d	5-day BOD-The 2:1 depletion requirement was not met for this sample
E	Organics-Concentration of the target analyte exceeds the instrument calibration range
E	Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
H	Analytical holding time was exceeded
h	Preparation or preservation holding time was exceeded
J	Value is estimated
N	Metals-The Matrix spike sample recovery is not within specified control limits
N	Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
N/A	Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
ND	Analyte concentration is not detected above the reporting limit
UI	Gamma Spectroscopy-Uncertain identification
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	QC Samples were not spiked with this compound
Z	Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.

# RADIOLOGICAL ANALYSIS

**Radiochemistry Case Narrative  
Connecticut Yankee Atomic Power Co. (YANK)  
Work Order 178968**

**Method/Analysis Information**

**Product:** Alphaspec Am241, Cm, Solid ALL FSS  
**Analytical Method:** DOE EML HASL-300, Am-05-RC Modified  
**Prep Method:** Ash Soil Prep  
**Dry Soil Prep GL-RAD-A-021 Method:** Dry Soil Prep  
**Analytical Batch Number:** 602063  
**Prep Batch Number:** 602056  
**Dry Soil Prep GL-RAD-A-021 Batch Number:** 602055

<b>Sample ID</b>	<b>Client ID</b>
178968002	9506-0000-019F
1201260615	Method Blank (MB)
1201260616	178968002(9506-0000-019F) Sample Duplicate (DUP)
1201260617	178968002(9506-0000-019F) Matrix Spike (MS)
1201260618	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 14.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 178968002 (9506-0000-019F).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Miscellaneous Information:**

**NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Manual Integration**

No manual integrations were performed on data in this batch.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** Alphaspec Pu, Solid-ALL FSS

Analytical Method: DOE EML HASL-300, Pu-11-RC Modified

Prep Method: Ash Soil Prep

Dry Soil Prep GL-RAD-A-021 Method: Dry Soil Prep

Analytical Batch Number: 602064

Prep Batch Number: 602056

Dry Soil Prep GL-RAD-A-021 Batch Number: 602055

<b>Sample ID</b>	<b>Client ID</b>
178968002	9506-0000-019F
1201260619	Method Blank (MB)
1201260620	178968002(9506-0000-019F) Sample Duplicate (DUP)
1201260621	178968002(9506-0000-019F) Matrix Spike (MS)
1201260622	Laboratory Control Sample (LCS)

#### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 14.

#### **Calibration Information:**

##### **Calibration Information**

All initial and continuing calibration requirements have been met.

##### **Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

##### **Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

#### **Quality Control (QC) Information:**

##### **Blank Information**

The blank volume is representative of the sample volume in this batch.

##### **Designated QC**

The following sample was used for QC: 178968002 (9506-0000-019F).

##### **QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Miscellaneous Information:**

**NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Manual Integration**

No manual integrations were performed on data in this batch.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

<b>Product:</b>	<b>Liquid Scint Pu241, Solid-ALL FSS</b>
Analytical Method:	DOE EML HASL-300, Pu-11-RC Modified
Prep Method:	Ash Soil Prep
Dry Soil Prep GL-RAD-A-021 Method:	Dry Soil Prep
Analytical Batch Number:	602065
Prep Batch Number:	602056
Dry Soil Prep GL-RAD-A-021 Batch Number:	602055

<b>Sample ID</b>	<b>Client ID</b>
178968002	9506-0000-019F
1201260623	Method Blank (MB)
1201260624	178968002(9506-0000-019F) Sample Duplicate (DUP)
1201260625	178968002(9506-0000-019F) Matrix Spike (MS)
1201260626	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-035 REV# 8.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 178968002 (9506-0000-019F).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Miscellaneous Information:**

**NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this

SDG.

**Manual Integration**

No manual integrations were performed on data in this batch.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** Gamma,Solid-FSS GAM & ALL FSS 226 Ingrowth Waived  
**Analytical Method:** EML HASL 300, 4.5.2.3  
**Prep Method:** Dry Soil Prep  
**Analytical Batch Number:** 602159  
**Prep Batch Number:** 602055

<b>Sample ID</b>	<b>Client ID</b>
178968001	9506-0000-018F
178968002	9506-0000-019F
178968003	9506-0000-020F
1201260866	Method Blank (MB)
1201260867	178923021(9539-0002-020-I) Sample Duplicate (DUP)
1201260868	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 REV# 13.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 178923021 (9539-0002-020-I).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Miscellaneous Information:**

**NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier information**

Qualifier	Reason	Analyte	Sample
UI	Data rejected due to low abundance.	Americium-241	178968002
		Bismuth-214	1201260866
		Cesium-134	178968002
			178968003
			1201260867
		Lead-212	1201260866
		Potassium-40	1201260866
		Radium-226	1201260866

## Method/Analysis Information

**Product:** GFPC, Sr90, solid-ALL FSS  
**Analytical Method:** EPA 905.0 Modified  
**Prep Method:** Ash Soil Prep  
**Dry Soil Prep GL-RAD-A-021 Method:** Dry Soil Prep  
**Analytical Batch Number:** 603226  
**Prep Batch Number:** 602056  
**Dry Soil Prep GL-RAD-A-021 Batch Number:** 602055

<b>Sample ID</b>	<b>Client ID</b>
178968002	9506-0000-019F
1201263218	Method Blank (MB)
1201263219	178968002(9506-0000-019F) Sample Duplicate (DUP)
1201263220	178968002(9506-0000-019F) Matrix Spike (MS)
1201263221	Laboratory Control Sample (LCS)

### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-004 REV# 10.

### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

#### **Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

### **Quality Control (QC) Information:**

#### **Blank Information**

The blank volume is representative of the sample volume in this batch.

#### **Designated QC**

The following sample was used for QC: 178968002 (9506-0000-019F).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

Sample 178968002 (9506-0000-019F) was reprepared due to high blank activity.

**Chemical Recoveries**

All chemical recoveries meet the required acceptance limits for this sample set.

**Miscellaneous Information:**

**NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Additional Comments**

Sample 178968002 (9506-0000-019F) was verified using the first prep.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

<b>Product:</b>	<b>Liquid Scint Tc99, Solid-ALL FSS</b>
Analytical Method:	DOE EML HASL-300, Tc-02-RC Modified
Analytical Batch Number:	601908

<b>Sample ID</b>	<b>Client ID</b>
178968002	9506-0000-019F
1201260283	Method Blank (MB)
1201260284	178924001(9539-0001-001-F) Sample Duplicate (DUP)
1201260285	178924001(9539-0001-001-F) Matrix Spike (MS)
1201260286	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-005 REV# 13.

**Calibration Information:****Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:****Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 178924001 (9539-0001-001-F).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:****Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Miscellaneous Information:****NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. The following NCR was generated for this SDG:

NCR 400520 was generated due to Container scanning event for custody missed. 1. The analyst did not scan sample 178968002 into the batch prior to analysis, however the sample did remain in their custody at all times. The error has been corrected and the analyst has been instructed on the proper scanning procedures. 1. Reporting results.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** Liquid Scint Fe55, Solid-ALL FSS  
Analytical Method: DOE RESL Fe-1, Modified  
Prep Method: Ash Soil Prep  
Dry Soil Prep GL-RAD-A-021 Method: Dry Soil Prep  
Analytical Batch Number: 602972  
Prep Batch Number: 602056  
Dry Soil Prep GL-RAD-A-021 Batch Number: 602055

<b>Sample ID</b>	<b>Client ID</b>
178968002	9506-0000-019F
1201262579	Method Blank (MB)
1201262580	178924001(9539-0001-001-F) Sample Duplicate (DUP)
1201262581	178924001(9539-0001-001-F) Matrix Spike (MS)
1201262582	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-040 REV# 3.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 178924001 (9539-0001-001-F).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:****Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

Samples were recounted due to low/high recovery. Samples were reprepared due to low/high carrier/tracer yield. Samples were reprepared due to low/high recovery.

