



U.S. Department of Energy

Livermore Site Office, Livermore, California 94551

Lawrence Livermore National Laboratory



Lawrence Livermore National Security, LLC Livermore, California 94551

LLNL-AR-410444

**Building 212 Soil Removal Project
Status Report**

February 13, 2009



Environmental Restoration Department

This work performed under the auspices of the U. S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

**Building 212 Soil Removal Project
Status Report**

February 13, 2009

Environmental Restoration Department

Table of Contents

1. Purpose1

2. Project Chronology1

3. Scope of Work Completed2

4. Results3

5. Waste Disposal3

6. Issues4

7. Future Work4

8. Schedule5

List of Figures

- Figure 1. Location of Building 212 at the Livermore Site.
- Figure 2. Excavation area where mercury was discovered in soil, north side of former Building 212.
- Figure 3. Confirmation sample locations and results.
- Figure 4. Building 212 excavation area concrete cover.

Attachments

- Attachment A. Work Plan for a Time-Critical Removal Action of Mercury in Soil North of Building 212
- Attachment B. Analytical data from confirmation sample analysis
- Attachment C. Analytical data from waste drum soil sample analysis
- Attachment D. Clean fill certification

1. Purpose

This document presents the status of the time-critical removal action of mercury in soil north of Building 212 at Lawrence Livermore National Laboratory (LLNL) (Figure 1). The United States (U.S.) Department of Energy (DOE) executed the regulatory approved Work Plan for the time-critical removal action in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA). The Work Plan for a Time-Critical Removal Action of Mercury in Soil North of Building 212 (July 2008) is presented as Attachment A.

The project was initiated, but not completed because conditions were encountered that were described in the Work Plan as “stopping points.” This document describes the activities performed to date to clean up the legacy mercury in landscaping soil on the northeast side of Building 212, and presents the sampling results, issues, and future work. The project area has been isolated and there are no health risks to the public or LLNL workers posed by the remaining soil contamination.

2. Project Chronology

| | |
|-----------------|---|
| April 17, 2008 | Mercury in the soil was identified during the Building 212 Demolition Project. The Alameda County Environmental Health Department, California Office of Emergency Services, National Response Center, U.S. Environmental Protection Agency (EPA), and San Francisco Bay Regional Water Quality Control Board (RWQCB) were notified. |
| April 28, 2008 | Notified the RWQCB of the discovery of mercury in soil at Building 212 in writing. |
| May 1, 2008 | Notified the Alameda County Environmental Health Department of the discovery of mercury in soil at Building 212 in writing. |
| May 9, 2008 | DOE Livermore Site Office (LSO) discussed the discovery of mercury at the Remedial Project Managers’ (RPM) meeting with the EPA, RWQCB, and the California Department of Toxic Substances Control (DTSC). |
| May 12, 2008 | Notified the DTSC of the discovery of mercury in soil at Building 212 in writing. |
| June 25, 2008 | The regulatory agencies concurred with DOE’s decision to initiate the removal of the mercury and requested a written work plan be submitted for approval. |
| July 10, 2008 | The Work Plan was submitted to the regulatory agencies. |
| August 19, 2008 | Initiated the Time Critical soil removal action for the mercury at Building 212 (see Figure 2). Sampled soil as it was being excavated to characterize soil. |

| | |
|--------------------|--|
| August 22, 2008 | Concluded excavation to boundaries described in work plan. |
| September 15, 2008 | Sampled soil in trench to characterize remaining soil and determine if contamination was still present. |
| October 30, 2008 | DOE LSO discussed the status of the time-critical removal action at the RPM meeting and received approval from the EPA, RWQCB, and the DTSC to temporarily fill in and cover the excavation. |
| November 5, 2008 | Confirmation sample results indicate presence of low-level radioactivity along with mercury in some locations within trench. See Figure 3. |
| January 13, 2009 | Lined the excavation and backfilled with clean soil. |
| January 15, 2009 | Covered excavation area with concrete. |

3. Scope of Work Completed

Per the Work Plan, work was conducted in the following steps:

1. Mercury Absorb was sprinkled on the visible mercury to bind it and lessen the chance of migration during soil removal.
2. Soil was removed where the mercury was visible using a backhoe and 12-inch bucket in 6-inch layers.
3. The excavated soil from the backhoe bucket was placed into drums (see Section 5, Waste Disposal).
4. Steps 1-3 were repeated until mercury was no longer visible. Approximately 4 cubic yards were excavated in total.
5. A Jerome 431-X Mercury Vapor Analyzer was utilized to check the area for mercury vapor. Additional soil was excavated and placed in drums (see Section 5, Waste Disposal).
6. Plastic sheeting was placed over the entire excavated area. The plastic sheeting was lifted and the area was tested using the Jerome meter for mercury vapors.
7. Soil samples were collected to evaluate the remaining mercury in soil against the EPA industrial Preliminary Remediation Goal (PRG) of 28 mg/kg, the Total Threshold Limit Concentrations (TTLC) California Hazardous Waste threshold of 20 mg/kg, and the California Soluble Threshold Limit Concentrations (STLC) and the RCRA hazardous waste Toxicity Characteristic Leaching Procedure (TCLP) metals threshold of 0.2 mg/L.

Fourteen five-part composite soil samples were collected per five-foot sections on the floor and walls of the excavation. Samples were collected from the four corners of the five-foot sections, and one from the middle. All five samples were collected with a hand tool and mixed prior to placing into a single sample container. A sample from the container was analyzed for TTLC, STLC, and TCLP metals. The five samples from the bottom of the trench were also analyzed for tritium and gross alpha and beta. Results are

presented in Attachment B. The sampling locations are shown in Figure 3. Sampling results are discussed in Section 4 below.

8. Cleanup activities were not completed due to encountering defined conditions (“stopping points”) as described below in Section 4. Therefore, the excavated area was not backfilled with clean soil and the Work Plan Step 8 was not completed.
9. The area was covered with plywood and plastic to avoid rainwater infiltration until it was lined with plastic and filled with clean soil. The area was also covered with concrete (see Figure 4).

4. Results

The following conditions were defined as “stopping points” in the Work Plan that would trigger work stoppage and reevaluation of the removal action plan:

- 1) Mercury is detected at the boundary of the defined area (18-inches wide [from the concrete foundation to the pedestrian sidewalk] and 25-feet long).
- 2) Mercury is detected at the three-foot depth.
- 3) Utility lines are encountered.

Soil was excavated 25 feet horizontally and to a depth of 3 feet as described in the Work Plan. Based on the analytical data, the horizontal extent of the mercury exceeds the 25-foot removal area, triggering stopping point #1. The data also indicate that the vertical extent of the mercury exceeds the 3-foot depth, triggering stopping point #2. A third stopping point was defined as encountering underground utilities, which also occurred at the bottom of the trench.

The confirmation sample data (Figure 3 and Attachment B) indicate that the contamination is not fully bound vertically or laterally. In addition, isotopic thorium, uranium, plutonium, and americium (TUPA) and gamma spectrometry results from the analysis of waste drum soil samples (Attachment C) indicate the presence of man-made radioisotopes cesium-137 and plutonium-239 and uranium isotopes above the screening levels specified in the Moratorium for clean site soils. The soil waste sampling and analysis is described in Section 5 below.

5. Waste Disposal

A total of four layers were excavated and segregated in drums. The soil layers were sampled and analyzed for TTLC metals, STLC metals, TCLP metals, gross alpha and beta, TUPA, gamma, and tritium to characterize the waste for disposal. Five samples were collected and analyzed. The layers were characterized as follows:

| Layer | Waste Type | Number of Drums | Estimated Cost for Disposal |
|-------|----------------------------|-----------------|-----------------------------|
| 1 | RCRA Regulated Mixed Waste | 9 | \$800,600 |
| 2 | CA Combined | 6 | \$700/drum |

| | | | |
|---|-------------------|---|------------|
| 3 | CA Combined | 4 | \$500/drum |
| 4 | Radiological Only | 3 | \$400/drum |

Twenty-two drums of excavated soil waste were generated. The nine drums of RCRA Mixed Waste Layer 1 soil have been transferred from the Waste Accumulation Area (WAA) to the LLNL Radiological and Hazardous Waste Management permitted facility. Upon receiving approval and funding, Layer 1 soil will be disposed of at either Perma-Fix or EnergySolutions.

Layers 2 through 4 are being stored at the WAA until funding is available. This soil will be disposed of by direct burial at EnergySolutions.

When funding becomes available, a waste profile and an actual cost estimate will be developed. The estimated costs presented above are based on historical disposal costs and may not be accurate for future work.

6. Issues

The following issues prohibit the completion of the soil removal action at Building 212 in fiscal year 2008:

- Analytical results indicate that there is still mercury above cleanup levels at the easternmost portion of the trench. Excavation is not complete vertically or laterally. Additional soil removal is necessary to address the remaining contamination.
- Utilities were discovered in the excavation area. The utilities will have to be addressed when continuing the soil removal.
- Site infrastructure such as a road and sidewalk are in the excavation area and will have to be addressed when continuing the soil removal.
- Unexpected radioactive products were detected in the excavation area soil. The extent of the radioactive soil contamination will have to be characterized.
- Layer 1 soil has been characterized as RCRA Mixed Waste and will need to be disposed of accordingly.

The issues described above exceed the scope and budget of the work approved in the July 2008 Work Plan. DOE will need to obtain funds for soil treatment and disposal as well as any additional contaminated soil removal through the budgeting process (see Section 8, Schedule).

7. Future Work

Because the data indicate that the contamination is not fully bound vertically or laterally, additional excavation is necessary. A Work Plan will be developed to continue the excavation. However, due to the issues described in Section 6 above, DOE LSO will need to secure additional funding before planning can proceed. The Work Plan will be reviewed and approved by the EPA, DTSC, and RWQCB.

Due to the unforeseen generation of RCRA Regulated Mixed Waste, disposal of the waste-soil generated during the execution of the July 2008 Work Plan exceeds the project budget. The soil will be disposed of when DOE allocates funding.

The excavation area was lined with plastic and temporarily backfilled with clean soil (see Attachment D). The excavation area was covered with concrete until work can proceed. Future work will occur once a funding source can be secured. The project area has been isolated, and there are no health risks to the public or LLNL workers posed by the remaining soil contamination.

8. Schedule

The Work Plan for continuing soil removal at Building 212 will be completed in fiscal year 2011 if funding is allocated. In addition, the RCRA Regulated Mixed Waste will be placed on the LLNL Site Treatment Plan and the milestone to treat the waste will be proposed in February 2010.

Figures

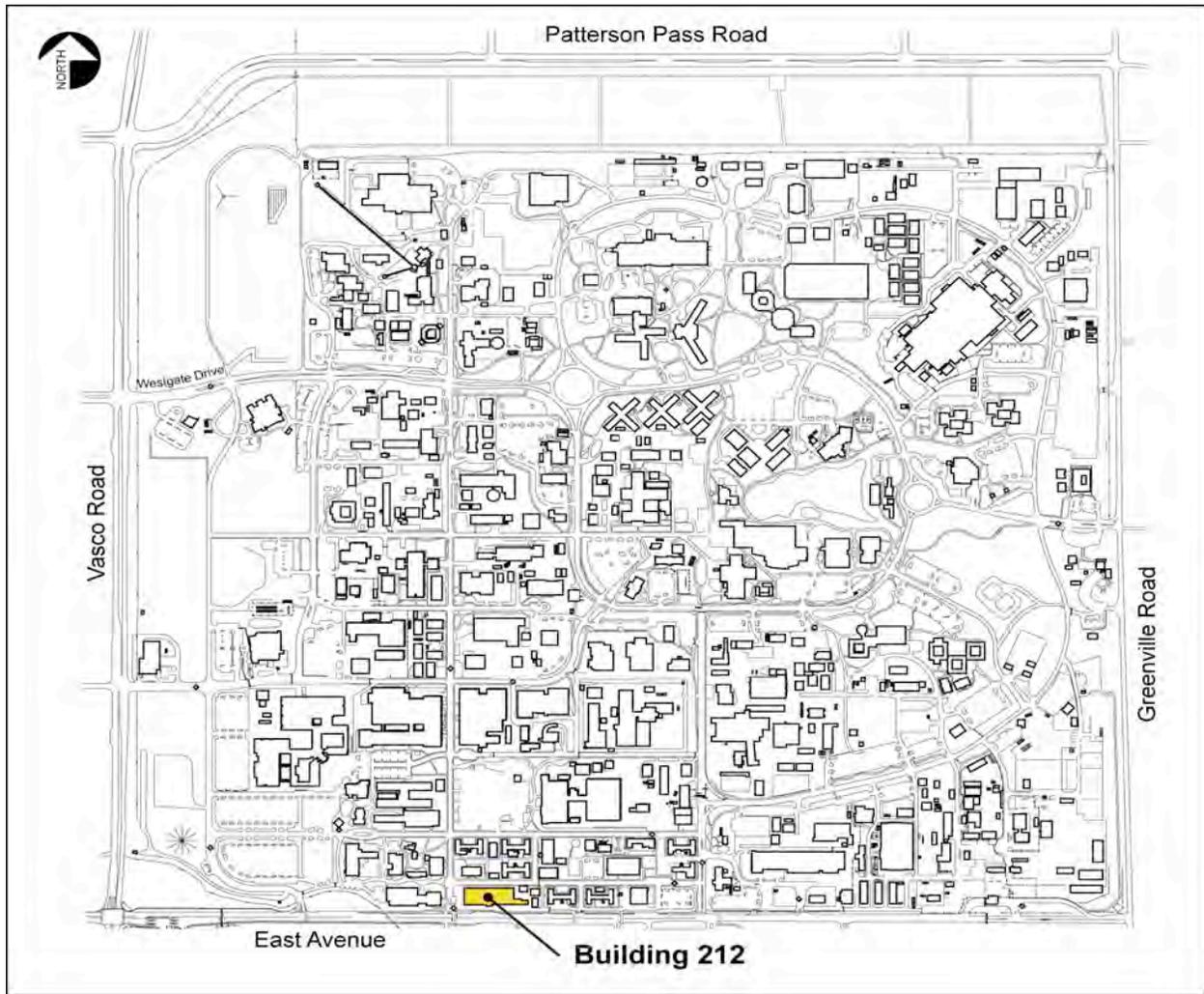


Figure 1. Location of Building 212 at the Livermore Site.



Figure 2. Excavation area where mercury was discovered in soil, north side of former Building 212.

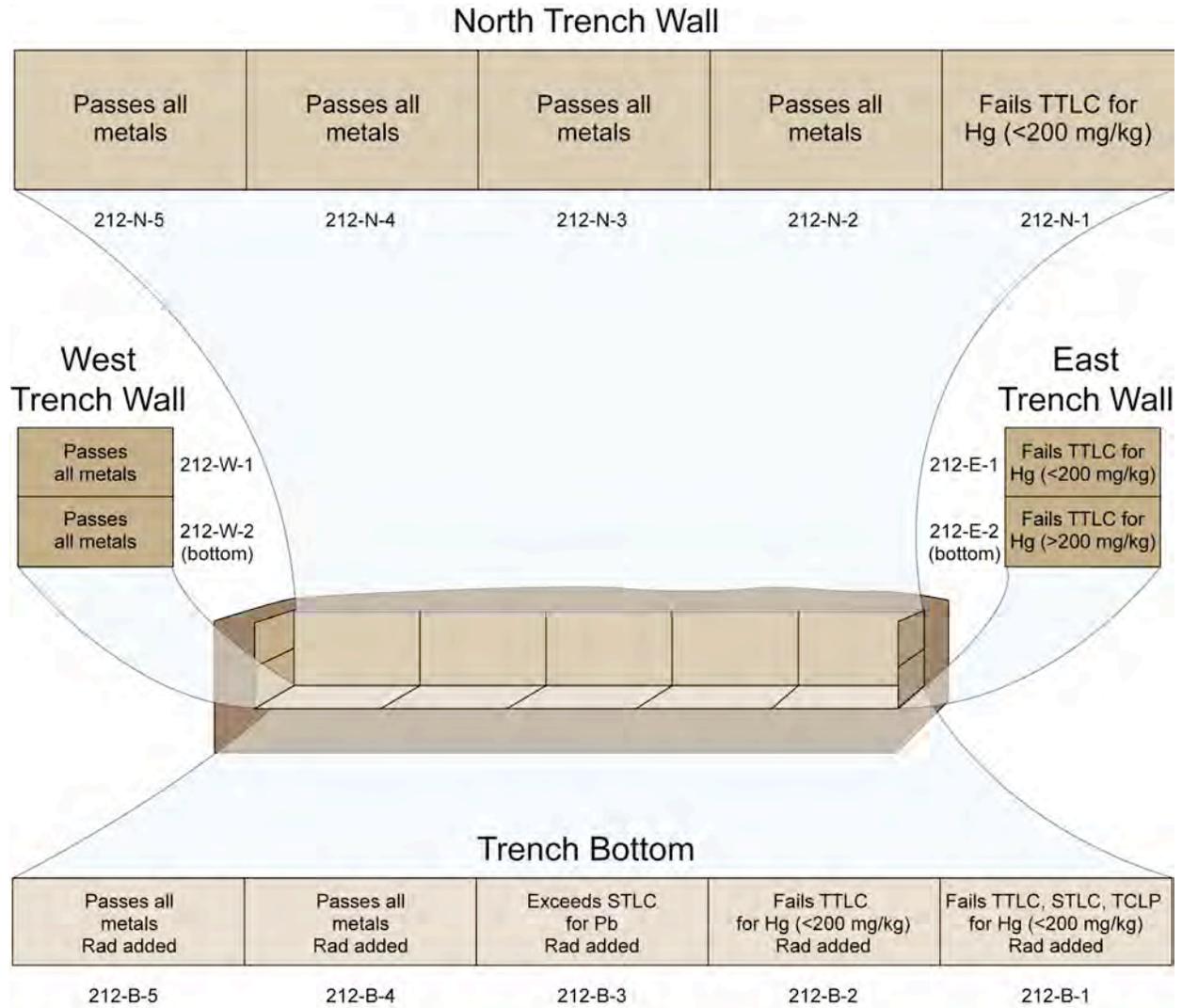


Figure 3. Confirmation sample locations and results.



Figure 4. Building 212 excavation area concrete cover.

Attachment A

Work Plan for a Time-Critical Removal Action of Mercury in Soil North of Building 212



U.S. Department of Energy

Livermore Site Office, Livermore, California 94551

Lawrence Livermore National Laboratory



Lawrence Livermore National Security, LLC Livermore, California 94551

LLNL-AR-405227

**Work Plan for a
Time-Critical Removal Action
of Mercury in Soil
North of Building 212**



Environmental Restoration Department

This work was performed under the auspices of the U.S. Department of Energy by the University of California, Lawrence Livermore National Laboratory under Contract W-705-Eng-48.

**Work Plan for a
Time-Critical Removal Action
of Mercury in Soil
North of Building 212**

Environmental Restoration Department

Table of Contents

| | |
|---|---|
| 1. Purpose | 1 |
| 2. Notification..... | 1 |
| 3. Site Conditions and Background | 1 |
| 4. Scope of Work..... | 2 |
| 4.1. Cleanup and Characterization..... | 2 |
| 4.2. Stopping Points..... | 3 |
| 5. Waste Disposal | 4 |
| 6. Key Personnel..... | 4 |
| 7. Schedule..... | 4 |

List of Figures

- Figure 1. Location of Building 212 at the Livermore Site.
- Figure 2. Area where mercury was discovered in soil, north side of former Building 212.
- Figure 3. Proximity of impacted area to former Building 212 foundation, sidewalk, and roadway.
- Figure 4. Access control area pending removal action.

1. Purpose

This document outlines the work plan for the time-critical removal action to be executed by the Department of Energy (DOE) adjacent to Building 212 at Lawrence Livermore National Laboratory (LLNL) in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA). This document identifies and describes proposed activities to be performed to complete the clean up of legacy mercury in landscaping soil on the northeast side of Building 212. The objectives of this project are to safely and efficiently define the extent of the contamination, clean up the identified mercury to the extent that is practical, and identify key stopping points. This work plan is being submitted for approval prior to proceeding with the removal.

2. Notification

Mercury in the soil was identified April 17, 2008. LLNL staff determined that the quantity of mercury discovered exceeded the CERCLA reportable quantity and notified the National Response Center, U.S. Environmental Protection Agency (EPA), Alameda County Environmental Health Department, California Office of Emergency services, and the Regional Water Quality Control Board — San Francisco Bay Region (RWQCB). DOE Livermore Site Office (LSO) discussed the discovery of mercury at the May 9, 2008 Remedial Project Managers' (RPMs') meeting among DOE-LSO, EPA, RWQCB, and the California Department of Toxic Substances Control (DTSC). The information in this work plan was discussed with the RPMs at a meeting on June 25, 2008. The regulatory agencies concurred with DOE's decision to initiate the removal of the mercury, and requested this written work plan to be submitted for approval.

3. Site Conditions and Background

LLNL is in the process of demolishing Building 212 at the Livermore Site. The building is located on the south perimeter of LLNL along East Avenue (Fig. 1). The building was constructed in the mid-1940s and was in continuous use by the Naval Air Station and LLNL until the mid-1980s. LLNL began demolition of the building in April 2008.

On April 16, 2008, demolition staff discovered several small beads of mercury on the concrete foundation. LLNL staff responded and cleaned up these beads of mercury and managed it as hazardous waste. On April 17, 2008, additional small beads of mercury were discovered in the soil adjacent to the foundation. The extent of visible mercury in the soil was small and LLNL developed and implemented a plan to clean up the affected area. After a shovel of soil approximately one-inch deep was removed, a larger amount of mercury was discovered, at which point clean-up actions were halted to further evaluate the site. The affected area was secured by covering with secured plastic sheeting (Fig. 2).

Visually verifiable contamination is in an area approximately 18 inches wide by 24 inches long with an unknown depth. This area is bound on the north by a pedestrian sidewalk and on the south by the Building 212 concrete foundation (Fig. 3). Because the mercury is beneath the soil, it is impossible to determine the extent of contamination until soil is disturbed. To be conservative, an area 25 feet long has been isolated (Fig. 4).

4. Scope of Work

Work will be conducted in a phased approach. The removal will take about three to five days. Cost of the removal is dependent on the amount of affected soil, but is not anticipated to exceed \$120,000. The following describes the steps to be followed for the cleanup and characterization, as well as conditions that will stop work and initiate reevaluation.

4.1. Cleanup and Characterization

Soil removal will start in the area of visible contamination. If more mercury is exposed as work progresses, then the removal will move out laterally and to deeper depths. Work will be conducted in the following steps:

1. Sprinkle Mercury Absorb on the visible mercury to bind it and lessen the chance of migration as the soil is removed.
2. Using a backhoe and 12-inch bucket, remove 6-inches of soil where the mercury is visible.
3. Place the excavated soil from the backhoe bucket into a drum.
4. Visually inspect the area where soil was removed for additional mercury. If mercury is visible, repeat Steps 1-4 until no mercury is visible or until reaching one of the stopping points outlined in Section 4.2.
5. Once mercury is no longer visible, use a Jerome 431-X Mercury Vapor Analyzer to check the area for mercury vapor. If mercury vapor is detected, repeat steps 1-5 until no mercury vapor is detected or until reaching one of the stopping points outlined in Section 4.2. The Jerome meter can measure mercury levels from 0.003 to 0.999 mg/m³ under favorable conditions for off-gassing.
6. If mercury is not detected on the Jerome meter, place plastic sheeting over the entire area that has been excavated. Leave the sheeting in place for several hours during the middle of the day. (Note: this is important because the mercury will off-gas with warmer temperatures). Following all industrial hygienist & health physicist controls for worker safety, lift a corner of the plastic sheeting and probe the area with the Jerome meter for mercury.

If mercury is detected, repeat steps 1-6 until no mercury is detected or until reaching one of the stopping points outlined in Section 4.2.

7. If no mercury is detected, stop excavation and call the Environmental Analyst to have soil samples collected. Soil samples will be collected to verify that the remaining mercury in soil is below the EPA industrial Preliminary Remediation Goal (PRG) of 28 mg/kg, the Total Threshold Limit Concentrations (TTL) California Hazardous Waste threshold of 20 mg/kg, and the California Soluble Threshold Limit Concentrations (STLC) and the RCRA hazardous waste Toxicity Characteristic Leaching Procedure (TCLP) metals threshold of 0.2 mg/L. The number of samples required will depend on the ultimate size of the excavation. Approximately one five-part composite sample will be collected per three-foot section on the floor of the excavation. Samples will be collected from the four corners of the three-foot section, and one from the middle. All five samples will be collected with a hand tool and mixed prior to placing into a single sample container. A sample from the container will be analyzed for TTL, STLC, and TCLP metals. If the analytical results indicate that the mercury is below the thresholds stated above, the area will be considered clean. If the results show detectable mercury above these thresholds, then clean up will resume following the steps outlined above or until the stopping points outlined in Section 4.2 are reached. If the excavation exceeds six inches, samples will also be collected from the sides of the excavation to determine if additional cleanup beyond the scope of this removal action is warranted in the future.
8. Once clean up activities have been completed and confirmed, the excavated area will be backfilled with clean soil. Confirmation that the backfill soil is clean will be included in the forthcoming Action Memorandum.
9. If mercury clean up cannot be completed according to the steps outlined in this plan, the area will be backfilled with clean soil and an asphalt cap. Further removal action, if warranted, will be conducted under a separate removal action.

4.2. Stopping Points

If the following conditions are encountered, work will stop and the removal action plan will be reevaluated.

- Currently an area 18-inches wide (from the concrete foundation to the pedestrian sidewalk) and 25-feet long is barricaded. Work will begin in the area where there is visible mercury and expand as needed. If mercury is found at the boundary of the 25-foot section then work will stop and the plan will be reevaluated.
- Due to logistic and safety issues, excavation will go as deep as three feet. Soil will be removed in approximately six-inch lifts until mercury is no longer visible or detected on the Jerome meter. If mercury is still detectable at three-foot depth, work will stop and the plan will be reevaluated.
- If utility lines are encountered prior to reaching the three-foot depth, work will stop and the plan will be reevaluated.

5. Waste Disposal

Excavated soil will be analyzed for proper waste disposal for the following: TTLC metals, STLC metals, TCLP metals, gross alpha and beta, and tritium. The number of samples will be determined based on the total amount of soil excavated. All of the soil excavated will be disposed as waste. Given the area of 18 inches by 25 feet and a 3-foot depth it is estimated that the maximum total soil volume would be 4.5 cubic yards.

6. Key Personnel

The following are key personnel and contact information for this removal action.

| | | |
|---|---------------|---------------------------------------|
| Livermore Site DOE Remedial Project Manager | Phil Wong | 925-422-0765 phil.wong@oak.doe.gov |
| Environmental Restoration Department Leader | Jesse Yow | 925-422-3521 yow1@llnl.gov |
| Livermore Site CERCLA Project Leader | Lindee Berg | 925-422-0618 berg3@llnl.gov |
| Decontamination, Decommissioning, and Demolition Project Leader | Mike Auble | 925-422-8158 auble2@llnl.gov |
| Building 212 Project Manager | Bill Miller | 925-423-7530 miller46@llnl.gov |
| Environmental Analyst | Lisa Crawford | 925-422-6343 crawford25@llnl.gov |

7. Schedule

DOE-LSO is currently securing funding for this removal and work is anticipated to begin once this work plan is approved by the regulatory agencies.

Figures

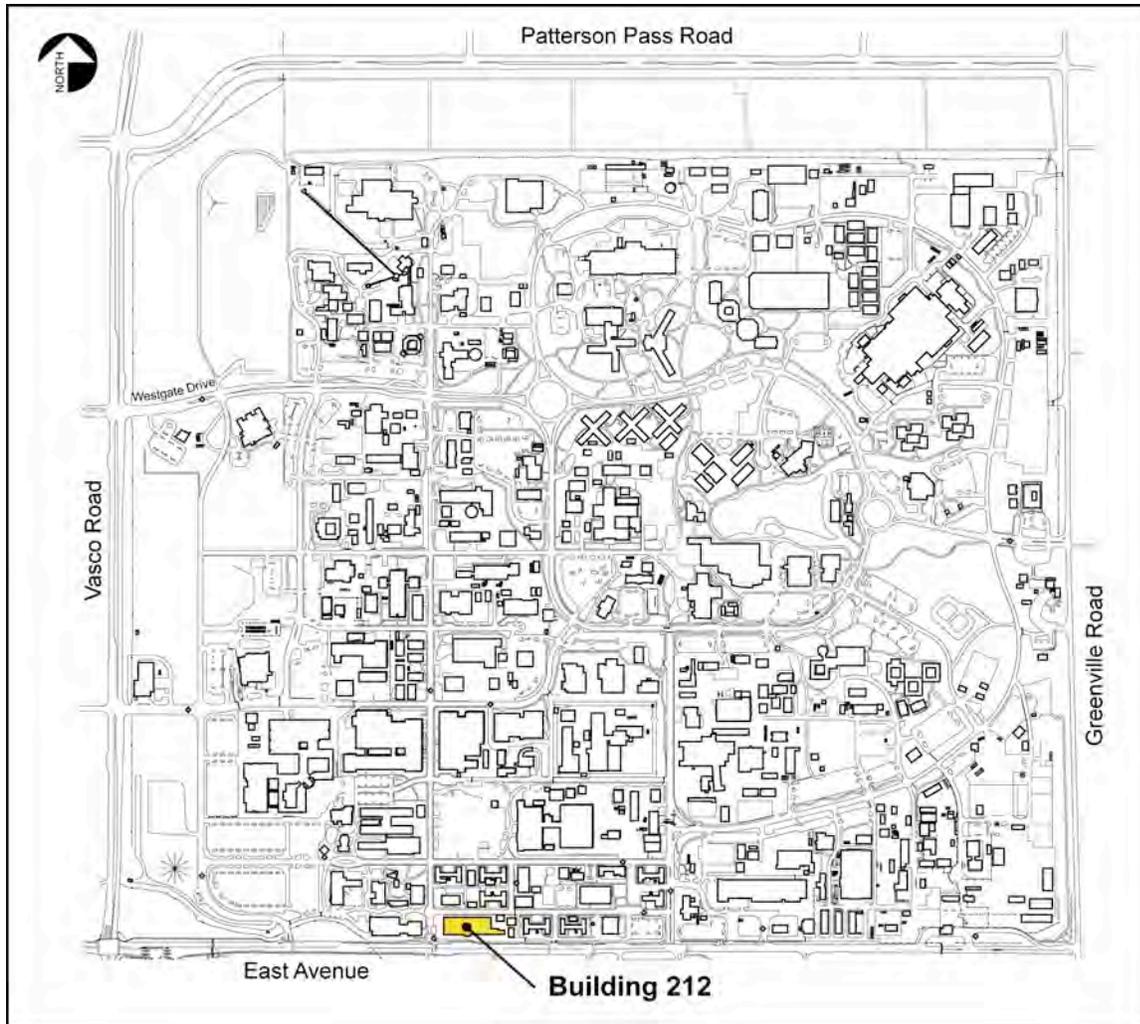


Figure 1. Location of Building 212 at the Livermore Site.



Figure 2. Area where mercury was discovered in soil, north side of former Building 212.



Figure 3. Proximity of impacted area to former Building 212 foundation, sidewalk, and roadway.



Figure 4. Access control area pending removal action.



**LAWRENCE LIVERMORE
NATIONAL LABORATORY**

Lawrence Livermore National Security, LLC • Livermore, California • 94551

Attachment B

Analytical data from confirmation sample analysis

CES COC #
17500

CES Chain of Custody

COC
 Version 6.0
 10/12/2006

Send Results to:
 LISA CRAWFORD
 L- 626 phone 2-6343
 Copy: _____
 L- _____

Field Contact: TIM FULLER
 LLNL Account #: 1418 08
 Project Name: B212 SAT PROJECT
 Tank Volume: N/A liters

Turnaround Time:
 E
 R
 N
 CES
 DQO: N/A

Data Package Required: Normal CLP
 Reporting level: Level 1 Level 2 Level 3
 RETURN UNUSED SAMPLE TO CLIENT
 EDD Required (data from off-site labs only)
 Client ID: SAT
 FOR CES USE ONLY
 No Discrepancies
 Condition/Variance

| Client Sample Identification | Date Sampled | Time Sampled | Bldg | RAD (Y/N) | Matrix Code | Gen Code | # of Bottles | Tests / Preservation Codes | | | | Additional Instructions: |
|------------------------------|--------------|--------------|------|-----------|-------------|----------|--------------|----------------------------|---------|----------|-----------|-----------------------------------|
| | | | | | | | | TLCPMET | STLCMET | TCLP MET | RADWG: H3 | |
| 212-B-1 | 9/15/08 | 1045 | 212 | Y | SO | WS | 4 | R | R | R | R | Soil bottom composite |
| 212-B-2 | 9/15/08 | 1045 | 212 | Y | SO | WS | 4 | R | R | R | R | Soil bottom composite |
| 212-B-3 | 9/15/08 | 1045 | 212 | Y | SO | WS | 4 | R | R | R | R | Soil bottom composite |
| 212-B-4 | 9/15/08 | 1045 | 212 | Y | SO | WS | 4 | R | R | R | R | Soil bottom composite |
| 212-B-5 | 9/15/08 | 1045 | 212 | Y | SO | WS | 4 | R | R | R | R | Soil bottom composite |
| 212-E-1 | 9/15/08 | 1045 | 212 | Y | SO | WS | 3 | R | R | R | | Soil East end top 12" composite |
| 212-E-2 | 9/15/08 | 1045 | 212 | Y | SO | WS | 3 | R | R | R | | Soil East end lower 12" composite |
| 212-W-1 | 9/15/08 | 1045 | 212 | Y | SO | WS | 3 | R | R | R | | Soil West end top 12" composite |
| 212-W-1RP | 9/15/08 | 1045 | 212 | Y | SO | WS | 3 | R | R | R | | Replicate West end top 12" comp |

Signature: [Signature] Date: 9/15/08 Time: 1300
 Received by: _____ Date: _____ Time: _____
 Received by: _____ Date: _____ Time: _____
 Received by: _____ Date: _____ Time: _____

See page 2 for codes and additional instructions. ELAP Certifications #1554

"The worker certifies that the Standard ES&H Roles, Responsibilities and Authorities defined by Service Category 1, described by Section 4.3.1 of Document 2.1 "Laboratory and ES&H Policies, General Worker Responsibilities and Integrated Safety Management," apply and that in e IWS or IWSs authorizing the work have the appropriate controls for the hazards involved in the task/analysis."

For document control purposes, user SHALL ensure that all working copies are identical to current electronic version, http://cms.llnl.gov/ces/QA_Docs/QA_Docs.html

COC
Version 6.0
10/12/2006

CES Chain of Custody

CES
COC # 17500

Send Results to: _____

LISA CRAWFORD
L- 626 phone 2-6343
Copy: _____
L- _____

Turnaround Time
 E
 R
 N
 CES
 DQO: N/A

Field Contact: TIM FULLER
 LLNL Account #: 1418 - 08
 Project Name: B212 SAT PROJECT
 Tank Volume: N/A liters

Data Package Required: Normal CLP
 Reporting level: Level 1 Level 2 Level 3
 RETURN UNUSED SAMPLE TO CLIENT
 EDD Required (data from off-site labs only)
 Client ID: SAT

FOR CES USE ONLY
 Condition Upon Receipt: No Discrepancies
 Condition/Variance

| Client Sample Identification | Date Sampled | Time Sampled | RAD (Y/N) | Matrix Code | Gen Code | # of Bottles | Circle Preservation Code for On-site Analyses | | | | Additional Instructions: |
|------------------------------|--------------|--------------|-----------|-------------|----------|--------------|---|---------|---------|--------------|-------------------------------|
| | | | | | | | TLCMET | STLCMET | TCLPMET | RADWG: GA+GB | |
| 212-W-2 1 | 9/15/08 | 1045 | Y | SO | WS | 3 | R | R | R | | Soil West end lower 12" Comp. |
| 212-N-1 2 | 9/15/08 | 1045 | Y | SO | WS | 3 | R | R | R | | Soil North wall comp. |
| 212-N-2 3 | 9/15/08 | 1045 | Y | SO | WS | 3 | R | R | R | | Soil North wall comp. |
| 212-N-3 4 | 9/15/08 | 1045 | Y | SO | WS | 3 | R | R | R | | Soil North wall comp. |
| 212-N-4 5 | 9/15/08 | 1045 | Y | SO | WS | 3 | R | R | R | | Soil North wall comp. |
| 212-N-5 6 | 9/15/08 | 1045 | Y | SO | WS | 3 | R | R | R | | Soil North wall comp. |
| 7 | | | | | | | | | | | |
| 8 | | | | | | | | | | | |
| 9 | | | | | | | | | | | |

Signature: *Linda Cardenas* Date: 9/15/08 Time: 1300

Received by: *[Signature]* Date: 9/15/08 Time: 1300

Received by: _____ Date: _____ Time: _____

Received by: _____ Date: _____ Time: _____

ELAP Certifications #1554

See page 2 for codes and additional instructions.

For document control purposes, user SHALL ensure that all working copies are identical to current electronic version, http://cms.inl.gov/ces/QA_Docs/QA_Docs.html

"The worker certifies that the Standard ES&H Roles, Responsibilities and Authorities defined by Service Category 1 described by Section 4.3.1 of Document 2.1 "Laboratory and ES&H Policies, General Worker Responsibilities and Integrated Safety Management," apply and that it e IWS or IWSs authorizing the work have the appropriate controls for the hazards involved in the task/analysis."

| | | |
|---|-------------------------------------|--|
|  | <p>CSF 6/4/08</p> | <p align="center">CES CASE SUMMARY FORM</p> |
|---|-------------------------------------|--|

Laboratory Identification:

C&MS Environmental Services
Lawrence Livermore National Laboratory
7000 East Avenue, L-Code 232
Livermore, CA 94550-9234
(925) 423-6008
ELAP Certification No. 1554

Packet Completion Date

10-21-08

Client:

Lisa Crawford / Tim Fuller

Sample Receipt:

Fifteen samples (15 samples: all soil samples from B212 SAT Project: 212-B-1, 212-B-2, 212-B-3, 212-B-4, 212-B-5, 212-E-1, 212-E-2, 212-W-1, 212-W-1RP, 212-W-2, 212-N-1, 212-N-2, 212-N-3, 212-N-4, 212-N-5) (50 bottles total) were received on September 15, 2008 by CES for analysis. The sample was delivered with CES chain of custody, SHA, and RHWCM CCR documentation. The sample containers were intact and without any visible sign of tampering.