**Miscellaneous Information:****NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

<b>Product:</b>	<b>Liquid Scint Ni63, Solid-ALL FSS</b>
Analytical Method:	DOE RESL Ni-1, Modified
Prep Method:	Ash Soil Prep
Dry Soil Prep GL-RAD-A-021 Method:	Dry Soil Prep
Analytical Batch Number:	602983
Prep Batch Number:	602056
Dry Soil Prep GL-RAD-A-021 Batch Number:	602055

<b>Sample ID</b>	<b>Client ID</b>
178968002	9506-0000-019F
1201262609	Method Blank (MB)
1201262610	178968002(9506-0000-019F) Sample Duplicate (DUP)
1201262611	178968002(9506-0000-019F) Matrix Spike (MS)
1201262612	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-022 REV# 8.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 178968002 (9506-0000-019F).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

Samples were re-prepped due to low/high recovery.

**Miscellaneous Information:**

**NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this

SDG.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** LSC, Tritium Dist, Solid - 3 pCi/g

Analytical Method: EPA 906.0 Modified

Analytical Batch Number: 601909

<b>Sample ID</b>	<b>Client ID</b>
178968002	9506-0000-019F
1201260287	Method Blank (MB)
1201260288	178923010(9539-0002-009-F) Sample Duplicate (DUP)
1201260289	178923010(9539-0002-009-F) Matrix Spike (MS)
1201260290	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-002 REV# 13.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 178923010 (9539-0002-009-F).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:****Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

Sample 1201260290 (LCS) was recounted due to analyst transcription error.

**Miscellaneous Information:****NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

<b>Product:</b>	<b>Liquid Scint C14, Solid All,FSS</b>
Analytical Method:	EPA EERF C-01 Modified
Analytical Batch Number:	601910

<b>Sample ID</b>	<b>Client ID</b>
178968002	9506-0000-019F
1201260291	Method Blank (MB)
1201260292	178924001(9539-0001-001-F) Sample Duplicate (DUP)
1201260293	178924001(9539-0001-001-F) Matrix Spike (MS)
1201260294	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in

accordance with GL-RAD-A-003 REV# 8.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 178924001 (9539-0001-001-F).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

Sample 1201260293 (9539-0001-001-F) was recounted due to spectral interference.

**Miscellaneous Information:**

**NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier information**

Manual qualifiers were not required.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

Reviewer/Date:                     *VCmd* 11/19/07

<b>COMPANY - WIDE NONCONFORMANCE REPORT</b>			
<b>Mo.Day Yr.</b> 17-JAN-07	<b>Division:</b> Radiochemistry	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> LSC	<b>Test / Method:</b> DOE EML HASL-300, Tc-02-RC Modified	<b>Matrix Type:</b> Solid	<b>Client Code:</b> YANK
<b>Batch ID:</b> 601908	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG):</b> 178923(MSR#07-0036),178924(MSR#07-0035),178968(MSR#07-0037)			
<b>Application Issues:</b> Container scanning event for custody missed			
<b>Specification and Requirements</b>		<b>NRG Disposition:</b>	
<b>Nonconformance Description:</b>			
1. The analyst did not scan sample 178968002 into the batch prior to analysis, however the sample did remain in their custody at all times. The error has been corrected and the analyst has been instructed on the proper scanning procedures.		1. Reporting results.	

**Originator's Name:**  
 Layota Yom                      17-JAN-07

**Data Validator/Group Leader:**  
 Lesley Anderson                      19-JAN-07

**Quality Review:**

**Director:**

# SAMPLE DATA SUMMARY

## GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

### Certificate of Analysis Report for

YANK001 Connecticut Yankee Atomic Power Co.

Client SDG: MSR#07-0037 GEL Work Order: 178968

**The Qualifiers in this report are defined as follows:**

\* A quality control analyte recovery is outside of specified acceptance criteria

\*\* Analyte is a surrogate compound

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

UI Gamma Spectroscopy--Uncertain identification

ND The analyte concentration is not detected above the detection limit.

The above sample is reported on a dry weight basis except where prohibited by the analytical procedure.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Cheryl Jones.



Reviewed by \_\_\_\_\_

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
 Address : 362 Injun Hollow Rd  
 East Hampton, Connecticut 06424  
 Contact: Mr. Jack McCarthy  
 Project: Soils PO# 002332

Report Date: January 19, 2007

Client Sample ID:	9506-0000-018F	Project:	YANK01204
Sample ID:	178968001	Client ID:	YANK001
Matrix:	TS	Vol. Recv.:	
Collect Date:	11-JAN-07		
Receive Date:	12-JAN-07		
Collector:	Client		
Moisture:	24.3%		

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid - FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.583	+/-0.104	0.0349	+/-0.104	0.0698	pCi/g		MJH1	01/15/07	1725	602159	1
Americium-241	U	0.0146	+/-0.0486	0.0391	+/-0.0486	0.0782	pCi/g						
Bismuth-212		0.249	+/-0.136	0.074	+/-0.136	0.148	pCi/g						
Bismuth-214		0.409	+/-0.0583	0.0165	+/-0.0583	0.033	pCi/g						
Cesium-134	U	0.0223	+/-0.0147	0.0112	+/-0.0147	0.0225	pCi/g						
Cesium-137		0.176	+/-0.0242	0.0111	+/-0.0242	0.0221	pCi/g						
Cobalt-60	U	0.00384	+/-0.0125	0.0108	+/-0.0125	0.0216	pCi/g						
Europium-152	U	-0.0204	+/-0.0387	0.0249	+/-0.0387	0.0499	pCi/g						
Europium-154	U	0.00972	+/-0.039	0.0335	+/-0.039	0.0669	pCi/g						
Europium-155	U	0.00881	+/-0.0354	0.0291	+/-0.0354	0.0581	pCi/g						
Lead-212		0.451	+/-0.0493	0.0155	+/-0.0493	0.0311	pCi/g						
Lead-214		0.444	+/-0.0593	0.0193	+/-0.0593	0.0386	pCi/g						
Manganese-54	U	0.00218	+/-0.0133	0.0101	+/-0.0133	0.0202	pCi/g						
Niobium-94	U	-0.00222	+/-0.0114	0.00951	+/-0.0114	0.019	pCi/g						
Potassium-40		10.3	+/-0.786	0.0921	+/-0.786	0.184	pCi/g						
Radium-226		0.409	+/-0.0583	0.0165	+/-0.0583	0.033	pCi/g						
Silver-108m	U	-0.00131	+/-0.011	0.00927	+/-0.011	0.0185	pCi/g						
Thallium-208		0.175	+/-0.0283	0.00978	+/-0.0283	0.0195	pCi/g						

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	01/12/07	1141	602055

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3

Notes:

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria

# GEL LABORATORIES LLC.

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: January 19, 2007

Client Sample ID: 9506-0000-018F  
Sample ID: 178968001

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
-----------	-----------	--------	-------------	----	-----	-----	-------	----	---------	------	------	-------	-----

- \*\* Analyte is a surrogate compound
  - < Result is less than value reported
  - > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - ND Analyte concentration is not detected above the detection limit
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy--Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
 Address : 362 Injun Hollow Rd  
 East Hampton, Connecticut 06424  
 Contact: Mr. Jack McCarthy  
 Project: Soils PO# 002332