Project Name: Normal Sampling

CES DQO #: N/A

Client DQO #: N/A

Client COC #: N/A

CES COC#: 17500

Client ID

CES ID

Requested Analyses

| | | |
|-----------|-----------|---|
| 212-B-1 | 212-B-1 | TTLC, STLC, TCLP metals, GAB and Tritium. |
| 212-B-2 | 212-B-2 | TTLC, STLC, TCLP metals, GAB and Tritium. |
| 212-B-3 | 212-B-3 | TTLC, STLC, TCLP metals, GAB and Tritium. |
| 212-B-4 | 212-B-4 | TTLC, STLC, TCLP metals, GAB and Tritium. |
| 212-B-5 | 212-B-5 | TTLC, STLC, TCLP metals, GAB and Tritium. |
| 212-E-1 | 212-E-1 | TTLC, STLC, TCLP metals. |
| 212-E-2 | 212-E-2 | TTLC, STLC, TCLP metals. |
| 212-W-1 | 212-W-1 | TTLC, STLC, TCLP metals. |
| 212-W-1RP | 212-W-1RP | TTLC, STLC, TCLP metals. |
| 212-W-2 | 212-W-2 | TTLC, STLC, TCLP metals. |
| 212-N-1 | 212-N-1 | TTLC, STLC, TCLP metals. |
| 212-N-2 | 212-N-2 | TTLC, STLC, TCLP metals. |
| 212-N-3 | 212-N-3 | TTLC, STLC, TCLP metals. |
| 212-N-4 | 212-N-4 | TTLC, STLC, TCLP metals. |
| 212-N-5 | 212-N-5 | TTLC, STLC, TCLP metals. |

Case Narrative:

Re: COC # 17500: TTLC, STLC, TCLP metals, GAB and Tritium tests were performed by GEL Labs LLC, Charleston, South Carolina. Result for these analyses are deemed acceptable.

I certify that this data package is complete as per the customer's request and compliant with technical and administrative requirements. All analytical work performed by outside contract laboratories is reported on their letterhead and released by the associated laboratory, independent of CES. The Laboratory Director (or designee) as verified by the following signature authorizes release of this data package:



Hector Pedemonte

October 21, 2008
Date

| | | |
|---|--------------------------------------|--|
|  | V/C Version 1.0 3/22/00 | Off-Site Laboratory Report Validation Checklist |
|---|--------------------------------------|--|

This form should be used to ensure that the precision, accuracy, representativeness, completeness, and comparability criteria as specified in the Waste Disposal Requisition.

The checklist should be complete by placing a check (√) in the “Acceptable” column if the item is present. An explanation should be stated in the “Comments” column if the item is not present. A copy of this report should be maintained with the associated data package.

| | |
|--|--|
| Outside Lab Name GEL Laboratories LLC, Charleston, South Carolina. | DB No/Matrix COC # 17500: (15 samples: all soil samples from B212 SAT Project: 212-B-1, 212-B-2, 212-B-3, 212-B-4, 212-B-5, 212-E-1, 212-E-2, 212-W-1, 212-W-1RP, 212-W-2, 212-N-1, 212-N-2, 212-N-3, 212-N-4, 212-N-5). |
| Method No(s) GEL Labs LLC: TTLC, STLC, TCLP metals, GAB, Tritium. | Report Level Results and Summary QC |

| Parameters | Acceptable | Comments |
|---|------------|--|
| 1. Precision | √ | See Comments below. |
| 2. Accuracy | √ | See Comments below. |
| 3. Representativeness | √ | The acquired samples are representative of the waste stream. |
| 4. Completeness | √ | All the requested analyses were reported. |
| 5. Comparability | √ | The acquired samples are comparable to the waste matrix. |
| Additional Comments: Re: COC # 17500: (15 samples: all soil samples from B212 SAT Project: 212-B-1, 212-B-2, 212-B-3, 212-B-4, 212-B-5, 212-E-1, 212-E-2, 212-W-1, 212-W-1RP, 212-W-2, 212-N-1, 212-N-2, 212-N-3, 212-N-4, 212-N-5): TTLC, STLC, TCLP metals, GAB and Tritium tests were performed by GEL Labs, LLC, Charleston, South Carolina. Results are either above or below regulatory levels and compensating for the difference in MS, MSD and RPD would not alter the results and usability of data. Results are deemed acceptable. | | |
| Signature  | | Date October 21, 2008 |



Laboratories LLC

a member of **The GEL Group** INC



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2040 Savage Road Charleston, SC 29407

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October 07, 2008

Mr. Chad F. Davis
Lawrence Livermore National Security, LLC
7000 East Avenue
Mailstop L-620
Livermore, California 94551

Re: CES - Normal Deliverable
Work Orders: 215963 215964 215966

Dear Mr. Davis:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on September 17, 2008. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4453.

Sincerely,

Edith Kent
Project Manager

Purchase Order: LDH0585
Chain of Custody: LDH0585
Enclosures

problem solved

**General Narrative
for
Lawrence Livermore National Labs (#H712000)
CES - Normal Deliverable
SDG: 215963, 215963-1 and 215963-2**

October 07, 2008

Laboratory Identification:

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

Summary

Sample receipt

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on September 17, 2008, 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. There are no additional comments concerning sample receipt.

Items of Note There are no additional items of note concerning this SDG.

Sample Identification

The laboratory received the following samples:

| <u>Laboratory Identification</u> | <u>Sample Description</u> |
|---|----------------------------------|
| 215963001 | 212-B-1 |
| 215963002 | 212-B-2 |
| 215963003 | 212-B-3 |
| 215963004 | 212-B-4 |
| 215963005 | 212-B-5 |
| 215963006 | 212-E-1 |
| 215963007 | 212-E-2 |
| 215963008 | 212-W-1 |
| 215963009 | 212-W-1RP |
| 215963010 | 212-W-2 |
| 215963011 | 212-N-1 |
| 215963012 | 212-N-2 |
| 215963013 | 212-N-3 |
| 215963014 | 212-N-4 |
| 215963015 | 212-N-5 |
| 215964001 | 212-B-1 |
| 215964002 | 212-B-2 |
| 215964003 | 212-B-3 |
| 215964004 | 212-B-4 |
| 215964005 | 212-B-5 |
| 215964006 | 212-E-1 |
| 215964007 | 212-E-2 |

| | |
|------------------|-----------|
| 215964008 | 212-W-1 |
| 215964009 | 212-W-1RP |
| 215964010 | 212-W-2 |
| 215964011 | 212-N-1 |
| 215964012 | 212-N-2 |
| 215964013 | 212-N-3 |
| 215964014 | 212-N-4 |
| 215964015 | 212-N-5 |
| 215966001 | 212-B-1 |
| 215966002 | 212-B-2 |
| 215966003 | 212-B-3 |
| 215966004 | 212-B-4 |
| 215966005 | 212-B-5 |
| 215966006 | 212-E-1 |
| 215966007 | 212-E-2 |
| 215966008 | 212-W-1 |
| 215966009 | 212-W-1RP |
| 215966010 | 212-W-2 |
| 215966011 | 212-N-1 |
| 215966012 | 212-N-2 |
| 215966013 | 212-N-3 |
| 215966014 | 212-N-4 |
| 215966015 | 212-N-5 |

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.

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: Metals and Radiochemistry. This package, to the best of my knowledge, is in compliance with technical and administrative requirements.



Edith Kent

Project Manager

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.

**Metals Fractional Narrative
Lawrence Livermore National Labs (LLNL)
SDG 215963**

Sample Analysis

| Sample ID | Client ID |
|------------------|---|
| 215963001 | 212-B-1 |
| 215963002 | 212-B-2 |
| 215963003 | 212-B-3 |
| 215963004 | 212-B-4 |
| 215963005 | 212-B-5 |
| 215963006 | 212-E-1 |
| 215963007 | 212-E-2 |
| 215963008 | 212-W-1 |
| 215963009 | 212-W-1RP |
| 215963010 | 212-W-2 |
| 215963011 | 212-N-1 |
| 215963012 | 212-N-2 |
| 215963013 | 212-N-3 |
| 215963014 | 212-N-4 |
| 215963015 | 212-N-5 |
| 1201674261 | Method Blank (MB) ICP |
| 1201674262 | Laboratory Control Sample (LCS) |
| 1201674265 | 215963001(212-B-1L) Serial Dilution (SD) |
| 1201674263 | 215963001(212-B-1S) Matrix Spike (MS) |
| 1201674264 | 215963001(212-B-1SD) Matrix Spike Duplicate (MSD) |
| 1201673384 | Method Blank (MB) CVAA |
| 1201673385 | Laboratory Control Sample (LCS) |
| 1201673388 | 215963001(212-B-1L) Serial Dilution (SD) |
| 1201673386 | 215963001(212-B-1S) Matrix Spike (MS) |
| 1201673387 | 215963001(212-B-1SD) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on a "dry weight" basis.

Method/Analysis Information

| | |
|---------------------------------------|--|
| Analytical Batch: | 796830 and 796414 |
| Prep Batch : | 796829 and 796413 |
| Standard Operating Procedures: | GL-MA-E-013 REV# 18, GL-MA-E-009 REV# 17 and GL-MA-E-010 REV# 19 |
| Analytical Method: | SW846 3050B/6010B and SW846 7471A |
| Prep Method : | SW846 3050B and SW846 7471A Prep |

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

System Configuration

The Metals analysis-ICP was performed on a P E 4300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with a Burgener nebulizer, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 1.4L/min, argon gas flows of 15 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis-Mercury was performed on a Perkin-Elmer Flow Injection Mercury System (FIMS-400) automated mercury analyzer. The instrument consists of a cold vapor atomic absorption spectrometer set to detect mercury at a wavelength of 253.7 nm. Sample introduction through the flow injection system is performed via a peristaltic pump at 9 mL/min and nitrogen carrier gas rate of 80 mL/min.

Calibration Information

Instrument Calibration

All initial calibration requirements have been met for this sample delivery group (SDG).

CRDL Requirements

All CRDL standard(s) met the referenced advisory control limits.

ICSA/ICSAB Statement

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

Continuing Calibration Blank (CCB) Requirements

All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

Continuing Calibration Verification (CCV) Requirements

All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

Quality Control (QC) Information

Method Blank (MB) Statement

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following samples were selected as the quality control (QC) samples for this SDG: 215963001 (212-B-1)-ICP and CVAA.

Matrix Spike (MS) Recovery Statement

The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The MS met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes, with the exceptions of antimony and thallium, as indicated by the “*” qualifiers.

Matrix Spike Duplicate (MSD) Recovery Statement

The percent recovery (%R) obtained from the MSD analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The MSD met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes, with the exceptions of antimony and thallium, as indicated by the “*” qualifiers.

MS/MSD Relative Percent Difference (RPD) Statement

The relative percent difference (RPD) obtained from the designated matrix spike duplicate (MSD) is evaluated based on acceptance criteria of 20%. The RPD between qualifying elements results in the MS and MSD were within the acceptance limits of 20%, with the exception of copper, as indicated by the “*” qualifier.

Serial Dilution % Difference Statement

The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations that are 25X the IDL for CVAA, 50X the IDL for ICP, and 100X the IDL for ICP-MS analyses are applicable for serial dilution assessment. All applicable analytes met the acceptance criteria of less than 10% difference (%D), with the exceptions of barium, cobalt, nickel and zinc, as indicated by the “*” qualifiers.

Technical Information

Holding Time Specifications

GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instruments. The samples in this SDG were diluted 10 for selenium and/or thallium in order to minimize suppression due to matrix interferences. The samples in this SDG required various dilutions for mercury in order to bring over range concentrations within the linear calibration range of the instrument.

Preparation Information

The samples in this SDG were prepared exactly according to the cited SOP.

Miscellaneous Information

Nonconformance 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: 608662. A copy is included in the Miscellaneous Data section of this package.

Additional Comments

Additional comments were not required for this SDG.

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: By Davis Date: 10-15-08

**Metals Fractional Narrative
Lawrence Livermore National Labs (LLNL)
SDG 215963-1**

Sample Analysis

| Sample ID | Client ID |
|------------------|---|
| 215964001 | 212-B-1 |
| 215964002 | 212-B-2 |
| 215964003 | 212-B-3 |
| 215964004 | 212-B-4 |
| 215964005 | 212-B-5 |
| 215964006 | 212-E-1 |
| 215964007 | 212-E-2 |
| 215964008 | 212-W-1 |
| 215964009 | 212-W-1RP |
| 215964010 | 212-W-2 |
| 215964011 | 212-N-1 |
| 215964012 | 212-N-2 |
| 215964013 | 212-N-3 |
| 215964014 | 212-N-4 |
| 215964015 | 212-N-5 |
| 1201683045 | Tumbling Blank (TB) |
| 1201685288 | Method Blank (MB) ICP |
| 1201685289 | Laboratory Control Sample (LCS) |
| 1201685292 | 215964001(212-B-1L) Serial Dilution (SD) |
| 1201683041 | 215964001(212-B-1S) Matrix Spike (MS) |
| 1201683043 | 215964001(212-B-1SD) Matrix Spike Duplicate (MSD) |
| 1201683045 | Tumbling Blank (TB) |
| 1201685170 | Method Blank (MB) CVAA |
| 1201685171 | Laboratory Control Sample (LCS) |
| 1201685174 | 215964002(212-B-2L) Serial Dilution (SD) |
| 1201683042 | 215964002(212-B-2S) Matrix Spike (MS) |
| 1201683044 | 215964002(212-B-2SD) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

Method/Analysis Information

Analytical Batch: 801834 and 801780
Prep Batch : 801833 and 801779
Prep Batch : 800775
Standard Operating Procedures: GL-MA-E-013 REV# 18, GL-MA-E-008 REV# 13, GL-LB-E-023 REV# 5 and GL-MA-E-010 REV# 19
Analytical Method: SW846 3010/6010B and SW846 7470A
Prep Method : SW846 3010A and SW846 7470A Prep
Prep Method : California Code of Regulations

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

System Configuration

The Metals analysis-ICP was performed on a P E 4300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with a Burgener nebulizer, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 1.4L/min, argon gas flows of 15 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis-Mercury was performed on a Perkin-Elmer Flow Injection Mercury System (FIMS-100) automated mercury analyzer. The instrument consists of a cold vapor atomic absorption spectrometer set to detect mercury at a wavelength of 253.7 nm. Sample introduction through the flow injection system is performed via a peristaltic pump at 9 mL/min and nitrogen carrier gas rate of 80 mL/min.

Calibration Information

Instrument Calibration

All initial calibration requirements have been met for this sample delivery group (SDG).

CRDL Requirements

All CRDL standard(s) met the referenced advisory control limits.

ICSA/ICSAB Statement

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

Continuing Calibration Blank (CCB) Requirements

All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

Continuing Calibration Verification (CCV) Requirements

All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

Quality Control (QC) Information**Method Blank (MB) Statement**

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following samples were selected as the quality control (QC) samples for this SDG: 215964001 (212-B-1)-ICP and 215964002 (212-B-2)-CVAA.

Matrix Spike (MS) Recovery Statement

The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The MS met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes, with the exceptions of silver and mercury, as indicated by the “*” qualifiers.

Matrix Spike Duplicate (MSD) Recovery Statement

The percent recovery (%R) obtained from the MSD analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The MSD met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes, with the exceptions of thallium, zinc and mercury, as indicated by the “*” qualifiers.

MS/MSD Relative Percent Difference (RPD) Statement

The relative percent difference (RPD) obtained from the designated matrix spike duplicate (MSD) is evaluated based on acceptance criteria of 20%. The RPD between qualifying elements results in the MS and MSD were within the acceptance limits of 20%, with the exception of mercury, as indicated by the “*” qualifier.

Serial Dilution % Difference Statement

The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations that are 25X the IDL for CVAA, 50X the IDL for ICP, and 100X the IDL for ICP-MS analyses are applicable for serial dilution assessment. All applicable analytes met the acceptance criteria of less than 10% difference (%D).

Technical Information

Holding Time Specifications

GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. The samples in this SDG did not require dilutions.

Preparation Information

The samples and associated matrix QC were prepared at a 10x factor for ICP/ICPMS to minimize potential interferences arising from the high sodium content in the TCLP leaching solution. The samples and associated matrix QC were prepared at a 1000x factor for CVAA analysis because larger volumes of this matrix consume excessive amounts of potassium permanganate.

Miscellaneous Information

Nonconformance 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: 608539 and 611226. A copy of each is included in the Miscellaneous Data section of this package.

Additional Comments

Additional comments were not required for this SDG.

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: Byr Davis Date: 10-14-08

**Metals Fractional Narrative
Lawrence Livermore National Labs (LLNL)
SDG 215963-2**

Sample Analysis

| Sample ID | Client ID |
|------------------|---|
| 215966001 | 212-B-1 |
| 215966002 | 212-B-2 |
| 215966003 | 212-B-3 |
| 215966004 | 212-B-4 |
| 215966005 | 212-B-5 |
| 215966006 | 212-E-1 |
| 215966007 | 212-E-2 |
| 215966008 | 212-W-1 |
| 215966009 | 212-W-1RP |
| 215966010 | 212-W-2 |
| 215966011 | 212-N-1 |
| 215966012 | 212-N-2 |
| 215966013 | 212-N-3 |
| 215966014 | 212-N-4 |
| 215966015 | 212-N-5 |
| 1201683050 | Tumbling Blank (TB) |
| 1201684126 | Method Blank (MB) ICP |
| 1201684127 | Laboratory Control Sample (LCS) |
| 1201684130 | 215966001(212-B-1L) Serial Dilution (SD) |
| 1201683046 | 215966001(212-B-1S) Matrix Spike (MS) |
| 1201683048 | 215966001(212-B-1SD) Matrix Spike Duplicate (MSD) |
| 1201683050 | Tumbling Blank (TB) |
| 1201684060 | Method Blank (MB) CVAA |
| 1201684061 | Laboratory Control Sample (LCS) |
| 1201684069 | 215966001(212-B-1L) Serial Dilution (SD) |
| 1201683047 | 215966001(212-B-1S) Matrix Spike (MS) |
| 1201683049 | 215966001(212-B-1SD) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

Method/Analysis Information

Analytical Batch: 801337 and 801306
Prep Batch : 801335 and 801305
TCLP Prep Batch : 800777
Standard Operating Procedures: GL-MA-E-013 REV# 18, GL-MA-E-008 REV# 13, GL-LB-E-006 REV# 13 and GL-MA-E-010 REV# 19
Analytical Method: SW846 3010/6010B and SW846 7470A
Prep Method : SW846 3010A and SW846 7470A Prep
TCLP Prep Method : SW846 1311

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

System Configuration

The Metals analysis-ICP was performed on a P E 4300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with a Burgener nebulizer, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 1.4L/min, argon gas flows of 15 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis-Mercury was performed on a Perkin-Elmer Flow Injection Mercury System (FIMS-100) automated mercury analyzer. The instrument consists of a cold vapor atomic absorption spectrometer set to detect mercury at a wavelength of 253.7 nm. Sample introduction through the flow injection system is performed via a peristaltic pump at 9 mL/min and nitrogen carrier gas rate of 80 mL/min.

Calibration Information

Instrument Calibration

All initial calibration requirements have been met for this sample delivery group (SDG).

CRDL Requirements

All CRDL standard(s) met the referenced advisory control limits.

ICSA/ICSAB Statement

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

Continuing Calibration Blank (CCB) Requirements

All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

Continuing Calibration Verification (CCV) Requirements

All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

Quality Control (QC) Information**Method Blank (MB) Statement**

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following samples were selected as the quality control (QC) samples for this SDG: 215966001 (212-B-1)-ICP and CVAA.

Matrix Spike (MS) Recovery Statement

The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. All applicable elements met the acceptance criteria.

Matrix Spike Duplicate (MSD) Recovery Statement

The percent recovery (%R) obtained from the MSD analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The MSD met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes, with the exception of copper, as indicated by the "*" qualifier.

MS/MSD Relative Percent Difference (RPD) Statement

The RPD(s) between the MS and MSD met the acceptance limits.

Serial Dilution % Difference Statement

The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations that are 25X the IDL for CVAA, 50X the IDL for ICP, and 100X the IDL for ICP-MS analyses are applicable for serial dilution assessment. All applicable analytes met the acceptance criteria of less than 10% difference (%D).

Technical Information**Holding Time Specifications**

GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days

expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instruments. Sample 2159660013 was diluted 5x for selenium in order to minimize suppression due to matrix interferences. Samples 215996001, 215996002, 216966007 and associated QCs were diluted 10x for mercury in order to bring over range concentrations within the linear calibration range of the instrument.

Preparation Information

The samples and associated matrix QC were prepared at a 10x factor for ICP/ICPMS to minimize potential interferences arising from the high sodium content in the TCLP leaching solution. The samples and associated matrix QC were prepared at a 10x dilution for CVAA because larger volumes of this matrix consumes excessive amounts of potassium permanganate.

Miscellaneous Information

Nonconformance 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: 610003. A copy is included in the Miscellaneous Data section of this package.

Additional Comments

Additional comments were not required for this SDG.

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: By Davis Date: 10-13-08

**Radiochemistry Case Narrative
Lawrence Livermore National Labs (LLNL)
SDG 215963**

Method/Analysis Information

Procedure: Dry Weight-Percent Moisture

Analytical Method:

Analytical Batch Number: 796484

| Sample ID | Client ID |
|------------------|---|
| 215963001 | 212-B-1 |
| 215963002 | 212-B-2 |
| 215963003 | 212-B-3 |
| 215963004 | 212-B-4 |
| 215963005 | 212-B-5 |
| 1201673523 | 215963001(212-B-1) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

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-OA-E-020 REV# 8.

Calibration Information:

Quality Control (QC) Information:

Designated QC

The following sample was used for QC: 215963001 (212-B-1).

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

Procedure: **Dry Weight-Percent Moisture**

Analytical Method:

Analytical Batch Number: 796795

| Sample ID | Client ID |
|------------------|---|
| 215963006 | 212-E-1 |
| 215963007 | 212-E-2 |
| 215963008 | 212-W-1 |
| 215963009 | 212-W-1RP |
| 215963010 | 212-W-2 |
| 215963011 | 212-N-1 |
| 215963012 | 212-N-2 |
| 215963013 | 212-N-3 |
| 215963014 | 212-N-4 |
| 215963015 | 212-N-5 |
| 1201674212 | 215963006(212-E-1) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

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-OA-E-020 REV# 8.

Calibration Information:

Quality Control (QC) Information:

Designated QC

The following sample was used for QC: 215963006 (212-E-1).

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: | GFPC, Gross A/B, solid |
| Analytical Method: | EPA 900.0 Modified |
| Prep Method: | Dry Soil Prep |
| Analytical Batch Number: | 797363 |
| Prep Batch Number: | 796260 |

| Sample ID | Client ID |
|------------------|---|
| 215963001 | 212-B-1 |
| 215963002 | 212-B-2 |
| 215963003 | 212-B-3 |
| 215963004 | 212-B-4 |
| 215963005 | 212-B-5 |
| 1201675582 | Method Blank (MB) |
| 1201675583 | 215963001(212-B-1) Sample Duplicate (DUP) |
| 1201675584 | 215963001(212-B-1) Matrix Spike (MS) |
| 1201675585 | 215963001(212-B-1) Matrix Spike Duplicate (MSD) |
| 1201675586 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on a "dry weight" basis.

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-001B REV# 12.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. The discrimination settings are calibrated in beta discriminating mode to reduce beta to alpha crosstalk.

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: 215963001 (212-B-1).

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 1201675582 (MB) was recounted due to a suspected blank false positive.

Chemical Recoveries

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

Gross Alpha/Beta Preparation Information

High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating.

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

The blank, 1201675582 (MB), did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots. All other samples met the detection limits.

Qualifier information

Manual qualifiers were not required.

Method/Analysis Information

Product: LSC, Tritium Dist, Solid

Analytical Method: EPA 906.0 Modified

Analytical Batch Number: 798304

| Sample ID | Client ID |
|------------------|---|
| 215963001 | 212-B-1 |
| 215963002 | 212-B-2 |
| 215963003 | 212-B-3 |
| 215963004 | 212-B-4 |
| 215963005 | 212-B-5 |
| 1201677662 | Method Blank (MB) |
| 1201677663 | 215963001(212-B-1) Sample Duplicate (DUP) |
| 1201677664 | 215963001(212-B-1) Matrix Spike (MS) |
| 1201677665 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

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# 17.

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: 215963001 (212-B-1).

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.



SHA
Version 4.3
10/25/2005

Sample Hazard Assessment

Client Sample ID

212-F-1

For Authorized Reviewer Use Only

Qualifying Constituents

| Hazard Type | Yes | Comment | Hazard Type | Yes | Comment |
|---|-------------------------------------|-----------------------------|------------------|--------------------------|---------|
| Radiological | | | Solvents | <input type="checkbox"/> | |
| Alpha | <input checked="" type="checkbox"/> | possible | Corrosive | | |
| Beta | <input checked="" type="checkbox"/> | possible | Acid | <input type="checkbox"/> | |
| Tritium | <input checked="" type="checkbox"/> | possible | Base | <input type="checkbox"/> | |
| Inhalation | <input checked="" type="checkbox"/> | possible | Reactive | <input type="checkbox"/> | |
| Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be) | <input type="checkbox"/> | possible for H ₂ | Oxidizer | <input type="checkbox"/> | |
| Biologically Active Materials | <input type="checkbox"/> | | Ignitable | <input type="checkbox"/> | |
| Does the sample contain (Fed. or State-defined) Acutely or Extremely Hazardous Material? | | | | <input type="checkbox"/> | |
| Does the sample contain high explosives? | | | | <input type="checkbox"/> | |
| Does the sample contain <10 mg non-primary initiating or secondary explosives, or <25% high explosives by mass? | | | | <input type="checkbox"/> | |

None of the hazards listed above are present in the sample.

Check here, if WDR is not available (For RHWM use only).

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Reviewer (Print Name):

CHAS DAVIS

Authorized Reviewer (Signature):

[Signature]

Date:

9/15/08

For Sampler Use Only

| Qualifying Constituents | YES | NO | Comments |
|--|-------------------------------------|-------------------------------------|---------------------------------------|
| Was Hazard Assessment Control (HAC) necessary? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| Per Sample Basis: Are rad levels detectable by meter? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> Check if N/A |
| Exceeds 30,000 CPM | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 5 mR/hr @ 30 cm (1 ft) | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 1 microCurie | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |

Comments:

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Sampler (Print Name):

CLAUDE CARDENAS

Authorized Sampler (Signature):

[Signature]

Date:

9/15/08

For CES Use Only

RHWM personnel must notify CES PEL, or designee, if rad levels exceed 1 microCurie for approval to submit sample.

| | | | | |
|---------------------------------|--------------------------|-----------------|---------|------------|
| SHA is not required for: | 5. Research Samples | SHA Received by | Date: | CES COC #: |
| 1. Berms | 6. Preconstruction Soils | (initials): | 9/15/08 | 17500 |
| 2. Retention Tanks | 7. Environmental Soils | | | |
| 3. PE Samples | 8. Trip or Field Blanks | | | |
| 4. Field or Bulk Gamma | | | | |

Sample Transportation Determination

Section I

Requester Chad Davis Phone # 3-4117

Requisition # / Sample ID 212-B-1

Waste Type: Non-hazardous waste or retention tank (not DOT) – Print and sign below and process sample. No further action required.

Hazardous Radioactive Mixed CA Combined

Number of containers:

40 mL _____

125 mL _____

250 mL 4 _____

500 mL _____

1000 mL _____

Print and sign below and forward to Sample Team Lead for further review and Section II completion. Ensure WDR or other preliminary characterization information is submitted along with this form.

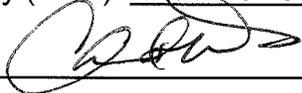
Determined by (Print) Chad Davis Date 9/15/08

Signature 

Section II (Sample Team Lead – complete and return to Requester if not DOT regulated)

DOT Regulated? Yes No

Determined by (Print) Chad Davis Date 9/15/08

Signature 

If DOT regulated forward to RHWM Disposal Office for completion of Section III.

Section III

DOT Information

Proper Shipping Name _____

Packaging _____

Rad Info. Attached

COC # _____



SHA
Version 4.3
10/25/2005

Sample Hazard Assessment

Client Sample ID

212-B-2

For Authorized Reviewer Use Only

Qualifying Constituents

| Hazard Type | Yes | Comment | Hazard Type | Yes | Comment |
|---|-------------------------------------|------------------|------------------|-------------------------------------|---------|
| Radiological | | | Solvents | <input type="checkbox"/> | |
| Alpha | <input checked="" type="checkbox"/> | possible | Corrosive | | |
| Beta | <input checked="" type="checkbox"/> | possible | Acid | <input type="checkbox"/> | |
| Tritium | <input checked="" type="checkbox"/> | possible | Base | <input type="checkbox"/> | |
| Inhalation | <input checked="" type="checkbox"/> | possible for fly | Reactive | <input checked="" type="checkbox"/> | |
| Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be) | <input type="checkbox"/> | | Oxidizer | <input type="checkbox"/> | |
| Biologically Active Materials | <input type="checkbox"/> | | Ignitable | <input type="checkbox"/> | |
| Does the sample contain (Fed. or State-defined) Acutely or Extremely Hazardous Material? | | | | <input type="checkbox"/> | |
| Does the sample contain high explosives? | | | | <input type="checkbox"/> | |
| Does the sample contain <10 mg non-primary initiating or secondary explosives, or <25% high explosives by mass? | | | | <input type="checkbox"/> | |

None of the hazards listed above are present in the sample.

Check here, if WDR is not available (For RHWM use only).

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Reviewer (Print Name):

CHAS DAVIS

Authorized Reviewer (Signature):

[Signature]

Date:

9/15/08

For Sampler Use Only

| Qualifying Constituents | YES | NO | Comments |
|--|-------------------------------------|-------------------------------------|---------------------------------------|
| Was Hazard Assessment Control (HAC) necessary? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| Per Sample Basis: Are rad levels detectable by meter? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> Check if N/A |
| Exceeds 30,000 CPM | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 5 mR/hr @ 30 cm (1 ft) | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 1 microCurie | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |

Comments:

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Sampler (Print Name):

CHAS DAVIS

Authorized Sampler (Signature):

[Signature]

Date:

9/15/08

For CES Use Only

RHWM personnel must notify CES PEL, or designee, if rad levels exceed 1 microCurie for approval to submit sample.

SHA is not required for:

- Berms
- Retention Tanks
- PE Samples
- Field or Bulk Gamma

- Research Samples
- Preconstruction Soils
- Environmental Soils
- Trip or Field Blanks

SHA Received by (initials):

cpd

Date:

9/15/08

CES COC #:

17500

Sample Transportation Determination

Section I

Requester Chad Davis Phone # 3-4117

Requisition # / Sample ID 212-B-2

Waste Type: Non-hazardous waste or retention tank (not DOT) – Print and sign below and process sample. No further action required.

Hazardous Radioactive Mixed CA Combined

Number of containers:

40 mL _____

125 mL _____

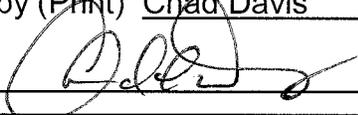
250 mL 4 _____

500 mL _____

1000 mL _____

Print and sign below and forward to Sample Team Lead for further review and Section II completion. Ensure WDR or other preliminary characterization information is submitted along with this form.

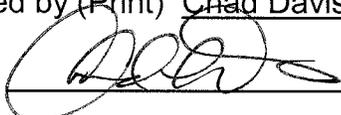
Determined by (Print) Chad Davis Date 9/15/08

Signature 

Section II (Sample Team Lead – complete and return to Requester if not DOT regulated)

DOT Regulated? Yes No

Determined by (Print) Chad Davis Date 9/15/08

Signature 

If DOT regulated forward to RHWM Disposal Office for completion of Section III.

Section III

DOT Information

Proper Shipping Name _____

Packaging _____

Rad Info. Attached

COC # _____



SHA
Version 4.3
10/25/2005

Sample Hazard Assessment

Client Sample ID

212-F-3

For Authorized Reviewer Use Only

Qualifying Constituents

| Hazard Type | Yes | Comment | Hazard Type | Yes | Comment |
|---|-------------------------------------|-----------------|------------------|--------------------------|---------|
| Radiological | | | Solvents | <input type="checkbox"/> | |
| Alpha | <input checked="" type="checkbox"/> | possible | Corrosive | | |
| Beta | <input checked="" type="checkbox"/> | | Acid | <input type="checkbox"/> | |
| Tritium | <input checked="" type="checkbox"/> | | Base | <input type="checkbox"/> | |
| Inhalation | <input checked="" type="checkbox"/> | possible for Hg | Reactive | <input type="checkbox"/> | |
| Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be) | <input type="checkbox"/> | | Oxidizer | <input type="checkbox"/> | |
| Biologically Active Materials | <input type="checkbox"/> | | Ignitable | <input type="checkbox"/> | |
| Does the sample contain (Fed. or State-defined) Acutely or Extremely Hazardous Material? | | | | <input type="checkbox"/> | |
| Does the sample contain high explosives? | | | | <input type="checkbox"/> | |
| Does the sample contain <10 mg non-primary initiating or secondary explosives, or <25% high explosives by mass? | | | | <input type="checkbox"/> | |

None of the hazards listed above are present in the sample.

Check here, if WDR is not available (For RHWM use only).

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Reviewer (Print Name):

CHAS DAVIS

Authorized Reviewer (Signature):

[Signature]

Date:

9/15/08

For Sampler Use Only

| Qualifying Constituents | YES | NO | Comments |
|--|-------------------------------------|-------------------------------------|---------------------------------------|
| Was Hazard Assessment Control (HAC) necessary? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| Per Sample Basis: Are rad levels detectable by meter? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> Check if N/A |
| Exceeds 30,000 CPM | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 5 mR/hr @ 30 cm (1 ft) | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 1 microCurie | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |

Comments:

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Sampler (Print Name):

CLAUDE CARDENAS

Authorized Sampler (Signature):

[Signature]

Date:

9/15/08

For CES Use Only

RHWM personnel must notify CES PEL, or designee, if rad levels exceed 1 microCurie for approval to submit sample.

SHA is not required for:

1. Berms
2. Retention Tanks
3. PE Samples
4. Field or Bulk Gamma

5. Research Samples
6. Preconstruction Soils
7. Environmental Soils
8. Trip or Field Blanks

SHA Received by (initials):

cd

Date:

9/15/08

CES COC #:

17500

Sample Transportation Determination

Section I

Requester Chad Davis Phone # 3-4117

Requisition # / Sample ID 212-B-3

Waste Type: Non-hazardous waste or retention tank (not DOT) – Print and sign below and process sample. No further action required.

Hazardous Radioactive Mixed CA Combined

Number of containers:

40 mL _____

125 mL _____

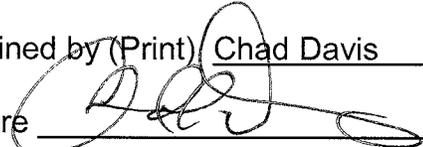
250 mL 4

500 mL _____

1000 mL _____

Print and sign below and forward to Sample Team Lead for further review and Section II completion. Ensure WDR or other preliminary characterization information is submitted along with this form.

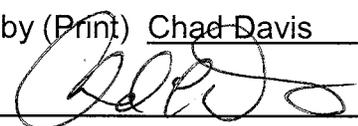
Determined by (Print) Chad Davis Date 9/15/08

Signature 

Section II (Sample Team Lead – complete and return to Requester if not DOT regulated)

DOT Regulated? Yes No

Determined by (Print) Chad Davis Date 9/15/08

Signature 

If DOT regulated forward to RHWM Disposal Office for completion of Section III.

Section III

DOT Information

Proper Shipping Name _____

Packaging _____

Rad Info. Attached

COC # _____



SHA
Version 4.3
10/25/2005

Sample Hazard Assessment

Client Sample ID

212-B-4

For Authorized Reviewer Use Only

Qualifying Constituents

| Hazard Type | Yes | Comment | Hazard Type | Yes | Comment |
|---|-------------------------------------|-----------------|------------------|--------------------------|---------|
| Radiological | | | Solvents | <input type="checkbox"/> | |
| Alpha | <input checked="" type="checkbox"/> | possible | Corrosive | | |
| Beta | <input checked="" type="checkbox"/> | | Acid | <input type="checkbox"/> | |
| Tritium | <input checked="" type="checkbox"/> | | Base | <input type="checkbox"/> | |
| Inhalation | <input checked="" type="checkbox"/> | possible for th | Reactive | <input type="checkbox"/> | |
| Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be) | <input type="checkbox"/> | | Oxidizer | <input type="checkbox"/> | |
| Biologically Active Materials | <input type="checkbox"/> | | Ignitable | <input type="checkbox"/> | |
| Does the sample contain (Fed. or State-defined) Acutely or Extremely Hazardous Material? | | | | <input type="checkbox"/> | |
| Does the sample contain high explosives? | | | | <input type="checkbox"/> | |
| Does the sample contain <10 mg non-primary initiating or secondary explosives, or <25% high explosives by mass? | | | | <input type="checkbox"/> | |

None of the hazards listed above are present in the sample.

Check here, if WDR is not available (For RHWM use only).

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Reviewer (Print Name):

CHAS DAVIS

Authorized Reviewer (Signature):

[Signature]

Date:

9/15/08

For Sampler Use Only

| Qualifying Constituents | YES | NO | Comments |
|--|-------------------------------------|-------------------------------------|---------------------------------------|
| Was Hazard Assessment Control (HAC) necessary? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| Per Sample Basis: Are rad levels detectable by meter? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> Check if N/A |
| Exceeds 30,000 CPM | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 5 mR/hr @ 30 cm (1 ft) | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 1 microCurie | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |

Comments:

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Sampler (Print Name):

CHAS DAVIS

Authorized Sampler (Signature):

[Signature]

Date:

9/15/08

For CES Use Only

RHWM personnel must notify CES PEL, or designee, if rad levels exceed 1 microCurie for approval to submit sample.

SHA is not required for:

- Berms
- Retention Tanks
- PE Samples
- Field or Bulk Gamma

- Research Samples
- Preconstruction Soils
- Environmental Soils
- Trip or Field Blanks

SHA Received by (initials):

cd

Date:

9/15/08

CES COC #:

17500

Sample Transportation Determination

Section I

Requester Chad Davis Phone # 3-4117

Requisition # / Sample ID 212-B-4

Waste Type: Non-hazardous waste or retention tank (not DOT) – Print and sign below and process sample. No further action required.

Hazardous Radioactive Mixed CA Combined

Number of containers:

40 mL _____

125 mL _____

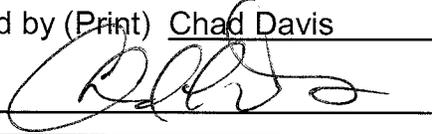
250 mL 4 _____

500 mL _____

1000 mL _____

Print and sign below and forward to Sample Team Lead for further review and Section II completion. Ensure WDR or other preliminary characterization information is submitted along with this form.

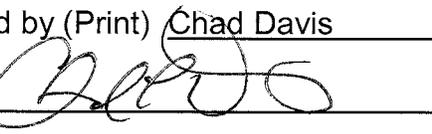
Determined by (Print) Chad Davis Date 9/15/08

Signature 

Section II (Sample Team Lead – complete and return to Requester if not DOT regulated)

DOT Regulated? Yes No

Determined by (Print) Chad Davis Date 9/15/08

Signature 

If DOT regulated forward to RHWM Disposal Office for completion of Section III.

Section III

DOT Information

Proper Shipping Name _____

Packaging _____

Rad Info. Attached

COC # _____



SHA
Version 4.3
10/25/2005

Sample Hazard Assessment

Client Sample ID

212-85

For Authorized Reviewer Use Only

Qualifying Constituents

| Hazard Type | Yes | Comment | Hazard Type | Yes | Comment |
|---|-------------------------------------|------------------|------------------|--------------------------|---------|
| Radiological | | | Solvents | <input type="checkbox"/> | |
| Alpha | <input checked="" type="checkbox"/> | possible | Corrosive | | |
| Beta | <input checked="" type="checkbox"/> | | Acid | <input type="checkbox"/> | |
| Tritium | <input checked="" type="checkbox"/> | | Base | <input type="checkbox"/> | |
| Inhalation | <input checked="" type="checkbox"/> | possible for the | Reactive | <input type="checkbox"/> | |
| Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be) | <input type="checkbox"/> | | Oxidizer | <input type="checkbox"/> | |
| Biologically Active Materials | <input type="checkbox"/> | | Ignitable | <input type="checkbox"/> | |
| Does the sample contain (Fed. or State-defined) Acutely or Extremely Hazardous Material? | | | | <input type="checkbox"/> | |
| Does the sample contain high explosives? | | | | <input type="checkbox"/> | |
| Does the sample contain <10 mg non-primary initiating or secondary explosives, or <25% high explosives by mass? | | | | <input type="checkbox"/> | |

None of the hazards listed above are present in the sample.

Check here, if WDR is not available (For RHWM use only).

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Reviewer (Print Name):

CHAD DAVIS

Authorized Reviewer (Signature):

[Signature]

Date:

9/15/08

For Sampler Use Only

| Qualifying Constituents | YES | NO | Comments |
|--|-------------------------------------|-------------------------------------|---------------------------------------|
| Was Hazard Assessment Control (HAC) necessary? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| Per Sample Basis: Are rad levels detectable by meter? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> Check if N/A |
| Exceeds 30,000 CPM | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 5 mR/hr @ 30 cm (1 ft) | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 1 microCurie | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |

Comments:

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Sampler (Print Name):

CLAVOE CARDENAS

Authorized Sampler (Signature):

[Signature]

Date:

9/15/08

For CES Use Only

RHWM personnel must notify CES PEL, or designee, if rad levels exceed 1 microCurie for approval to submit sample.

SHA is not required for:

- Berms
- Retention Tanks
- PE Samples
- Field or Bulk Gamma

- Research Samples
- Preconstruction Soils
- Environmental Soils
- Trip or Field Blanks

SHA Received by (initials):

cpd

Date:

9/15/08

CES COC #:

17500

Sample Transportation Determination

Section I

Requester Chad Davis

Phone # 3-4117

Requisition # / Sample ID 212-B-5

Waste Type: Non-hazardous waste or retention tank (not DOT) – Print and sign below and process sample. No further action required.

Hazardous Radioactive Mixed CA Combined

Number of containers:

40 mL _____

125 mL _____

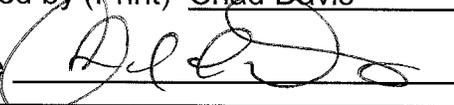
250 mL 4 _____

500 mL _____

1000 mL _____

Print and sign below and forward to Sample Team Lead for further review and Section II completion. Ensure WDR or other preliminary characterization information is submitted along with this form.

Determined by (Print) Chad Davis Date 9/15/08

Signature 

Section II (Sample Team Lead – complete and return to Requester if not DOT regulated)

DOT Regulated? Yes No

Determined by (Print) Chad Davis Date 9/15/08

Signature 

If DOT regulated forward to RHWM Disposal Office for completion of Section III.

Section III

DOT Information

Proper Shipping Name _____

Packaging _____

Rad Info. Attached

COC # _____



SHA
Version 4.3
10/25/2005

Sample Hazard Assessment

Client Sample ID

212-F-1

For Authorized Reviewer Use Only

Qualifying Constituents

| Hazard Type | Yes | Comment | Hazard Type | Yes | Comment |
|---|-------------------------------------|-----------------------------|------------------|--------------------------|---------|
| Radiological | | | Solvents | <input type="checkbox"/> | |
| Alpha | <input checked="" type="checkbox"/> | possible | Corrosive | | |
| Beta | <input checked="" type="checkbox"/> | | Acid | <input type="checkbox"/> | |
| Tritium | <input checked="" type="checkbox"/> | | Base | <input type="checkbox"/> | |
| Inhalation | <input checked="" type="checkbox"/> | possible for H ₂ | Reactive | <input type="checkbox"/> | |
| Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be) | <input type="checkbox"/> | | Oxidizer | <input type="checkbox"/> | |
| Biologically Active Materials | <input type="checkbox"/> | | Ignitable | <input type="checkbox"/> | |
| Does the sample contain (Fed. or State-defined) Acutely or Extremely Hazardous Material? | | | | <input type="checkbox"/> | |
| Does the sample contain high explosives? | | | | <input type="checkbox"/> | |
| Does the sample contain <10 mg non-primary initiating or secondary explosives, or <25% high explosives by mass? | | | | <input type="checkbox"/> | |

None of the hazards listed above are present in the sample.

Check here, if WDR is not available (For RHWM use only).

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Reviewer (Print Name):

CHRIS DAVIS

Authorized Reviewer (Signature):

[Signature]

Date:

9/15/08

For Sampler Use Only

| Qualifying Constituents | YES | NO | Comments |
|--|-------------------------------------|-------------------------------------|---------------------------------------|
| Was Hazard Assessment Control (HAC) necessary? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| Per Sample Basis: Are rad levels detectable by meter? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> Check if N/A |
| Exceeds 30,000 CPM | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 5 mR/hr @ 30 cm (1 ft) | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 1 microCurie | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |

Comments:

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Sampler (Print Name):

CLAUDIA CARDENAS

Authorized Sampler (Signature):

[Signature]

Date:

9/15/08

For CES Use Only

RHWM personnel must notify CES PEL, or designee, if rad levels exceed 1 microCurie for approval to submit sample.

| | | | | |
|--|--|--|-----------------------------|--------------------------------|
| <p>SHA is not required for:</p> <ol style="list-style-type: none"> Berms Retention Tanks PE Samples Field or Bulk Gamma | <ol style="list-style-type: none"> Research Samples Preconstruction Soils Environmental Soils Trip or Field Blanks | <p>SHA Received by (initials):</p> <p><i>cpf</i></p> | <p>Date:</p> <p>9/15/08</p> | <p>CES COC #:</p> <p>17500</p> |
|--|--|--|-----------------------------|--------------------------------|

Sample Transportation Determination

Section I

Requester Chad Davis Phone # 3-4117

Requisition # / Sample ID 212-E-1

Waste Type: Non-hazardous waste or retention tank (not DOT) – Print and sign below and process sample. No further action required.

Hazardous Radioactive Mixed CA Combined

Number of containers:

40 mL _____

125 mL _____

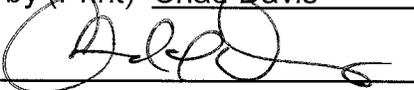
250 mL 3

500 mL _____

1000 mL _____

Print and sign below and forward to Sample Team Lead for further review and Section II completion. Ensure WDR or other preliminary characterization information is submitted along with this form.

Determined by (Print) Chad Davis Date 9/15/08

Signature 

Section II (Sample Team Lead – complete and return to Requester if not DOT regulated)

DOT Regulated? Yes No

Determined by (Print) Chad Davis Date 9/15/08

Signature 

If DOT regulated forward to RHWM Disposal Office for completion of Section III.

Section III

DOT Information

Proper Shipping Name _____

Packaging _____

Rad Info. Attached

COC # _____



SHA
Version 4.3
10/25/2005

Sample Hazard Assessment

Client Sample ID

212-E-2

For Authorized Reviewer Use Only

Qualifying Constituents

| Hazard Type | Yes | Comment | Hazard Type | Yes | Comment |
|---|-------------------------------------|-----------------|------------------|--------------------------|---------|
| Radiological | | | Solvents | <input type="checkbox"/> | |
| Alpha | <input checked="" type="checkbox"/> | possible | Corrosive | | |
| Beta | <input checked="" type="checkbox"/> | possible | Acid | <input type="checkbox"/> | |
| Tritium | <input checked="" type="checkbox"/> | possible | Base | <input type="checkbox"/> | |
| Inhalation | <input checked="" type="checkbox"/> | possible for Hg | Reactive | <input type="checkbox"/> | |
| Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be) | <input type="checkbox"/> | | Oxidizer | <input type="checkbox"/> | |
| Biologically Active Materials | <input type="checkbox"/> | | Ignitable | <input type="checkbox"/> | |
| Does the sample contain (Fed. or State-defined) Acutely or Extremely Hazardous Material? | | | | <input type="checkbox"/> | |
| Does the sample contain high explosives? | | | | <input type="checkbox"/> | |
| Does the sample contain <10 mg non-primary initiating or secondary explosives, or <25% high explosives by mass? | | | | <input type="checkbox"/> | |

None of the hazards listed above are present in the sample.

Check here, if WDR is not available (For RHWM use only).

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Reviewer (Print Name):

CHAD DAVIS

Authorized Reviewer (Signature):

(Signature)

Date:

9/15/08

For Sampler Use Only

| Qualifying Constituents | YES | NO | Comments |
|--|-------------------------------------|-------------------------------------|---------------------------------------|
| Was Hazard Assessment Control (HAC) necessary? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| Per Sample Basis: Are rad levels detectable by meter? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> Check if N/A |
| Exceeds 30,000 CPM | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 5 mR/hr @ 30 cm (1 ft) | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 1 microCurie | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |

Comments:

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Sampler (Print Name):

CLAUDE CARDENAS

Authorized Sampler (Signature):

(Signature)

Date:

9/15/08

For CES Use Only

RHWM personnel must notify CES PEL, or designee, if rad levels exceed 1 microCurie for approval to submit sample.

SHA is not required for:

- Berms
- Retention Tanks
- PE Samples
- Field or Bulk Gamma

- Research Samples
- Preconstruction Soils
- Environmental Soils
- Trip or Field Blanks

SHA Received by (initials):

cpd

Date:

9/15/08

CES COC #:

17500

Sample Transportation Determination

Section I

Requester Chad Davis Phone # 3-4117

Requisition # / Sample ID 212-E-2

Waste Type: Non-hazardous waste or retention tank (not DOT) – Print and sign below and process sample. No further action required.

Hazardous Radioactive Mixed CA Combined

Number of containers:

40 mL _____

125 mL _____

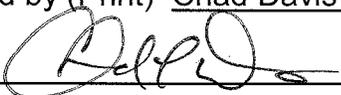
250 mL 3

500 mL _____

1000 mL _____

Print and sign below and forward to Sample Team Lead for further review and Section II completion. Ensure WDR or other preliminary characterization information is submitted along with this form.

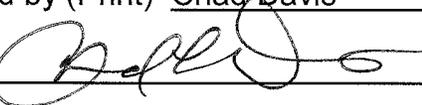
Determined by (Print) Chad Davis Date 9/15/08

Signature 

Section II (Sample Team Lead – complete and return to Requester if not DOT regulated)

DOT Regulated? Yes No

Determined by (Print) Chad Davis Date 9/15/08

Signature 

If DOT regulated forward to RHWM Disposal Office for completion of Section III.

Section III

DOT Information

Proper Shipping Name _____

Packaging _____

Rad Info. Attached

COC # _____



SHA
Version 4.3
10/25/2005

Sample Hazard Assessment

Client Sample ID

212-W-1 & W-1 RP

For Authorized Reviewer Use Only

Qualifying Constituents

| Hazard Type | Yes | Comment | Hazard Type | Yes | Comment |
|---|-------------------------------------|-----------------|------------------|--------------------------|---------|
| Radiological | | | Solvents | <input type="checkbox"/> | |
| Alpha | <input checked="" type="checkbox"/> | possible | Corrosive | | |
| Beta | <input checked="" type="checkbox"/> | | Acid | <input type="checkbox"/> | |
| Tritium | <input checked="" type="checkbox"/> | | Base | <input type="checkbox"/> | |
| Inhalation | <input checked="" type="checkbox"/> | possible for Hg | Reactive | <input type="checkbox"/> | |
| Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be) | <input type="checkbox"/> | | Oxidizer | <input type="checkbox"/> | |
| Biologically Active Materials | <input type="checkbox"/> | | Ignitable | <input type="checkbox"/> | |
| Does the sample contain (Fed. or State-defined) Acutely or Extremely Hazardous Material? | | | | <input type="checkbox"/> | |
| Does the sample contain high explosives? | | | | <input type="checkbox"/> | |
| Does the sample contain <10 mg non-primary initiating or secondary explosives, or <25% high explosives by mass? | | | | <input type="checkbox"/> | |

None of the hazards listed above are present in the sample.

Check here, if WDR is not available (For RHWM use only).

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Reviewer (Print Name):

Chao DAVIS

Authorized Reviewer (Signature):

[Signature]

Date:

9/15/08

For Sampler Use Only

| Qualifying Constituents | YES | NO | Comments |
|--|-------------------------------------|-------------------------------------|---------------------------------------|
| Was Hazard Assessment Control (HAC) necessary? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| Per Sample Basis: Are rad levels detectable by meter? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> Check if N/A |
| Exceeds 30,000 CPM | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 5 mR/hr @ 30 cm (1 ft) | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 1 microCurie | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |

Comments:

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Sampler (Print Name):

CLAUDE CARDENAS

Authorized Sampler (Signature):

[Signature]

Date:

9/15/08

For CES Use Only

RHWM personnel must notify CES PEL, or designee, if rad levels exceed 1 microCurie for approval to submit sample.

| | | | | |
|---|--|-----------------------------|---------|------------|
| SHA is not required for: | 5. Research Samples 6. Preconstruction Soils 7. Environmental Soils 8. Trip or Field Blanks | SHA Received by (initials): | Date: | CES COC #: |
| 1. Berms 2. Retention Tanks 3. PE Samples 4. Field or Bulk Gamma | | cpl | 9/15/08 | 17500 |

Sample Transportation Determination

Section I

Requester Chad Davis Phone # 3-4117

Requisition # / Sample ID 212-W-1

Waste Type: Non-hazardous waste or retention tank (not DOT) – Print and sign below and process sample. No further action required.

Hazardous Radioactive Mixed CA Combined

Number of containers:

40 mL _____

125 mL _____

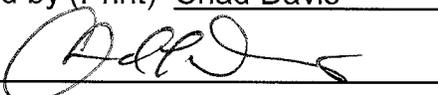
250 mL 3 _____

500 mL _____

1000 mL _____

Print and sign below and forward to Sample Team Lead for further review and Section II completion. Ensure WDR or other preliminary characterization information is submitted along with this form.

Determined by (Print) Chad Davis Date 9/15/08

Signature 

Section II (Sample Team Lead – complete and return to Requester if not DOT regulated)

DOT Regulated? Yes No

Determined by (Print) Chad Davis Date 9/15/08

Signature 

If DOT regulated forward to RHWM Disposal Office for completion of Section III.

Section III

DOT Information

Proper Shipping Name _____

Packaging _____

Rad Info. Attached

COC # _____

Sample Transportation Determination

Section I

Requester Chad Davis Phone # 3-4117

Requisition # / Sample ID 212-W-1RP

Waste Type: Non-hazardous waste or retention tank (not DOT) – Print and sign below and process sample. No further action required.

Hazardous Radioactive Mixed CA Combined

Number of containers:

40 mL _____

125 mL _____

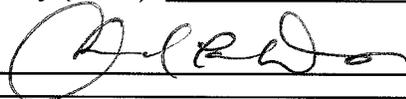
250 mL 3

500 mL _____

1000 mL _____

Print and sign below and forward to Sample Team Lead for further review and Section II completion. Ensure WDR or other preliminary characterization information is submitted along with this form.

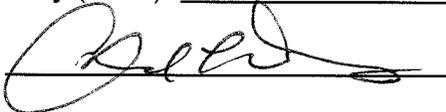
Determined by (Print) Chad Davis Date 9/15/08

Signature 

Section II (Sample Team Lead – complete and return to Requester if not DOT regulated)

DOT Regulated? Yes No

Determined by (Print) Chad Davis Date 9/15/08

Signature 

If DOT regulated forward to RHWM Disposal Office for completion of Section III.

Section III

DOT Information

Proper Shipping Name _____

Packaging _____

Rad Info. Attached

COC # _____



SHA
Version 4.3
10/25/2005

Sample Hazard Assessment

Client Sample ID

212-10-2

For Authorized Reviewer Use Only

Qualifying Constituents

| Hazard Type | Yes | Comment | Hazard Type | Yes | Comment |
|---|-------------------------------------|-----------------------------|------------------|--------------------------|---------|
| Radiological | | | Solvents | <input type="checkbox"/> | |
| Alpha | <input checked="" type="checkbox"/> | possible | Corrosive | | |
| Beta | <input checked="" type="checkbox"/> | | Acid | <input type="checkbox"/> | |
| Tritium | <input checked="" type="checkbox"/> | | Base | <input type="checkbox"/> | |
| Inhalation | <input checked="" type="checkbox"/> | possible for H ₂ | Reactive | <input type="checkbox"/> | |
| Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be) | <input type="checkbox"/> | | Oxidizer | <input type="checkbox"/> | |
| Biologically Active Materials | <input type="checkbox"/> | | Ignitable | <input type="checkbox"/> | |
| Does the sample contain (Fed. or State-defined) Acutely or Extremely Hazardous Material? | | | | <input type="checkbox"/> | |
| Does the sample contain high explosives? | | | | <input type="checkbox"/> | |
| Does the sample contain <10 mg non-primary initiating or secondary explosives, or <25% high explosives by mass? | | | | <input type="checkbox"/> | |

None of the hazards listed above are present in the sample.

Check here, if WDR is not available (For RHWM use only).

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Reviewer (Print Name):

CHAS DAVIS

Authorized Reviewer (Signature):

[Signature]

Date:

9/15/08

For Sampler Use Only

| Qualifying Constituents | YES | NO | Comments |
|--|-------------------------------------|-------------------------------------|---------------------------------------|
| Was Hazard Assessment Control (HAC) necessary? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| Per Sample Basis: Are rad levels detectable by meter? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> Check if N/A |
| Exceeds 30,000 CPM | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 5 mR/hr @ 30 cm (1 ft) | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 1 microCurie | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |

Comments:

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Sampler (Print Name):

CLAUDE CARDENAS

Authorized Sampler (Signature):

[Signature]

Date:

9/15/08

For CES Use Only

RHWM personnel must notify CES PEL, or designee, if rad levels exceed 1 microCurie for approval to submit sample.

SHA is not required for:

- Berms
- Retention Tanks
- PE Samples
- Field or Bulk Gamma

- Research Samples
- Preconstruction Soils
- Environmental Soils
- Trip or Field Blanks

SHA Received by (initials):

[Initials]

Date:

9/15/08

CES COC #:

17500

Sample Transportation Determination

Section I

Requester Chad Davis Phone # 3-4117

Requisition # / Sample ID 212-W-2

Waste Type: Non-hazardous waste or retention tank (not DOT) – Print and sign below and process sample. No further action required.

Hazardous Radioactive Mixed CA Combined

Number of containers:

40 mL _____

125 mL _____

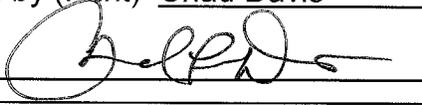
250 mL 3

500 mL _____

1000 mL _____

Print and sign below and forward to Sample Team Lead for further review and Section II completion. Ensure WDR or other preliminary characterization information is submitted along with this form.

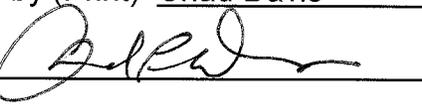
Determined by (Print) Chad Davis Date 9/15/08

Signature 

Section II (Sample Team Lead – complete and return to Requester if not DOT regulated)

DOT Regulated? Yes No

Determined by (Print) Chad Davis Date 9/15/08

Signature 

If DOT regulated forward to RHWM Disposal Office for completion of Section III.

Section III

DOT Information

Proper Shipping Name _____

Packaging _____

Rad Info. Attached

COC # _____



SHA
Version 4.3
10/25/2005

Sample Hazard Assessment

Client Sample ID

212-N-1

For Authorized Reviewer Use Only

Qualifying Constituents

| Hazard Type | Yes | Comment | Hazard Type | Yes | Comment |
|---|-------------------------------------|-----------------|------------------|--------------------------|---------|
| Radiological | | | Solvents | <input type="checkbox"/> | |
| Alpha | <input checked="" type="checkbox"/> | possible | Corrosive | | |
| Beta | <input checked="" type="checkbox"/> | | Acid | <input type="checkbox"/> | |
| Tritium | <input checked="" type="checkbox"/> | | Base | <input type="checkbox"/> | |
| Inhalation | <input checked="" type="checkbox"/> | possible for tg | Reactive | <input type="checkbox"/> | |
| Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be) | <input type="checkbox"/> | | Oxidizer | <input type="checkbox"/> | |
| Biologically Active Materials | <input type="checkbox"/> | | Ignitable | <input type="checkbox"/> | |
| Does the sample contain (Fed. or State-defined) Acutely or Extremely Hazardous Material? | | | | <input type="checkbox"/> | |
| Does the sample contain high explosives? | | | | <input type="checkbox"/> | |
| Does the sample contain <10 mg non-primary initiating or secondary explosives, or <25% high explosives by mass? | | | | <input type="checkbox"/> | |

None of the hazards listed above are present in the sample.

Check here, if WDR is not available (For RHWM use only).

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Reviewer (Print Name):

CHRIS DAVIS

Authorized Reviewer (Signature):

[Signature]

Date:

9/15/08

For Sampler Use Only

| Qualifying Constituents | YES | NO | Comments |
|--|-------------------------------------|-------------------------------------|---------------------------------------|
| Was Hazard Assessment Control (HAC) necessary? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| Per Sample Basis: Are rad levels detectable by meter? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> Check if N/A |
| Exceeds 30,000 CPM | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 5 mR/hr @ 30 cm (1 ft) | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 1 microCurie | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |

Comments:

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Sampler (Print Name):

CLAUDE CARDENAS

Authorized Sampler (Signature):

[Signature]

Date:

9/15/08

For CES Use Only

RHWM personnel must notify CES PEL, or designee, if rad levels exceed 1 microCurie for approval to submit sample.

| | | | | |
|---|--|-----------------------------|---------|------------|
| SHA is not required for: | 5. Research Samples 6. Preconstruction Soils 7. Environmental Soils 8. Trip or Field Blanks | SHA Received by (initials): | Date: | CES COC #: |
| 1. Berms 2. Retention Tanks 3. PE Samples 4. Field or Bulk Gamma | | cpd | 9/15/08 | 17500 |

Sample Transportation Determination

Section I

Requester Chad Davis Phone # 3-4117

Requisition # / Sample ID 212-N-1

Waste Type: Non-hazardous waste or retention tank (not DOT) – Print and sign below and process sample. No further action required.

Hazardous Radioactive Mixed CA Combined

Number of containers:

40 mL _____

125 mL _____

250 mL 3

500 mL _____

1000 mL _____

Print and sign below and forward to Sample Team Lead for further review and Section II completion. Ensure WDR or other preliminary characterization information is submitted along with this form.

Determined by (Print) Chad Davis Date 9/15/08

Signature 

Section II (Sample Team Lead – complete and return to Requester if not DOT regulated)

DOT Regulated? Yes No

Determined by (Print) Chad Davis Date 9/15/08

Signature 

If DOT regulated forward to RHWM Disposal Office for completion of Section III.

Section III

DOT Information

Proper Shipping Name _____

Packaging _____

Rad Info. Attached

COC # _____



SHA
Version 4.3
10/25/2005

Sample Hazard Assessment

Client Sample ID

212-N-2

For Authorized Reviewer Use Only

Qualifying Constituents

| Hazard Type | Yes | Comment | Hazard Type | Yes | Comment |
|---|-------------------------------------|-----------------------------|------------------|-------------------------------------|---------|
| Radiological | | | Solvents | <input type="checkbox"/> | |
| Alpha | <input checked="" type="checkbox"/> | possible | Corrosive | | |
| Beta | <input checked="" type="checkbox"/> | | Acid | <input type="checkbox"/> | |
| Tritium | <input checked="" type="checkbox"/> | | Base | <input type="checkbox"/> | |
| Inhalation | <input checked="" type="checkbox"/> | possible for H ₂ | Reactive | <input checked="" type="checkbox"/> | |
| Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be) | <input type="checkbox"/> | | Oxidizer | <input type="checkbox"/> | |
| Biologically Active Materials | <input type="checkbox"/> | | Ignitable | <input type="checkbox"/> | |
| Does the sample contain (Fed. or State-defined) Acutely or Extremely Hazardous Material? | | | | <input type="checkbox"/> | |
| Does the sample contain high explosives? | | | | <input type="checkbox"/> | |
| Does the sample contain <10 mg non-primary initiating or secondary explosives, or <25% high explosives by mass? | | | | <input type="checkbox"/> | |

None of the hazards listed above are present in the sample.

Check here, if WDR is not available (For RHWM use only).

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Reviewer (Print Name):

CITRUS DAVIS

Authorized Reviewer (Signature):

[Signature]

Date:

9/15/08

For Sampler Use Only

| Qualifying Constituents | YES | NO | Comments |
|--|-------------------------------------|-------------------------------------|---------------------------------------|
| Was Hazard Assessment Control (HAC) necessary? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| Per Sample Basis: Are rad levels detectable by meter? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> Check if N/A |
| Exceeds 30,000 CPM | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 5 mR/hr @ 30 cm (1 ft) | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 1 microCurie | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |

Comments:

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Sampler (Print Name):

CLAUDE CARDENAS

Authorized Sampler (Signature):

[Signature]

Date:

9/15/08

For CES Use Only

RHWM personnel must notify CES PEL, or designee, if rad levels exceed 1 microCurie for approval to submit sample.

| | | | | |
|---------------------------------|--------------------------|-----------------|----------------|--------------|
| SHA is not required for: | 5. Research Samples | SHA Received by | Date: | CES COC #: |
| 1. Berms | 6. Preconstruction Soils | (initials): | <i>9/15/08</i> | <i>17500</i> |
| 2. Retention Tanks | 7. Environmental Soils | <i>cpd</i> | | |
| 3. PE Samples | 8. Trip or Field Blanks | | | |
| 4. Field or Bulk Gamma | | | | |

Sample Transportation Determination

Section I

Requester Chad Davis Phone # 3-4117

Requisition # / Sample ID 212-N-2

Waste Type: Non-hazardous waste or retention tank (not DOT) – Print and sign below and process sample. No further action required.

Hazardous Radioactive Mixed CA Combined

Number of containers:

40 mL _____

125 mL _____

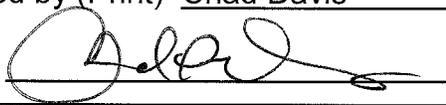
250 mL 3

500 mL _____

1000 mL _____

Print and sign below and forward to Sample Team Lead for further review and Section II completion. Ensure WDR or other preliminary characterization information is submitted along with this form.

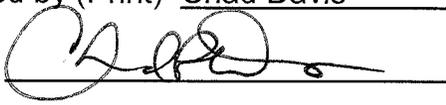
Determined by (Print) Chad Davis Date 9/15/08

Signature 

Section II (Sample Team Lead – complete and return to Requester if not DOT regulated)

DOT Regulated? Yes No

Determined by (Print) Chad Davis Date 9/15/08

Signature 

If DOT regulated forward to RHWM Disposal Office for completion of Section III.

Section III

DOT Information

Proper Shipping Name _____

Packaging _____

Rad Info. Attached

COC # _____



SHA
Version 4.3
10/25/2005

Sample Hazard Assessment

Client Sample ID

212-N-3

For Authorized Reviewer Use Only

Qualifying Constituents

| Hazard Type | Yes | Comment | Hazard Type | Yes | Comment |
|---|-------------------------------------|-----------------------------|------------------|--------------------------|---------|
| Radiological | | | Solvents | <input type="checkbox"/> | |
| Alpha | <input checked="" type="checkbox"/> | possible | Corrosive | | |
| Beta | <input checked="" type="checkbox"/> | | Acid | <input type="checkbox"/> | |
| Tritium | <input checked="" type="checkbox"/> | | Base | <input type="checkbox"/> | |
| Inhalation | <input checked="" type="checkbox"/> | possible for H ₂ | Reactive | <input type="checkbox"/> | |
| Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be) | <input type="checkbox"/> | | Oxidizer | <input type="checkbox"/> | |
| Biologically Active Materials | <input type="checkbox"/> | | Ignitable | <input type="checkbox"/> | |
| Does the sample contain (Fed. or State-defined) Acutely or Extremely Hazardous Material? | | | | <input type="checkbox"/> | |
| Does the sample contain high explosives? | | | | <input type="checkbox"/> | |
| Does the sample contain <10 mg non-primary initiating or secondary explosives, or <25% high explosives by mass? | | | | <input type="checkbox"/> | |

None of the hazards listed above are present in the sample.

Check here, if WDR is not available (For RHWM use only).

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Reviewer (Print Name):

CHAO DAVIS

Authorized Reviewer (Signature):

[Signature]

Date:

9/15/08

For Sampler Use Only

| Qualifying Constituents | YES | NO | Comments |
|--|-------------------------------------|-------------------------------------|---------------------------------------|
| Was Hazard Assessment Control (HAC) necessary? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| Per Sample Basis: Are rad levels detectable by meter? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> Check if N/A |
| Exceeds 30,000 CPM | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 5 mR/hr @ 30 cm (1 ft) | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 1 microCurie | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |

Comments:

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Sampler (Print Name):

CLAUDE CARDENAS

Authorized Sampler (Signature):

[Signature]

Date:

9/15/08

For CES Use Only

RHWM personnel must notify CES PEL, or designee, if rad levels exceed 1 microCurie for approval to submit sample.

| | | | | |
|---|--|--------------------------------|---------|------------|
| SHA is not required for: | 5. Research Samples 6. Preconstruction Soils 7. Environmental Soils 8. Trip or Field Blanks | SHA Received by (initials): | Date: | CES COC #: |
| 1. Berms 2. Retention Tanks 3. PE Samples 4. Field or Bulk Gamma | | <i>[Initials]</i> | 9/15/08 | 17500 |

Sample Transportation Determination

Section I

Requester Chad Davis Phone # 3-4117

Requisition # / Sample ID 212-N-3

Waste Type: Non-hazardous waste or retention tank (not DOT) – Print and sign below and process sample. No further action required.

Hazardous Radioactive Mixed CA Combined

Number of containers:

40 mL _____

125 mL _____

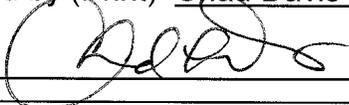
250 mL 3

500 mL _____

1000 mL _____

Print and sign below and forward to Sample Team Lead for further review and Section II completion. Ensure WDR or other preliminary characterization information is submitted along with this form.

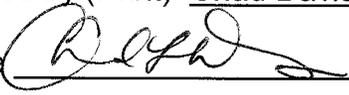
Determined by (Print) Chad Davis Date 9/15/08

Signature 

Section II (Sample Team Lead – complete and return to Requester if not DOT regulated)

DOT Regulated? Yes No

Determined by (Print) Chad Davis Date 9/15/08

Signature 

If DOT regulated forward to RHWM Disposal Office for completion of Section III.

Section III

DOT Information

Proper Shipping Name _____

Packaging _____

Rad Info. Attached

COC # _____



SHA
Version 4.3
10/25/2005

Sample Hazard Assessment

Client Sample ID

212-N-9

For Authorized Reviewer Use Only

Qualifying Constituents

| Hazard Type | Yes | Comment | Hazard Type | Yes | Comment |
|---|-------------------------------------|-----------------|------------------|--------------------------|---------|
| Radiological | | | Solvents | <input type="checkbox"/> | |
| Alpha | <input checked="" type="checkbox"/> | possible | Corrosive | | |
| Beta | <input checked="" type="checkbox"/> | | Acid | <input type="checkbox"/> | |
| Tritium | <input checked="" type="checkbox"/> | | Base | <input type="checkbox"/> | |
| Inhalation | <input checked="" type="checkbox"/> | possible for Hg | Reactive | <input type="checkbox"/> | |
| Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be) | <input type="checkbox"/> | | Oxidizer | <input type="checkbox"/> | |
| Biologically Active Materials | <input type="checkbox"/> | | Ignitable | <input type="checkbox"/> | |
| Does the sample contain (Fed. or State-defined) Acutely or Extremely Hazardous Material? | | | | <input type="checkbox"/> | |
| Does the sample contain high explosives? | | | | <input type="checkbox"/> | |
| Does the sample contain <10 mg non-primary initiating or secondary explosives, or <25% high explosives by mass? | | | | <input type="checkbox"/> | |

None of the hazards listed above are present in the sample.

Check here, if WDR is not available (For RHWM use only).

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Reviewer (Print Name):

CHAD DAVIS

Authorized Reviewer (Signature):

Chad Davis

Date:

9/15/08

For Sampler Use Only

| Qualifying Constituents | YES | NO | Comments |
|--|-------------------------------------|-------------------------------------|---------------------------------------|
| Was Hazard Assessment Control (HAC) necessary? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| Per Sample Basis: Are rad levels detectable by meter? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> Check if N/A |
| Exceeds 30,000 CPM | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 5 mR/hr @ 30 cm (1 ft) | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 1 microCurie | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |

Comments:

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Sampler (Print Name):

CLAUDE CARDENAS

Authorized Sampler (Signature):

Claude Cardenas

Date:

9/15/08

For CES Use Only

RHWM personnel must notify CES PEL, or designee, if rad levels exceed 1 microCurie for approval to submit sample.

SHA is not required for.

- Berms
- Retention Tanks
- PE Samples
- Field or Bulk Gamma

- Research Samples
- Preconstruction Soils
- Environmental Soils
- Trip or Field Blanks

SHA Received by (initials):

cpl

Date:

9/15/08

CES COC #:

1750

Sample Transportation Determination

Section I

Requester Chad Davis Phone # 3-4117

Requisition # / Sample ID 212-N-4

Waste Type: Non-hazardous waste or retention tank (not DOT) – Print and sign below and process sample. No further action required.

Hazardous Radioactive Mixed CA Combined

Number of containers:

40 mL _____

125 mL _____

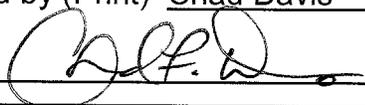
250 mL 3

500 mL _____

1000 mL _____

Print and sign below and forward to Sample Team Lead for further review and Section II completion. Ensure WDR or other preliminary characterization information is submitted along with this form.

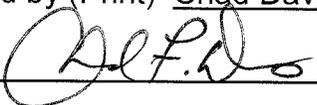
Determined by (Print) Chad Davis Date 9/15/08

Signature 

Section II (Sample Team Lead – complete and return to Requester if not DOT regulated)

DOT Regulated? Yes No

Determined by (Print) Chad Davis Date 9/15/08

Signature 

If DOT regulated forward to RHWM Disposal Office for completion of Section III.