Report Date: January 19, 2007

Client Sample ID: 9506-0000-019F  
 Sample ID: 178968002  
 Matrix: TS  
 Collect Date: 11-JAN-07  
 Receive Date: 12-JAN-07  
 Collector: Client  
 Moisture: 20.9%

Project: YANK01204  
 Client ID: YANK001  
 Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Alpha Spec Analysis</b>													
<i>Alphaspec Am241, Cm, Solid ALL FSS</i>													
Americium-241	U	-0.06	+/-0.0683	0.0564	+/-0.0683	0.198	pCi/g		MXA	01/16/07	0835	602063	1
Curium-242	U	0.0244	+/-0.0648	0.0288	+/-0.0649	0.145	pCi/g						
Curium-243/244	U	-0.0503	+/-0.104	0.109	+/-0.104	0.304	pCi/g						
<i>Alphaspec Pu, Solid-ALL FSS</i>													
Plutonium-238	U	-0.0649	+/-0.0519	0.099	+/-0.0524	0.320	pCi/g		MXA	01/15/07	2224	602064	2
Plutonium-239/240	U	-0.104	+/-0.154	0.171	+/-0.154	0.465	pCi/g						
<i>Liquid Scint Pu241, Solid-ALL FSS</i>													
Plutonium-241	U	-2.76	+/-11.0	9.34	+/-11.0	19.4	pCi/g		MXA	01/16/07	2331	602065	3
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.762	+/-0.154	0.0555	+/-0.154	0.111	pCi/g		MJH1	01/15/07	1726	602159	4
Americium-241	UI	0.00	+/-0.0292	0.020	+/-0.0292	0.0401	pCi/g						
Bismuth-212		0.393	+/-0.212	0.124	+/-0.212	0.248	pCi/g						
Bismuth-214		0.529	+/-0.0871	0.0261	+/-0.0871	0.0522	pCi/g						
Cesium-134	UI	0.00	+/-0.0265	0.0191	+/-0.0265	0.0383	pCi/g						
Cesium-137		0.0612	+/-0.0276	0.0157	+/-0.0276	0.0314	pCi/g						
Cobalt-60	U	0.00383	+/-0.0193	0.0163	+/-0.0193	0.0326	pCi/g						
Europium-152	U	-0.0316	+/-0.0619	0.035	+/-0.0619	0.0699	pCi/g						
Europium-154	U	-0.0628	+/-0.0631	0.0435	+/-0.0631	0.087	pCi/g						
Europium-155	U	0.044	+/-0.0503	0.0319	+/-0.0503	0.0639	pCi/g						
Lead-212		0.818	+/-0.0826	0.0188	+/-0.0826	0.0376	pCi/g						
Lead-214		0.617	+/-0.0846	0.0251	+/-0.0846	0.0502	pCi/g						
Manganese-54	U	0.0119	+/-0.0182	0.0162	+/-0.0182	0.0323	pCi/g						
Niobium-94	U	0.00793	+/-0.0165	0.0146	+/-0.0165	0.0293	pCi/g						
Potassium-40		11.8	+/-0.759	0.132	+/-0.759	0.263	pCi/g						
Radium-226		0.529	+/-0.0871	0.0261	+/-0.0871	0.0522	pCi/g						
Silver-108m	U	0.00402	+/-0.015	0.013	+/-0.015	0.026	pCi/g						
Thallium-208		0.264	+/-0.0436	0.0145	+/-0.0436	0.0289	pCi/g						
<b>Rad Gas Flow Proportional Counting</b>													
<i>GFPC, Sr90, solid-ALL FSS</i>													
Strontium-90		0.056	+/-0.0311	0.0224	+/-0.0312	0.0483	pCi/g		KSD1	01/19/07	0925	603226	5
<b>Rad Liquid Scintillation Analysis</b>													

*< 5% Eff 1/25/07  
(.0009) PCAL*

*< 5% Eff 1/25/07  
(.047) PCAL*

*Total De selects:  
< 10% (.0659) PCAL  
1/25/07*

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 – (843) 556-8171 – www.gel.com

## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: January 19, 2007

Client Sample ID: 9506-0000-019F  
Sample ID: 178968002

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Liquid Scintillation Analysis</b>													
<i>LSC, Tritium Dist, Solid – 3 pCi/g</i>													
Tritium	U	1.11	+/-1.37	1.08	+/-1.37	2.31	pCi/g		MXP1	01/15/07	1603	601909	8
<i>Liquid Scint C14, Solid All FSS</i>													
Carbon-14	U	-0.0662	+/-0.117	0.0991	+/-0.117	0.202	pCi/g		MXP1	01/15/07	1844	601910	9
<i>Liquid Scint Fe55, Solid-ALL FSS</i>													
Iron-55	U	-21.9	+/-26.9	20.3	+/-26.9	43.1	pCi/g		MXP1	01/18/07	0852	602972	10
<i>Liquid Scint Ni63, Solid-ALL FSS</i>													
Nickel-63	U	-10.2	+/-11.1	9.75	+/-11.1	20.4	pCi/g		MXP1	01/18/07	0815	602983	12
<i>Liquid Scint Tc99, Solid-ALL FSS</i>													
Technetium-99	U	0.175	+/-0.172	0.142	+/-0.172	0.288	pCi/g		MXP1	01/17/07	1344	601908	14

↳ < 5% (.018 d.c. GL) 2/19/07

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	01/12/07	1141	602055

**The following Analytical Methods were performed**

Method	Description
1	DOE EML HASL-300, Am-05-RC Modified
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, Pu-11-RC Modified
4	EML HASL 300, 4.5.2.3
5	EPA 905.0 Modified
6	EPA 905.0 Modified
7	EPA 905.0 Modified
8	EPA 906.0 Modified
9	EPA EERF C-01 Modified
10	DOE RESL Fe-1, Modified
11	DOE RESL Fe-1, Modified
12	DOE RESL Ni-1, Modified
13	DOE RESL Ni-1, Modified
14	DOE EML HASL-300, Tc-02-RC Modified
15	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer recovery	Test	Recovery %	Acceptable Limits
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## Certificate of Analysis

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Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: January 19, 2007

Client Sample ID: 9506-0000-019F  
Sample ID: 178968002

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time Batch	Mtd
<b>Surrogate/Tracer recovery</b>	<b>Test</b>				<b>Recovery %</b>		<b>Acceptable Limits</b>					
Carrier/Tracer Recovery		Alphaspec Am241, Cm, Solid ALL			84		(15%–125%)					
Carrier/Tracer Recovery		Alphaspec Am241, Cm, Solid ALL			84							
Plutonium–242		Alphaspec Pu, Solid–ALL FSS			63		(15%–125%)					
Plutonium–241		Liquid Scint Pu241, Solid–ALL FS			35		(25%–125%)					
Carrier/Tracer Recovery		Liquid Scint Pu241, Solid–ALL FS			35		(25%–125%)					
Strontium–90		GFPC, Sr90, solid–ALL FSS			87		(25%–125%)					
Carrier/Tracer Recovery		GFPC, Sr90, solid–ALL FSS			87		(25%–125%)					
Carrier/Tracer Recovery		GFPC, Sr90, solid–ALL FSS			87							
Nickel–63		Liquid Scint Ni63, Solid–ALL FS			66		(25%–125%)					
Carrier/Tracer Recovery		Liquid Scint Ni63, Solid–ALL FS			66		(25%–125%)					
Technetium–99		Liquid Scint Tc99, Solid–ALL FS			80		(15%–125%)					
Carrier/Tracer Recovery		Liquid Scint Tc99, Solid–ALL FS			80		(15%–125%)					