Section III

DOT Information

Proper Shipping Name _____

Packaging _____

Rad Info. Attached

COC # _____



SHA
Version 4.3
10/25/2005

Sample Hazard Assessment

Client Sample ID

212-N-5

For Authorized Reviewer Use Only

Qualifying Constituents

| Hazard Type | Yes | Comment | Hazard Type | Yes | Comment |
|---|-------------------------------------|-----------------------------|------------------|-------------------------------------|---------|
| Radiological | | | Solvents | <input type="checkbox"/> | |
| Alpha | <input checked="" type="checkbox"/> | possible | Corrosive | | |
| Beta | <input checked="" type="checkbox"/> | | Acid | <input type="checkbox"/> | |
| Tritium | <input checked="" type="checkbox"/> | | Base | <input type="checkbox"/> | |
| Inhalation | <input checked="" type="checkbox"/> | possible for H ₂ | Reactive | <input checked="" type="checkbox"/> | |
| Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be) | <input type="checkbox"/> | | Oxidizer | <input type="checkbox"/> | |
| Biologically Active Materials | <input type="checkbox"/> | | Ignitable | <input type="checkbox"/> | |
| Does the sample contain (Fed. or State-defined) Acutely or Extremely Hazardous Material? | | | | <input type="checkbox"/> | |
| Does the sample contain high explosives? | | | | <input type="checkbox"/> | |
| Does the sample contain <10 mg non-primary initiating or secondary explosives, or <25% high explosives by mass? | | | | <input type="checkbox"/> | |

None of the hazards listed above are present in the sample.

Check here, if WDR is not available (For RHWM use only).

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Reviewer (Print Name):

Chao DAVIS

Authorized Reviewer (Signature):

[Signature]

Date:

9/15/08

For Sampler Use Only

| Qualifying Constituents | YES | NO | Comments |
|--|-------------------------------------|-------------------------------------|---------------------------------------|
| Was Hazard Assessment Control (HAC) necessary? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| Per Sample Basis: Are rad levels detectable by meter? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> Check if N/A |
| Exceeds 30,000 CPM | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 5 mR/hr @ 30 cm (1 ft) | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 1 microCurie | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |

Comments:

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Sampler (Print Name):

CLAUDE CARDENAS

Authorized Sampler (Signature):

[Signature]

Date:

9/15/08

For CES Use Only

RHWM personnel must notify CES PEL, or designee, if rad levels exceed 1 microCurie for approval to submit sample.

| | | | | |
|---|--|-----------------------------|---------|------------|
| SHA is not required for: | 5. Research Samples 6. Preconstruction Soils 7. Environmental Soils 8. Trip or Field Blanks | SHA Received by (initials): | Date: | CES COC #: |
| 1. Berms 2. Retention Tanks 3. PE Samples 4. Field or Bulk Gamma | | <i>cpd</i> | 9/15/08 | 17500 |

Sample Transportation Determination

Section I

Requester Chad Davis Phone # 3-4117

Requisition # / Sample ID 212-N-5

Waste Type: Non-hazardous waste or retention tank (not DOT) – Print and sign below and process sample. No further action required.

Hazardous Radioactive Mixed CA Combined

Number of containers:

40 mL _____

125 mL _____

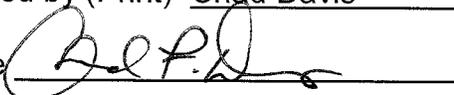
250 mL 3

500 mL _____

1000 mL _____

Print and sign below and forward to Sample Team Lead for further review and Section II completion. Ensure WDR or other preliminary characterization information is submitted along with this form.

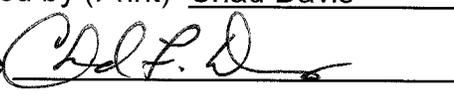
Determined by (Print) Chad Davis Date 9/15/08

Signature 

Section II (Sample Team Lead – complete and return to Requester if not DOT regulated)

DOT Regulated? Yes No

Determined by (Print) Chad Davis Date 9/15/08

Signature 

If DOT regulated forward to RHWM Disposal Office for completion of Section III.

Section III

DOT Information

Proper Shipping Name _____

Packaging _____

Rad Info. Attached

COC # _____

Sample Data Summary

| | | |
|---|-------------------------------------|-------------------------------------|
|  | RD Version 1.2 9/14/98 | REVIEW of RADIOCHEMICAL DATA |
|---|-------------------------------------|-------------------------------------|

CES COC# 17500 CES Sample # 212-B-1 Client Sample ID Mercury
Contaminated Soil

Rad Dec # RHWM-RD-08-0037-R

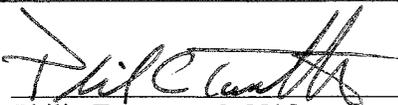
| | | |
|--|---|--------------------------------------|
| The sample was analyzed for : | | Subject was surveyed for: |
| <input checked="" type="checkbox"/> Bulk Gross Alpha | <input type="checkbox"/> Alpha TUPA | <input type="checkbox"/> Surface Rad |
| <input checked="" type="checkbox"/> Bulk Gross Beta | <input type="checkbox"/> Gamma Spec | |
| <input checked="" type="checkbox"/> Bulk Tritium | <input type="checkbox"/> Removable Rad α | |
| <input type="checkbox"/> Removable Rad H-3 | <input type="checkbox"/> Removable Rad β | |

| | \leq MDC | $>$ MDC | Check if by Limited Rad Declaration (LRD) |
|------------------------------|-------------------------------------|-------------------------------------|---|
| Bulk Contamination | | | |
| Gross Alpha | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Gross Beta | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Tritium | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Additional Analytical | | | |
| Gamma Spec | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Alpha TUPA | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Contamination | | | |
| Removable Rad H-3 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Removable Rad α | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Removable Rad β | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Rad α | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Rad β | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Radioactivity was was not can not say added to this sample.

Comments:

Gross alpha and gross beta activities were detected above the sample-specific MDC's and at levels that are above the screening levels specified in the Moratorium for clean site soils.

Finding by:  Date: October 23, 2008
 Philip Torretto, x2-5515

Criteria limits are those of "LLNL Criteria for Identifying Mixed Waste" for materials with the possibility of bulk contamination and DOE 5400.5 and 5480.11 for those with the possibility of fixed and removable surface contamination. For removable surface contamination from unknown radionuclides, the limits are 20 dpm/100 cm² for gross alpha, 200 dpm/cm² for gross beta and 1000 dpm/100 cm² for tritium.

GEL LABORATORIES LLC

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

Certificate of Analysis Report for

LLNL002 Lawrence Livermore National Labs (#H712000)

Client SDG: 215963 GEL Work Order: 215963

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
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

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.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the detection limit.

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, Edith Kent.



Reviewed by

10-15-08

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : Lawrence Livermore National
Security, LLC
Address : 7000 East Avenue
Mailstop L-620
Livermore, California 94551
Contact: Mr. Chad F. Davis
Project: **CES - Normal Deliverable**

Report Date: October 15, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-B-1 | Project: | LLNL00306 |
| Sample ID: | 215963001 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |
| Moisture: | 4.1% | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------|-------|-------|-----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>7471 Cold Vapor Hg in Solid "Dry Weight Corrected"</i> | | | | | | | | | | | |
| Mercury | | 32.2 | 0.171 | 1.14 | mg/kg | 100 | ETL | 09/29/08 | 1207 | 796414 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>6010 TAL Metals Soil Federal "Dry Weight Corrected"</i> | | | | | | | | | | | |
| Antimony | U | -0.229 | 0.318 | 1.50 | mg/kg | 1 | HSC | 10/12/08 | 1650 | 796830 | 2 |
| Arsenic | | 4.72 | 0.512 | 1.54 | mg/kg | 1 | | | | | |
| Barium | | 173 | 0.102 | 0.512 | mg/kg | 1 | | | | | |
| Beryllium | U | -0.342 | 0.102 | 0.512 | mg/kg | 1 | | | | | |
| Cadmium | J | 0.384 | 0.102 | 0.512 | mg/kg | 1 | | | | | |
| Chromium | | 34.2 | 0.102 | 0.512 | mg/kg | 1 | | | | | |
| Cobalt | | 10.5 | 0.205 | 0.512 | mg/kg | 1 | | | | | |
| Copper | | 344 | 0.307 | 2.00 | mg/kg | 1 | | | | | |
| Lead | | 19.5 | 0.256 | 1.50 | mg/kg | 1 | | | | | |
| Molybdenum | J | 0.656 | 0.205 | 1.02 | mg/kg | 1 | | | | | |
| Nickel | | 42.3 | 0.102 | 1.30 | mg/kg | 1 | | | | | |
| Silver | | 0.813 | 0.102 | 0.512 | mg/kg | 1 | | | | | |
| Thallium | U | -1.89 | 0.512 | 3.00 | mg/kg | 1 | | | | | |
| Vanadium | | 31.3 | 0.102 | 0.512 | mg/kg | 1 | | | | | |
| Zinc | | 128 | 0.205 | 1.02 | mg/kg | 1 | | | | | |
| Selenium | U | 3.47 | 5.12 | 15.4 | mg/kg | 10 | HSC | 10/14/08 | 1620 | 796830 | 3 |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|-----------------------------|---------|----------|------|------------|
| SW846 3050B | 846 3050BS PREP | FGA | 10/10/08 | 1430 | 796829 |
| SW846 7471A Prep | EPA 7471A Mercury Prep Soil | TXB3 | 09/26/08 | 1600 | 796413 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|-------------------|------------------|
| 1 | SW846 7471A | |
| 2 | SW846 3050B/6010B | |
| 3 | SW846 3050B/6010B | |

GEL LABORATORIES LLC

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

Certificate of Analysis Report for

LLNL002 Lawrence Livermore National Labs (#H712000)

Client SDG: 215963-1 GEL Work Order: 215964

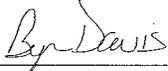
The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

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.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the detection limit.

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, Edith Kent.


Reviewed by

10-14-08

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : Lawrence Livermore National Security, LLC
 Address : 7000 East Avenue
 Mailstop L-620
 Livermore, California 94551
 Contact: Mr. Chad F. Davis
 Project: CES - Normal Deliverable

Report Date: October 14, 2008

Client Sample ID: 212-B-1
 Sample ID: 215964001
 Matrix: SO
 Collect Date: 15-SEP-08 10:45
 Receive Date: 17-SEP-08
 Collector: Client

Project: LLNL00306
 Client ID: LLNL002

| Parameter | Qualifier | Result | DL | RL | Units | DF | AnalystDate | Time | Batch | Method |
|---|-----------|----------|-------|-------|-------|----|-------------|----------|-------|----------|
| Mercury Analysis-CVAA | | | | | | | | | | |
| <i>STLC Hg in Solid "As Received"</i> | | | | | | | | | | |
| Mercury | | 0.565 | 0.030 | 0.200 | mg/L | 1 | JXL1 | 10/07/08 | 1324 | 801780 1 |
| Metals Analysis-ICP | | | | | | | | | | |
| <i>STLC ICP Metals for Solids "As Received"</i> | | | | | | | | | | |
| Antimony | U | 0.00363 | 0.030 | 1.00 | mg/L | 1 | KDL | 10/13/08 | 1227 | 801834 2 |
| Arsenic | U | -0.00489 | 0.050 | 0.150 | mg/L | 1 | | | | |
| Barium | | 9.94 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Beryllium | U | 0.00338 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Cadmium | J | 0.0149 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Chromium | | 0.131 | 0.020 | 0.050 | mg/L | 1 | | | | |
| Cobalt | | 0.323 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Copper | | 23.8 | 0.030 | 0.100 | mg/L | 1 | | | | |
| Lead | | 0.518 | 0.025 | 0.100 | mg/L | 1 | | | | |
| Molybdenum | U | -0.00331 | 0.020 | 0.100 | mg/L | 1 | | | | |
| Nickel | | 0.447 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Selenium | | 0.319 | 0.050 | 0.150 | mg/L | 1 | | | | |
| Silver | U | 0.00914 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Thallium | U | -0.0207 | 0.050 | 0.200 | mg/L | 1 | | | | |
| Vanadium | | 0.200 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Zinc | | 4.16 | 0.020 | 0.100 | mg/L | 1 | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|-------------------------------|-------------------------------------|---------|----------|------|------------|
| California Code of Regulation | California Wet Method STLC Leaching | CJPI | 10/01/08 | 1000 | 800775 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 10/06/08 | 0810 | 801833 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 10/06/08 | 1140 | 801779 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |

GEL LABORATORIES LLC

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

Certificate of Analysis Report for

LLNL002 Lawrence Livermore National Labs (#H712000)

Client SDG: 215963-2 GEL Work Order: 215966

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

J Value is estimated

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

h Preparation or preservation holding time was exceeded

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.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the detection limit.

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, Edith Kent.

B. Davis

10-12-08

Reviewed by

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : Lawrence Livermore National Security, LLC
 Address : 7000 East Avenue
 Mailstop L-620
 Livermore, California 94551
 Contact: Mr. Chad F. Davis
 Project: **CES - Normal Deliverable**

Report Date: October 13, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-B-1 | Project: | LLNL00306 |
| Sample ID: | 215966001 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|----------|-------|-------|-------|----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>TCLP Hg in Solid "As Received"</i> | | | | | | | | | | | |
| Mercury | | 0.269 | 0.003 | 0.020 | mg/L | 10 | JXL1 | 10/06/08 | 1203 | 801306 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>TCLP ICP Metals for Solid "As Received"</i> | | | | | | | | | | | |
| Antimony | J | 0.0538 | 0.030 | 0.100 | mg/L | 1 | KDL | 10/07/08 | 1655 | 801337 | 2 |
| Arsenic | U | 0.0161 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Barium | | 0.733 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Beryllium | U | 0.000487 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Cadmium | U | 0.00457 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Chromium | J | 0.0211 | 0.020 | 0.050 | mg/L | 1 | | | | | |
| Cobalt | J | 0.0329 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Copper | | 3.12 | 0.030 | 0.100 | mg/L | 1 | | | | | |
| Lead | J | 0.0294 | 0.025 | 0.100 | mg/L | 1 | | | | | |
| Molybdenum | U | 0.00475 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Nickel | | 0.0829 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Selenium | U | -0.00392 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Silver | U | -0.00366 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Thallium | J | 0.0544 | 0.050 | 0.200 | mg/L | 1 | | | | | |
| Vanadium | U | 0.00473 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Zinc | | 0.639 | 0.020 | 0.100 | mg/L | 1 | | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|------------------------------------|---------|----------|------|------------|
| SW846 1311 | SW846 1311 TCLP Leaching -FEDERAL | CXW3 | 10/01/08 | 1600 | 800777 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 10/06/08 | 0810 | 801335 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 10/03/08 | 1155 | 801305 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |

GEL LABORATORIES LLC

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Certificate of Analysis Report for

LLNL002 Lawrence Livermore National Labs (#H712000)

Client SDG: 215963 GEL Work Order: 215963

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
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

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.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the detection limit.

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, Edith Kent.



Reviewed by _____

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : Lawrence Livermore National Security, LLC
 Address : 7000 East Avenue
 Mailstop L-620
 Livermore, California 94551
 Contact: Mr. Chad F. Davis
 Project: CES - Normal Deliverable

Report Date: October 17, 2008

| | | | |
|-------------------|-----------|------------|-----------|
| Client Sample ID: | 212-B-1 | Project: | LLNL00306 |
| Sample ID: | 215963001 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |
| Moisture: | 4.1% | | |

| Parameter | Qualifier | Result | Uncertainty | DL | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|--|-----------|--------|-------------|------|----------|-------|-------|----|---------|----------|------|--------|------|
| Gravimetric Solids | | | | | | | | | | | | | |
| <i>"As Received"</i> | | | | | | | | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i> | | | | | | | | | | | | | |
| Alpha | | 11.1 | +/-1.81 | 1.66 | +/-3.35 | 0.500 | pCi/g | | DXB5 | 10/07/08 | 2109 | 797363 | 2 |
| Beta | | 17.4 | +/-1.51 | 1.69 | +/-2.88 | 1.50 | pCi/g | | | | | | |
| Rad Liquid Scintillation Analysis | | | | | | | | | | | | | |
| <i>LSC, Tritium Dist, Solid "As Received"</i> | | | | | | | | | | | | | |
| Tritium | U | -0.348 | +/-0.848 | 1.53 | +/-0.848 | 2.00 | pCi/g | | SXL4 | 09/30/08 | 1153 | 798304 | 3 |

The following Analytical Methods were performed

| Method | Description |
|--------|------------------------|
| 1 | ASTM D 2216 (Modified) |
| 2 | EPA 900.0 Modified |
| 3 | EPA 906.0 Modified |

Notes:

The Qualifiers in this report are defined as follows :

- ** 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 For General Chemistry and Organic analysis the 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
- E Metals--%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD

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Certificate of Analysis

Company : Lawrence Livermore National
Security, LLC
Address : 7000 East Avenue
Mailstop L-620
Livermore, California 94551
Contact: Mr. Chad F. Davis
Project: CES - Normal Deliverable

Report Date: October 17, 2008

Client Sample ID: 212-B-1
Sample ID: 215963001

Project: LLNL00306
Client ID: LLNL002

| Parameter | Qualifier | Result | Uncertainty | DL | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|-----------|-----------|--------|-------------|----|-----|----|-------|----|---------|------|------|-------|------|
|-----------|-----------|--------|-------------|----|-----|----|-------|----|---------|------|------|-------|------|

M Matrix Related Failure
N/A RPD or %Recovery limits do not apply.
ND Analyte concentration is not detected above the detection limit
NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
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. Qualifier Not Applicable for Radiochemistry.
h Preparation or preservation holding time was exceeded
The above sample is reported on a dry weight basis.

| | | |
|---|-------------------------------------|-------------------------------------|
|  | RD Version 1.2 9/14/98 | REVIEW of RADIOCHEMICAL DATA |
|---|-------------------------------------|-------------------------------------|

CES COC# 17500 CES Sample # 212-B-2 Client Sample ID Mercury
_____ Contaminated Soil

Rad Dec # RHWM-RD-08-0038-R

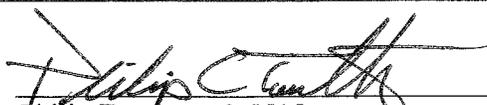
| | |
|--|--------------------------------------|
| The sample was analyzed for : | Subject was surveyed for: |
| <input checked="" type="checkbox"/> Bulk Gross Alpha <input type="checkbox"/> Alpha TUPA <input checked="" type="checkbox"/> Bulk Gross Beta <input type="checkbox"/> Gamma Spec <input checked="" type="checkbox"/> Bulk Tritium <input type="checkbox"/> Removable Rad α <input type="checkbox"/> Removable Rad H-3 <input type="checkbox"/> Removable Rad β | <input type="checkbox"/> Surface Rad |

| | \leq MDC | $>$ MDC | Check if by Limited Rad Declaration (LRD) |
|------------------------------|-------------------------------------|-------------------------------------|---|
| Bulk Contamination | | | |
| Gross Alpha | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Gross Beta | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Tritium | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Additional Analytical | | | |
| Gamma Spec | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Alpha TUPA | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Contamination | | | |
| Removable Rad H-3 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Removable Rad α | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Removable Rad β | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Rad α | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Rad β | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Radioactivity was was not can not say added to this sample.

Comments:

Gross alpha and gross beta activities were detected above the sample-specific MDC's and at levels that are above the screening-levels specified in the Moratorium for clean site soils.

Finding by:  Date: October 23, 2008
 Philip Torretto, x2-5515

Criteria limits are those of "LLNL Criteria for Identifying Mixed Waste" for materials with the possibility of bulk contamination and DOE 5400.5 and 5480.11 for those with the possibility of fixed and removable surface contamination. For removable surface contamination from unknown radionuclides, the limits are 20 dpm/100 cm² for gross alpha, 200 dpm/cm² for gross beta and 1000 dpm/100 cm² for tritium.

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Certificate of Analysis

Company : Lawrence Livermore National
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Address : 7000 East Avenue
Mailstop L-620
Livermore, California 94551
Contact: Mr. Chad F. Davis
Project: CES - Normal Deliverable

Report Date: October 13, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-B-2 | Project: | LLNL00306 |
| Sample ID: | 215966002 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | AnalystDate | Time | Batch | Method |
|--|-----------|-----------|-------|-------|-------|----|---------------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | |
| <i>TCLP Hg in Solid "As Received"</i> | | | | | | | | | | |
| Mercury | | 0.0799 | 0.003 | 0.020 | mg/L | 10 | JXL1 10/06/08 | 1211 | 801306 | 1 |
| Metals Analysis-ICP | | | | | | | | | | |
| <i>TCLP ICP Metals for Solid "As Received"</i> | | | | | | | | | | |
| Antimony | U | 0.00112 | 0.030 | 0.100 | mg/L | 1 | KDL 10/07/08 | 1723 | 801337 | 2 |
| Arsenic | U | 0.00937 | 0.050 | 0.150 | mg/L | 1 | | | | |
| Barium | | 0.691 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Beryllium | U | 0.00044 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Cadmium | U | -0.000036 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Chromium | J | 0.0215 | 0.020 | 0.050 | mg/L | 1 | | | | |
| Cobalt | | 0.0784 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Copper | | 0.432 | 0.030 | 0.100 | mg/L | 1 | | | | |
| Lead | U | 0.0193 | 0.025 | 0.100 | mg/L | 1 | | | | |
| Molybdenum | U | 0.00133 | 0.020 | 0.100 | mg/L | 1 | | | | |
| Nickel | | 0.110 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Selenium | U | -0.0766 | 0.050 | 0.150 | mg/L | 1 | | | | |
| Silver | U | -0.00214 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Thallium | U | 0.000923 | 0.050 | 0.200 | mg/L | 1 | | | | |
| Vanadium | U | 0.00926 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Zinc | | 0.183 | 0.020 | 0.100 | mg/L | 1 | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|------------------------------------|---------|----------|------|------------|
| SW846 1311 | SW846 1311 TCLP Leaching -FEDERAL | CXW3 | 10/01/08 | 1600 | 800777 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 10/06/08 | 0810 | 801335 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 10/03/08 | 1155 | 801305 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |

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Certificate of Analysis

Company : Lawrence Livermore National Security, LLC
 Address : 7000 East Avenue
 Mailstop L-620
 Livermore, California 94551
 Contact: Mr. Chad F. Davis
 Project: CES - Normal Deliverable

Report Date: October 17, 2008

| | | | |
|-------------------|-----------|------------|-----------|
| Client Sample ID: | 212-B-2 | Project: | LLNL00306 |
| Sample ID: | 215963002 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |
| Moisture: | 4.18% | | |

| Parameter | Qualifier | Result | Uncertainty | DL | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|--|-----------|--------|-------------|-------|----------|-------|-------|----|---------|----------|------|--------|------|
| Gravimetric Solids | | | | | | | | | | | | | |
| <i>"As Received"</i> | | | | | | | | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i> | | | | | | | | | | | | | |
| Alpha | | 9.43 | +/-1.45 | 0.929 | +/-2.61 | 0.500 | pCi/g | | DXB5 | 10/07/08 | 2108 | 797363 | 2 |
| Beta | | 19.9 | +/-1.49 | 1.45 | +/-3.20 | 1.50 | pCi/g | | | | | | |
| Rad Liquid Scintillation Analysis | | | | | | | | | | | | | |
| <i>LSC, Tritium Dist, Solid "As Received"</i> | | | | | | | | | | | | | |
| Tritium | U | -0.373 | +/-0.825 | 1.50 | +/-0.825 | 2.00 | pCi/g | | SXL4 | 09/30/08 | 1239 | 798304 | 3 |

The following Analytical Methods were performed

| Method | Description |
|--------|------------------------|
| 1 | ASTM D 2216 (Modified) |
| 2 | EPA 900.0 Modified |
| 3 | EPA 906.0 Modified |

Notes:

The Qualifiers in this report are defined as follows :

- ** 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 For General Chemistry and Organic analysis the 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
- E Metals--%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : Lawrence Livermore National
Security, LLC
Address : 7000 East Avenue
Mailstop L-620
Livermore, California 94551
Contact: Mr. Chad F. Davis
Project: CES - Normal Deliverable

Report Date: October 17, 2008

Client Sample ID: 212-B-2
Sample ID: 215963002

Project: LLNL00306
Client ID: LLNL002

| Parameter | Qualifier | Result | Uncertainty | DL | TPU | RL | Units | DF | Analyst | Date | Time Batch | Mtd. |
|-----------|-----------|--------|-------------|----|-----|----|-------|----|---------|------|------------|------|
|-----------|-----------|--------|-------------|----|-----|----|-------|----|---------|------|------------|------|

N/A RPD or %Recovery limits do not apply.

ND Analyte concentration is not detected above the detection limit

NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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. Qualifier Not Applicable for Radiochemistry.

h Preparation or preservation holding time was exceeded

The above sample is reported on a dry weight basis.

| | | |
|---|-------------------------------------|-------------------------------------|
|  | RD Version 1.2 9/14/98 | REVIEW of RADIOCHEMICAL DATA |
|---|-------------------------------------|-------------------------------------|

CES COC# 17500 Sample # 212-B-3 Client Sample ID Mercury Contaminated Soil

Rad Dec # RHWM-RD-08-0039-R

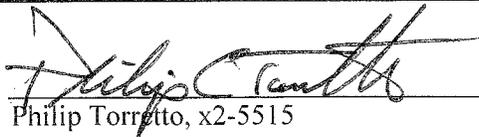
| | | |
|--|---|--------------------------------------|
| The sample was analyzed for : | | Subject was surveyed for: |
| <input checked="" type="checkbox"/> Bulk Gross Alpha | <input type="checkbox"/> Alpha TUPA | <input type="checkbox"/> Surface Rad |
| <input checked="" type="checkbox"/> Bulk Gross Beta | <input type="checkbox"/> Gamma Spec | |
| <input checked="" type="checkbox"/> Bulk Tritium | <input type="checkbox"/> Removable Rad α | |
| <input type="checkbox"/> Removable Rad H-3 | <input type="checkbox"/> Removable Rad β | |

| | \leq MDC | $>$ MDC | Check if by Limited Rad Declaration (LRD) |
|------------------------------|-------------------------------------|-------------------------------------|---|
| Bulk Contamination | | | |
| Gross Alpha | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Gross Beta | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Tritium | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Additional Analytical | | | |
| Gamma Spec | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Alpha TUPA | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Contamination | | | |
| Removable Rad H-3 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Removable Rad α | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Removable Rad β | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Rad α | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Rad β | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Radioactivity was was not can not say added to this sample.

Comments:

Gross alpha and gross beta activities were detected above the sample-specific MDC's and at levels that are above the screening-levels specified in the Moratorium for clean site soils.

Finding by:  Date: October 23, 2008
 Philip Torretto, x2-5515

Criteria limits are those of "LLNL Criteria for Identifying Mixed Waste" for materials with the possibility of bulk contamination and DOE 5400.5 and 5480.11 for those with the possibility of fixed and removable surface contamination. For removable surface contamination from unknown radionuclides, the limits are 20 dpm/100 cm² for gross alpha, 200 dpm/cm² for gross beta and 1000 dpm/100 cm² for tritium.

GEL LABORATORIES LLC

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Certificate of Analysis

Company : Lawrence Livermore National Security, LLC
 Address : 7000 East Avenue
 Mailstop L-620
 Livermore, California 94551
 Contact: Mr. Chad F. Davis
 Project: CES - Normal Deliverable

Report Date: October 15, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-B-3 | Project: | LLNL00306 |
| Sample ID: | 215963003 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |
| Moisture: | 4.55% | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|--------|-------|-------|-----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>7471 Cold Vapor Hg in Solid "Dry Weight Corrected"</i> | | | | | | | | | | | |
| Mercury | | 7.58 | 0.165 | 1.10 | mg/kg | 100 | ETL | 09/29/08 | 1221 | 796414 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>6010 TAL Metals Soil Federal "Dry Weight Corrected"</i> | | | | | | | | | | | |
| Antimony | U | -0.206 | 0.309 | 1.50 | mg/kg | 1 | HSC | 10/12/08 | 1724 | 796830 | 2 |
| Arsenic | | 4.71 | 0.499 | 1.50 | mg/kg | 1 | | | | | |
| Barium | | 167 | 0.0998 | 0.500 | mg/kg | 1 | | | | | |
| Beryllium | U | -0.31 | 0.0998 | 0.500 | mg/kg | 1 | | | | | |
| Cadmium | J | 0.172 | 0.0998 | 0.500 | mg/kg | 1 | | | | | |
| Chromium | | 42.0 | 0.0998 | 0.500 | mg/kg | 1 | | | | | |
| Cobalt | | 10.0 | 0.200 | 0.500 | mg/kg | 1 | | | | | |
| Copper | | 84.9 | 0.299 | 2.00 | mg/kg | 1 | | | | | |
| Lead | | 11.1 | 0.249 | 1.50 | mg/kg | 1 | | | | | |
| Molybdenum | J | 0.721 | 0.200 | 1.00 | mg/kg | 1 | | | | | |
| Nickel | | 44.6 | 0.0998 | 1.30 | mg/kg | 1 | | | | | |
| Silver | | 0.676 | 0.0998 | 0.500 | mg/kg | 1 | | | | | |
| Thallium | U | -1.78 | 0.499 | 3.00 | mg/kg | 1 | | | | | |
| Vanadium | | 30.3 | 0.0998 | 0.500 | mg/kg | 1 | | | | | |
| Zinc | | 71.8 | 0.200 | 1.00 | mg/kg | 1 | | | | | |
| Selenium | U | 3.58 | 4.99 | 15.0 | mg/kg | 10 | HSC | 10/14/08 | 1655 | 796830 | 3 |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|-----------------------------|---------|----------|------|------------|
| SW846 3050B | 846 3050BS PREP | FGA | 10/10/08 | 1430 | 796829 |
| SW846 7471A Prep | EPA 7471A Mercury Prep Soil | TXB3 | 09/26/08 | 1600 | 796413 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|-------------------|------------------|
| 1 | SW846 7471A | |
| 2 | SW846 3050B/6010B | |
| 3 | SW846 3050B/6010B | |

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Certificate of Analysis

Company : Lawrence Livermore National Security, LLC
 Address : 7000 East Avenue
 Mailstop L-620
 Livermore, California 94551
 Contact: Mr. Chad F. Davis
 Project: **CES - Normal Deliverable**

Report Date: October 13, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-B-3 | Project: | LLNL00306 |
| Sample ID: | 215966003 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|-----------|--------|-------|-------|----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>TCLP Hg in Solid "As Received"</i> | | | | | | | | | | | |
| Mercury | | 0.0105 | 0.0003 | 0.002 | mg/L | 1 | JXL1 | 10/06/08 | 1258 | 801306 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>TCLP ICP Metals for Solid "As Received"</i> | | | | | | | | | | | |
| Antimony | U | -0.00505 | 0.030 | 0.100 | mg/L | 1 | KDL | 10/07/08 | 1730 | 801337 | 2 |
| Arsenic | U | 0.0306 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Barium | | 1.15 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Beryllium | U | -0.000234 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Cadmium | U | 0.00141 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Chromium | U | 0.012 | 0.020 | 0.050 | mg/L | 1 | | | | | |
| Cobalt | U | -0.000032 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Copper | J | 0.0796 | 0.030 | 0.100 | mg/L | 1 | | | | | |
| Lead | U | 0.0136 | 0.025 | 0.100 | mg/L | 1 | | | | | |
| Molybdenum | U | 0.002 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Nickel | J | 0.0379 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Selenium | U | -0.0489 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Silver | U | -0.00575 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Thallium | U | -0.0237 | 0.050 | 0.200 | mg/L | 1 | | | | | |
| Vanadium | U | -0.00169 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Zinc | | 0.276 | 0.020 | 0.100 | mg/L | 1 | | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|------------------------------------|---------|----------|------|------------|
| SW846 1311 | SW846 1311 TCLP Leaching -FEDERAL | CXW3 | 10/01/08 | 1600 | 800777 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 10/06/08 | 0810 | 801335 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 10/03/08 | 1155 | 801305 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |

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Livermore, California 94551
Contact: Mr. Chad F. Davis
Project: CES - Normal Deliverable

Report Date: October 17, 2008

Client Sample ID: 212-B-3
Sample ID: 215963003
Matrix: SO
Collect Date: 15-SEP-08
Receive Date: 17-SEP-08
Collector: Client
Moisture: 4.55%

Project: LLNL00306
Client ID: LLNL002

| Parameter | Qualifier | Result | Uncertainty | DL | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|--|-----------|--------|-------------|------|----------|-------|-------|----|---------|----------|------|--------|------|
| Gravimetric Solids | | | | | | | | | | | | | |
| <i>"As Received"</i> | | | | | | | | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i> | | | | | | | | | | | | | |
| Alpha | | 8.95 | +/-1.55 | 1.36 | +/-2.79 | 0.500 | pCi/g | | DXB5 | 10/07/08 | 2155 | 797363 | 2 |
| Beta | | 17.2 | +/-1.44 | 1.52 | +/-2.80 | 1.50 | pCi/g | | | | | | |
| Rad Liquid Scintillation Analysis | | | | | | | | | | | | | |
| <i>LSC, Tritium Dist, Solid "As Received"</i> | | | | | | | | | | | | | |
| Tritium | U | -0.19 | +/-0.826 | 1.48 | +/-0.826 | 2.00 | pCi/g | | SXL4 | 09/30/08 | 1325 | 798304 | 3 |

The following Analytical Methods were performed

| Method | Description |
|--------|------------------------|
| 1 | ASTM D 2216 (Modified) |
| 2 | EPA 900.0 Modified |
| 3 | EPA 906.0 Modified |

Notes:

The Qualifiers in this report are defined as follows :

- ** 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 For General Chemistry and Organic analysis the 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
- E Metals--%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure

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Contact: Mr. Chad F. Davis
Project: CES - Normal Deliverable

Report Date: October 17, 2008

Client Sample ID: 212-B-3
Sample ID: 215963003

Project: LLNL00306
Client ID: LLNL002

| Parameter | Qualifier | Result | Uncertainty | DL | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|-----------|-----------|--------|-------------|----|-----|----|-------|----|---------|------|------|-------|------|
|-----------|-----------|--------|-------------|----|-----|----|-------|----|---------|------|------|-------|------|

N/A RPD or %Recovery limits do not apply.

ND Analyte concentration is not detected above the detection limit

NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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. Qualifier Not Applicable for Radiochemistry.

h Preparation or preservation holding time was exceeded

The above sample is reported on a dry weight basis.

| | | |
|--|-------------------------------------|-------------------------------------|
|  CES <small>CONTRACTOR EVALUATION SYSTEM</small> | RD Version 1.2 9/14/98 | REVIEW of RADIOCHEMICAL DATA |
|--|-------------------------------------|-------------------------------------|

CES COC# 17500 Sample # 212-B-4 Client Sample ID Mercury Contaminated Soil

Rad Dec # RHWM-RD-08-0040-R

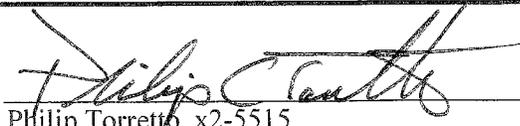
| The sample was analyzed for : | | Subject was surveyed for: |
|--|---|--------------------------------------|
| <input checked="" type="checkbox"/> Bulk Gross Alpha | <input type="checkbox"/> Alpha TUPA | <input type="checkbox"/> Surface Rad |
| <input checked="" type="checkbox"/> Bulk Gross Beta | <input type="checkbox"/> Gamma Spec | |
| <input checked="" type="checkbox"/> Bulk Tritium | <input type="checkbox"/> Removable Rad α | |
| <input type="checkbox"/> Removable Rad H-3 | <input type="checkbox"/> Removable Rad β | |

| | \leq MDC | $>$ MDC | Check if by Limited Rad Declaration (LRD) |
|------------------------------|-------------------------------------|-------------------------------------|---|
| Bulk Contamination | | | |
| Gross Alpha | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Gross Beta | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Tritium | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Additional Analytical | | | |
| Gamma Spec | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Alpha TUPA | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Contamination | | | |
| Removable Rad H-3 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Removable Rad α | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Removable Rad β | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Rad α | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Rad β | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Radioactivity was was not can not say added to this sample.

Comments:

Gross alpha and gross beta activities were detected above the sample-specific MDC's and at levels that are above the screening-levels specified in the Moratorium for clean site soils.

Finding by:  Date: October 23, 2008
 Philip Torretto, x2-5515

Criteria limits are those of "LLNL Criteria for Identifying Mixed Waste" for materials with the possibility of bulk contamination and DOE 5400.5 and 5480.11 for those with the possibility of fixed and removable surface contamination. For removable surface contamination from unknown radionuclides, the limits are 20 dpm/100 cm² for gross alpha, 200 dpm/cm² for gross beta and 1000 dpm/100 cm² for tritium.

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 Livermore, California 94551
 Contact: Mr. Chad F. Davis
 Project: CES - Normal Deliverable

Report Date: October 15, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-B-4 | Project: | LLNL00306 |
| Sample ID: | 215963004 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |
| Moisture: | 4.37% | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|--------|-------|-------|----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>7471 Cold Vapor Hg in Solid "Dry Weight Corrected"</i> | | | | | | | | | | | |
| Mercury | | 7.83 | 0.0888 | 0.592 | mg/kg | 50 | ETL | 09/29/08 | 1411 | 796414 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>6010 TAL Metals Soil Federal "Dry Weight Corrected"</i> | | | | | | | | | | | |
| Antimony | U | -0.505 | 0.310 | 1.50 | mg/kg | 1 | HSC | 10/12/08 | 1731 | 796830 | 2 |
| Arsenic | | 4.57 | 0.500 | 1.50 | mg/kg | 1 | | | | | |
| Barium | | 158 | 0.100 | 0.500 | mg/kg | 1 | | | | | |
| Beryllium | U | -0.331 | 0.100 | 0.500 | mg/kg | 1 | | | | | |
| Cadmium | J | 0.114 | 0.100 | 0.500 | mg/kg | 1 | | | | | |
| Chromium | | 33.2 | 0.100 | 0.500 | mg/kg | 1 | | | | | |
| Cobalt | | 10.3 | 0.200 | 0.500 | mg/kg | 1 | | | | | |
| Copper | | 96.8 | 0.300 | 2.00 | mg/kg | 1 | | | | | |
| Lead | | 9.08 | 0.250 | 1.50 | mg/kg | 1 | | | | | |
| Molybdenum | J | 0.435 | 0.200 | 1.00 | mg/kg | 1 | | | | | |
| Nickel | | 41.7 | 0.100 | 1.30 | mg/kg | 1 | | | | | |
| Silver | | 0.671 | 0.100 | 0.500 | mg/kg | 1 | | | | | |
| Thallium | U | -1.83 | 0.500 | 3.00 | mg/kg | 1 | | | | | |
| Vanadium | | 28.2 | 0.100 | 0.500 | mg/kg | 1 | | | | | |
| Zinc | | 56.7 | 0.200 | 1.00 | mg/kg | 1 | | | | | |
| Selenium | U | 4.69 | 5.00 | 15.0 | mg/kg | 10 | HSC | 10/14/08 | 1702 | 796830 | 3 |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|-----------------------------|---------|----------|------|------------|
| SW846 3050B | 846 3050BS PREP | FGA | 10/10/08 | 1430 | 796829 |
| SW846 7471A Prep | EPA 7471A Mercury Prep Soil | TXB3 | 09/26/08 | 1600 | 796413 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|-------------------|------------------|
| 1 | SW846 7471A | |
| 2 | SW846 3050B/6010B | |
| 3 | SW846 3050B/6010B | |

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Certificate of Analysis

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 Livermore, California 94551
 Contact: Mr. Chad F. Davis
 Project: **CES - Normal Deliverable**

Report Date: October 14, 2008

Client Sample ID: 212-B-4
 Sample ID: 215964004
 Matrix: SO
 Collect Date: 15-SEP-08 10:45
 Receive Date: 17-SEP-08
 Collector: Client

Project: LLNL00306
 Client ID: LLNL002

| Parameter | Qualifier | Result | DL | RL | Units | DF | AnalystDate | Time | Batch | Method |
|---|-----------|---------|-------|-------|-------|----|---------------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | |
| <i>STLC Hg in Solid "As Received"</i> | | | | | | | | | | |
| Mercury | U | -0.0598 | 0.030 | 0.200 | mg/L | 1 | JXL1 10/07/08 | 1336 | 801780 | 1 |
| Metals Analysis-ICP | | | | | | | | | | |
| <i>STLC ICP Metals for Solids "As Received"</i> | | | | | | | | | | |
| Antimony | U | 0.0266 | 0.030 | 1.00 | mg/L | 1 | KDL 10/13/08 | 1325 | 801834 | 2 |
| Arsenic | U | -0.0635 | 0.050 | 0.150 | mg/L | 1 | | | | |
| Barium | | 11.8 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Beryllium | U | 0.00324 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Cadmium | J | 0.028 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Chromium | | 0.147 | 0.020 | 0.050 | mg/L | 1 | | | | |
| Cobalt | | 0.462 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Copper | | 0.538 | 0.030 | 0.100 | mg/L | 1 | | | | |
| Lead | | 1.73 | 0.025 | 0.100 | mg/L | 1 | | | | |
| Molybdenum | U | 0.00695 | 0.020 | 0.100 | mg/L | 1 | | | | |
| Nickel | | 0.606 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Selenium | | 0.258 | 0.050 | 0.150 | mg/L | 1 | | | | |
| Silver | U | 0.010 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Thallium | U | 0.0227 | 0.050 | 0.200 | mg/L | 1 | | | | |
| Vanadium | | 0.246 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Zinc | | 9.62 | 0.020 | 0.100 | mg/L | 1 | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|-------------------------------|-------------------------------------|---------|----------|------|------------|
| California Code of Regulation | California Wet Method STLC Leaching | CJP1 | 10/01/08 | 1000 | 800775 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 10/06/08 | 0810 | 801833 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 10/06/08 | 1140 | 801779 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |

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Livermore, California 94551
Contact: Mr. Chad F. Davis
Project: CES - Normal Deliverable

Report Date: October 13, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-B-4 | Project: | LLNL00306 |
| Sample ID: | 215966004 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|-----------|--------|-------|-------|----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>TCLP Hg in Solid "As Received"</i> | | | | | | | | | | | |
| Mercury | U | -0.000669 | 0.0003 | 0.002 | mg/L | 1 | JXL1 | 10/06/08 | 1300 | 801306 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>TCLP ICP Metals for Solid "As Received"</i> | | | | | | | | | | | |
| Antimony | U | -0.00913 | 0.030 | 0.100 | mg/L | 1 | KDL | 10/07/08 | 1752 | 801337 | 2 |
| Arsenic | U | 0.0126 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Barium | | 0.703 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Beryllium | U | 0.000472 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Cadmium | U | 0.000778 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Chromium | U | 0.0161 | 0.020 | 0.050 | mg/L | 1 | | | | | |
| Cobalt | J | 0.037 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Copper | | 0.443 | 0.030 | 0.100 | mg/L | 1 | | | | | |
| Lead | U | 0.00989 | 0.025 | 0.100 | mg/L | 1 | | | | | |
| Molybdenum | U | 0.00384 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Nickel | | 0.0742 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Selenium | U | -0.103 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Silver | U | -0.00297 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Thallium | U | 0.0273 | 0.050 | 0.200 | mg/L | 1 | | | | | |
| Vanadium | U | 0.000478 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Zinc | | 0.163 | 0.020 | 0.100 | mg/L | 1 | | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|------------------------------------|---------|----------|------|------------|
| SW846 1311 | SW846 1311 TCLP Leaching -FEDERAL | CXW3 | 10/01/08 | 1600 | 800777 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 10/06/08 | 0810 | 801335 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 10/03/08 | 1155 | 801305 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |

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 Contact: Mr. Chad F. Davis
 Project: CES - Normal Deliverable

Report Date: October 17, 2008

| | | | |
|-------------------|-----------|------------|-----------|
| Client Sample ID: | 212-B-4 | Project: | LLNL00306 |
| Sample ID: | 215963004 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |
| Moisture: | 4.37% | | |

| Parameter | Qualifier | Result | Uncertainty | DL | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|--|-----------|--------|-------------|------|----------|-------|-------|----|---------|----------|------|--------|------|
| Gravimetric Solids | | | | | | | | | | | | | |
| <i>"As Received"</i> | | | | | | | | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i> | | | | | | | | | | | | | |
| Alpha | | 9.39 | +/-1.73 | 1.72 | +/-2.78 | 0.500 | pCi/g | | DXB5 | 10/07/08 | 2155 | 797363 | 2 |
| Beta | | 17.2 | +/-1.56 | 1.76 | +/-2.66 | 1.50 | pCi/g | | | | | | |
| Rad Liquid Scintillation Analysis | | | | | | | | | | | | | |
| <i>LSC, Tritium Dist, Solid "As Received"</i> | | | | | | | | | | | | | |
| Tritium | U | 0.209 | +/-0.882 | 1.54 | +/-0.883 | 2.00 | pCi/g | | SXL4 | 09/30/08 | 1412 | 798304 | 3 |

The following Analytical Methods were performed

| Method | Description |
|--------|------------------------|
| 1 | ASTM D 2216 (Modified) |
| 2 | EPA 900.0 Modified |
| 3 | EPA 906.0 Modified |

Notes:

The Qualifiers in this report are defined as follows :

- ** 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 For General Chemistry and Organic analysis the 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
- E Metals--%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure

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Certificate of Analysis

Company : Lawrence Livermore National
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Address : 7000 East Avenue
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Livermore, California 94551
Contact: Mr. Chad F. Davis
Project: CES - Normal Deliverable

Report Date: October 17, 2008

Client Sample ID: 212-B-4
Sample ID: 215963004

Project: LLNL00306
Client ID: LLNL002

| Parameter | Qualifier | Result | Uncertainty | DL | TPU | RL | Units | DF | Analyst | Date | Time Batch | Mtd. |
|-----------|-----------|--------|-------------|----|-----|----|-------|----|---------|------|------------|------|
|-----------|-----------|--------|-------------|----|-----|----|-------|----|---------|------|------------|------|

N/A RPD or %Recovery limits do not apply.

ND Analyte concentration is not detected above the detection limit

NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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. Qualifier Not Applicable for Radiochemistry.

h Preparation or preservation holding time was exceeded

The above sample is reported on a dry weight basis.

| | | |
|--|-------------------------------------|-------------------------------------|
|  CES | RD Version 1.2 9/14/98 | REVIEW of RADIOCHEMICAL DATA |
|--|-------------------------------------|-------------------------------------|

CES COC# 17500 Sample # 212-B-5 Client Sample ID Mercury Contaminated Soil

Rad Dec # RHWM-RD-08-0041-R

| | | |
|--|---|--------------------------------------|
| The sample was analyzed for : | | Subject was surveyed for: |
| <input checked="" type="checkbox"/> Bulk Gross Alpha | <input type="checkbox"/> Alpha TUPA | <input type="checkbox"/> Surface Rad |
| <input checked="" type="checkbox"/> Bulk Gross Beta | <input type="checkbox"/> Gamma Spec | |
| <input checked="" type="checkbox"/> Bulk Tritium | <input type="checkbox"/> Removable Rad α | |
| <input type="checkbox"/> Removable Rad H-3 | <input type="checkbox"/> Removable Rad β | |

| | \leq MDC | $>$ MDC | Check if by Limited Rad Declaration (LRD) |
|------------------------------|-------------------------------------|-------------------------------------|---|
| Bulk Contamination | | | |
| Gross Alpha | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Gross Beta | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Tritium | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Additional Analytical | | | |
| Gamma Spec | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Alpha TUPA | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Contamination | | | |
| Removable Rad H-3 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Removable Rad α | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Removable Rad β | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Rad α | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Rad β | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Radioactivity was was not can not say added to this sample.

Comments:

Gross alpha and gross beta activities were detected above the sample-specific MDC's and at levels that are above the screening-levels specified in the Moratorium for clean site soils.

Finding by:  Date: October 23, 2008
 Philip Torretto, x2-5515

Criteria limits are those of "LLNL Criteria for Identifying Mixed Waste" for materials with the possibility of bulk contamination and DOE 5400.5 and 5480.11 for those with the possibility of fixed and removable surface contamination. For removable surface contamination from unknown radionuclides, the limits are 20 dpm/100 cm² for gross alpha, 200 dpm/cm² for gross beta and 1000 dpm/100 cm² for tritium.

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 Contact: Mr. Chad F. Davis
 Project: **CES - Normal Deliverable**

Report Date: October 15, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-B-5 | Project: | LLNL00306 |
| Sample ID: | 215963005 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |
| Moisture: | 3.69% | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | AnalystDate | Time | Batch | Method |
|--|-----------|--------|--------|-------|-------|-----|--------------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | |
| <i>7471 Cold Vapor Hg in Solid "Dry Weight Corrected"</i> | | | | | | | | | | |
| Mercury | | 3.32 | 0.158 | 1.06 | mg/kg | 100 | ETL 09/29/08 | 1225 | 796414 | 1 |
| Metals Analysis-ICP | | | | | | | | | | |
| <i>6010 TAL Metals Soil Federal "Dry Weight Corrected"</i> | | | | | | | | | | |
| Antimony | U | -0.172 | 0.310 | 1.50 | mg/kg | 1 | HSC 10/12/08 | 1739 | 796830 | 2 |
| Arsenic | | 3.80 | 0.499 | 1.50 | mg/kg | 1 | | | | |
| Barium | | 174 | 0.0998 | 0.500 | mg/kg | 1 | | | | |
| Beryllium | U | -0.317 | 0.0998 | 0.500 | mg/kg | 1 | | | | |
| Cadmium | J | 0.478 | 0.0998 | 0.500 | mg/kg | 1 | | | | |
| Chromium | | 32.6 | 0.0998 | 0.500 | mg/kg | 1 | | | | |
| Cobalt | | 10.0 | 0.200 | 0.500 | mg/kg | 1 | | | | |
| Copper | | 618 | 0.300 | 2.00 | mg/kg | 1 | | | | |
| Lead | | 16.5 | 0.250 | 1.50 | mg/kg | 1 | | | | |
| Molybdenum | J | 0.665 | 0.200 | 1.00 | mg/kg | 1 | | | | |
| Nickel | | 40.4 | 0.0998 | 1.30 | mg/kg | 1 | | | | |
| Silver | | 0.900 | 0.0998 | 0.500 | mg/kg | 1 | | | | |
| Vanadium | | 29.7 | 0.0998 | 0.500 | mg/kg | 1 | | | | |
| Zinc | | 188 | 0.200 | 1.00 | mg/kg | 1 | | | | |
| Selenium | J | 7.88 | 4.99 | 15.0 | mg/kg | 10 | HSC 10/14/08 | 1709 | 796830 | 3 |
| Thallium | U | -0.905 | 4.99 | 20.0 | mg/kg | 10 | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|-----------------------------|---------|----------|------|------------|
| SW846 3050B | 846 3050BS PREP | FGA | 10/10/08 | 1430 | 796829 |
| SW846 7471A Prep | EPA 7471A Mercury Prep Soil | TXB3 | 09/26/08 | 1600 | 796413 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|-------------------|------------------|
| 1 | SW846 7471A | |
| 2 | SW846 3050B/6010B | |
| 3 | SW846 3050B/6010B | |

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 Contact: Mr. Chad F. Davis
 Project: **CES - Normal Deliverable**

Report Date: October 14, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-B-5 | Project: | LLNL00306 |
| Sample ID: | 215964005 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | AnalystDate | Time | Batch | Method |
|---|-----------|---------|-------|-------|-------|----|---------------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | |
| <i>STLC Hg in Solid "As Received"</i> | | | | | | | | | | |
| Mercury | J | 0.112 | 0.030 | 0.200 | mg/L | 1 | JXL1 10/07/08 | 1338 | 801780 | 1 |
| Metals Analysis-ICP | | | | | | | | | | |
| <i>STLC ICP Metals for Solids "As Received"</i> | | | | | | | | | | |
| Antimony | U | -0.0181 | 0.030 | 1.00 | mg/L | 1 | KDL 10/13/08 | 1332 | 801834 | 2 |
| Arsenic | U | 0.00629 | 0.050 | 0.150 | mg/L | 1 | | | | |
| Barium | | 9.10 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Beryllium | U | 0.00264 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Cadmium | U | 0.00944 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Chromium | | 0.0905 | 0.020 | 0.050 | mg/L | 1 | | | | |
| Cobalt | | 0.384 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Copper | | 0.576 | 0.030 | 0.100 | mg/L | 1 | | | | |
| Lead | | 0.257 | 0.025 | 0.100 | mg/L | 1 | | | | |
| Molybdenum | J | 0.0214 | 0.020 | 0.100 | mg/L | 1 | | | | |
| Nickel | | 0.474 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Selenium | | 0.176 | 0.050 | 0.150 | mg/L | 1 | | | | |
| Silver | U | 0.00815 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Thallium | U | 0.00147 | 0.050 | 0.200 | mg/L | 1 | | | | |
| Vanadium | | 0.187 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Zinc | | 3.68 | 0.020 | 0.100 | mg/L | 1 | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|-------------------------------|-------------------------------------|---------|----------|------|------------|
| California Code of Regulation | California Wet Method STLC Leaching | CJP1 | 10/01/08 | 1000 | 800775 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 10/06/08 | 0810 | 801833 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 10/06/08 | 1140 | 801779 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |

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 Project: **CES - Normal Deliverable**

Report Date: October 13, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-B-5 | Project: | LLNL00306 |
| Sample ID: | 215966005 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|-----------|--------|-------|-------|----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>TCLP Hg in Solid "As Received"</i> | | | | | | | | | | | |
| Mercury | J | 0.000675 | 0.0003 | 0.002 | mg/L | 1 | JXL1 | 10/06/08 | 1302 | 801306 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>TCLP ICP Metals for Solid "As Received"</i> | | | | | | | | | | | |
| Antimony | U | -0.00791 | 0.030 | 0.100 | mg/L | 1 | KDL | 10/07/08 | 1759 | 801337 | 2 |
| Arsenic | U | 0.014 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Barium | | 1.24 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Beryllium | U | -0.000027 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Cadmium | U | 0.00352 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Chromium | U | 0.0136 | 0.020 | 0.050 | mg/L | 1 | | | | | |
| Cobalt | J | 0.0486 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Copper | | 3.37 | 0.030 | 0.100 | mg/L | 1 | | | | | |
| Lead | U | 0.00739 | 0.025 | 0.100 | mg/L | 1 | | | | | |
| Molybdenum | U | -0.000099 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Nickel | | 0.0866 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Selenium | U | -0.0129 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Silver | U | -0.000487 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Thallium | U | -0.00733 | 0.050 | 0.200 | mg/L | 1 | | | | | |
| Vanadium | U | -0.000606 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Zinc | | 0.974 | 0.020 | 0.100 | mg/L | 1 | | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|------------------------------------|---------|----------|------|------------|
| SW846 1311 | SW846 1311 TCLP Leaching -FEDERAL | CXW3 | 10/01/08 | 1600 | 800777 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 10/06/08 | 0810 | 801335 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 10/03/08 | 1155 | 801305 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |

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Livermore, California 94551
Contact: Mr. Chad F. Davis
Project: CES - Normal Deliverable

Report Date: October 17, 2008

| | | | |
|-------------------|-----------|------------|-----------|
| Client Sample ID: | 212-B-5 | Project: | LLNL00306 |
| Sample ID: | 215963005 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |
| Moisture: | 3.69% | | |

| Parameter | Qualifier | Result | Uncertainty | DL | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|--|-----------|--------|-------------|------|----------|-------|-------|----|---------|----------|------|--------|------|
| Gravimetric Solids | | | | | | | | | | | | | |
| <i>"As Received"</i> | | | | | | | | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i> | | | | | | | | | | | | | |
| Alpha | | 9.96 | +/-1.54 | 1.14 | +/-2.78 | 0.500 | pCi/g | | DXB5 | 10/07/08 | 2155 | 797363 | 2 |
| Beta | | 17.7 | +/-1.47 | 1.53 | +/-2.88 | 1.50 | pCi/g | | | | | | |
| Rad Liquid Scintillation Analysis | | | | | | | | | | | | | |
| <i>LSC, Tritium Dist, Solid "As Received"</i> | | | | | | | | | | | | | |
| Tritium | U | -0.115 | +/-0.854 | 1.52 | +/-0.854 | 2.00 | pCi/g | | SXL4 | 09/30/08 | 1458 | 798304 | 3 |

The following Analytical Methods were performed

| Method | Description |
|--------|------------------------|
| 1 | ASTM D 2216 (Modified) |
| 2 | EPA 900.0 Modified |
| 3 | EPA 906.0 Modified |

Notes:

The Qualifiers in this report are defined as follows :

- ** 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 For General Chemistry and Organic analysis the 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
- E Metals--%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure

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Contact: Mr. Chad F. Davis
Project: CES - Normal Deliverable

Report Date: October 17, 2008

Client Sample ID: 212-B-5
Sample ID: 215963005

Project: LLNL00306
Client ID: LLNL002

| Parameter | Qualifier | Result | Uncertainty | DL | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|-----------|-----------|--------|-------------|----|-----|----|-------|----|---------|------|------|-------|------|
|-----------|-----------|--------|-------------|----|-----|----|-------|----|---------|------|------|-------|------|

N/A RPD or %Recovery limits do not apply.

ND Analyte concentration is not detected above the detection limit

NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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. Qualifier Not Applicable for Radiochemistry.

h Preparation or preservation holding time was exceeded

The above sample is reported on a dry weight basis.

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Project: **CES - Normal Deliverable**

Report Date: October 15, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-E-1 | Project: | LLNL00306 |
| Sample ID: | 215963006 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |
| Moisture: | 2.37% | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|--------|-------|-------|-----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>7471 Cold Vapor Hg in Solid "Dry Weight Corrected"</i> | | | | | | | | | | | |
| Mercury | | 69.4 | 0.355 | 2.36 | mg/kg | 200 | ETL | 09/29/08 | 1337 | 796414 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>6010 TAL Metals Soil Federal "Dry Weight Corrected"</i> | | | | | | | | | | | |
| Antimony | U | -0.127 | 0.308 | 1.50 | mg/kg | 1 | HSC | 10/12/08 | 1801 | 796830 | 2 |
| Arsenic | | 5.43 | 0.497 | 1.50 | mg/kg | 1 | | | | | |
| Barium | | 184 | 0.0994 | 0.500 | mg/kg | 1 | | | | | |
| Beryllium | U | -0.432 | 0.0994 | 0.500 | mg/kg | 1 | | | | | |
| Cadmium | | 1.57 | 0.0994 | 0.500 | mg/kg | 1 | | | | | |
| Chromium | | 38.2 | 0.0994 | 0.500 | mg/kg | 1 | | | | | |
| Cobalt | | 10.7 | 0.199 | 0.500 | mg/kg | 1 | | | | | |
| Copper | | 64.4 | 0.298 | 2.00 | mg/kg | 1 | | | | | |
| Lead | | 94.6 | 0.249 | 1.50 | mg/kg | 1 | | | | | |
| Molybdenum | J | 0.969 | 0.199 | 1.00 | mg/kg | 1 | | | | | |
| Nickel | | 42.2 | 0.0994 | 1.30 | mg/kg | 1 | | | | | |
| Silver | | 1.21 | 0.0994 | 0.500 | mg/kg | 1 | | | | | |
| Thallium | U | -1.81 | 0.497 | 3.00 | mg/kg | 1 | | | | | |
| Vanadium | | 29.9 | 0.0994 | 0.500 | mg/kg | 1 | | | | | |
| Zinc | | 397 | 0.199 | 1.00 | mg/kg | 1 | | | | | |
| Selenium | U | 3.97 | 4.97 | 14.9 | mg/kg | 10 | HSC | 10/14/08 | 1716 | 796830 | 3 |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|-----------------------------|---------|----------|------|------------|
| SW846 3050B | 846 3050BS PREP | FGA | 10/10/08 | 1430 | 796829 |
| SW846 7471A Prep | EPA 7471A Mercury Prep Soil | TXB3 | 09/26/08 | 1600 | 796413 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|-------------------|------------------|
| 1 | SW846 7471A | |
| 2 | SW846 3050B/6010B | |
| 3 | SW846 3050B/6010B | |

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 Project: CES - Normal Deliverable

Report Date: October 13, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-E-1 | Project: | LLNL00306 |
| Sample ID: | 215966006 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | AnalystDate | Time | Batch | Method |
|--|-----------|-----------|--------|-------|-------|----|---------------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | |
| <i>TCLP Hg in Solid "As Received"</i> | | | | | | | | | | |
| Mercury | | 0.0162 | 0.0003 | 0.002 | mg/L | 1 | JXL1 10/06/08 | 1304 | 801306 | 1 |
| Metals Analysis-ICP | | | | | | | | | | |
| <i>TCLP ICP Metals for Solid "As Received"</i> | | | | | | | | | | |
| Antimony | U | 0.010 | 0.030 | 0.100 | mg/L | 1 | KDL 10/07/08 | 1806 | 801337 | 2 |
| Arsenic | U | 0.00107 | 0.050 | 0.150 | mg/L | 1 | | | | |
| Barium | | 0.998 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Beryllium | U | -0.000084 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Cadmium | J | 0.012 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Chromium | U | 0.0135 | 0.020 | 0.050 | mg/L | 1 | | | | |
| Cobalt | U | 0.00314 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Copper | U | 0.0173 | 0.030 | 0.100 | mg/L | 1 | | | | |
| Lead | J | 0.0683 | 0.025 | 0.100 | mg/L | 1 | | | | |
| Molybdenum | U | 0.00948 | 0.020 | 0.100 | mg/L | 1 | | | | |
| Nickel | J | 0.0414 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Selenium | U | 0.0181 | 0.050 | 0.150 | mg/L | 1 | | | | |
| Silver | U | -0.00552 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Thallium | U | -0.0353 | 0.050 | 0.200 | mg/L | 1 | | | | |
| Vanadium | U | 0.000217 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Zinc | | 1.80 | 0.020 | 0.100 | mg/L | 1 | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|------------------------------------|---------|----------|------|------------|
| SW846 1311 | SW846 1311 TCLP Leaching -FEDERAL | CXW3 | 10/01/08 | 1600 | 800777 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 10/06/08 | 0810 | 801335 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 10/03/08 | 1155 | 801305 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : Lawrence Livermore National Security, LLC
 Address : 7000 East Avenue
 Mailstop L-620
 Livermore, California 94551
 Contact: Mr. Chad F. Davis
 Project: CES - Normal Deliverable

Report Date: October 15, 2008

Client Sample ID: 212-E-2
 Sample ID: 215963007
 Matrix: SO
 Collect Date: 15-SEP-08 10:45
 Receive Date: 17-SEP-08
 Collector: Client
 Moisture: 4.9%

Project: LLNL00306
 Client ID: LLNL002

| Parameter | Qualifier | Result | DL | RL | Units | DF | AnalystDate | Time | Batch | Method |
|--|-----------|--------|-------|-------|-------|------|-------------|----------|-------|----------|
| Mercury Analysis-CVAA | | | | | | | | | | |
| <i>7471 Cold Vapor Hg in Solid "Dry Weight Corrected"</i> | | | | | | | | | | |
| Mercury | | 291 | 3.62 | 24.1 | mg/kg | 2000 | ETL | 09/29/08 | 1403 | 796414 1 |
| Metals Analysis-ICP | | | | | | | | | | |
| <i>6010 TAL Metals Soil Federal "Dry Weight Corrected"</i> | | | | | | | | | | |
| Antimony | U | -0.147 | 0.322 | 1.50 | mg/kg | 1 | HSC | 10/12/08 | 1808 | 796830 2 |
| Arsenic | | 5.27 | 0.520 | 1.56 | mg/kg | 1 | | | | |
| Barium | | 183 | 0.104 | 0.520 | mg/kg | 1 | | | | |
| Beryllium | U | -0.376 | 0.104 | 0.520 | mg/kg | 1 | | | | |
| Cadmium | | 0.734 | 0.104 | 0.520 | mg/kg | 1 | | | | |
| Chromium | | 36.1 | 0.104 | 0.520 | mg/kg | 1 | | | | |
| Cobalt | | 11.0 | 0.208 | 0.520 | mg/kg | 1 | | | | |
| Copper | | 68.0 | 0.312 | 2.00 | mg/kg | 1 | | | | |
| Lead | | 39.1 | 0.260 | 1.50 | mg/kg | 1 | | | | |
| Molybdenum | J | 0.636 | 0.208 | 1.04 | mg/kg | 1 | | | | |
| Nickel | | 44.6 | 0.104 | 1.30 | mg/kg | 1 | | | | |
| Silver | | 0.992 | 0.104 | 0.520 | mg/kg | 1 | | | | |
| Thallium | U | -2.05 | 0.520 | 3.00 | mg/kg | 1 | | | | |
| Vanadium | | 31.5 | 0.104 | 0.520 | mg/kg | 1 | | | | |
| Zinc | | 224 | 0.208 | 1.04 | mg/kg | 1 | | | | |
| Selenium | J | 14.8 | 5.20 | 15.6 | mg/kg | 10 | HSC | 10/14/08 | 1723 | 796830 3 |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|-----------------------------|---------|----------|------|------------|
| SW846 3050B | 846 3050BS PREP | FGA | 10/10/08 | 1430 | 796829 |
| SW846 7471A Prep | EPA 7471A Mercury Prep Soil | TXB3 | 09/26/08 | 1600 | 796413 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|-------------------|------------------|
| 1 | SW846 7471A | |
| 2 | SW846 3050B/6010B | |
| 3 | SW846 3050B/6010B | |

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Certificate of Analysis

Company : Lawrence Livermore National Security, LLC
 Address : 7000 East Avenue
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 Livermore, California 94551
 Contact: Mr. Chad F. Davis
 Project: CES - Normal Deliverable

Report Date: October 14, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-E-2 | Project: | LLNL00306 |
| Sample ID: | 215964007 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|-----------|-----------|-------|-------|-------|----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>STLC Hg in Solid "As Received"</i> | | | | | | | | | | | |
| Mercury | U | -0.0519 | 0.030 | 0.200 | mg/L | 1 | JXL1 | 10/07/08 | 1342 | 801780 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>STLC ICP Metals for Solids "As Received"</i> | | | | | | | | | | | |
| Antimony | U | -0.0153 | 0.030 | 1.00 | mg/L | 1 | KDL | 10/13/08 | 1358 | 801834 | 2 |
| Arsenic | U | 0.0276 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Barium | | 11.1 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Beryllium | U | 0.00354 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Cadmium | J | 0.0235 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Chromium | | 0.168 | 0.020 | 0.050 | mg/L | 1 | | | | | |
| Cobalt | | 0.370 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Copper | | 2.78 | 0.030 | 0.100 | mg/L | 1 | | | | | |
| Lead | | 1.19 | 0.025 | 0.100 | mg/L | 1 | | | | | |
| Molybdenum | U | 0.00519 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Nickel | | 0.502 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Selenium | | 0.267 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Silver | U | -0.000962 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Thallium | U | 0.00209 | 0.050 | 0.200 | mg/L | 1 | | | | | |
| Vanadium | | 0.213 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Zinc | | 6.02 | 0.020 | 0.100 | mg/L | 1 | | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|-------------------------------|-------------------------------------|---------|----------|------|------------|
| California Code of Regulation | California Wet Method STLC Leaching | CJP1 | 10/01/08 | 1000 | 800775 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 10/06/08 | 0810 | 801833 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 10/06/08 | 1140 | 801779 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |

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Livermore, California 94551
Contact: Mr. Chad F. Davis
Project: **CES - Normal Deliverable**

Report Date: October 13, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-E-2 | Project: | LLNL00306 |
| Sample ID: | 215966007 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|-----------|-------|-------|-------|----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>TCLP Hg in Solid "As Received"</i> | | | | | | | | | | | |
| Mercury | | 0.0765 | 0.003 | 0.020 | mg/L | 10 | JXL1 | 10/06/08 | 1225 | 801306 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>TCLP ICP Metals for Solid "As Received"</i> | | | | | | | | | | | |
| Antimony | U | -0.000478 | 0.030 | 0.100 | mg/L | 1 | KDL | 10/07/08 | 1813 | 801337 | 2 |
| Arsenic | U | 0.00426 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Barium | | 0.844 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Beryllium | U | -0.000019 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Cadmium | U | 0.00427 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Chromium | U | 0.0106 | 0.020 | 0.050 | mg/L | 1 | | | | | |
| Cobalt | U | 0.00336 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Copper | U | 0.0206 | 0.030 | 0.100 | mg/L | 1 | | | | | |
| Lead | U | 0.0248 | 0.025 | 0.100 | mg/L | 1 | | | | | |
| Molybdenum | U | 0.00179 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Nickel | J | 0.0434 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Selenium | U | -0.0419 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Silver | U | -0.00158 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Thallium | U | -0.0174 | 0.050 | 0.200 | mg/L | 1 | | | | | |
| Vanadium | U | -0.000641 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Zinc | | 0.837 | 0.020 | 0.100 | mg/L | 1 | | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|------------------------------------|---------|----------|------|------------|
| SW846 1311 | SW846 1311 TCLP Leaching -FEDERAL | CXW3 | 10/01/08 | 1600 | 800777 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 10/06/08 | 0810 | 801335 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 10/03/08 | 1155 | 801305 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |

RHWM ANALYSIS REPORT

| | | | |
|------------|-----------|------------------------|-------|
| WDR Number | Sample ID | Analytical Log Book ID | COC |
| N/A | 212-W-1 | | 17500 |

| | | | |
|---------|---------------|---------|------------|
| Analyst | Date Analyzed | Element | Percentage |
| | | | |

| (LSC) RADIOLOGICAL SCREENING REPORT | | | |
|-------------------------------------|-----------------|-------------------|--|
| Aliquot (mL or g) | Tritium | Gross alpha, beta | |
| 1g | 1g | 1g | |
| Analyst | Claude Cardenas | Claude Cardenas | |
| Date Analyzed | 9/15/2008 | 9/15/2008 | |
| Energy Window | 0-18.6 keV | 18.6-2000 keV | |
| DPM | 0 | 0 | |
| MDC | 1000 | 3000 | |
| Actual Result | 0 | 0 | |
| Reportable Result | Below MDC | Below MDC | |
| Unit | picocuries / kg | picocuries / kg | |

| XRF | | | |
|---------|---------------|---------|------------|
| Analyst | Date Analyzed | Element | Percentage |
| | | | |

| SAW GC | | | |
|---------------|----------|---------|-----------------|
| Date Analyzed | Chemical | Analyst | Result |
| | | | |
| | | | Detection Limit |
| | | | |

| | | | |
|-------|--|--|--|
| Total | | | |
|-------|--|--|--|

| FLASH POINT (METHOD 1010) | | | |
|---------------------------|---------------|-----|--------|
| Analyst | Date Analyzed | MDL | Result |
| | | | |
| | | | Unit |

| COMMENTS | | | |
|----------|--|--|--|
| | | | |

| BOILING POINT | | | |
|---------------|------|--|--|
| Result | Unit | | |
| | | | |

| | | | |
|--|--|--|--|
| | | | |
|--|--|--|--|

| LIQUIFICATION TESTING | | | |
|-----------------------|---------------|--------|--|
| Analyst | Date Analyzed | Result | |
| | | | |
| Freeze / Thaw Testing | | | |
| Analyst | Date Analyzed | Result | |
| | | | |

| | | | |
|--|--|--|--|
| | | | |
|--|--|--|--|

| Paint Filter Activity | | | |
|-----------------------|---------------|--------|--|
| Analyst | Date Analyzed | Result | |
| | | | |

| | | | |
|--|--|--|--|
| | | | |
|--|--|--|--|

| | | | |
|----------------|-----------|-------------|--|
| Date Completed | 9/15/2008 | Reviewed By |  |
|----------------|-----------|-------------|--|

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Certificate of Analysis

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 Livermore, California 94551
 Contact: Mr. Chad F. Davis
 Project: **CES - Normal Deliverable**

Report Date: October 15, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-W-1 | Project: | LLNL00306 |
| Sample ID: | 215963008 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |
| Moisture: | 2.32% | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------|-------|-------|-----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>7471 Cold Vapor Hg in Solid "Dry Weight Corrected"</i> | | | | | | | | | | | |
| Mercury | | 2.35 | 0.159 | 1.06 | mg/kg | 100 | ETL | 09/29/08 | 1231 | 796414 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>6010 TAL Metals Soil Federal "Dry Weight Corrected"</i> | | | | | | | | | | | |
| Antimony | U | 0.0571 | 0.315 | 1.50 | mg/kg | 1 | HSC | 10/12/08 | 1815 | 796830 | 2 |
| Arsenic | | 4.06 | 0.509 | 1.53 | mg/kg | 1 | | | | | |
| Barium | | 172 | 0.102 | 0.509 | mg/kg | 1 | | | | | |
| Beryllium | U | -0.258 | 0.102 | 0.509 | mg/kg | 1 | | | | | |
| Cadmium | J | 0.379 | 0.102 | 0.509 | mg/kg | 1 | | | | | |
| Chromium | | 28.9 | 0.102 | 0.509 | mg/kg | 1 | | | | | |
| Cobalt | | 9.09 | 0.204 | 0.509 | mg/kg | 1 | | | | | |
| Copper | | 27.3 | 0.305 | 2.00 | mg/kg | 1 | | | | | |
| Lead | | 26.2 | 0.254 | 1.50 | mg/kg | 1 | | | | | |
| Molybdenum | J | 0.436 | 0.204 | 1.02 | mg/kg | 1 | | | | | |
| Nickel | | 36.8 | 0.102 | 1.30 | mg/kg | 1 | | | | | |
| Silver | | 0.705 | 0.102 | 0.509 | mg/kg | 1 | | | | | |
| Thallium | U | -1.5 | 0.509 | 3.00 | mg/kg | 1 | | | | | |
| Vanadium | | 26.1 | 0.102 | 0.509 | mg/kg | 1 | | | | | |
| Zinc | | 220 | 0.204 | 1.02 | mg/kg | 1 | | | | | |
| Selenium | U | 3.15 | 5.09 | 15.3 | mg/kg | 10 | HSC | 10/14/08 | 1745 | 796830 | 3 |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|-----------------------------|---------|----------|------|------------|
| SW846 3050B | 846 3050BS PREP | FGA | 10/10/08 | 1430 | 796829 |
| SW846 7471A Prep | EPA 7471A Mercury Prep Soil | TXB3 | 09/26/08 | 1600 | 796413 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|-------------------|------------------|
| 1 | SW846 7471A | |
| 2 | SW846 3050B/6010B | |
| 3 | SW846 3050B/6010B | |

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Livermore, California 94551
Contact: Mr. Chad F. Davis
Project: **CES - Normal Deliverable**

Report Date: October 13, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-W-1 | Project: | LLNL00306 |
| Sample ID: | 215966008 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | AnalystDate | Time | Batch | Method |
|--|-----------|-----------|--------|-------|-------|----|---------------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | |
| <i>TCLP Hg in Solid "As Received"</i> | | | | | | | | | | |
| Mercury | U | -0.000725 | 0.0003 | 0.002 | mg/L | 1 | JXL1 10/06/08 | 1306 | 801306 | 1 |
| Metals Analysis-ICP | | | | | | | | | | |
| <i>TCLP ICP Metals for Solid "As Received"</i> | | | | | | | | | | |
| Antimony | U | -0.0303 | 0.030 | 0.100 | mg/L | 1 | KDL 10/07/08 | 1821 | 801337 | 2 |
| Arsenic | U | -0.00316 | 0.050 | 0.150 | mg/L | 1 | | | | |
| Barium | | 1.03 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Beryllium | U | -0.000207 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Cadmium | U | 0.00276 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Chromium | U | 0.0102 | 0.020 | 0.050 | mg/L | 1 | | | | |
| Cobalt | U | 0.00153 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Copper | U | 0.0001 | 0.030 | 0.100 | mg/L | 1 | | | | |
| Lead | U | 0.0143 | 0.025 | 0.100 | mg/L | 1 | | | | |
| Molybdenum | U | 0.00457 | 0.020 | 0.100 | mg/L | 1 | | | | |
| Nickel | J | 0.0271 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Selenium | U | -0.0547 | 0.050 | 0.150 | mg/L | 1 | | | | |
| Silver | U | -0.00573 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Thallium | U | -0.0351 | 0.050 | 0.200 | mg/L | 1 | | | | |
| Vanadium | U | 0.000701 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Zinc | | 0.697 | 0.020 | 0.100 | mg/L | 1 | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|------------------------------------|---------|----------|------|------------|
| SW846 1311 | SW846 1311 TCLP Leaching -FEDERAL | CXW3 | 10/01/08 | 1600 | 800777 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 10/06/08 | 0810 | 801335 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 10/03/08 | 1155 | 801305 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |

RHWM ANALYSIS REPORT

| | | | |
|------------|-----------|------------------------|-------|
| WDR Number | Sample ID | Analytical Log Book ID | COC |
| N/A | 212-W-1RP | | 17500 |

| | | | |
|---------|---------------|---------|------------|
| Analyst | Date Analyzed | Element | XRF |
| | | | Percentage |

| (LSC) RADIOLOGICAL SCREENING REPORT | |
|-------------------------------------|-------------------|
| Aliquot (mL or g) | Gross alpha, beta |
| 1g | 1g |
| Analyst | Claude Cardenas |
| Date Analyzed | 9/15/2008 |
| Energy Window | 18.6-2000 keV |
| DPM | 0 |
| MDC | 1000 |
| Actual Result | 0 |
| Reportable Result | Below MDC |
| Unit | picocuries / kg |

| pH & NORMALITY | |
|-------------------------------|---------------|
| Analyst | Date Analyzed |
| | |
| pH Result | |
| Normality Result (eq/L) | |
| HYDROMETER / SPECIFIC GRAVITY | |
| Analyst | Date Analyzed |
| | |
| Specific Gravity Result | |
| Hydrometer Result | |

| FLASH POINT (METHOD 1010) | |
|---------------------------|---------------|
| Analyst | Date Analyzed |
| | |
| MDL | |
| Result | |
| Unit | |

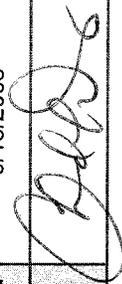
| BOILING POINT | |
|---------------|------|
| Result | Unit |
| | |

| LIQUIFICATION TESTING | |
|-----------------------|---------|
| Vibration Testing | Analyst |
| | |
| Date Analyzed | |
| Result | |
| Freeze / Thaw Testing | |
| Analyst | |
| Date Analyzed | |
| Result | |

| Paint Filter Activity | |
|-----------------------|---------------|
| Analyst | Date Analyzed |
| | |
| Date Analyzed | |
| Result | |

| SAW GC | |
|---------------|-----------------|
| Date Analyzed | Analyst |
| | |
| Chemical | Result |
| | |
| | Detection Limit |
| | |

| COMMENTS | |
|----------|--|
| | |

| | |
|----------------|--|
| Total | |
| Date Completed | 9/15/2008 |
| Reviewed By |  |

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 Contact: Mr. Chad F. Davis
 Project: CES - Normal Deliverable

Report Date: October 15, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-W-1RP | Project: | LLNL00306 |
| Sample ID: | 215963009 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |
| Moisture: | 1.97% | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | AnalystDate | Time | Batch | Method |
|--|-----------|--------|--------|-------|-------|-----|--------------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | |
| <i>7471 Cold Vapor Hg in Solid "Dry Weight Corrected"</i> | | | | | | | | | | |
| Mercury | | 5.15 | 0.184 | 1.22 | mg/kg | 100 | ETL 09/29/08 | 1233 | 796414 | 1 |
| Metals Analysis-ICP | | | | | | | | | | |
| <i>6010 TAL Metals Soil Federal "Dry Weight Corrected"</i> | | | | | | | | | | |
| Antimony | U | -0.56 | 0.303 | 1.50 | mg/kg | 1 | HSC 10/12/08 | 1822 | 796830 | 2 |
| Arsenic | | 4.77 | 0.490 | 1.50 | mg/kg | 1 | | | | |
| Barium | | 187 | 0.0979 | 0.500 | mg/kg | 1 | | | | |
| Beryllium | U | -0.26 | 0.0979 | 0.500 | mg/kg | 1 | | | | |
| Cadmium | J | 0.400 | 0.0979 | 0.500 | mg/kg | 1 | | | | |
| Chromium | | 34.4 | 0.0979 | 0.500 | mg/kg | 1 | | | | |
| Cobalt | | 10.5 | 0.196 | 0.500 | mg/kg | 1 | | | | |
| Copper | | 31.5 | 0.294 | 2.00 | mg/kg | 1 | | | | |
| Lead | | 24.7 | 0.245 | 1.50 | mg/kg | 1 | | | | |
| Molybdenum | J | 0.458 | 0.196 | 1.00 | mg/kg | 1 | | | | |
| Nickel | | 42.5 | 0.0979 | 1.30 | mg/kg | 1 | | | | |
| Silver | | 0.756 | 0.0979 | 0.500 | mg/kg | 1 | | | | |
| Vanadium | | 29.8 | 0.0979 | 0.500 | mg/kg | 1 | | | | |
| Zinc | | 153 | 0.196 | 1.00 | mg/kg | 1 | | | | |
| Selenium | J | 6.45 | 4.90 | 14.7 | mg/kg | 10 | HSC 10/14/08 | 1752 | 796830 | 3 |
| Thallium | U | 0.993 | 4.90 | 19.6 | mg/kg | 10 | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|-----------------------------|---------|----------|------|------------|
| SW846 3050B | 846 3050BS PREP | FGA | 10/10/08 | 1430 | 796829 |
| SW846 7471A Prep | EPA 7471A Mercury Prep Soil | TXB3 | 09/26/08 | 1600 | 796413 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|-------------------|------------------|
| 1 | SW846 7471A | |
| 2 | SW846 3050B/6010B | |
| 3 | SW846 3050B/6010B | |

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Certificate of Analysis

Company : Lawrence Livermore National
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Address : 7000 East Avenue
Mailstop L-620
Livermore, California 94551
Contact: Mr. Chad F. Davis
Project: CES - Normal Deliverable

Report Date: October 13, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-W-IRP | Project: | LLNL00306 |
| Sample ID: | 215966009 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|-----------|--------|-------|-------|----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>TCLP Hg in Solid "As Received"</i> | | | | | | | | | | | |
| Mercury | U | -0.000875 | 0.0003 | 0.002 | mg/L | 1 | JXL1 | 10/06/08 | 1308 | 801306 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>TCLP ICP Metals for Solid "As Received"</i> | | | | | | | | | | | |
| Antimony | U | -0.0198 | 0.030 | 0.100 | mg/L | 1 | KDL | 10/07/08 | 1828 | 801337 | 2 |
| Arsenic | U | 0.020 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Barium | | 1.10 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Beryllium | U | -0.000116 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Cadmium | U | 0.0047 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Chromium | U | 0.0169 | 0.020 | 0.050 | mg/L | 1 | | | | | |
| Cobalt | U | 0.00339 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Copper | U | -0.0025 | 0.030 | 0.100 | mg/L | 1 | | | | | |
| Lead | U | 0.00276 | 0.025 | 0.100 | mg/L | 1 | | | | | |
| Molybdenum | U | -0.000365 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Nickel | J | 0.024 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Selenium | U | -0.0794 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Silver | U | -0.00596 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Thallium | U | -0.0319 | 0.050 | 0.200 | mg/L | 1 | | | | | |
| Vanadium | U | -0.00144 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Zinc | | 0.636 | 0.020 | 0.100 | mg/L | 1 | | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|------------------------------------|---------|----------|------|------------|
| SW846 1311 | SW846 1311 TCLP Leaching -FEDERAL | CXW3 | 10/01/08 | 1600 | 800777 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 10/06/08 | 0810 | 801335 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 10/03/08 | 1155 | 801305 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |

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Contact: Mr. Chad F. Davis
Project: CES - Normal Deliverable

Report Date: October 15, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-W-2 | Project: | LLNL00306 |
| Sample ID: | 215963010 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |
| Moisture: | 4.07% | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|--------|-------|-------|-----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>7471 Cold Vapor Hg in Solid "Dry Weight Corrected"</i> | | | | | | | | | | | |
| Mercury | | 6.32 | 0.177 | 1.18 | mg/kg | 100 | ETL | 09/29/08 | 1235 | 796414 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>6010 TAL Metals Soil Federal "Dry Weight Corrected"</i> | | | | | | | | | | | |
| Antimony | U | -0.385 | 0.310 | 1.50 | mg/kg | 1 | HSC | 10/12/08 | 1830 | 796830 | 2 |
| Arsenic | | 4.93 | 0.499 | 1.50 | mg/kg | 1 | | | | | |
| Barium | | 183 | 0.0998 | 0.500 | mg/kg | 1 | | | | | |
| Beryllium | U | -0.308 | 0.0998 | 0.500 | mg/kg | 1 | | | | | |
| Cadmium | J | 0.304 | 0.0998 | 0.500 | mg/kg | 1 | | | | | |
| Chromium | | 33.2 | 0.0998 | 0.500 | mg/kg | 1 | | | | | |
| Cobalt | | 10.1 | 0.200 | 0.500 | mg/kg | 1 | | | | | |
| Copper | | 83.6 | 0.300 | 2.00 | mg/kg | 1 | | | | | |
| Lead | | 19.0 | 0.250 | 1.50 | mg/kg | 1 | | | | | |
| Molybdenum | J | 0.502 | 0.200 | 1.00 | mg/kg | 1 | | | | | |
| Nickel | | 41.5 | 0.0998 | 1.30 | mg/kg | 1 | | | | | |
| Silver | | 0.753 | 0.0998 | 0.500 | mg/kg | 1 | | | | | |
| Thallium | U | -1.69 | 0.499 | 3.00 | mg/kg | 1 | | | | | |
| Vanadium | | 29.2 | 0.0998 | 0.500 | mg/kg | 1 | | | | | |
| Zinc | | 140 | 0.200 | 1.00 | mg/kg | 1 | | | | | |
| Selenium | J | 5.28 | 4.99 | 15.0 | mg/kg | 10 | HSC | 10/14/08 | 1758 | 796830 | 3 |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|-----------------------------|---------|----------|------|------------|
| SW846 3050B | 846 3050BS PREP | FGA | 10/10/08 | 1430 | 796829 |
| SW846 7471A Prep | EPA 7471A Mercury Prep Soil | TXB3 | 09/26/08 | 1600 | 796413 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|-------------------|------------------|
| 1 | SW846 7471A | |
| 2 | SW846 3050B/6010B | |
| 3 | SW846 3050B/6010B | |

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Contact: Mr. Chad F. Davis
Project: CES - Normal Deliverable

Report Date: October 14, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-W-2 | Project: | LLNL00306 |
| Sample ID: | 215964010 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|-----------|----------|-------|-------|-------|----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>STLC Hg in Solid "As Received"</i> | | | | | | | | | | | |
| Mercury | U | -0.0541 | 0.030 | 0.200 | mg/L | 1 | JXL1 | 10/07/08 | 1351 | 801780 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>STLC ICP Metals for Solids "As Received"</i> | | | | | | | | | | | |
| Antimony | J | 0.0728 | 0.030 | 1.00 | mg/L | 1 | KDL | 10/13/08 | 1420 | 801834 | 2 |
| Arsenic | U | -0.0093 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Barium | | 12.4 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Beryllium | U | 0.00442 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Cadmium | J | 0.0352 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Chromium | | 0.167 | 0.020 | 0.050 | mg/L | 1 | | | | | |
| Cobalt | | 0.493 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Copper | | 1.43 | 0.030 | 0.100 | mg/L | 1 | | | | | |
| Lead | | 1.42 | 0.025 | 0.100 | mg/L | 1 | | | | | |
| Molybdenum | U | -0.00592 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Nickel | | 0.679 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Selenium | | 0.416 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Silver | J | 0.0103 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Thallium | U | -0.00274 | 0.050 | 0.200 | mg/L | 1 | | | | | |
| Vanadium | | 0.248 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Zinc | | 8.62 | 0.020 | 0.100 | mg/L | 1 | | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|-------------------------------|-------------------------------------|---------|----------|------|------------|
| California Code of Regulation | California Wet Method STLC Leaching | CJP1 | 10/01/08 | 1000 | 800775 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 10/06/08 | 0810 | 801833 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 10/06/08 | 1140 | 801779 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |

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 Contact: Mr. Chad F. Davis
 Project: **CES - Normal Deliverable**

Report Date: October 13, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-W-2 | Project: | LLNL00306 |
| Sample ID: | 215966010 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|-----------|--------|-------|-------|----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>TCLP Hg in Solid "As Received"</i> | | | | | | | | | | | |
| Mercury | U | -0.000873 | 0.0003 | 0.002 | mg/L | 1 | JXL1 | 10/06/08 | 1310 | 801306 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>TCLP ICP Metals for Solid "As Received"</i> | | | | | | | | | | | |
| Antimony | U | -0.0122 | 0.030 | 0.100 | mg/L | 1 | KDL | 10/07/08 | 1835 | 801337 | 2 |
| Arsenic | U | 0.0102 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Barium | | 0.845 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Beryllium | U | -0.000242 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Cadmium | U | -0.000719 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Chromium | U | 0.0126 | 0.020 | 0.050 | mg/L | 1 | | | | | |
| Cobalt | U | 0.00528 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Copper | J | 0.0525 | 0.030 | 0.100 | mg/L | 1 | | | | | |
| Lead | U | 0.0162 | 0.025 | 0.100 | mg/L | 1 | | | | | |
| Molybdenum | U | 0.00154 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Nickel | J | 0.0303 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Selenium | U | -0.095 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Silver | U | -0.00772 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Thallium | U | -0.0211 | 0.050 | 0.200 | mg/L | 1 | | | | | |
| Vanadium | U | -0.000358 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Zinc | | 0.826 | 0.020 | 0.100 | mg/L | 1 | | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|------------------------------------|---------|----------|------|------------|
| SW846 1311 | SW846 1311 TCLP Leaching -FEDERAL | CXW3 | 10/01/08 | 1600 | 800777 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 10/06/08 | 0810 | 801335 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 10/03/08 | 1155 | 801305 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |

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 Livermore, California 94551
 Contact: Mr. Chad F. Davis
 Project: **CES - Normal Deliverable**

Report Date: October 15, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-N-1 | Project: | LLNL00306 |
| Sample ID: | 215963011 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |
| Moisture: | 2.68% | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------|-------|-------|------|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>7471 Cold Vapor Hg in Solid "Dry Weight Corrected"</i> | | | | | | | | | | | |
| Mercury | | 137 | 1.59 | 10.6 | mg/kg | 1000 | ETL | 09/29/08 | 1341 | 796414 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>6010 TAL Metals Soil Federal "Dry Weight Corrected"</i> | | | | | | | | | | | |
| Antimony | U | -0.299 | 0.307 | 1.50 | mg/kg | 1 | HSC | 10/12/08 | 1837 | 796830 | 2 |
| Arsenic | | 5.18 | 0.495 | 1.50 | mg/kg | 1 | | | | | |
| Barium | | 183 | 0.099 | 0.500 | mg/kg | 1 | | | | | |
| Beryllium | U | -0.295 | 0.099 | 0.500 | mg/kg | 1 | | | | | |
| Cadmium | J | 0.358 | 0.099 | 0.500 | mg/kg | 1 | | | | | |
| Chromium | | 33.3 | 0.099 | 0.500 | mg/kg | 1 | | | | | |
| Cobalt | | 10.5 | 0.198 | 0.500 | mg/kg | 1 | | | | | |
| Copper | | 67.1 | 0.297 | 2.00 | mg/kg | 1 | | | | | |
| Lead | | 24.2 | 0.247 | 1.50 | mg/kg | 1 | | | | | |
| Molybdenum | J | 0.483 | 0.198 | 1.00 | mg/kg | 1 | | | | | |
| Nickel | | 42.6 | 0.099 | 1.30 | mg/kg | 1 | | | | | |
| Silver | | 0.685 | 0.099 | 0.500 | mg/kg | 1 | | | | | |
| Thallium | U | -1.78 | 0.495 | 3.00 | mg/kg | 1 | | | | | |
| Vanadium | | 30.0 | 0.099 | 0.500 | mg/kg | 1 | | | | | |
| Zinc | | 126 | 0.198 | 1.00 | mg/kg | 1 | | | | | |
| Selenium | U | 4.81 | 4.95 | 14.8 | mg/kg | 10 | HSC | 10/14/08 | 1805 | 796830 | 3 |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|-----------------------------|---------|----------|------|------------|
| SW846 3050B | 846 3050BS PREP | FGA | 10/10/08 | 1430 | 796829 |
| SW846 7471A Prep | EPA 7471A Mercury Prep Soil | TXB3 | 09/26/08 | 1600 | 796413 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|-------------------|------------------|
| 1 | SW846 7471A | |
| 2 | SW846 3050B/6010B | |
| 3 | SW846 3050B/6010B | |

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Project: **CES - Normal Deliverable**

Report Date: October 14, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-N-1 | Project: | LLNL00306 |
| Sample ID: | 215964011 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|-----------|----------|-------|-------|-------|----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>STLC Hg in Solid "As Received"</i> | | | | | | | | | | | |
| Mercury | U | -0.0697 | 0.030 | 0.200 | mg/L | 1 | JXL1 | 10/07/08 | 1353 | 801780 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>STLC ICP Metals for Solids "As Received"</i> | | | | | | | | | | | |
| Antimony | U | -0.00667 | 0.030 | 1.00 | mg/L | 1 | KDL | 10/13/08 | 1427 | 801834 | 2 |
| Arsenic | U | -0.00839 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Barium | | 12.4 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Beryllium | U | 0.00456 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Cadmium | J | 0.0201 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Chromium | | 0.164 | 0.020 | 0.050 | mg/L | 1 | | | | | |
| Cobalt | | 0.531 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Copper | | 1.97 | 0.030 | 0.100 | mg/L | 1 | | | | | |
| Lead | | 1.00 | 0.025 | 0.100 | mg/L | 1 | | | | | |
| Molybdenum | U | 0.00623 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Nickel | | 0.641 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Selenium | | 0.346 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Silver | U | 0.00452 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Thallium | U | 0.0139 | 0.050 | 0.200 | mg/L | 1 | | | | | |
| Vanadium | | 0.208 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Zinc | | 4.40 | 0.020 | 0.100 | mg/L | 1 | | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|-------------------------------|-------------------------------------|---------|----------|------|------------|
| California Code of Regulation | California Wet Method STLC Leaching | CJPI | 10/01/08 | 1000 | 800775 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 10/06/08 | 0810 | 801833 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 10/06/08 | 1140 | 801779 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |

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 Project: CES - Normal Deliverable

Report Date: October 13, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-N-1 | Project: | LLNL00306 |
| Sample ID: | 215966011 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|-----------|--------|-------|-------|----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>TCLP Hg in Solid "As Received"</i> | | | | | | | | | | | |
| Mercury | U | -0.000646 | 0.0003 | 0.002 | mg/L | 1 | JXL1 | 10/06/08 | 1312 | 801306 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>TCLP ICP Metals for Solid "As Received"</i> | | | | | | | | | | | |
| Antimony | U | 0.00658 | 0.030 | 0.100 | mg/L | 1 | KDL | 10/07/08 | 1843 | 801337 | 2 |
| Arsenic | U | -0.0216 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Barium | | 0.820 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Beryllium | U | -0.00011 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Cadmium | U | 0.00142 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Chromium | U | 0.0108 | 0.020 | 0.050 | mg/L | 1 | | | | | |
| Cobalt | U | 0.00912 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Copper | U | 0.0164 | 0.030 | 0.100 | mg/L | 1 | | | | | |
| Lead | U | 0.0218 | 0.025 | 0.100 | mg/L | 1 | | | | | |
| Molybdenum | U | -0.00523 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Nickel | | 0.0552 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Selenium | U | -0.0102 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Silver | U | -0.008 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Thallium | U | -0.0128 | 0.050 | 0.200 | mg/L | 1 | | | | | |
| Vanadium | U | -0.000861 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Zinc | | 0.345 | 0.020 | 0.100 | mg/L | 1 | | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|------------------------------------|---------|----------|------|------------|
| SW846 1311 | SW846 1311 TCLP Leaching -FEDERAL | CXW3 | 10/01/08 | 1600 | 800777 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 10/06/08 | 0810 | 801335 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 10/03/08 | 1155 | 801305 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |

RHWM ANALYSIS REPORT

| | | | |
|------------|-----------|------------------------|-------|
| WDR Number | Sample ID | Analytical Log Book ID | COC |
| N/A | 212-N-2 | | 17500 |

| | |
|---------------|------------|
| XRF | Analyst |
| Date Analyzed | Element |
| | Percentage |

| (LSC) RADIOLOGICAL SCREENING REPORT | |
|-------------------------------------|-------------------|
| Aliquot (mL or g) | Gross alpha, beta |
| 1g | 1g |
| Analyst | Claude Cardenas |
| Date Analyzed | 9/15/2008 |
| Energy Window | 18.6-2000 keV |
| DPM | 0 |
| MDC | 3000 |
| Actual Result | 0 |
| Reportable Result | Below MDC |
| Unit | picocuries / kg |

| pH & NORMALITY | |
|----------------|-------------------------|
| Analyst | Date Analyzed |
| | |
| pH Result | Normality Result (eq/L) |
| | |

| HYDROMETER / SPECIFIC GRAVITY | |
|-------------------------------|-------------------|
| Analyst | Date Analyzed |
| | |
| Specific Gravity Result | Hydrometer Result |
| | |

| FLASH POINT (METHOD 1010) | |
|---------------------------|---------------|
| Analyst | Date Analyzed |
| | |
| MDL | Result |
| Unit | |

| BOILING POINT | |
|---------------|------|
| Result | Unit |
| | |

| LIQUIFICATION TESTING | |
|-----------------------|---------------|
| Vibration Testing | |
| Analyst | Date Analyzed |
| | |
| Result | |

| Freeze / Thaw Testing | |
|-----------------------|---------------|
| Analyst | Date Analyzed |
| | |
| Result | |

| Paint Filter Activity | |
|-----------------------|---------------|
| Analyst | Date Analyzed |
| | |
| Result | |

| SAW GC | |
|---------------|-----------------|
| Date Analyzed | Chemical |
| | |
| Analyst | Result |
| | Detection Limit |

| COMMENTS | |
|----------------|--|
| | |
| Date Completed | 9/15/2008 |
| Reviewed By |  |

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Certificate of Analysis

Company : Lawrence Livermore National
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Address : 7000 East Avenue
Mailstop L-620
Livermore, California 94551
Contact: Mr. Chad F. Davis
Project: CES - Normal Deliverable

Report Date: October 15, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-N-2 | Project: | LLNL00306 |
| Sample ID: | 215963012 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |
| Moisture: | 2.06% | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|---------|-------|-------|-------|-----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>7471 Cold Vapor Hg in Solid "Dry Weight Corrected"</i> | | | | | | | | | | | |
| Mercury | | 15.0 | 0.171 | 1.14 | mg/kg | 100 | ETL | 09/29/08 | 1239 | 796414 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>6010 TAL Metals Soil Federal "Dry Weight Corrected"</i> | | | | | | | | | | | |
| Antimony | U | -0.0555 | 0.313 | 1.50 | mg/kg | 1 | HSC | 10/12/08 | 1843 | 796830 | 2 |
| Arsenic | | 4.68 | 0.505 | 1.52 | mg/kg | 1 | | | | | |
| Barium | | 184 | 0.101 | 0.505 | mg/kg | 1 | | | | | |
| Beryllium | U | -0.352 | 0.101 | 0.505 | mg/kg | 1 | | | | | |
| Cadmium | | 0.565 | 0.101 | 0.505 | mg/kg | 1 | | | | | |
| Chromium | | 32.8 | 0.101 | 0.505 | mg/kg | 1 | | | | | |
| Cobalt | | 10.6 | 0.202 | 0.505 | mg/kg | 1 | | | | | |
| Copper | | 54.1 | 0.303 | 2.00 | mg/kg | 1 | | | | | |
| Lead | | 27.7 | 0.253 | 1.50 | mg/kg | 1 | | | | | |
| Molybdenum | J | 0.482 | 0.202 | 1.01 | mg/kg | 1 | | | | | |
| Nickel | | 42.8 | 0.101 | 1.30 | mg/kg | 1 | | | | | |
| Silver | | 0.772 | 0.101 | 0.505 | mg/kg | 1 | | | | | |
| Thallium | U | -1.89 | 0.505 | 3.00 | mg/kg | 1 | | | | | |
| Vanadium | | 30.0 | 0.101 | 0.505 | mg/kg | 1 | | | | | |
| Zinc | | 204 | 0.202 | 1.01 | mg/kg | 1 | | | | | |
| Selenium | U | 3.91 | 5.05 | 15.2 | mg/kg | 10 | HSC | 10/14/08 | 1813 | 796830 | 3 |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|-----------------------------|---------|----------|------|------------|
| SW846 3050B | 846 3050BS PREP | FGA | 10/10/08 | 1430 | 796829 |
| SW846 7471A Prep | EPA 7471A Mercury Prep Soil | TXB3 | 09/26/08 | 1600 | 796413 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|-------------------|------------------|
| 1 | SW846 7471A | |
| 2 | SW846 3050B/6010B | |
| 3 | SW846 3050B/6010B | |

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Livermore, California 94551
Contact: Mr. Chad F. Davis
Project: CES - Normal Deliverable

Report Date: October 14, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-N-2 | Project: | LLNL00306 |
| Sample ID: | 215964012 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|-----------|---------|-------|-------|-------|----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>STLC Hg in Solid "As Received"</i> | | | | | | | | | | | |
| Mercury | U | -0.0593 | 0.030 | 0.200 | mg/L | 1 | JXL1 | 10/07/08 | 1355 | 801780 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>STLC ICP Metals for Solids "As Received"</i> | | | | | | | | | | | |
| Antimony | U | 0.0156 | 0.030 | 1.00 | mg/L | 1 | KDL | 10/13/08 | 1501 | 801834 | 2 |
| Arsenic | U | 0.0188 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Barium | | 10.2 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Beryllium | U | 0.00398 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Cadmium | J | 0.0252 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Chromium | | 0.148 | 0.020 | 0.050 | mg/L | 1 | | | | | |
| Cobalt | | 0.437 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Copper | | 0.897 | 0.030 | 0.100 | mg/L | 1 | | | | | |
| Lead | | 1.34 | 0.025 | 0.100 | mg/L | 1 | | | | | |
| Molybdenum | U | 0.00178 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Nickel | | 0.546 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Selenium | | 0.177 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Silver | U | 0.00521 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Thallium | U | 0.0129 | 0.050 | 0.200 | mg/L | 1 | | | | | |
| Vanadium | | 0.187 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Zinc | | 17.6 | 0.020 | 0.100 | mg/L | 1 | | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|-----------------------------|-------------------------------------|---------|----------|------|------------|
| California Code of Regulati | California Wet Method STLC Leaching | CJPI | 10/01/08 | 1000 | 800775 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 10/06/08 | 0810 | 801833 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 10/06/08 | 1140 | 801779 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |

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Livermore, California 94551
Contact: Mr. Chad F. Davis
Project: **CES - Normal Deliverable**

Report Date: October 13, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-N-2 | Project: | LLNL00306 |
| Sample ID: | 215966012 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|-----------|--------|-------|-------|----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>TCLP Hg in Solid "As Received"</i> | | | | | | | | | | | |
| Mercury | U | -0.000486 | 0.0003 | 0.002 | mg/L | 1 | JXL1 | 10/06/08 | 1314 | 801306 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>TCLP ICP Metals for Solid "As Received"</i> | | | | | | | | | | | |
| Antimony | U | -0.00567 | 0.030 | 0.100 | mg/L | 1 | KDL | 10/07/08 | 1850 | 801337 | 2 |
| Arsenic | U | 0.0114 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Barium | | 0.900 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Beryllium | U | -0.000082 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Cadmium | U | 0.00478 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Chromium | U | 0.0138 | 0.020 | 0.050 | mg/L | 1 | | | | | |
| Cobalt | U | -0.000613 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Copper | U | 0.012 | 0.030 | 0.100 | mg/L | 1 | | | | | |
| Lead | U | 0.0182 | 0.025 | 0.100 | mg/L | 1 | | | | | |
| Molybdenum | U | 0.00179 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Nickel | J | 0.0459 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Selenium | U | -0.0451 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Silver | U | -0.00323 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Thallium | U | -0.00316 | 0.050 | 0.200 | mg/L | 1 | | | | | |
| Vanadium | U | 0.000386 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Zinc | | 0.911 | 0.020 | 0.100 | mg/L | 1 | | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|------------------------------------|---------|----------|------|------------|
| SW846 1311 | SW846 1311 TCLP Leaching -FEDERAL | CXW3 | 10/01/08 | 1600 | 800777 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 10/06/08 | 0810 | 801335 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 10/03/08 | 1155 | 801305 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |

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 Livermore, California 94551
 Contact: Mr. Chad F. Davis
 Project: **CES - Normal Deliverable**

Report Date: October 15, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-N-3 | Project: | LLNL00306 |
| Sample ID: | 215963013 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |
| Moisture: | 2.27% | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | AnalystDate | Time | Batch | Method |
|--|-----------|---------|--------|-------|-------|-----|--------------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | |
| <i>7471 Cold Vapor Hg in Solid "Dry Weight Corrected"</i> | | | | | | | | | | |
| Mercury | | 7.75 | 0.155 | 1.04 | mg/kg | 100 | ETL 09/29/08 | 1245 | 796414 | 1 |
| Metals Analysis-ICP | | | | | | | | | | |
| <i>6010 TAL Metals Soil Federal "Dry Weight Corrected"</i> | | | | | | | | | | |
| Antimony | U | -0.0663 | 0.306 | 1.50 | mg/kg | 1 | HSC 10/12/08 | 1850 | 796830 | 2 |
| Arsenic | | 5.33 | 0.494 | 1.50 | mg/kg | 1 | | | | |
| Barium | | 170 | 0.0988 | 0.500 | mg/kg | 1 | | | | |
| Beryllium | U | -0.372 | 0.0988 | 0.500 | mg/kg | 1 | | | | |
| Cadmium | | 0.502 | 0.0988 | 0.500 | mg/kg | 1 | | | | |
| Chromium | | 34.0 | 0.0988 | 0.500 | mg/kg | 1 | | | | |
| Cobalt | | 9.95 | 0.198 | 0.500 | mg/kg | 1 | | | | |
| Copper | | 36.4 | 0.296 | 2.00 | mg/kg | 1 | | | | |
| Lead | | 26.8 | 0.247 | 1.50 | mg/kg | 1 | | | | |
| Molybdenum | J | 0.543 | 0.198 | 1.00 | mg/kg | 1 | | | | |
| Nickel | | 40.8 | 0.0988 | 1.30 | mg/kg | 1 | | | | |
| Silver | | 0.863 | 0.0988 | 0.500 | mg/kg | 1 | | | | |
| Thallium | U | -1.8 | 0.494 | 3.00 | mg/kg | 1 | | | | |
| Vanadium | | 29.4 | 0.0988 | 0.500 | mg/kg | 1 | | | | |
| Zinc | | 196 | 0.198 | 1.00 | mg/kg | 1 | | | | |
| Selenium | J | 5.01 | 4.94 | 14.8 | mg/kg | 10 | HSC 10/14/08 | 1819 | 796830 | 3 |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|-----------------------------|---------|----------|------|------------|
| SW846 3050B | 846 3050BS PREP | FGA | 10/10/08 | 1430 | 796829 |
| SW846 7471A Prep | EPA 7471A Mercury Prep Soil | TXB3 | 09/26/08 | 1600 | 796413 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|-------------------|------------------|
| 1 | SW846 7471A | |
| 2 | SW846 3050B/6010B | |
| 3 | SW846 3050B/6010B | |

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 Project: CES - Normal Deliverable

Report Date: October 14, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-N-3 | Project: | LLNL00306 |
| Sample ID: | 215964013 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|-----------|---------|-------|-------|-------|----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>STLC Hg in Solid "As Received"</i> | | | | | | | | | | | |
| Mercury | U | -0.0563 | 0.030 | 0.200 | mg/L | 1 | JXL1 | 10/07/08 | 1357 | 801780 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>STLC ICP Metals for Solids "As Received"</i> | | | | | | | | | | | |
| Antimony | U | 0.0076 | 0.030 | 1.00 | mg/L | 1 | KDL | 10/13/08 | 1508 | 801834 | 2 |
| Arsenic | U | -0.023 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Barium | | 10.4 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Beryllium | U | 0.00293 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Cadmium | U | 0.00712 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Chromium | | 0.113 | 0.020 | 0.050 | mg/L | 1 | | | | | |
| Cobalt | | 0.331 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Copper | | 3.28 | 0.030 | 0.100 | mg/L | 1 | | | | | |
| Lead | | 0.554 | 0.025 | 0.100 | mg/L | 1 | | | | | |
| Molybdenum | U | 0.0126 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Nickel | | 0.418 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Selenium | | 0.300 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Silver | U | 0.00688 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Thallium | U | 0.0438 | 0.050 | 0.200 | mg/L | 1 | | | | | |
| Vanadium | | 0.221 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Zinc | | 4.92 | 0.020 | 0.100 | mg/L | 1 | | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|-------------------------------|-------------------------------------|---------|----------|------|------------|
| California Code of Regulation | California Wet Method STLC Leaching | CJP1 | 10/01/08 | 1000 | 800775 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 10/06/08 | 0810 | 801833 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 10/06/08 | 1140 | 801779 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |

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Contact: Mr. Chad F. Davis
Project: CES - Normal Deliverable

Report Date: October 13, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-N-3 | Project: | LLNL00306 |
| Sample ID: | 215966013 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|-----------|--------|-------|-------|----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>TCLP Hg in Solid "As Received"</i> | | | | | | | | | | | |
| Mercury | U | -0.000565 | 0.0003 | 0.002 | mg/L | 1 | JXL1 | 10/06/08 | 1316 | 801306 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>TCLP ICP Metals for Solid "As Received"</i> | | | | | | | | | | | |
| Antimony | U | -0.0392 | 0.030 | 0.100 | mg/L | 1 | KDL | 10/07/08 | 1857 | 801337 | 2 |
| Arsenic | U | -0.0115 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Barium | | 0.949 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Beryllium | U | -0.000033 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Cadmium | U | 0.00304 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Chromium | U | 0.0119 | 0.020 | 0.050 | mg/L | 1 | | | | | |
| Cobalt | U | 0.00356 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Copper | U | 0.00204 | 0.030 | 0.100 | mg/L | 1 | | | | | |
| Lead | U | 0.0143 | 0.025 | 0.100 | mg/L | 1 | | | | | |
| Molybdenum | U | 0.00353 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Nickel | J | 0.0485 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Silver | U | -0.00527 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Thallium | U | -0.0345 | 0.050 | 0.200 | mg/L | 1 | | | | | |
| Vanadium | U | 0.000666 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Zinc | | 1.33 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Selenium | J | 0.415 | 0.250 | 0.750 | mg/L | 5 | KDL | 10/09/08 | 1900 | 801337 | 3 |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|------------------------------------|---------|----------|------|------------|
| SW846 1311 | SW846 1311 TCLP Leaching -FEDERAL | CXW3 | 10/01/08 | 1600 | 800777 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 10/06/08 | 0810 | 801335 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 10/03/08 | 1155 | 801305 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |
| 3 | SW846 3010/6010B | |

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : Lawrence Livermore National Security, LLC
 Address : 7000 East Avenue
 Mailstop L-620
 Livermore, California 94551
 Contact: Mr. Chad F. Davis
 Project: **CES - Normal Deliverable**

Report Date: October 15, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-N-4 | Project: | LLNL00306 |
| Sample ID: | 215963014 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |
| Moisture: | 2.16% | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|--------|-------|-------|----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>7471 Cold Vapor Hg in Solid "Dry Weight Corrected"</i> | | | | | | | | | | | |
| Mercury | | 0.802 | 0.0897 | 0.598 | mg/kg | 50 | ETL | 09/29/08 | 1405 | 796414 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>6010 TAL Metals Soil Federal "Dry Weight Corrected"</i> | | | | | | | | | | | |
| Antimony | U | -0.549 | 0.314 | 1.50 | mg/kg | 1 | HSC | 10/12/08 | 1858 | 796830 | 2 |
| Arsenic | | 5.11 | 0.506 | 1.52 | mg/kg | 1 | | | | | |
| Barium | | 190 | 0.101 | 0.506 | mg/kg | 1 | | | | | |
| Beryllium | U | -0.362 | 0.101 | 0.506 | mg/kg | 1 | | | | | |
| Cadmium | J | 0.179 | 0.101 | 0.506 | mg/kg | 1 | | | | | |
| Chromium | | 33.0 | 0.101 | 0.506 | mg/kg | 1 | | | | | |
| Cobalt | | 10.9 | 0.202 | 0.506 | mg/kg | 1 | | | | | |
| Copper | | 36.0 | 0.304 | 2.00 | mg/kg | 1 | | | | | |
| Lead | | 12.1 | 0.253 | 1.50 | mg/kg | 1 | | | | | |
| Molybdenum | J | 0.458 | 0.202 | 1.01 | mg/kg | 1 | | | | | |
| Nickel | | 43.2 | 0.101 | 1.30 | mg/kg | 1 | | | | | |
| Silver | | 0.694 | 0.101 | 0.506 | mg/kg | 1 | | | | | |
| Vanadium | | 30.6 | 0.101 | 0.506 | mg/kg | 1 | | | | | |
| Zinc | | 94.5 | 0.202 | 1.01 | mg/kg | 1 | | | | | |
| Selenium | U | 4.30 | 5.06 | 15.2 | mg/kg | 10 | HSC | 10/14/08 | 1826 | 796830 | 3 |
| Thallium | U | 0.0102 | 5.06 | 20.2 | mg/kg | 10 | | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|-----------------------------|---------|----------|------|------------|
| SW846 3050B | 846 3050BS PREP | FGA | 10/10/08 | 1430 | 796829 |
| SW846 7471A Prep | EPA 7471A Mercury Prep Soil | TXB3 | 09/26/08 | 1600 | 796413 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|-------------------|------------------|
| 1 | SW846 7471A | |
| 2 | SW846 3050B/6010B | |
| 3 | SW846 3050B/6010B | |