**Notes:**

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
  - \*\* Analyte is a surrogate compound
  - < Result is less than value reported
  - > Result is greater than value reported
  - A The TIC is a suspected aldol–condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - ND Analyte concentration is not detected above the detection limit
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: January 19, 2007

Client Sample ID: 9506-0000-020F  
Sample ID: 178968003  
Matrix: TS  
Collect Date: 11-JAN-07  
Receive Date: 12-JAN-07  
Collector: Client  
Moisture: 12.2%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.766	+/-0.129	0.0321	+/-0.129	0.0673	pCi/g		MJH1	01/15/07	1830	602159	1
Americium-241	U	-0.0225	+/-0.0505	0.0428	+/-0.0505	0.0872	pCi/g						
Bismuth-212		0.399	+/-0.144	0.0679	+/-0.144	0.142	pCi/g						
Bismuth-214		0.477	+/-0.0622	0.0167	+/-0.0622	0.0346	pCi/g						
Cesium-134	UI	0.00	+/-0.0189	0.0119	+/-0.0189	0.0248	pCi/g						
Cesium-137		0.131	+/-0.0274	0.00907	+/-0.0274	0.0189	pCi/g						
Cobalt-60	U	0.00787	+/-0.0113	0.00998	+/-0.0113	0.0211	pCi/g						
Europium-152	U	-0.024	+/-0.0264	0.0231	+/-0.0264	0.0477	pCi/g						
Europium-154	U	-0.00404	+/-0.0348	0.0292	+/-0.0348	0.0615	pCi/g						
Europium-155	U	0.0207	+/-0.0381	0.0274	+/-0.0381	0.0558	pCi/g						
Lead-212		0.695	+/-0.0625	0.0139	+/-0.0625	0.0286	pCi/g						
Lead-214		0.535	+/-0.0705	0.0167	+/-0.0705	0.0344	pCi/g						
Manganese-54	U	-0.00176	+/-0.0104	0.00907	+/-0.0104	0.0189	pCi/g						
Niobium-94	U	0.00918	+/-0.00985	0.00874	+/-0.00985	0.0182	pCi/g						
Potassium-40		11.1	+/-0.894	0.0818	+/-0.894	0.175	pCi/g						
Radium-226		0.477	+/-0.0622	0.0167	+/-0.0622	0.0346	pCi/g						
Silver-108m	U	-0.0036	+/-0.00925	0.0081	+/-0.00925	0.0168	pCi/g						
Thallium-208		0.229	+/-0.0345	0.00831	+/-0.0345	0.0173	pCi/g						

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	01/12/07	1141	602055

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3

Notes:

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- \*\* Analyte is a surrogate compound

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: January 19, 2007

Client Sample ID: 9506-0000-020F  
Sample ID: 178968003

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
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- < Result is less than value reported
  - > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - ND Analyte concentration is not detected above the detection limit
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

# QUALITY CONTROL DATA

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## QC Summary

Report Date: January 19, 2007  
Page 1 of 9

Client : Connecticut Yankee Atomic Power  
362 Injun Hollow Rd

Contact: East Hampton, Connecticut  
Mr. Jack McCarthy

Workorder: 178968

Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Rad Alpha Spec</b>											
Batch	602063										
QC1201260616	178968002 DUP										
Americium-241	U	-0.06	U	0.133	pCi/g	529		(0% - 100%)	MXA1	01/16/07	08:35
		Uncert: +/-0.0683		+/-0.156							
		TPU: +/-0.0683		+/-0.157							
Curium-242	U	0.0244	U	0.046	pCi/g	61		(0% - 100%)			
		Uncert: +/-0.0648		+/-0.130							
		TPU: +/-0.0649		+/-0.130							
Curium-243/244	U	-0.0503	U	-0.229	pCi/g	128		(0% - 100%)			
		Uncert: +/-0.104		+/-0.128							
		TPU: +/-0.104		+/-0.130							
QC1201260618	LCS										
Americium-241		13.5		13.8	pCi/g		102	(75%-125%)			
		Uncert: +/-1.29		+/-2.10							
		TPU: +/-2.10		+/-0.139							
Curium-242	U	-0.0139	U	-0.072	pCi/g						
		Uncert: +/-0.072		+/-0.072							
		TPU: +/-0.072		16.6							
Curium-243/244		16.2		16.6	pCi/g		102	(75%-125%)			
		Uncert: +/-1.42		+/-2.44							
		TPU: +/-2.44		-0.0186							
QC1201260615	MB										
Americium-241			U	-0.0186	pCi/g						
		Uncert: +/-0.0961		+/-0.0961							
		TPU: +/-0.0961		-0.0146							
Curium-242	U	-0.0146	U	-0.0631	pCi/g						
		Uncert: +/-0.0631		+/-0.0632							
		TPU: +/-0.0632		-0.0229							
Curium-243/244	U	-0.0229	U	-0.149	pCi/g						
		Uncert: +/-0.149		+/-0.149							
		TPU: +/-0.149		-0.06							
QC1201260617	178968002 MS										
Americium-241	U	-0.06	U	12.3	pCi/g		91	(75%-125%)			
		Uncert: +/-0.0683		+/-1.23							
		TPU: +/-0.0683		+/-1.93							
Curium-242	U	0.0244	U	0.00908	pCi/g						
		Uncert: +/-0.0648		+/-0.0688							
		TPU: +/-0.0649		+/-0.0688							
Curium-243/244	U	-0.0503	U	17.4	pCi/g		107	(75%-125%)			
		Uncert: +/-0.104		+/-1.46							
		TPU: +/-0.104		+/-2.56							
Batch	602064										
QC1201260620	178968002 DUP										
Plutonium-238	U	-0.0649	U	-0.0718	pCi/g	10		(0% - 100%)	MXA1	01/15/07	22:24

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## QC Summary

Workorder: 178968

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Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Rad Alpha Spec</b>										
Batch	602064									
Plutonium-239/240										
	Uncert:	+/-0.0519	+/-0.0629							
	TPU:	+/-0.0524	+/-0.0636							
	U	-0.104	U	0.287	pCi/g	427	(0% - 100%)			
	Uncert:	+/-0.154	+/-0.294							
	TPU:	+/-0.154	+/-0.296							
QC1201260622 LCS										
Plutonium-238										
	Uncert:		+/-0.143							
	TPU:		+/-0.143							
Plutonium-239/240	12.5		12.0		pCi/g	96	(75%-125%)			
	Uncert:		+/-1.27							
	TPU:		+/-1.79							
QC1201260619 MB										
Plutonium-238										
	Uncert:		+/-0.117							
	TPU:		+/-0.117							
Plutonium-239/240										
	Uncert:		+/-0.0302							
	TPU:		+/-0.0304							
QC1201260621 178968002 MS										
Plutonium-238	U	-0.0649	U	0.104	pCi/g		(75%-125%)			
	Uncert:	+/-0.0519	+/-0.180							
	TPU:	+/-0.0524	+/-0.180							
Plutonium-239/240	12.5	U	-0.104	12.2	pCi/g	98	(75%-125%)			
	Uncert:	+/-0.154	+/-1.57							
	TPU:	+/-0.154	+/-2.15							
Batch	602065									
QC1201260624 178968002 DUP										
Plutonium-241	U	-2.76	U	1.82	pCi/g	0	(0% - 100%)	MXA1	01/17/07	01:05
	Uncert:	+/-11.0	+/-9.11							
	TPU:	+/-11.0	+/-9.11							
QC1201260626 LCS										
Plutonium-241										
		141		115	pCi/g	81	(75%-125%)		01/17/07	02:39
	Uncert:		+/-7.45							
	TPU:		+/-13.6							
QC1201260623 MB										
Plutonium-241										
	Uncert:		+/-4.93							
	TPU:		+/-4.93							
QC1201260625 178968002 MS										
Plutonium-241	142	U	-2.76	110	pCi/g	78	(75%-125%)		01/17/07	01:52
	Uncert:	+/-11.0	+/-18.0							
	TPU:	+/-11.0	+/-25.0							
<b>Rad Gamma Spec</b>										
Batch	602159									
QC1201260867 178923021 DUP										
Actinium-228										
		0.470		0.412	pCi/g	13	(0% - 100%)	MJH1	01/15/07	18:31
	Uncert:	+/-0.112	+/-0.104							
			+/-0.104							