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Certificate of Analysis

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 Livermore, California 94551
 Contact: Mr. Chad F. Davis
 Project: CES - Normal Deliverable

Report Date: October 14, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-N-4 | Project: | LLNL00306 |
| Sample ID: | 215964014 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|-----------|---------|-------|-------|-------|----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>STLC Hg in Solid "As Received"</i> | | | | | | | | | | | |
| Mercury | U | -0.0872 | 0.030 | 0.200 | mg/L | 1 | JXL1 | 10/07/08 | 1359 | 801780 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>STLC ICP Metals for Solids "As Received"</i> | | | | | | | | | | | |
| Antimony | U | 0.0113 | 0.030 | 1.00 | mg/L | 1 | KDL | 10/13/08 | 1516 | 801834 | 2 |
| Arsenic | U | -0.0244 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Barium | | 9.72 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Beryllium | U | 0.00271 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Cadmium | U | 0.00773 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Chromium | | 0.0935 | 0.020 | 0.050 | mg/L | 1 | | | | | |
| Cobalt | | 0.422 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Copper | | 1.47 | 0.030 | 0.100 | mg/L | 1 | | | | | |
| Lead | | 0.211 | 0.025 | 0.100 | mg/L | 1 | | | | | |
| Molybdenum | U | 0.00475 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Nickel | | 0.491 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Selenium | | 0.225 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Silver | U | 0.00657 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Thallium | U | 0.0114 | 0.050 | 0.200 | mg/L | 1 | | | | | |
| Vanadium | | 0.187 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Zinc | | 2.39 | 0.020 | 0.100 | mg/L | 1 | | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|-------------------------------|-------------------------------------|---------|----------|------|------------|
| California Code of Regulation | California Wet Method STLC Leaching | CJP1 | 10/01/08 | 1000 | 800775 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 10/06/08 | 0810 | 801833 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 10/06/08 | 1140 | 801779 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |

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Livermore, California 94551
Contact: Mr. Chad F. Davis
Project: CES - Normal Deliverable

Report Date: October 13, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-N-4 | Project: | LLNL00306 |
| Sample ID: | 215966014 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | AnalystDate | Time | Batch | Method |
|--|-----------|-----------|--------|-------|-------|----|---------------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | |
| <i>TCLP Hg in Solid "As Received"</i> | | | | | | | | | | |
| Mercury | U | -0.000613 | 0.0003 | 0.002 | mg/L | 1 | JXL1 10/06/08 | 1322 | 801306 | 1 |
| Metals Analysis-ICP | | | | | | | | | | |
| <i>TCLP ICP Metals for Solid "As Received"</i> | | | | | | | | | | |
| Antimony | U | -0.0017 | 0.030 | 0.100 | mg/L | 1 | KDL 10/07/08 | 1918 | 801337 | 2 |
| Arsenic | U | -0.0126 | 0.050 | 0.150 | mg/L | 1 | | | | |
| Barium | | 1.05 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Beryllium | U | -0.000345 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Cadmium | U | 0.000869 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Chromium | U | 0.011 | 0.020 | 0.050 | mg/L | 1 | | | | |
| Cobalt | U | -0.00107 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Copper | U | -0.00084 | 0.030 | 0.100 | mg/L | 1 | | | | |
| Lead | U | 0.00977 | 0.025 | 0.100 | mg/L | 1 | | | | |
| Molybdenum | U | -0.00737 | 0.020 | 0.100 | mg/L | 1 | | | | |
| Nickel | J | 0.0244 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Selenium | U | 0.0112 | 0.050 | 0.150 | mg/L | 1 | | | | |
| Silver | U | 0.000425 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Thallium | U | 0.0391 | 0.050 | 0.200 | mg/L | 1 | | | | |
| Vanadium | U | 0.00186 | 0.010 | 0.050 | mg/L | 1 | | | | |
| Zinc | | 0.141 | 0.020 | 0.100 | mg/L | 1 | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|------------------------------------|---------|----------|------|------------|
| SW846 1311 | SW846 1311 TCLP Leaching -FEDERAL | CXW3 | 10/01/08 | 1600 | 800777 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 10/06/08 | 0810 | 801335 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 10/03/08 | 1155 | 801305 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |

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Livermore, California 94551
Contact: Mr. Chad F. Davis
Project: CES - Normal Deliverable

Report Date: October 15, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-N-5 | Project: | LLNL00306 |
| Sample ID: | 215963015 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |
| Moisture: | 2.3% | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | AnalystDate | Time | Batch | Method |
|--|-----------|--------|--------|-------|-------|----|-------------|----------|-------|----------|
| Mercury Analysis-CVAA | | | | | | | | | | |
| <i>7471 Cold Vapor Hg in Solid "Dry Weight Corrected"</i> | | | | | | | | | | |
| Mercury | | 0.185 | 0.0161 | 0.107 | mg/kg | 10 | ETL | 09/29/08 | 1407 | 796414 1 |
| Metals Analysis-ICP | | | | | | | | | | |
| <i>6010 TAL Metals Soil Federal "Dry Weight Corrected"</i> | | | | | | | | | | |
| Antimony | U | -0.337 | 0.306 | 1.50 | mg/kg | 1 | HSC | 10/12/08 | 1905 | 796830 2 |
| Arsenic | | 4.51 | 0.493 | 1.50 | mg/kg | 1 | | | | |
| Barium | | 183 | 0.0986 | 0.500 | mg/kg | 1 | | | | |
| Beryllium | U | -0.37 | 0.0986 | 0.500 | mg/kg | 1 | | | | |
| Cadmium | J | 0.140 | 0.0986 | 0.500 | mg/kg | 1 | | | | |
| Chromium | | 31.8 | 0.0986 | 0.500 | mg/kg | 1 | | | | |
| Cobalt | | 10.3 | 0.197 | 0.500 | mg/kg | 1 | | | | |
| Copper | | 28.7 | 0.296 | 2.00 | mg/kg | 1 | | | | |
| Lead | | 11.1 | 0.247 | 1.50 | mg/kg | 1 | | | | |
| Molybdenum | J | 0.426 | 0.197 | 1.00 | mg/kg | 1 | | | | |
| Nickel | | 42.4 | 0.0986 | 1.30 | mg/kg | 1 | | | | |
| Silver | | 0.682 | 0.0986 | 0.500 | mg/kg | 1 | | | | |
| Vanadium | | 29.4 | 0.0986 | 0.500 | mg/kg | 1 | | | | |
| Zinc | | 65.3 | 0.197 | 1.00 | mg/kg | 1 | | | | |
| Selenium | J | 7.05 | 4.93 | 14.8 | mg/kg | 10 | HSC | 10/14/08 | 1841 | 796830 3 |
| Thallium | U | -1.52 | 4.93 | 19.7 | mg/kg | 10 | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|-----------------------------|---------|----------|------|------------|
| SW846 3050B | 846 3050BS PREP | FGA | 10/10/08 | 1430 | 796829 |
| SW846 7471A Prep | EPA 7471A Mercury Prep Soil | TXB3 | 09/26/08 | 1600 | 796413 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|-------------------|------------------|
| 1 | SW846 7471A | |
| 2 | SW846 3050B/6010B | |
| 3 | SW846 3050B/6010B | |

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Certificate of Analysis

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Contact: Mr. Chad F. Davis
Project: CES - Normal Deliverable

Report Date: October 14, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-N-5 | Project: | LLNL00306 |
| Sample ID: | 215964015 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|-----------|---------|-------|-------|-------|----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>STLC Hg in Solid "As Received"</i> | | | | | | | | | | | |
| Mercury | U | -0.0801 | 0.030 | 0.200 | mg/L | 1 | JXL1 | 10/07/08 | 1401 | 801780 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>STLC ICP Metals for Solids "As Received"</i> | | | | | | | | | | | |
| Antimony | U | 0.029 | 0.030 | 1.00 | mg/L | 1 | KDL | 10/13/08 | 1523 | 801834 | 2 |
| Arsenic | U | -0.0206 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Barium | | 13.3 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Beryllium | U | 0.00404 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Cadmium | U | 0.00502 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Chromium | | 0.160 | 0.020 | 0.050 | mg/L | 1 | | | | | |
| Cobalt | | 0.556 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Copper | | 0.568 | 0.030 | 0.100 | mg/L | 1 | | | | | |
| Lead | | 0.406 | 0.025 | 0.100 | mg/L | 1 | | | | | |
| Molybdenum | U | 0.00133 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Nickel | | 0.766 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Selenium | | 0.261 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Silver | U | 0.00373 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Thallium | U | 0.00398 | 0.050 | 0.200 | mg/L | 1 | | | | | |
| Vanadium | | 0.263 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Zinc | | 1.85 | 0.020 | 0.100 | mg/L | 1 | | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|-------------------------------|-------------------------------------|---------|----------|------|------------|
| California Code of Regulation | California Wet Method STLC Leaching | CJP1 | 10/01/08 | 1000 | 800775 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 10/06/08 | 0810 | 801833 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 10/06/08 | 1140 | 801779 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |

GEL LABORATORIES LLC

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Certificate of Analysis

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 Livermore, California 94551
 Contact: Mr. Chad F. Davis
 Project: CES - Normal Deliverable

Report Date: October 13, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-N-5 | Project: | LLNL00306 |
| Sample ID: | 215966015 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 15-SEP-08 10:45 | | |
| Receive Date: | 17-SEP-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|-----------|--------|-------|-------|----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>TCLP Hg in Solid "As Received"</i> | | | | | | | | | | | |
| Mercury | U | -0.000801 | 0.0003 | 0.002 | mg/L | 1 | JXL1 | 10/06/08 | 1324 | 801306 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>TCLP ICP Metals for Solid "As Received"</i> | | | | | | | | | | | |
| Antimony | U | 0.00232 | 0.030 | 0.100 | mg/L | 1 | KDL | 10/07/08 | 1926 | 801337 | 2 |
| Arsenic | U | -0.0158 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Barium | | 1.16 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Beryllium | U | 0.000162 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Cadmium | U | 0.00113 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Chromium | U | 0.0129 | 0.020 | 0.050 | mg/L | 1 | | | | | |
| Cobalt | U | 0.00343 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Copper | U | -0.0022 | 0.030 | 0.100 | mg/L | 1 | | | | | |
| Lead | J | 0.0345 | 0.025 | 0.100 | mg/L | 1 | | | | | |
| Molybdenum | U | 0.00297 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Nickel | J | 0.0383 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Selenium | U | -0.0474 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Silver | U | -0.00437 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Thallium | U | -0.0186 | 0.050 | 0.200 | mg/L | 1 | | | | | |
| Vanadium | U | -0.00119 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Zinc | | 0.206 | 0.020 | 0.100 | mg/L | 1 | | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|------------------------------------|---------|----------|------|------------|
| SW846 1311 | SW846 1311 TCLP Leaching -FEDERAL | CXW3 | 10/01/08 | 1600 | 800777 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 10/06/08 | 0810 | 801335 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 10/03/08 | 1155 | 801305 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: October 15, 2008

Page 1 of 4

Lawrence Livermore National Security, LLC
7000 East Avenue
Mailstop L-620
Livermore, California

Contact: Mr. Chad F. Davis

Workorder: 215963

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---------------------|-----------|--------|--------|---------|-------|------|------|------------|-------|----------|-------|
| Metals Analysis-ICP | | | | | | | | | | | |
| Batch | 796830 | | | | | | | | | | |
| QC1201674262 | LCS | | | | | | | | | | |
| Antimony | 48.5 | | | 47.4 | mg/kg | | 98 | (80%-120%) | HSC | 10/12/08 | 16:43 |
| Arsenic | 48.5 | | | 47.3 | mg/kg | | 98 | (80%-120%) | | | |
| Barium | 48.5 | | | 48.0 | mg/kg | | 99 | (80%-120%) | | | |
| Beryllium | 48.5 | | | 49.0 | mg/kg | | 101 | (80%-120%) | | | |
| Cadmium | 48.5 | | | 47.7 | mg/kg | | 98 | (80%-120%) | | | |
| Chromium | 48.5 | | | 47.3 | mg/kg | | 98 | (80%-120%) | | | |
| Cobalt | 48.5 | | | 47.5 | mg/kg | | 98 | (80%-120%) | | | |
| Copper | 48.5 | | | 48.3 | mg/kg | | 100 | (80%-120%) | | | |
| Lead | 48.5 | | | 47.3 | mg/kg | | 98 | (80%-120%) | | | |
| Molybdenum | 48.5 | | | 46.3 | mg/kg | | 95 | (80%-120%) | | | |
| Nickel | 48.5 | | | 47.0 | mg/kg | | 97 | (80%-120%) | | | |
| Selenium | 48.5 | | | 49.1 | mg/kg | | 101 | (80%-120%) | | | |
| Silver | 48.5 | | | 47.5 | mg/kg | | 98 | (80%-120%) | | | |
| Thallium | 48.5 | | | 47.6 | mg/kg | | 98 | (80%-120%) | | | |
| Vanadium | 48.5 | | | 47.8 | mg/kg | | 99 | (80%-120%) | | | |
| Zinc | 48.5 | | | 46.6 | mg/kg | | 96 | (80%-120%) | | | |
| QC1201674261 | MB | | | | | | | | | | |
| Antimony | | | U | 0.053 | mg/kg | | | | | 10/12/08 | 16:35 |
| Arsenic | | | U | 0.212 | mg/kg | | | | | | |
| Barium | | | U | 0.0943 | mg/kg | | | | | | |
| Beryllium | | | U | 0.00819 | mg/kg | | | | | | |
| Cadmium | | | U | 0.00183 | mg/kg | | | | | | |
| Chromium | | | U | 0.0963 | mg/kg | | | | | | |
| Cobalt | | | U | 0.00922 | mg/kg | | | | | | |
| Copper | | | U | 0.0481 | mg/kg | | | | | | |
| Lead | | | U | -0.0471 | mg/kg | | | | | | |
| Molybdenum | | | U | -0.0126 | mg/kg | | | | | | |
| Nickel | | | U | 0.0728 | mg/kg | | | | | | |
| Selenium | | | U | -0.304 | mg/kg | | | | | | |
| Silver | | | U | 0.0558 | mg/kg | | | | | | |
| Thallium | | | U | 0.0952 | mg/kg | | | | | | |
| Vanadium | | | U | -0.0567 | mg/kg | | | | | | |
| Zinc | | | J | 0.289 | mg/kg | | | | | | |
| QC1201674263 | 215963001 | MS | | | | | | | | | |
| Antimony | 52.1 | U | -0.229 | 38.3 | mg/kg | | 74* | (75%-125%) | | 10/12/08 | 16:57 |
| Arsenic | 52.1 | | 4.72 | 52.4 | mg/kg | | 91 | (75%-125%) | | | |
| Barium | 52.1 | | 173 | 213 | mg/kg | | 76 | (75%-125%) | | | |

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QC Summary

Workorder: 215963

Page 2 of 4

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|------------------------------|------|--------|--------|------|--------|------|-------|------------|-------|----------|-------|
| Metals Analysis-ICP | | | | | | | | | | | |
| Batch 796830 | | | | | | | | | | | |
| Beryllium | 52.1 | U | -0.342 | 48.2 | mg/kg | | 92 | (75%-125%) | | | |
| Cadmium | 52.1 | J | 0.384 | 46.9 | mg/kg | | 89 | (75%-125%) | HSC | 10/12/08 | 16:57 |
| Chromium | 52.1 | | 34.2 | 86.9 | mg/kg | | 101 | (75%-125%) | | | |
| Cobalt | 52.1 | | 10.5 | 56.1 | mg/kg | | 87 | (75%-125%) | | | |
| Copper | 52.1 | | 344 | 322 | mg/kg | | N/A | (75%-125%) | | | |
| Lead | 52.1 | | 19.5 | 64.5 | mg/kg | | 86 | (75%-125%) | | | |
| Molybdenum | 52.1 | J | 0.656 | 45.5 | mg/kg | | 86 | (75%-125%) | | | |
| Nickel | 52.1 | | 42.3 | 87.7 | mg/kg | | 87 | (75%-125%) | | | |
| Selenium | 52.1 | U | 3.47 | 59.2 | mg/kg | | 107 | (75%-125%) | | 10/14/08 | 16:27 |
| Silver | 52.1 | | 0.813 | 49.8 | mg/kg | | 94 | (75%-125%) | | 10/12/08 | 16:57 |
| Thallium | 52.1 | U | -1.89 | 33.7 | mg/kg | | 65* | (75%-125%) | | | |
| Vanadium | 52.1 | | 31.3 | 81.6 | mg/kg | | 97 | (75%-125%) | | | |
| Zinc | 52.1 | | 128 | 179 | mg/kg | | 98 | (75%-125%) | | | |
| QC1201674264 215963001 MSD | | | | | | | | | | | |
| Antimony | 50.6 | U | -0.229 | 37.6 | mg/kg | 2 | 74* | (0%-20%) | | 10/12/08 | 17:03 |
| Arsenic | 50.6 | | 4.72 | 50.7 | mg/kg | 3 | 91 | (0%-20%) | | | |
| Barium | 50.6 | | 173 | 219 | mg/kg | 3 | 90 | (0%-20%) | | | |
| Beryllium | 50.6 | U | -0.342 | 46.7 | mg/kg | 3 | 92 | (0%-20%) | | | |
| Cadmium | 50.6 | J | 0.384 | 45.6 | mg/kg | 3 | 89 | (0%-20%) | | | |
| Chromium | 50.6 | | 34.2 | 82.7 | mg/kg | 5 | 96 | (0%-20%) | | | |
| Cobalt | 50.6 | | 10.5 | 55.1 | mg/kg | 2 | 88 | (0%-20%) | | | |
| Copper | 50.6 | | 344 | 449 | mg/kg | 33* | N/A | (0%-20%) | | | |
| Lead | 50.6 | | 19.5 | 60.8 | mg/kg | 6 | 82 | (0%-20%) | | | |
| Molybdenum | 50.6 | J | 0.656 | 44.2 | mg/kg | 3 | 86 | (0%-20%) | | | |
| Nickel | 50.6 | | 42.3 | 87.6 | mg/kg | 0 | 90 | (0%-20%) | | | |
| Selenium | 50.6 | U | 3.47 | 61.8 | mg/kg | 4 | 115 | (0%-20%) | | 10/14/08 | 16:34 |
| Silver | 50.6 | | 0.813 | 48.4 | mg/kg | 3 | 94 | (0%-20%) | | 10/12/08 | 17:03 |
| Thallium | 50.6 | U | -1.89 | 34.5 | mg/kg | 2 | 68* | (0%-20%) | | | |
| Vanadium | 50.6 | | 31.3 | 80.7 | mg/kg | 1 | 98 | (0%-20%) | | | |
| Zinc | 50.6 | | 128 | 176 | mg/kg | 2 | 95 | (0%-20%) | | | |
| QC1201674265 215963001 SDILT | | | | | | | | | | | |
| Antimony | | U | -2.24 | U | 0.629 | ug/L | N/A | (0%-10%) | | 10/12/08 | 17:10 |
| Arsenic | | | 46.1 | J | 13.2 | ug/L | 43.7 | (0%-10%) | | | |
| Barium | | | 1690 | | 375 | ug/L | 10.9* | (0%-10%) | | | |
| Beryllium | | U | -3.34 | U | -0.674 | ug/L | N/A | (0%-10%) | | | |
| Cadmium | | J | 3.75 | U | 0.538 | ug/L | N/A | (0%-10%) | | | |
| Chromium | | | 334 | | 72.1 | ug/L | 8.07 | (0%-10%) | | | |
| Cobalt | | | 103 | | 23.2 | ug/L | 12.8* | (0%-10%) | | | |
| Copper | | | 3350 | | 703 | ug/L | 4.72 | (0%-10%) | | | |
| Lead | | | 190 | | 41.4 | ug/L | 8.92 | (0%-10%) | | | |
| Molybdenum | | J | 6.40 | U | 1.26 | ug/L | N/A | (0%-10%) | | | |
| Nickel | | | 413 | | 92.3 | ug/L | 11.8* | (0%-10%) | | | |

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QC Summary

Workorder: 215963

Page 3 of 4

| Parname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|--------------------------------|-----------------|--------|-------|----|----------|-------|--------|------------|----------|----------|-------|
| Metals Analysis-ICP | | | | | | | | | | | |
| Batch | 796830 | | | | | | | | | | |
| Selenium | | U | 3.39 | U | 2.67 | ug/L | N/A | (0%-10%) | | 10/14/08 | 16:41 |
| Silver | | | 7.93 | J | 2.24 | ug/L | 41 | (0%-10%) | HSC | 10/12/08 | 17:10 |
| Thallium | | U | -18.4 | U | -2.75 | ug/L | N/A | (0%-10%) | | | |
| Vanadium | | | 306 | | 64.7 | ug/L | 5.78 | (0%-10%) | | | |
| Zinc | | | 1250 | | 276 | ug/L | 10.6 * | (0%-10%) | | | |
| Metals Analysis-Mercury | | | | | | | | | | | |
| Batch | 796414 | | | | | | | | | | |
| QC1201673385 | LCS | | | | | | | | | | |
| Mercury | | | 0.112 | | 0.116 | mg/kg | 103 | (66%-134%) | ETL | 09/29/08 | 12:05 |
| QC1201673384 | MB | | | | | | | | | | |
| Mercury | | | | U | -0.00223 | mg/kg | | | | 09/29/08 | 12:03 |
| QC1201673386 | 215963001 MS | | | | | | | | | | |
| Mercury | | | 0.106 | | 32.2 | mg/kg | N/A | (75%-125%) | | 09/29/08 | 12:09 |
| QC1201673387 | 215963001 MSD | | | | | | | | | | |
| Mercury | | | 0.119 | | 32.2 | mg/kg | 9 | N/A | (0%-20%) | 09/29/08 | 12:11 |
| QC1201673388 | 215963001 SDILT | | | | | | | | | | |
| Mercury | | | 5.65 | | 1.09 | ug/L | 3.36 | (0%-10%) | | 09/29/08 | 12:13 |

Notes:

The Qualifiers in this report are defined as follows:

- ** 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 For General Chemistry and Organic analysis the 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
- E Metals--%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

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QC Summary

Workorder: 215963

Page 4 of 4

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------|-----|--|------|----|-------|------|------|-------|-------|------|------|
| 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. Qualifier Not Applicable for Radiochemistry. | | | | | | | | | |
| 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.

^ 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.

* Indicates that a Quality Control parameter was not within specifications.

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.

COMPANY - WIDE NONCONFORMANCE REPORT

| | | | |
|--------------------------------|--|--|-----------------------------|
| Mo.Day Yr. 07-OCT-08 | Division: Federal | Quality Criteria: Specifications | Type: Process |
| Instrument Type: ICP | Test / Method: SW846 3050B/6010B | Matrix Type: Solid | Client Code: LLNL |
| Batch ID: 796830 | Sample Numbers: See Below | | |

Potentially affected work order(s)(SDG): 215963

Application Issues:

- Failed Recovery for MS/PS
- Failed RPD for MS/MSD, or PS/PSD
- Failed Recovery for MSD/PSD

Specification and Requirements Nonconformance Description:

1. Failed Recovery for MS/PS:
 QC 1201674263MS
2. Failed RPD for MS/MSD, or PS/PSD:
 QC 1201674264MSD
3. Failed Recovery for MSD/PSD:
 QC 1201674264MSD

NRG Disposition:

The matrix spike and matrix spike dup. both failed for antimony, copper and thallium due to possible matrix interference. The MSD/MSD's RPD failed for copper because the sample was not homogeneous. The sample was a brown soil. Data reported.

Originator's Name:

Kurt Leshner 07-OCT-08

Data Validator/Group Leader:

Kurt Leshner 15-OCT-08

Quality Review:

Director:

GEL LABORATORIES LLC

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QC Summary

Lawrence Livermore National Security, LLC
 7000 East Avenue
 Mailstop L-620
 Livermore, California

Report Date: October 14, 2008

Page 1 of 4

Contact: Mr. Chad F. Davis

Workorder: 215964

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---------------------|--------------|--------|----------|----------|-------|------|------|------------|-------|----------|-------|
| Metals Analysis-ICP | | | | | | | | | | | |
| Batch | 801834 | | | | | | | | | | |
| QC1201685289 | LCS | | | | | | | | | | |
| Antimony | 5.00 | | | 4.66 | mg/L | | 93 | (80%-120%) | KDL | 10/13/08 | 12:20 |
| Arsenic | 5.00 | | | 4.83 | mg/L | | 97 | (80%-120%) | | | |
| Barium | 5.00 | | | 4.94 | mg/L | | 99 | (80%-120%) | | | |
| Beryllium | 5.00 | | | 4.77 | mg/L | | 96 | (80%-120%) | | | |
| Cadmium | 5.00 | | | 4.79 | mg/L | | 96 | (80%-120%) | | | |
| Chromium | 5.00 | | | 4.81 | mg/L | | 96 | (80%-120%) | | | |
| Cobalt | 5.00 | | | 4.90 | mg/L | | 98 | (80%-120%) | | | |
| Copper | 5.00 | | | 4.98 | mg/L | | 100 | (80%-120%) | | | |
| Lead | 5.00 | | | 4.86 | mg/L | | 97 | (80%-120%) | | | |
| Molybdenum | 5.00 | | | 4.78 | mg/L | | 96 | (80%-120%) | | | |
| Nickel | 5.00 | | | 4.74 | mg/L | | 95 | (80%-120%) | | | |
| Selenium | 5.00 | | | 4.52 | mg/L | | 90 | (80%-120%) | | | |
| Silver | 5.00 | | | 4.84 | mg/L | | 97 | (80%-120%) | | | |
| Thallium | 5.00 | | | 4.83 | mg/L | | 97 | (80%-120%) | | | |
| Vanadium | 5.00 | | | 4.90 | mg/L | | 98 | (80%-120%) | | | |
| Zinc | 5.00 | | | 4.57 | mg/L | | 91 | (80%-120%) | | | |
| QC1201685288 | MB | | | | | | | | | | |
| Antimony | | | U | -0.0015 | mg/L | | | | | 10/13/08 | 12:03 |
| Arsenic | | | U | -0.0218 | mg/L | | | | | | |
| Barium | | | U | 0.00271 | mg/L | | | | | | |
| Beryllium | | | U | 0.000683 | mg/L | | | | | | |
| Cadmium | | | U | -0.00286 | mg/L | | | | | | |
| Chromium | | | U | 0.000319 | mg/L | | | | | | |
| Cobalt | | | U | 0.00505 | mg/L | | | | | | |
| Copper | | | U | -0.00825 | mg/L | | | | | | |
| Lead | | | U | -0.00844 | mg/L | | | | | | |
| Molybdenum | | | U | 0.0199 | mg/L | | | | | | |
| Nickel | | | U | -0.00384 | mg/L | | | | | | |
| Selenium | | | U | 0.0284 | mg/L | | | | | | |
| Silver | | | U | 0.00175 | mg/L | | | | | | |
| Thallium | | | U | 0.0217 | mg/L | | | | | | |
| Vanadium | | | U | -0.00349 | mg/L | | | | | | |
| Zinc | | | U | 0.00962 | mg/L | | | | | | |
| QC1201683041 | 215964001 MS | | | | | | | | | | |
| Antimony | 2.11 | U | 0.00363 | 1.74 | mg/L | | 82 | (75%-125%) | | 10/13/08 | 12:35 |
| Arsenic | 5.26 | U | -0.00489 | 4.80 | mg/L | | 91 | (75%-125%) | | | |
| Barium | 10.5 | | 9.94 | 17.9 | mg/L | | 76 | (75%-125%) | | | |

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QC Summary

Workorder: 215964

Page 2 of 4

| Parname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|------------------------------|--------|--------|----------|-------|--------|------|-------|------------|-------|----------|-------|
| Metals Analysis-ICP | | | | | | | | | | | |
| Batch | 801834 | | | | | | | | | | |
| Beryllium | 2.11 | U | 0.00338 | 1.73 | mg/L | | 82 | (75%-125%) | | | |
| Cadmium | 1.05 | J | 0.0149 | 0.902 | mg/L | | 84 | (75%-125%) | KDL | 10/13/08 | 12:35 |
| Chromium | 5.26 | | 0.131 | 4.58 | mg/L | | 85 | (75%-125%) | | | |
| Cobalt | 2.11 | | 0.323 | 2.04 | mg/L | | 82 | (75%-125%) | | | |
| Copper | 2.11 | | 23.8 | 25.6 | mg/L | | N/A | (75%-125%) | | | |
| Lead | 5.26 | | 0.518 | 4.73 | mg/L | | 80 | (75%-125%) | | | |
| Molybdenum | 2.11 | U | -0.00331 | 1.78 | mg/L | | 84 | (75%-125%) | | | |
| Nickel | 2.11 | | 0.447 | 2.19 | mg/L | | 83 | (75%-125%) | | | |
| Selenium | 1.05 | | 0.319 | 1.19 | mg/L | | 83 | (75%-125%) | | | |
| Silver | 0.526 | U | 0.00914 | 0.396 | mg/L | | 74* | (75%-125%) | | | |
| Thallium | 2.11 | U | -0.0207 | 1.60 | mg/L | | 76 | (75%-125%) | | | |
| Vanadium | 2.11 | | 0.200 | 2.08 | mg/L | | 89 | (75%-125%) | | | |
| Zinc | 2.11 | | 4.16 | 5.99 | mg/L | | 87 | (75%-125%) | | | |
| QC1201683043 215964001 MSD | | | | | | | | | | | |
| Antimony | 2.11 | U | 0.00363 | 1.68 | mg/L | 3 | 80 | (0%-20%) | | 10/13/08 | 12:42 |
| Arsenic | 5.26 | U | -0.00489 | 4.75 | mg/L | 1 | 90 | (0%-20%) | | | |
| Barium | 10.5 | | 9.94 | 18.2 | mg/L | 2 | 78 | (0%-20%) | | | |
| Beryllium | 2.11 | U | 0.00338 | 1.75 | mg/L | 1 | 83 | (0%-20%) | | | |
| Cadmium | 1.05 | J | 0.0149 | 0.878 | mg/L | 3 | 82 | (0%-20%) | | | |
| Chromium | 5.26 | | 0.131 | 4.20 | mg/L | 9 | 77 | (0%-20%) | | | |
| Cobalt | 2.11 | | 0.323 | 2.00 | mg/L | 2 | 80 | (0%-20%) | | | |
| Copper | 2.11 | | 23.8 | 26.2 | mg/L | 2 | N/A | (0%-20%) | | | |
| Lead | 5.26 | | 0.518 | 4.61 | mg/L | 3 | 78 | (0%-20%) | | | |
| Molybdenum | 2.11 | U | -0.00331 | 1.74 | mg/L | 2 | 83 | (0%-20%) | | | |
| Nickel | 2.11 | | 0.447 | 2.14 | mg/L | 3 | 80 | (0%-20%) | | | |
| Selenium | 1.05 | | 0.319 | 1.25 | mg/L | 5 | 88 | (0%-20%) | | | |
| Silver | 0.526 | U | 0.00914 | 0.406 | mg/L | 2 | 75 | (0%-20%) | | | |
| Thallium | 2.11 | U | -0.0207 | 1.56 | mg/L | 3 | 74* | (0%-20%) | | | |
| Vanadium | 2.11 | | 0.200 | 1.92 | mg/L | 8 | 82 | (0%-20%) | | | |
| Zinc | 2.11 | | 4.16 | 5.57 | mg/L | 7 | 67* | (0%-20%) | | | |
| QC1201685292 215964001 SDILT | | | | | | | | | | | |
| Antimony | | U | 0.363 | U | -2.1 | ug/L | N/A | (0%-10%) | | 10/13/08 | 12:49 |
| Arsenic | | U | -0.489 | U | -3.78 | ug/L | N/A | (0%-10%) | | | |
| Barium | | | 994 | | 199 | ug/L | .0916 | (0%-10%) | | | |
| Beryllium | | U | 0.338 | U | 0.116 | ug/L | N/A | (0%-10%) | | | |
| Cadmium | | J | 1.49 | U | 0.0241 | ug/L | N/A | (0%-10%) | | | |
| Chromium | | | 13.1 | J | 2.26 | ug/L | 13.5 | (0%-10%) | | | |
| Cobalt | | | 32.3 | | 7.11 | ug/L | 10 | (0%-10%) | | | |
| Copper | | | 2380 | | 481 | ug/L | .82 | (0%-10%) | | | |
| Lead | | | 51.8 | J | 8.92 | ug/L | 13.9 | (0%-10%) | | | |
| Molybdenum | | U | -0.331 | U | 1.07 | ug/L | N/A | (0%-10%) | | | |
| Nickel | | | 44.7 | | 8.73 | ug/L | 2.43 | (0%-10%) | | | |

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QC Summary

Workorder: 215964

Page 3 of 4

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|--------------------------------|-----------|--------|---------|----------|---------|------|------|------------|----------|----------|-------|
| Metals Analysis-ICP | | | | | | | | | | | |
| Batch | 801834 | | | | | | | | | | |
| Selenium | | 31.9 | | 21.0 | ug/L | 229 | | (0%-10%) | | | |
| Silver | U | 0.914 | J | 1.30 | ug/L | N/A | | (0%-10%) | KDL | 10/13/08 | 12:49 |
| Thallium | U | -2.07 | U | 4.27 | ug/L | N/A | | (0%-10%) | | | |
| Vanadium | | 20.0 | J | 3.82 | ug/L | 4.61 | | (0%-10%) | | | |
| Zinc | | 416 | | 85.8 | ug/L | 3.02 | | (0%-10%) | | | |
| QC1201683045 | TB | | | | | | | | | | |
| Antimony | | | U | 0.00664 | mg/L | | | | | 10/13/08 | 12:10 |
| Arsenic | | | U | -0.0449 | mg/L | | | | | | |
| Barium | | | U | 0.00304 | mg/L | | | | | | |
| Beryllium | | | U | 0.00081 | mg/L | | | | | | |
| Cadmium | | | U | -0.00115 | mg/L | | | | | | |
| Chromium | | | U | -0.00316 | mg/L | | | | | | |
| Cobalt | | | U | 0.00731 | mg/L | | | | | | |
| Copper | | | U | -0.0068 | mg/L | | | | | | |
| Lead | | | U | -0.0277 | mg/L | | | | | | |
| Molybdenum | | | U | 0.00796 | mg/L | | | | | | |
| Nickel | | | U | -0.0106 | mg/L | | | | | | |
| Selenium | | | J | 0.106 | mg/L | | | | | | |
| Silver | | | U | 0.00414 | mg/L | | | | | | |
| Thallium | | | U | 0.0291 | mg/L | | | | | | |
| Vanadium | | | U | -0.00401 | mg/L | | | | | | |
| Zinc | | | U | 0.00276 | mg/L | | | | | | |
| Metals Analysis-Mercury | | | | | | | | | | | |
| Batch | 801780 | | | | | | | | | | |
| QC1201685171 | LCS | | | | | | | | | | |
| Mercury | 2.00 | | | 2.13 | mg/L | | 106 | (80%-120%) | JXL1 | 10/07/08 | 13:18 |
| QC1201685170 | MB | | | | | | | | | | |
| Mercury | | | U | -0.0607 | mg/L | | | | | 10/07/08 | 13:16 |
| QC1201683042 | 215964002 | MS | | | | | | | | | |
| Mercury | 0.020 | U | -0.0362 | U | 0.00973 | mg/L | 49 * | (75%-125%) | | 10/07/08 | 13:28 |
| QC1201683044 | 215964002 | MSD | | | | | | | | | |
| Mercury | 0.020 | U | -0.0362 | U | 0.00423 | mg/L | 79 * | 21 * | (0%-20%) | 10/07/08 | 13:30 |
| QC1201685174 | 215964002 | SDILT | | | | | | | | | |
| Mercury | | U | -0.0362 | U | -0.106 | ug/L | N/A | (0%-10%) | | 10/07/08 | 13:32 |
| QC1201683045 | TB | | | | | | | | | | |
| Mercury | | | U | -0.0648 | mg/L | | | | | 10/07/08 | 13:14 |

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported

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QC Summary

Workorder: 215964

Page 4 of 4

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------|--|--------|------|----|-------|------|------|-------|-------|------|------|
| A | The TIC is a suspected aldol-condensation product | | | | | | | | | | |
| B | For General Chemistry and Organic analysis the target analyte was detected in the associated blank. | | | | | | | | | | |
| C | Analyte has been confirmed by GC/MS analysis | | | | | | | | | | |
| D | Results are reported from a diluted aliquot of the sample | | | | | | | | | | |
| E | Metals--%difference of sample and SD is >10%. Sample concentration must meet flagging criteria | | | | | | | | | | |
| F | Estimated Value | | | | | | | | | | |
| H | Analytical holding time was exceeded | | | | | | | | | | |
| J | Value is estimated | | | | | | | | | | |
| M | Matrix Related Failure | | | | | | | | | | |
| N/A | RPD or %Recovery limits do not apply. | | | | | | | | | | |
| ND | Analyte concentration is not detected above the detection limit | | | | | | | | | | |
| NJ | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier | | | | | | | | | | |
| R | Sample results are rejected | | | | | | | | | | |
| U | Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. | | | | | | | | | | |
| 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. Qualifier Not Applicable for Radiochemistry. | | | | | | | | | | |
| 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.