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## QC Summary

Workorder: 178968

Page 3 of 9

Parname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Rad Gamma Spec</b>										
Batch	602159									
Americium-241		TPU: +/-0.112								
	U	-1.790E-05	U	-0.00479	pCi/g	199	(0% - 100%)			
		Uncert: +/-0.0485		+/-0.0184						
Bismuth-212		TPU: +/-0.0485		+/-0.0184						
		0.270		0.392	pCi/g	37	(0% - 100%)			
		Uncert: +/-0.141		+/-0.254						
Bismuth-214		TPU: +/-0.141		+/-0.254						
		0.324		0.330	pCi/g	2	(0% - 100%)			
		Uncert: +/-0.0574		+/-0.0623						
Cesium-134		TPU: +/-0.0574		+/-0.0623						
	UI	0.00	UI	0.00	pCi/g	42	(0% - 100%)			
		Uncert: +/-0.0199		+/-0.0157						
Cesium-137		TPU: +/-0.0199		+/-0.0157						
	U	0.0185	U	0.00344	pCi/g	137	(0% - 100%)			
		Uncert: +/-0.0166		+/-0.0146						
Cobalt-60		TPU: +/-0.0166		+/-0.0146						
	U	0.000568	U	0.00334	pCi/g	142	(0% - 100%)			
		Uncert: +/-0.0102		+/-0.0153						
		TPU: +/-0.0102		+/-0.0153						
Europium-152		U	U	-0.0217	pCi/g	79	(0% - 100%)			
		Uncert: +/-0.0256		+/-0.0346						
		TPU: +/-0.0256		+/-0.0346						
Europium-154		U	U	-0.0145	pCi/g	3690	(0% - 100%)			
		Uncert: +/-0.0306		+/-0.0467						
		TPU: +/-0.0306		+/-0.0467						
Europium-155		U	U	0.00826	pCi/g	121	(0% - 100%)			
		Uncert: +/-0.0281		+/-0.0296						
		TPU: +/-0.0281		+/-0.0296						
Lead-212		0.465		0.425	pCi/g	9	(0% - 100%)			
		Uncert: +/-0.0462		+/-0.0349						
		TPU: +/-0.0462		+/-0.0349						
Lead-214		0.359		0.305	pCi/g	16	(0% - 100%)			
		Uncert: +/-0.0537		+/-0.0455						
		TPU: +/-0.0537		+/-0.0455						
Manganese-54		U	U	0.00257	pCi/g	63	(0% - 100%)			
		Uncert: +/-0.0118		+/-0.0148						
		TPU: +/-0.0118		+/-0.0148						
Niobium-94		U	U	0.00442	pCi/g	149	(0% - 100%)			
		Uncert: +/-0.0103		+/-0.0134						
		TPU: +/-0.0103		+/-0.0134						
Potassium-40		7.08		7.71	pCi/g	9	(0% - 20%)			
		Uncert: +/-0.627		+/-0.486						
		TPU: +/-0.627		+/-0.486						
Radium-226		0.324		0.330	pCi/g	2	(0% - 100%)			
		Uncert: +/-0.0574		+/-0.0623						
		TPU: +/-0.0574		+/-0.0623						
Silver-108m		U	U	0.000361	pCi/g	242	(0% - 100%)			
		Uncert: +/-0.00875		+/-0.0115						

# GEL LABORATORIES LLC

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## QC Summary

Workorder: 178968

Page 4 of 9

Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec									
Batch	602159								
Thallium-208	TPU:	+/-0.00875	+/-0.0115						
		0.154	0.144	pCi/g	7		(0% - 100%)		
	Uncert:	+/-0.0276	+/-0.0329						
	TPU:	+/-0.0276	+/-0.0329						
QC1201260868	LCS								
Actinium-228			U	0.126	pCi/g				01/15/07 18:31
	Uncert:			+/-0.177					
	TPU:			+/-0.177					
Americium-241	23.4			24.7	pCi/g	106	(75%-125%)		
	Uncert:			+/-0.203					
	TPU:			+/-0.203					
Bismuth-212			U	-0.12	pCi/g				
	Uncert:			+/-0.296					
	TPU:			+/-0.296					
Bismuth-214			U	0.00592	pCi/g				
	Uncert:			+/-0.066					
	TPU:			+/-0.066					
Cesium-134			U	0.0198	pCi/g				
	Uncert:			+/-0.045					
	TPU:			+/-0.045					
Cesium-137	9.50			10.2	pCi/g	108	(75%-125%)		
	Uncert:			+/-0.160					
	TPU:			+/-0.160					
Cobalt-60	13.8			14.6	pCi/g	106	(75%-125%)		
	Uncert:			+/-0.218					
	TPU:			+/-0.218					
Europium-152			U	-0.0332	pCi/g				
	Uncert:			+/-0.0834					
	TPU:			+/-0.0834					
Europium-154			U	-0.00106	pCi/g				
	Uncert:			+/-0.0791					
	TPU:			+/-0.0791					
Europium-155			U	0.00685	pCi/g				
	Uncert:			+/-0.0603					
	TPU:			+/-0.0603					
Lead-212			U	0.00459	pCi/g				
	Uncert:			+/-0.0482					
	TPU:			+/-0.0482					
Lead-214			U	0.0952	pCi/g				
	Uncert:			+/-0.0608					
	TPU:			+/-0.0608					
Manganese-54			U	-0.0315	pCi/g				
	Uncert:			+/-0.0432					
	TPU:			+/-0.0432					
Niobium-94			U	-0.00549	pCi/g				
	Uncert:			+/-0.0342					
	TPU:			+/-0.0342					
Potassium-40			U	0.0853	pCi/g				

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## QC Summary

Workorder: 178968

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Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec										
Batch	602159									
Radium-226		U	0.00592	pCi/g			(75%-125%)			
	Uncert:		+/-0.475							
	TPU:		+/-0.475							
Silver-108m		U	0.0179	pCi/g						
	Uncert:		+/-0.066							
	TPU:		+/-0.066							
Thallium-208		U	0.0314	pCi/g						
	Uncert:		+/-0.0323							
	TPU:		+/-0.0323							
QC1201260866 MB										
Actinium-228		U	0.025	pCi/g					01/15/07	18:30
	Uncert:		+/-0.0286							
	TPU:		+/-0.0286							
Americium-241		U	-0.102	pCi/g						
	Uncert:		+/-0.0344							
	TPU:		+/-0.0344							
Bismuth-212		U	0.0447	pCi/g						
	Uncert:		+/-0.0589							
	TPU:		+/-0.0589							
Bismuth-214		UI	0.00	pCi/g						
	Uncert:		+/-0.0176							
	TPU:		+/-0.0176							
Cesium-134		U	0.00274	pCi/g						
	Uncert:		+/-0.00793							
	TPU:		+/-0.00793							
Cesium-137		U	0.00225	pCi/g						
	Uncert:		+/-0.00842							
	TPU:		+/-0.00842							
Cobalt-60		U	-0.00244	pCi/g						
	Uncert:		+/-0.00918							
	TPU:		+/-0.00918							
Europium-152		U	0.00949	pCi/g						
	Uncert:		+/-0.0225							
	TPU:		+/-0.0225							
Europium-154		U	-0.00214	pCi/g						
	Uncert:		+/-0.0215							
	TPU:		+/-0.0215							
Europium-155		U	-0.0128	pCi/g						
	Uncert:		+/-0.0199							
	TPU:		+/-0.0199							
Lead-212		UI	0.00	pCi/g						
	Uncert:		+/-0.013							
	TPU:		+/-0.013							
Lead-214		U	0.000666	pCi/g						
	Uncert:		+/-0.0262							
	TPU:		+/-0.0262							

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## QC Summary

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Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Rad Gamma Spec</b>										
Batch	602159									
Manganese-54			U	0.00102	pCi/g					
	Uncert:			+/-0.00755						
	TPU:			+/-0.00755						
Niobium-94			U	0.00487	pCi/g					
	Uncert:			+/-0.00745						
	TPU:			+/-0.00745						
Potassium-40			UI	0.00	pCi/g					
	Uncert:			+/-0.0986						
	TPU:			+/-0.0986						
Radium-226			UI	0.00	pCi/g					
	Uncert:			+/-0.0176						
	TPU:			+/-0.0176						
Silver-108m			U	-0.0072	pCi/g					
	Uncert:			+/-0.00721						
	TPU:			+/-0.00721						
Thallium-208			U	0.00917	pCi/g					
	Uncert:			+/-0.0149						
	TPU:			+/-0.0149						
<b>Rad Gas Flow</b>										
Batch	603226									
QC1201263219	178968002 DUP									
Strontium-90		0.056	U	0.0192	pCi/g	98	(0% - 100%)	KSD1	01/19/07	09:25
	Uncert:	+/-0.0311		+/-0.0281						
	TPU:	+/-0.0312		+/-0.0281						
QC1201263221	LCS									
Strontium-90	1.81			1.97	pCi/g	109	(75%-125%)		01/19/07	09:38
	Uncert:			+/-0.134						
	TPU:			+/-0.153						
QC1201263218	MB									
Strontium-90			U	-0.0156	pCi/g				01/19/07	09:25
	Uncert:			+/-0.0264						
	TPU:			+/-0.0264						
QC1201263220	178968002 MS									
Strontium-90	5.43	0.056		4.70	pCi/g	86	(75%-125%)			
	Uncert:	+/-0.0311		+/-0.269						
	TPU:	+/-0.0312		+/-0.387						
<b>Rad Liquid Scintillation</b>										
Batch	601908									
QC1201260284	178924001 DUP									
Technetium-99		0.387	U	0.311	pCi/g	22	(0% - 100%)	MXP1	01/17/07	15:18
	Uncert:	+/-0.187		+/-0.193						
	TPU:	+/-0.188		+/-0.193						
QC1201260286	LCS									
Technetium-99	14.3			14.0	pCi/g	98	(75%-125%)		01/17/07	16:52
	Uncert:			+/-0.331						
	TPU:			+/-0.470						
QC1201260283	MB									
Technetium-99			U	-0.00407	pCi/g				01/17/07	14:31

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## QC Summary

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Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Rad Liquid Scintillation</b>										
Batch	601908									
QC1201260285	178924001	MS								
Technetium-99	14.8	0.387	14.8	pCi/g		97	(75%-125%)		01/17/07	16:05
	Uncert:		+/-0.154							
	TPU:		+/-0.154							
Batch	601909									
QC1201260288	178923010	DUP								
Tritium	U	0.425	U	1.18	pCi/g	0	(0% - 100%)	MXP1	01/15/07	17:06
	Uncert:	+/-1.30		+/-1.38						
	TPU:	+/-1.30		+/-1.38						
QC1201260290	LCS									
Tritium	8.17		6.75	pCi/g		83	(75%-125%)		01/15/07	18:10
	Uncert:		+/-1.04							
	TPU:		+/-1.05							
QC1201260287	MB									
Tritium			U	0.265	pCi/g				01/15/07	16:35
	Uncert:			+/-0.647						
	TPU:			+/-0.647						
QC1201260289	178923010	MS								
Tritium	8.31	U	0.425	7.56	pCi/g	91	(75%-125%)		01/15/07	17:38
	Uncert:	+/-1.30		+/-1.81						
	TPU:	+/-1.30		+/-1.81						
Batch	601910									
QC1201260292	178924001	DUP								
Carbon-14	U	-0.00673	U	-0.0176	pCi/g	0	(0% - 100%)	MXP1	01/15/07	20:52
	Uncert:	+/-0.119		+/-0.116						
	TPU:	+/-0.119		+/-0.116						
QC1201260294	LCS									
Carbon-14	7.16		7.18	pCi/g		100	(75%-125%)		01/15/07	23:00
	Uncert:		+/-0.216							
	TPU:		+/-0.243							
QC1201260291	MB									
Carbon-14			U	-0.0566	pCi/g				01/15/07	19:48
	Uncert:			+/-0.115						
	TPU:			+/-0.115						
QC1201260293	178924001	MS								
Carbon-14	15.8	U	-0.00673	14.9	pCi/g	94	(75%-125%)		01/16/07	08:43
	Uncert:	+/-0.119		+/-0.928						
	TPU:	+/-0.119		+/-0.957						
Batch	602972									
QC1201262580	178924001	DUP								
Iron-55	U	-17.2	U	-26.7	pCi/g	0	(0% - 100%)	MXP1	01/18/07	09:26
	Uncert:	+/-28.4		+/-23.0						
	TPU:	+/-28.4		+/-23.0						
QC1201262582	LCS									
Iron-55	799		795	pCi/g		100	(75%-125%)		01/18/07	09:59
	Uncert:		+/-66.3							
	TPU:		+/-87.8							

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## QC Summary

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Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
<b>Rad Liquid Scintillation</b>									
Batch 602972									
QC1201262579	MB								
Iron-55		U	31.7	pCi/g					01/18/07 09:09
			Uncert: +/-37.6						
			TPU: +/-37.7						
QC1201262581	178924001 MS								
Iron-55		624 U	-17.2	546	pCi/g	87	(75%-125%)		01/18/07 09:42
			Uncert: +/-28.4	+/-48.4					
			TPU: +/-28.4	+/-63.7					
Batch 602983									
QC1201262610	178968002 DUP								
Nickel-63		U	-10.2	U	-7.47	pCi/g	0	(0% - 100%) MXP1	01/18/07 10:59
			Uncert: +/-11.1	+/-8.38					
			TPU: +/-11.1	+/-8.38					
QC1201262612	LCS								
Nickel-63		518		468	pCi/g	90	(75%-125%)		01/18/07 09:04
			Uncert: +/-22.2						
			TPU: +/-27.5						
QC1201262609	MB								
Nickel-63		U	-4.74	pCi/g					01/18/07 08:31
			Uncert: +/-10.8						
			TPU: +/-10.8						
QC1201262611	178968002 MS								
Nickel-63		585 U	-10.2	566	pCi/g	97	(75%-125%)		01/18/07 08:48
			Uncert: +/-11.1	+/-28.7					
			TPU: +/-11.1	+/-35.4					

**Notes:**

The Qualifiers in this report are defined as follows:

- \* A quality control analyte recovery is outside of specified acceptance criteria
- \*\* Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B Target analyte was detected in the associated blank
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- H Analytical holding time was exceeded
- J Value is estimated
- N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
- ND Analyte concentration is not detected above the detection limit
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification  
Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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## QC Summary

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Paramname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
X										
Y										
^										
h										

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.

\*\* Indicates analyte is a surrogate compound.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

NORTH SITE GROUNDS (NON-PROTECTED AREA)/EOF  
SURVEY UNIT 9506-0000

RELEASE RECORD

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**ATTACHMENT 4 (DQA RESULTS)**

NORTH SITE GROUNDS (NON-PROTECTED AREA)/EOF  
SURVEY UNIT 9506-0000

RELEASE RECORD

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**ATTACHMENT 4A  
(PRELIMINARY DATA REVIEW)**

### Preliminary Data Review Form - Samples for the Sign Test

Survey Unit: 9506- 0000  
 Survey Unit Name: North Site Grounds (Non-protected Area)/EOF

Classification: 3  
 Survey Media: Soil  
 Type of Survey: Final Status Survey  
 Type of Measurement: Radionuclide Specific  
 Number of Measurements: 15  
 Operational DCGL (pCi/g) 6.01E+00

#### BASIC STATISTICAL QUANTITIES

Cs-137

Minimum Value: -2.11E-02  
 Maximum Value: 2.52E-01  
 Mean: 7.99E-02  
 Median: 5.52E-02  
 Standard Deviation: 7.11E-02

#### RADIONUCLIDE CONCENTRATION (pCi/g)

NUMBER	Cs-137	Identified?
9506-0000-001F	1.820E-02	Y
9506-0000-002F	8.150E-02	N
9506-0000-005F	1.630E-01	Y
9506-0000-006F	5.090E-02	Y
9506-0000-007F	4.720E-02	Y
9506-0000-008F	5.520E-02	Y
9506-0000-009F	6.370E-02	Y
9506-0000-010F	4.980E-02	Y
9506-0000-011F	-2.110E-02	N
9506-0000-012F	2.53E-02	N
9506-0000-013F	2.520E-01	Y
9506-0000-014F	4.400E-02	Y
9506-0000-018F	1.760E-01	Y
9506-0000-019F	6.120E-02	Y
9506-0000-020F	1.310E-01	Y

Performed By: MAJ

Date: 2/6/07

Independent Review: R. Massie

Date: 2/12/07

NORTH SITE GROUNDS (NON-PROTECTED AREA)/EOF  
SURVEY UNIT 9506-0000

RELEASE RECORD

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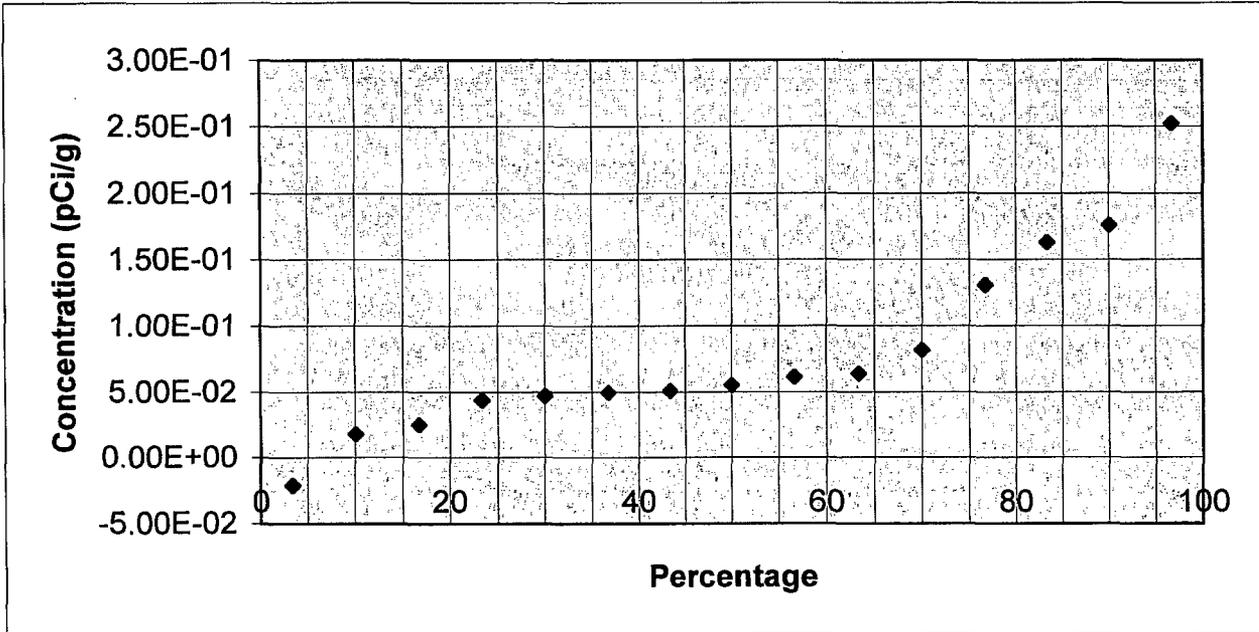
**ATTACHMENT 4B  
(GRAPHICAL REPRESENTATION OF  
DATA)**

**Quantile Plot For Cesium - 137**

Survey Unit: 9506-0000

Survey Unit Name: North Site Grounds (Non-protected Area)/EOF

Mean: 7.99E-02 pCi/g



Cs-137	Rank	Percentage
-2.11E-02	1	3 %
1.82E-02	2	10 %
2.53E-02	3	17 %
4.40E-02	4	23 %
4.72E-02	5	30 %
4.98E-02	6	37 %
5.09E-02	7	43 %
5.52E-02	8	50 %
6.12E-02	9	57 %
6.37E-02	10	63 %
8.15E-02	11	70 %
1.31E-01	12	77 %
1.63E-01	13	83 %
1.76E-01	14	90 %
2.52E-01	15	97 %

Prepared By: WHA

Date: 2/1/07

Reviewed By: R. Massari

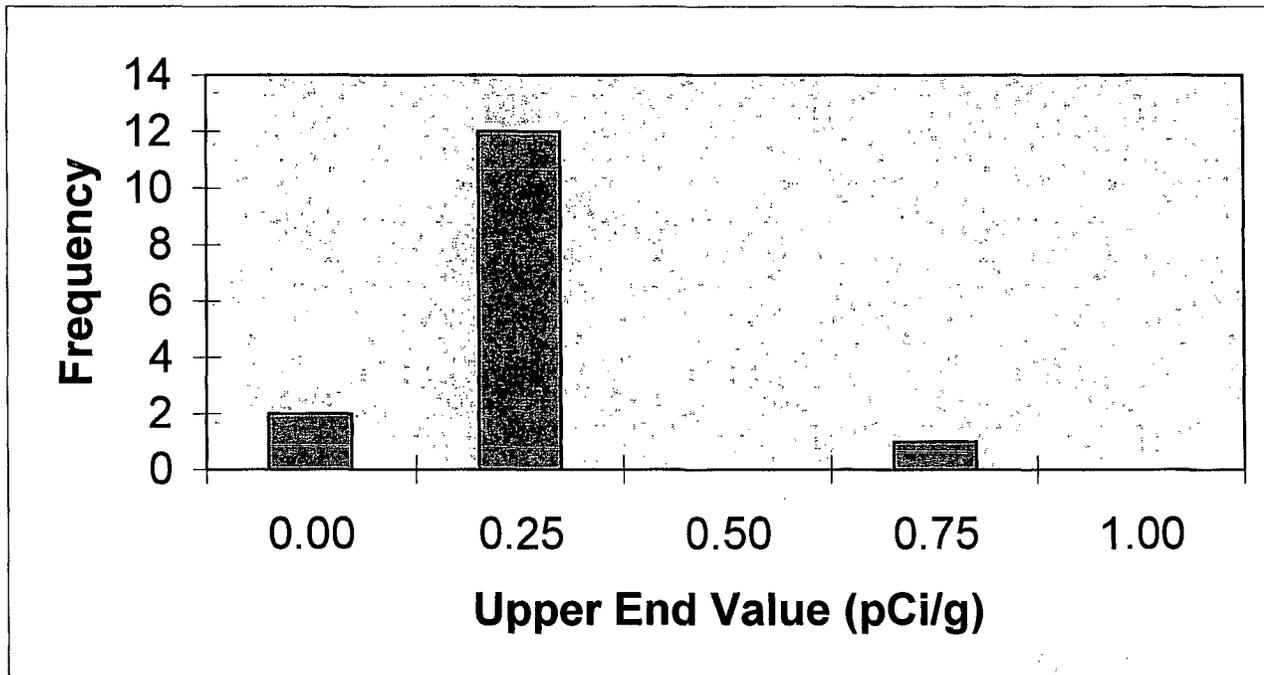
Date: 2/12/07

**Frequency Plot For Cs - 137**

Survey Unit: 9506-0000

Survey Unit Name: North Site Grounds (Non-protected Area)/EOF

Mean: 0.080 pCi/g



Upper End Value	Observation Frequency	Observation % Frequency
0.00	2	13%
0.25	12	80%
0.50	0	0%
0.75	1	7%
1.00	0	0%
<b>Total</b>	<b>15</b>	<b>100%</b>

Prepared By: *att/kl*

Date: 2-6-07

Reviewed By: *Robert Massengill*

Date: 2-6-07

NORTH SITE GROUNDS (NON-PROTECTED AREA)/EOF  
SURVEY UNIT 9506-0000

RELEASE RECORD

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**ATTACHMENT 4C (SIGN TEST)**

**Sign Test Calculation Sheet for Single Radionuclide**

Survey Area Number: 9506		Survey Unit Number: 0000		WPIR #: 2006-0038	
Survey Area Name: North Site Grounds (Non-protected Area)/EOF		Classification: 3		TYPE I ( $\alpha$ error): 0.05 N: 15	
Radionuclides:		1 <sup>st</sup> Radionuclide Cs-137			
DCGL:		6.01E+00			
Results 1 <sup>st</sup> Radionuclide (pCi/g)		DCGL- Results	Weighted Sum ( $W_s$ )	1- $W_s$	Sign
1.82E-02		5.99E+00	0.00	1.00	+1
8.15E-02		5.93E+00	0.01	0.99	+1
1.63E-01		5.84E+00	0.03	0.97	+1
5.09E-02		5.64E+00	0.01	0.99	+1
4.72E-02		5.96E+00	0.01	0.99	+1
5.52E-02		5.95E+00	0.01	0.99	+1
6.37E-02		5.94E+00	0.01	0.99	+1
4.98E-02		5.96E+00	0.01	0.99	+1
-2.11E-02		6.01E+00	0.00	1.00	+1
2.53E-02		5.98E+00	0.00	1.00	+1
2.52E-01		5.75E+00	0.04	0.96	+1
4.40E-02		5.96E+00	0.01	0.99	+1
1.76E-01		5.83E+00	0.03	0.97	+1
6.12E-02		5.94E+00	0.01	0.99	+1
1.31E-01		5.87E+00	0.02	0.98	+1
Number of positive differences (S+)					15

Critical Value 11

Survey Unit Meets the Acceptance Criteria

Performed by: Arthur Hammond 

Date: 2/12/2007

Independent Review by: 

Date: 2/12/2007

NORTH SITE GROUNDS (NON-PROTECTED AREA)/EOF  
SURVEY UNIT 9506-0000

RELEASE RECORD

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**ATTACHMENT 4D  
(QC SPLIT RESULTS)**

### Split Sample Assessment Form

Survey Area #: 9506	Survey Unit #: 0000	Survey Unit Name: North Site Grounds (Non-protected Area)/EOF						
Sample Plan or WPIR#: 2006-038		SML #: 9506-0000-002FS						
Sample Description: Comparison of split samples collected from sample measurement location #2 and analyzed using gamma spectroscopy by an off-site vendor laboratory. The standard sample was <u>9506-0000-002F</u> the comparison sample was <u>9506-0000-002FS</u> .								
STANDARD				COMPARISON				
Radionuclide	Activity Value	Standard Error	Resolution	Agreement Range	Activity Value	Standard Error	Comparison Ratio	Acceptable (Y/N)
Cs-137	8.15E-02	2.82E-02	3	NONE -	9.41E-02	2.76E-02	1.15	NA
K-40	9.65E+00	6.50E-01	15	0.6 - 1.66	1.07E+01	6.35E-01	1.11	Y
Comments/Corrective Actions: In consideration of Cs-137 results, guidance for agreement ranges, obtained from USNRC Inspection Procedure 84750, does not address resolution ratios less than 4, therefore, a determination of acceptability for such ratios cannot be made. The agreement level for K-40 was found to be acceptable, no further actions are warranted.					Table is provided to show acceptance criteria used to assess split samples.			
					Resolution		Agreement Range	
					4	7	0.50	2.00
					8	15	0.60	1.66
					16	50	0.75	1.33
					51	200	0.80	1.25
					> 200		0.85	1.18
Performed By: <i>Detle 2/11</i>		Date: <i>2/16/07</i>		Reviewed By: <i>Robert Massengill</i>		Date: <i>02-06-2007</i>		

WPIR – Work Plan and Inspection Record  
SML – Sample Measurement Location designation

**Split Sample Assessment Form**

Survey Area#:	9506	Survey Unit #:	0000	Survey Unit Name:	North Site Grounds (Non-protected Area)/EOF				
Sample Plan or WPIR#:					2006-0038				
					SML #: 9506-0000-008FS				
Sample Description: Comparison of split samples collected from sample measurement location #8 and analyzed using gamma spectroscopy by an off-site vendor laboratory. The standard sample was <u>9506-0000-008F</u> , the comparison sample was <u>9506-0000-008FS</u> .									
STANDARD					COMPARISON				
Radionuclide	Activity Value	Standard Error	Resolution	Agreement Range	Activity Value	Standard Error	Comparison Ratio	Acceptable (Y/N)	
Cs-137	5.52E-02	1.10E-02	5	0.5 2	8.91E-02	1.70E-02	1.61	Y	
Comments/Corrective Actions: The agreement level for Cs-137 was found to be acceptable, no further actions are warranted.					Table is provided to show acceptance criteria used to assess split samples.				
					Resolution		Agreement Range		
					4	7	0.50	2.00	
		8	15	0.60	1.66				
		16	50	0.75	1.33				
		51	200	0.80	1.25				
		> 200		0.85	1.18				
Performed By:				Date:		Reviewed By:			Date:
<i>ate/dl</i>				2/6/07		<i>R. Massey</i>			2/12/07

WPIR – Work Plan and Inspection Record

SML – Sample Measurement Location designation

NORTH SITE GROUNDS (NON-PROTECTED AREA)/EOF  
SURVEY UNIT 9506-0000

RELEASE RECORD

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**ATTACHMENT 4E  
(COMPASS POWER CURVE)**

Revision 0



# DQA Surface Soil Report

## Assessment Summary

Site: 9506-0000  
Planner(s): Arthur L. Hammond  
Survey Unit Name: North Site Grounds (Non-Protected Area)/EOF  
Report Number: 1  
Survey Unit Samples: 15  
Reference Area Samples: 0  
Test Performed: Sign Test Result: Not Performed  
Judgmental Samples: 0 EMC Result: Not Performed  
Assessment Conclusion: **Reject Null Hypothesis (Survey Unit PASSES)**

## Retrospective Power Curve