^ 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.

* Indicates that a Quality Control parameter was not within specifications.

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.

| COMPANY - WIDE NONCONFORMANCE REPORT | | | |
|--|--------------------------------------|---|-----------------------------|
| Mo.Day Yr. 07-OCT-08 | Division: Federal | Quality Criteria: Specifications | Type: Process |
| Instrument Type: MERCURY | Test / Method: SW846 7470A | Matrix Type: Solid | Client Code: LLNL |
| Batch ID: 801780 | Sample Numbers: See Below | | |
| Potentially affected work order(s)(SDG): 215964(215963-1) Application Issues: Failed Recovery for MS/PS Failed RPD for MS/MSD, or PS/PSD Failed Recovery for MSD/PSD | | | |
| Specification and Requirements | | NRG Disposition: | |
| Nonconformance Description: | | | |
| 1. Failed Recovery for MS/PS: QC 1201683042MS 2. Failed RPD for MS/MSD, or PS/PSD: QC 1201683044MSD 3. Failed Recovery for MSD/PSD: QC 1201683044MSD | | 1. The MS recovered outside of its acceptance window due to the prep factor of 1000x. 2. The MSD recovered greater than 20% of the MS however the RPD is N/A. 3. The MSD recovered outside of its acceptance window due to the prep factor of 1000x. Data reported as is. | |

Originator's Name:
 Jason Loy 07-OCT-08

Data Validator/Group Leader:
 Eric Lawson 07-OCT-08

Quality Review:

Director:

| COMPANY - WIDE NONCONFORMANCE REPORT | | | |
|---|---|--|-----------------------------|
| Mo.Day Yr. 13-OCT-08 | Division: Federal | Quality Criteria: Specifications | Type: Process |
| Instrument Type: ICP | Test / Method: SW846 3010/6010B | Matrix Type: Solid | Client Code: LLNL |
| Batch ID: 801834 | Sample Numbers: See Below | | |
| Potentially affected work order(s)(SDG): 215964(215963-1) | | | |
| Application Issues: Failed Recovery for MS/PS Failed Recovery for MSD/PSD | | | |
| Specification and Requirements Nonconformance Description: | | NRG Disposition: | |
| 1. Failed Recovery for MS/PS: QC 1201683041MS 2. Failed Recovery for MSD/PSD: QC 1201683043MSD | | 1. and 2. The MS recovery for silver and the MSD recoveries for thallium and zinc were below the established acceptance limits. Low MS/MSD recoveries were attributed to possible matrix interference. All of the associated data were reported. | |

Originator's Name:
 Kurt Leshner 13-OCT-08

Data Validator/Group Leader:
 Jerry Wigfall 14-OCT-08

Quality Review:

Director:

GEL LABORATORIES LLC

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

QC Summary

Lawrence Livermore National Security, LLC
 7000 East Avenue
 Mailstop L-620
 Livermore, California

Report Date: October 13, 2008
 Page 1 of 4

Contact: Mr. Chad F. Davis

Workorder: 215966

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------------------------|--------------|--------|--------|-----------|-------|------|------|------------|-------|----------|-------|
| Metals Analysis-ICP | | | | | | | | | | | |
| Batch | 801337 | | | | | | | | | | |
| QC1201684127 | LCS | | | | | | | | | | |
| Antimony | 5.00 | | | 4.81 | mg/L | | 96 | (80%-120%) | KDL | 10/07/08 | 16:48 |
| Arsenic | 5.00 | | | 4.76 | mg/L | | 95 | (80%-120%) | | | |
| Barium | 5.00 | | | 4.79 | mg/L | | 96 | (80%-120%) | | | |
| Beryllium | 5.00 | | | 4.70 | mg/L | | 94 | (80%-120%) | | | |
| Cadmium | 5.00 | | | 4.69 | mg/L | | 94 | (80%-120%) | | | |
| Chromium | 5.00 | | | 4.78 | mg/L | | 96 | (80%-120%) | | | |
| Cobalt | 5.00 | | | 4.79 | mg/L | | 96 | (80%-120%) | | | |
| Copper | 5.00 | | | 4.91 | mg/L | | 98 | (80%-120%) | | | |
| Lead | 5.00 | | | 4.75 | mg/L | | 95 | (80%-120%) | | | |
| Molybdenum | 5.00 | | | 4.80 | mg/L | | 96 | (80%-120%) | | | |
| Nickel | 5.00 | | | 4.75 | mg/L | | 95 | (80%-120%) | | | |
| Selenium | 5.00 | | | 4.42 | mg/L | | 88 | (80%-120%) | | | |
| Silver | 5.00 | | | 4.71 | mg/L | | 94 | (80%-120%) | | | |
| Thallium | 5.00 | | | 4.72 | mg/L | | 94 | (80%-120%) | | | |
| Vanadium | 5.00 | | | 4.87 | mg/L | | 97 | (80%-120%) | | | |
| Zinc | 5.00 | | | 4.59 | mg/L | | 92 | (80%-120%) | | | |
| QC1201684126 | MB | | | | | | | | | | |
| Antimony | | | U | -0.0136 | mg/L | | | | | 10/07/08 | 16:34 |
| Arsenic | | | U | -0.00674 | mg/L | | | | | | |
| Barium | | | U | 0.000783 | mg/L | | | | | | |
| Beryllium | | | U | 0.000051 | mg/L | | | | | | |
| Cadmium | | | U | 0.00107 | mg/L | | | | | | |
| Chromium | | | U | 0.00962 | mg/L | | | | | | |
| Cobalt | | | U | -0.0015 | mg/L | | | | | | |
| Copper | | | U | -0.00755 | mg/L | | | | | | |
| Lead | | | U | 0.00246 | mg/L | | | | | | |
| Molybdenum | | | U | 0.00383 | mg/L | | | | | | |
| Nickel | | | U | 0.00163 | mg/L | | | | | | |
| Selenium | | | U | -0.0497 | mg/L | | | | | | |
| Silver | | | U | -0.000592 | mg/L | | | | | | |
| Thallium | | | U | 0.012 | mg/L | | | | | | |
| Vanadium | | | U | -0.00187 | mg/L | | | | | | |
| Zinc | | | U | 0.011 | mg/L | | | | | | |
| QC1201683046 | 215966001 MS | | | | | | | | | | |
| Antimony | 2.11 | J | 0.0538 | 1.90 | mg/L | | 88 | (75%-125%) | | 10/07/08 | 17:02 |
| Arsenic | 5.26 | U | 0.0161 | 4.78 | mg/L | | 91 | (75%-125%) | | | |
| Barium | 10.5 | | 0.733 | 10.1 | mg/L | | 89 | (75%-125%) | | | |

GEL LABORATORIES LLC

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

QC Summary

Workorder: 215966

Page 2 of 4

| Parname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|------------------------------|--------|--------|----------|-------|---------|------|------|------------|-------|----------|-------|
| Metals Analysis-ICP | | | | | | | | | | | |
| Batch | 801337 | | | | | | | | | | |
| Beryllium | 2.11 | U | 0.000487 | 1.86 | mg/L | | 88 | (75%-125%) | | | |
| Cadmium | 1.05 | U | 0.00457 | 0.965 | mg/L | | 91 | (75%-125%) | KDL | 10/07/08 | 17:02 |
| Chromium | 5.26 | J | 0.0211 | 4.69 | mg/L | | 89 | (75%-125%) | | | |
| Cobalt | 2.11 | J | 0.0329 | 1.93 | mg/L | | 90 | (75%-125%) | | | |
| Copper | 2.11 | | 3.12 | 4.77 | mg/L | | 78 | (75%-125%) | | | |
| Lead | 5.26 | J | 0.0294 | 4.67 | mg/L | | 88 | (75%-125%) | | | |
| Molybdenum | 2.11 | U | 0.00475 | 1.89 | mg/L | | 89 | (75%-125%) | | | |
| Nickel | 2.11 | | 0.0829 | 2.01 | mg/L | | 91 | (75%-125%) | | | |
| Selenium | 1.05 | U | -0.00392 | 0.872 | mg/L | | 83 | (75%-125%) | | | |
| Silver | 0.526 | U | -0.00366 | 0.440 | mg/L | | 84 | (75%-125%) | | | |
| Thallium | 2.11 | J | 0.0544 | 1.82 | mg/L | | 84 | (75%-125%) | | | |
| Vanadium | 2.11 | U | 0.00473 | 1.93 | mg/L | | 92 | (75%-125%) | | | |
| Zinc | 2.11 | | 0.639 | 2.42 | mg/L | | 85 | (75%-125%) | | | |
| QC1201683048 215966001 MSD | | | | | | | | | | | |
| Antimony | 2.11 | J | 0.0538 | 1.89 | mg/L | 1 | 87 | (0%-20%) | | 10/07/08 | 17:09 |
| Arsenic | 5.26 | U | 0.0161 | 4.68 | mg/L | 2 | 89 | (0%-20%) | | | |
| Barium | 10.5 | | 0.733 | 9.86 | mg/L | 2 | 87 | (0%-20%) | | | |
| Beryllium | 2.11 | U | 0.000487 | 1.83 | mg/L | 2 | 87 | (0%-20%) | | | |
| Cadmium | 1.05 | U | 0.00457 | 0.941 | mg/L | 3 | 89 | (0%-20%) | | | |
| Chromium | 5.26 | J | 0.0211 | 4.57 | mg/L | 3 | 86 | (0%-20%) | | | |
| Cobalt | 2.11 | J | 0.0329 | 1.88 | mg/L | 2 | 88 | (0%-20%) | | | |
| Copper | 2.11 | | 3.12 | 4.68 | mg/L | 2 | 74* | (0%-20%) | | | |
| Lead | 5.26 | J | 0.0294 | 4.56 | mg/L | 2 | 86 | (0%-20%) | | | |
| Molybdenum | 2.11 | U | 0.00475 | 1.85 | mg/L | 2 | 88 | (0%-20%) | | | |
| Nickel | 2.11 | | 0.0829 | 1.95 | mg/L | 3 | 89 | (0%-20%) | | | |
| Selenium | 1.05 | U | -0.00392 | 0.811 | mg/L | 7 | 77 | (0%-20%) | | | |
| Silver | 0.526 | U | -0.00366 | 0.418 | mg/L | 5 | 79 | (0%-20%) | | | |
| Thallium | 2.11 | J | 0.0544 | 1.80 | mg/L | 1 | 83 | (0%-20%) | | | |
| Vanadium | 2.11 | U | 0.00473 | 1.89 | mg/L | 2 | 89 | (0%-20%) | | | |
| Zinc | 2.11 | | 0.639 | 2.36 | mg/L | 2 | 82 | (0%-20%) | | | |
| QC1201684130 215966001 SDILT | | | | | | | | | | | |
| Antimony | | J | 5.38 | U | -0.305 | ug/L | N/A | (0%-10%) | | 10/07/08 | 17:17 |
| Arsenic | | U | 1.61 | U | 1.00 | ug/L | N/A | (0%-10%) | | | |
| Barium | | | 73.3 | | 15.5 | ug/L | 5.4 | (0%-10%) | | | |
| Beryllium | | U | 0.0487 | U | -0.0101 | ug/L | N/A | (0%-10%) | | | |
| Cadmium | | U | 0.457 | U | 0.0307 | ug/L | N/A | (0%-10%) | | | |
| Chromium | | J | 2.11 | U | 0.777 | ug/L | N/A | (0%-10%) | | | |
| Cobalt | | J | 3.29 | U | 0.805 | ug/L | N/A | (0%-10%) | | | |
| Copper | | | 312 | | 61.1 | ug/L | 2.24 | (0%-10%) | | | |
| Lead | | J | 2.94 | U | 2.33 | ug/L | N/A | (0%-10%) | | | |
| Molybdenum | | U | 0.475 | U | 0.0654 | ug/L | N/A | (0%-10%) | | | |
| Nickel | | | 8.29 | U | 0.990 | ug/L | N/A | (0%-10%) | | | |

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QC Summary

Workorder: 215966

Page 3 of 4

| Parname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|--------------------------------|-----------------|--------|------|-----------|-------|------|------|------------|-------|----------|-------|
| Metals Analysis-ICP | | | | | | | | | | | |
| Batch | 801337 | | | | | | | | | | |
| Selenium | U | -0.392 | U | -12.2 | ug/L | N/A | | (0%-10%) | | | |
| Silver | U | -0.366 | U | -0.543 | ug/L | N/A | | (0%-10%) | KDL | 10/07/08 | 17:17 |
| Thallium | J | 5.44 | U | 0.647 | ug/L | N/A | | (0%-10%) | | | |
| Vanadium | U | 0.473 | U | 0.021 | ug/L | N/A | | (0%-10%) | | | |
| Zinc | | 63.9 | | 13.0 | ug/L | 1.76 | | (0%-10%) | | | |
| QC1201683050 | TB | | | | | | | | | | |
| Antimony | | | U | -0.022 | mg/L | | | | | 10/07/08 | 16:41 |
| Arsenic | | | U | -0.00394 | mg/L | | | | | | |
| Barium | | | U | 0.000911 | mg/L | | | | | | |
| Beryllium | | | U | -0.000228 | mg/L | | | | | | |
| Cadmium | | | U | 0.000408 | mg/L | | | | | | |
| Chromium | | | U | 0.0104 | mg/L | | | | | | |
| Cobalt | | | U | -0.000732 | mg/L | | | | | | |
| Copper | | | U | -0.00349 | mg/L | | | | | | |
| Lead | | | U | 0.0189 | mg/L | | | | | | |
| Molybdenum | | | U | 0.00293 | mg/L | | | | | | |
| Nickel | | | U | 0.00944 | mg/L | | | | | | |
| Selenium | | | J | 0.0732 | mg/L | | | | | | |
| Silver | | | U | -0.00603 | mg/L | | | | | | |
| Thallium | | | U | -0.0323 | mg/L | | | | | | |
| Vanadium | | | U | -0.00223 | mg/L | | | | | | |
| Zinc | | | U | 0.0132 | mg/L | | | | | | |
| Metals Analysis-Mercury | | | | | | | | | | | |
| Batch | 801306 | | | | | | | | | | |
| QC1201684061 | LCS | | | | | | | | | | |
| Mercury | 0.020 | | | 0.0223 | mg/L | | 111 | (80%-120%) | JXL1 | 10/06/08 | 12:01 |
| QC1201684060 | MB | | | | | | | | | | |
| Mercury | | | U | -0.000983 | mg/L | | | | | 10/06/08 | 11:55 |
| QC1201683047 | 215966001 MS | | | | | | | | | | |
| Mercury | 0.020 | 0.269 | | 0.265 | mg/L | | N/A | (75%-125%) | | 10/06/08 | 12:05 |
| QC1201683049 | 215966001 MSD | | | | | | | | | | |
| Mercury | 0.020 | 0.269 | | 0.240 | mg/L | 10 | N/A | (0%-20%) | | 10/06/08 | 12:07 |
| QC1201684069 | 215966001 SDILT | | | | | | | | | | |
| Mercury | | 2.69 | | 0.526 | ug/L | 2.3 | | (0%-10%) | | 10/06/08 | 12:09 |
| QC1201683050 | TB | | | | | | | | | | |
| Mercury | | | U | -0.000924 | mg/L | | | | | 10/06/08 | 11:53 |

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported

GEL LABORATORIES LLC

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

QC Summary

Workorder: 215966

Page 4 of 4

| Parname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---------|--|--------|------|----|-------|------|------|-------|-------|------|------|
| A | The TIC is a suspected aldol-condensation product | | | | | | | | | | |
| B | For General Chemistry and Organic analysis the target analyte was detected in the associated blank. | | | | | | | | | | |
| C | Analyte has been confirmed by GC/MS analysis | | | | | | | | | | |
| D | Results are reported from a diluted aliquot of the sample | | | | | | | | | | |
| E | Metals--%difference of sample and SD is >10%. Sample concentration must meet flagging criteria | | | | | | | | | | |
| F | Estimated Value | | | | | | | | | | |
| H | Analytical holding time was exceeded | | | | | | | | | | |
| J | Value is estimated | | | | | | | | | | |
| M | Matrix Related Failure | | | | | | | | | | |
| N/A | RPD or %Recovery limits do not apply. | | | | | | | | | | |
| ND | Analyte concentration is not detected above the detection limit | | | | | | | | | | |
| NJ | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier | | | | | | | | | | |
| R | Sample results are rejected | | | | | | | | | | |
| U | Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. | | | | | | | | | | |
| 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. Qualifier Not Applicable for Radiochemistry. | | | | | | | | | | |
| 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.

^ 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.

* Indicates that a Quality Control parameter was not within specifications.

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.

| COMPANY - WIDE NONCONFORMANCE REPORT | | | |
|---|---|--|-----------------------------|
| Mo.Day Yr. 09-OCT-08 | Division: Federal | Quality Criteria: Specifications | Type: Process |
| Instrument Type: ICP | Test / Method: SW846 3010/6010B | Matrix Type: Solid | Client Code: LLNL |
| Batch ID: 801337 | Sample Numbers: See Below | | |
| Potentially affected work order(s)(SDG): 215966(215963-2),216544(216542-2) | | | |
| Application Issues: Failed Recovery for MSD/PSD | | | |
| Specification and Requirements Nonconformance Description: | | NRG Disposition: | |
| 1. Failed Recovery for MSD/PSD: QC 1201683048MSD | | 1. The MSD recovery for copper was below the established acceptance limits. Low recovery was attributed to possible matrix interference. All of the associated data were reported. | |

Originator's Name:

Kurt Leshner 09-OCT-08

Data Validator/Group Leader:

Helen Camello 10-OCT-08

Quality Review:

Director:

GEL LABORATORIES LLC

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

QC Summary

Report Date: October 17, 2008

Page 1 of 3

Client : Lawrence Livermore National Security, LLC
7000 East Avenue
Mailstop L-620
Livermore, California
Contact: Mr. Chad F. Davis
Workorder: 215963

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|--------------------------|-----------|---------|---------|----------|-------|----------|-------|-------------|----------|---------------|
| Rad Gas Flow | | | | | | | | | | |
| Batch | 797363 | | | | | | | | | |
| QC1201675583 | 215963001 | DUP | | | | | | | | |
| Alpha | | 11.1 | | 8.51 | pCi/g | 27 | | (0% - 100%) | DXB5 | 10/07/0821:55 |
| | | Uncert: | +/-1.81 | +/-1.71 | | | | | | |
| | | TPU: | +/-3.35 | +/-2.60 | | | | | | |
| Beta | | 17.4 | | 17.3 | pCi/g | 1 | | (0% - 20%) | | |
| | | Uncert: | +/-1.51 | +/-1.51 | | | | | | |
| | | TPU: | +/-2.88 | +/-2.85 | | | | | | |
| QC1201675586 | LCS | | | | | | | | | |
| Alpha | 107 | | | 128 | pCi/g | | 119 | (75%-125%) | | 10/08/0811:33 |
| | | Uncert: | | +/-12.6 | | | | | | |
| | | TPU: | | +/-32.6 | | | | | | |
| Beta | 375 | | | 373 | pCi/g | | 100 | (75%-125%) | | |
| | | Uncert: | | +/-14.6 | | | | | | |
| | | TPU: | | +/-53.9 | | | | | | |
| QC1201675582 | MB | | | | | | | | | |
| Alpha | | | U | 0.485 | pCi/g | | | | | 10/16/0821:17 |
| | | Uncert: | | +/-0.401 | | | | | | |
| | | TPU: | | +/-0.413 | | | | | | |
| Beta | | | U | -2.92 | pCi/g | | | | | |
| | | Uncert: | | +/-1.23 | | | | | | |
| | | TPU: | | +/-1.23 | | | | | | |
| QC1201675584 | 215963001 | MS | | | | | | | | |
| Alpha | 110 | 11.1 | | 138 | pCi/g | | 115 | (75%-125%) | | 10/08/0811:33 |
| | | Uncert: | +/-1.81 | +/-14.9 | | | | | | |
| | | TPU: | +/-3.35 | +/-35.8 | | | | | | |
| Beta | 382 | 17.4 | | 427 | pCi/g | | 107 | (75%-125%) | | |
| | | Uncert: | +/-1.51 | +/-16.7 | | | | | | |
| | | TPU: | +/-2.88 | +/-61.7 | | | | | | |
| QC1201675585 | 215963001 | MSD | | | | | | | | |
| Alpha | 111 | 11.1 | | 117 | pCi/g | 16 | 96 | (0%-20%) | | 10/08/0811:33 |
| | | Uncert: | +/-1.81 | +/-13.9 | | | | | | |
| | | TPU: | +/-3.35 | +/-31.2 | | | | | | |
| Beta | 386 | 17.4 | | 390 | pCi/g | 9 | 97 | (0%-20%) | | |
| | | Uncert: | +/-1.51 | +/-15.6 | | | | | | |
| | | TPU: | +/-2.88 | +/-56.5 | | | | | | |
| Rad Liquid Scintillation | | | | | | | | | | |
| Batch | 798304 | | | | | | | | | |
| QC1201677663 | 215963001 | DUP | | | | | | | | |
| Tritium | | | U | -0.348 | U | -0.268 | pCi/g | 0 | N/A SXL4 | 09/30/0816:30 |
| | | Uncert: | | +/-0.848 | | +/-0.855 | | | | |
| | | TPU: | | +/-0.848 | | +/-0.855 | | | | |
| QC1201677665 | LCS | | | | | | | | | |

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QC Summary

Workorder: 215963

Page 2 of 3

| Parmname | NOM | Sample Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---------------------------------|---------|-------------|----------|-------|------|----------------|-------|-------|---------------|
| Rad Liquid Scintillation | | | | | | | | | |
| Batch | 798304 | | | | | | | | |
| Tritium | 12.0 | | 12.6 | pCi/g | | 105 (75%-125%) | | | |
| | Uncert: | | +/-1.39 | | | | | | |
| | TPU: | | +/-3.17 | | | | | | |
| QC1201677662 MB | | | | | | | | | |
| Tritium | | U | -0.394 | pCi/g | | | | | 09/30/0815:44 |
| | Uncert: | | +/-0.820 | | | | | | |
| | TPU: | | +/-0.820 | | | | | | |
| QC1201677664 215963001 MS | | | | | | | | | |
| Tritium | 12.2 U | -0.348 | 12.8 | pCi/g | | 105 (75%-125%) | | | 09/30/0817:17 |
| | Uncert: | +/-0.848 | +/-1.40 | | | | | | |
| | TPU: | +/-0.848 | +/-3.22 | | | | | | |

Notes:

The Qualifiers in this report are defined as follows:

- ** 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 For General Chemistry and Organic analysis the 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
- E Metals--%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- 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. Qualifier Not Applicable for Radiochemistry.
- h Preparation or preservation holding time was exceeded

GEL LABORATORIES LLC

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

QC Summary

Workorder: 215963

Page 3 of 3

| Parmname | NOM | Sample Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------|-----|-------------|----|-------|------|------|-------|-------|------|------|
|----------|-----|-------------|----|-------|------|------|-------|-------|------|------|

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.

Attachment C

Analytical data from waste drum soil sample analysis



COC
Version 6.0
10/12/2006

CES Chain of Custody

CES COC #
17485



Send Results to:

LISA CRAWFORD

L- 626 phone 2-6343

Copy:

L- _____

Turnaround

Time

E
 R
 N

CES

DQO:

N/A

Field Contact

TIM FULLER

LLNL Account #

1418 - 08

Project Name

B212 SAT PROJECT

Tank Volume

N/A _____ liters

Data Package Required: Normal CLP

Reporting level: Level 1 Level 2 Level 3

RETURN UNUSED SAMPLE TO CLIENT

EDD Required (data from off-site labs only)

Client ID SAT

FOR CES USE ONLY

Condition Upon Receipt: No Discrepancies

Condition/Variance

Tests / Preservation Codes

Circle Preservation Code for On-site Analyses

| Client Sample Identification | Date Sampled | Time Sampled | Bldg | RAD (Y/N) | Matrix Code | Gen Code | # of Bottles | TLCMET | STLCMET | TCLPMET | RADWG: GA+GB | RADWG: HB | Additional Instructions: |
|------------------------------|--------------|--------------|------|-----------|-------------|----------|--------------|--------|---------|---------|--------------|-----------|--|
| 212-1 | 8/19/08 | 1130 | 212 | Y | SO | WS | 4 | R | R | R | R | R | 212-1 = 0" to 6" 212-2 = 6" to 12" 212-5 = 24" to 30" SAS DECS REQUESTED |
| 212-2 | 8/19/08 | 1430 | 212 | Y | SO | WS | 4 | R | R | R | R | R | MERCURY CONTAMINATED SOIL |
| 212-5 | 8/28/08 | 1125 | 212 | Y | SO | WS | 4 | R | R | R | R | R | MERCURY CONTAMINATED SOIL |
| 4 | | | | | | | | | | | | | MERCURY CONTAMINATED SOIL |
| 5 | | | | | | | | | | | | | MERCURY CONTAMINATED SOIL |
| 6 | | | | | | | | | | | | | MERCURY CONTAMINATED SOIL |
| 7 | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |

Sampled and Relinquished by: [Signature] Date: 8/28/08 Time: 1400

Relinquished by: _____ Date: _____ Time: _____

Received by: _____ Date: 8/28/08 Time: 1400

Received by: _____ Date: _____ Time: _____

Signature: [Signature]

ELAP Certifications #1554

See page 2 for codes and additional instructions.

"The worker certifies that the Standard ES&H Roles, Responsibilities and Authorities defined by Service Category 1 described by Section 4.3.1 of Document 2.1 "Laboratory and ES&H Policies, General Worker Responsibilities and Integrated Safety Management," apply and that the IWS or IWSs authorizing the work have the appropriate controls for the hazards involved in the task/analysis."

For document control purposes, user SHALL ensure that all working copies are identical to current electronic version, http://cms.llnl.gov/ces/QA_Docs/QA_Docs.html



CSF
6/4/08

CES CASE SUMMARY FORM

Packet Completion Date

9-17-08

Laboratory Identification:

C&MS Environmental Services
Lawrence Livermore National Laboratory
7000 East Avenue, L-Code 232
Livermore, CA 94550-9234
(925) 423-6008
ELAP Certification No. 1554

Client:

Lisa Crawford / Tim Fuller

Sample Receipt:

Three samples (Three Mercury contaminated soil samples: (1) 212-1 = 0"-6" / (2) 212-2 = 6"-12" / (3) 212-5 = 24"-30") (4 bottles each sample) were received on August 28, 2008 by CES for analysis. The sample was delivered with CES chain of custody, SHA, and RHWM CCR documentation. The sample containers were intact and without any visible sign of tampering.

Project Name: Normal Sampling

CES DQO #: N/A

Client DQO #: N/A

Client COC #: N/A

CES COC#: 17485

Client ID

212-1

212-2

212-5

CES ID

212-1

212-2

212-5

Requested Analyses

TTLC, STLC, TCLP metals, GAB, Tritium, Rad Dec.

TTLC, STLC, TCLP metals, GAB, Tritium, Rad Dec.

TTLC, STLC, TCLP metals, GAB, Tritium, Rad Dec.

Case Narrative:

Re: COC # 17485: TTLC, STLC, TCLP metals, GAB and Tritium tests were performed by GEL Labs, LLC, Charleston, South Carolina. Rad Decs were performed by WSAP on site laboratory. The analytical results for COC # 17485 were deemed acceptable.

I certify that this data package is complete as per the customer's request and compliant with technical and administrative requirements. All analytical work performed by outside contract laboratories is reported on their letterhead and released by the associated laboratory, independent of CES. The Laboratory Director (or designee) as verified by the following signature authorizes release of this data package:


Hector Pedemonte

September 17, 2008
Date

| | | |
|---|--------------------------------------|--|
|  | V/C Version 1.0 3/22/00 | Off-Site Laboratory Report Validation Checklist |
|---|--------------------------------------|--|

This form should be used to ensure that the precision, accuracy, representativeness, completeness, and comparability criteria as specified in the Waste Disposal Requisition.

The checklist should be complete by placing a check (✓) in the "Acceptable" column if the item is present. An explanation should be stated in the "Comments" column if the item is not present. A copy of this report should be maintained with the associated data package.

| | |
|--|--|
| Outside Lab Name GEL Laboratories LLC, Charleston, South Carolina. WSAP (LLNL) | DB No/Matrix COC # 17485 (Three Mercury contaminated soil samples: (1) 212-1 = 0"-6" / (2) 212-2 = 6"-12" / (3) 212-5 = 24"-30") |
| Method No(s) GEL Labs LLC: TTLC, STLC, TCLP metals, GAB and Tritium. WSAP: Rad Decs | Report Level Results and Summary QC |

| Parameters | Acceptable | Comments |
|-----------------------|------------|--|
| 1. Precision | ✓ | See Additional Comments section below. |
| 2. Accuracy | ✓ | See Additional Comments section below. |
| 3. Representativeness | ✓ | The acquired sample is representative of the waste stream. |
| 4. Completeness | ✓ | All requested analyses were reported. |
| 5. Comparability | ✓ | The acquired sample is comparable to the waste matrix. |

Additional Comments:

Re: COC # 17485 (Three Mercury contaminated soil samples: (1) 212-1 = 0"-6" / (2) 212-2 = 6"-12" / (3) 212-5 = 24"-30"). TTLC, STLC, TCLP metals, GAB and Tritium tests were performed by GEL Labs, LLC, Charleston, South Carolina. Rad Decs were performed by WSAP on site laboratory. Due to the heterogeneity of the stream (brown soil with plant matter) the original sample acquisition and subsequent laboratory subsampling will result in varying analytical results, therefore MS, MSD and RPD will probably show as outliers. The analytical results for COC # 17485 are deemed acceptable.

Signature

Hector Redmon

Date

September 17, 2008



Laboratories, LLC

a member of The GEL Group, Inc.



PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171 F 843.766.1178

www.gel.com

September 10, 2008

Mr. Chad F. Davis
Lawrence Livermore National Security, LLC
7000 East Avenue
Mailstop L-620
Livermore, California 94551

Re: CES - Normal Deliverable
Work Orders: 214909 214911 214912

Dear Mr. Davis:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on August 30, 2008. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4453.

Sincerely,

Edith Kent
Project Manager

Purchase Order: LDH0574
Chain of Custody: LDH0574
Enclosures

General Narrative
for
Lawrence Livermore National Labs (#H712000)
CES - Normal Deliverable
SDG: 214909, 214909-1 and 214909-2

September 10, 2008

Laboratory Identification:

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

Summary

Sample receipt

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on August 30, 2008, 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. There are no additional comments concerning sample receipt.

Items of Note Due to the Labor Day holiday, samples received under LDH0574 on Saturday 8/30/08 would start the turn around time on Tuesday 9/2/08. Please see email for further details. The radiochemistry and TCLP metals data was reported a day late on 09/10/08.

Sample Identification

The laboratory received the following samples:

| <u>Laboratory Identification</u> | <u>Sample Description</u> |
|----------------------------------|---------------------------|
| 214909001 | 212-1 |
| 214909002 | 212-2 |
| 214909003 | 212-5 |
| 214911001 | 212-1 |
| 214911002 | 212-2 |
| 214911003 | 212-5 |
| 214912001 | 212-1 |
| 214912002 | 212-2 |
| 214912003 | 212-5 |

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.

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: Metals and Radiochemistry. This package, to the best of my knowledge, is in compliance with technical and administrative requirements.

Edith M. Kent

Edith Kent
Project Manager

**Metals Fractional Narrative
Lawrence Livermore National Labs (LLNL)
SDG 214909**

Sample Analysis

| Sample ID | Client ID |
|------------------|---|
| 214909001 | 212-1 |
| 214909002 | 212-2 |
| 214909003 | 212-5 |
| 1201660208 | Method Blank (MB) ICP |
| 1201660209 | Laboratory Control Sample (LCS) |
| 1201660212 | 214909001(212-1L) Serial Dilution (SD) |
| 1201660210 | 214909001(212-1S) Matrix Spike (MS) |
| 1201660211 | 214909001(212-1SD) Matrix Spike Duplicate (MSD) |
| 1201659497 | Method Blank (MB) CVAA |
| 1201659498 | Laboratory Control Sample (LCS) |
| 1201659501 | 214909001(212-1L) Serial Dilution (SD) |
| 1201659499 | 214909001(212-1S) Matrix Spike (MS) |
| 1201659500 | 214909001(212-1SD) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on a "dry weight" basis.

Method/Analysis Information

Analytical Batch: 790812 and 790539
Prep Batch : 790808 and 790538
Standard Operating Procedures: GL-MA-E-013 REV# 17, GL-MA-E-009 REV# 17 and GL-MA-E-010 REV# 18
Analytical Method: SW846 3050B/6010B and SW846 7471A
Prep Method : SW846 3050B and SW846 7471A Prep

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

System Configuration

The Metals analysis-ICP was performed on a P E 4300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with a Burgener nebulizer, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 1.4L/min, argon gas flows of 15 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis-Mercury was performed on a Perkin-Elmer Flow Injection Mercury System (FIMS-400) automated mercury analyzer. The instrument consists of a cold vapor atomic absorption spectrometer set to detect mercury at a wavelength of 253.7 nm. Sample introduction through the flow injection system is performed via a peristaltic pump at 9 mL/min and nitrogen carrier gas rate of 80 mL/min.

Calibration Information

Instrument Calibration

All initial calibration requirements have been met for this sample delivery group (SDG).

CRDL Requirements

All CRDL standard(s) met the referenced advisory control limits.

ICSA/ICSAB Statement

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

Continuing Calibration Blank (CCB) Requirements

All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

Continuing Calibration Verification (CCV) Requirements

All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

Quality Control (QC) Information

Method Blank (MB) Statement

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following samples were selected as the quality control (QC) samples for this SDG: 214909001 (212-1)-ICP and CVAA.

Matrix Spike (MS) Recovery Statement

The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The MS met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes, with the exceptions of antimony and barium, as indicated by the “*” qualifiers.

Matrix Spike Duplicate (MSD) Recovery Statement

The percent recovery (%R) obtained from the MSD analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The MSD met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes, with the exceptions of antimony, barium, beryllium, nickel and thallium, as indicated by the “*” qualifiers.

MS/MSD Relative Percent Difference (RPD) Statement

The relative percent difference (RPD) obtained from the designated matrix spike duplicate (MSD) is evaluated based on acceptance criteria of 20%. The RPD between qualifying elements results in the MS and MSD were within the acceptance limits of 20%, with the exceptions of chromium, copper, lead, nickel and silver, as indicated by the “*” qualifiers.

Serial Dilution % Difference Statement

The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations that are 25X the IDL for CVAA, 50X the IDL for ICP, and 100X the IDL for ICP-MS analyses are applicable for serial dilution assessment. All applicable analytes met the acceptance criteria of less than 10% difference (%D).

Technical Information

Holding Time Specifications

GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. Sample 214909001 and associated QCs were diluted 500x for antimony and beryllium in order to minimize suppression due to matrix interferences. Sample 219909001 and associated QCs were

diluted 50x for copper, lead, silver and zinc because copper and silver were over the linear calibration range of the instrument and copper affects lead and zinc. Sample 214909001 and associated QCs were diluted 25,000x for mercury in order to bring over range concentrations within the linear calibration range of the instrument. Sample 214909002 was diluted 5x for beryllium and thallium in order to minimize suppression due to matrix interferences. Sample 214909002 was diluted 5x for zinc in order to bring over range concentrations within the linear calibration range of the instrument. Sample 214909002 was diluted 500x for mercury in order to bring over range concentrations within the linear calibration range of the instrument. Sample 214909003 was diluted 5x for beryllium and cadmium in order to minimize suppression due to matrix interferences. Sample 214909003 was diluted 500x for mercury in order to bring over range concentrations within the linear calibration range of the instrument.

Preparation Information

The samples in this SDG were prepared exactly according to the cited SOP.

Miscellaneous Information

Nonconformance 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: 596410. A copy is included in the Miscellaneous Data section of this package.

Additional Comments

Additional comments were not required for this SDG.

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: _____ *By Davis* **Date:** *9-10-02* _____

**Metals Fractional Narrative
Lawrence Livermore National Labs (LLNL)
SDG 214909-1**

Sample Analysis

| Sample ID | Client ID |
|------------------|---|
| 214911001 | 212-1 |
| 214911002 | 212-2 |
| 214911003 | 212-5 |
| 1201659021 | Tumbling Blank (TB) |
| 1201661525 | Method Blank (MB) ICP |
| 1201661526 | Laboratory Control Sample (LCS) |
| 1201661529 | 214600001(B298-BBBL) Serial Dilution (SD) |
| 1201659017 | 214600001(B298-BBBS) Matrix Spike (MS) |
| 1201659019 | 214600001(B298-BBBS) Matrix Spike Duplicate (MSD) |
| 1201659021 | Tumbling Blank (TB) |
| 1201661773 | Method Blank (MB) CVAA |
| 1201661774 | Laboratory Control Sample (LCS) |
| 1201661777 | 214600001(B298-BBBL) Serial Dilution (SD) |
| 1201659018 | 214600001(B298-BBBS) Matrix Spike (MS) |
| 1201659020 | 214600001(B298-BBBS) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

Method/Analysis Information

| | |
|---------------------------------------|--|
| Analytical Batch: | 791414 and 791494 |
| Prep Batch : | 791413 and 791492 |
| Prep Batch : | 790317 |
| Standard Operating Procedures: | GL-MA-E-013 REV# 17, GL-MA-E-008 REV# 13, GL-LB-E-023 REV# 5 and GL-MA-E-010 REV# 18 |
| Analytical Method: | SW846 3010/6010B and SW846 7470A |
| Prep Method : | SW846 3010A and SW846 7470A Prep |
| Prep Method : | California Code of Regulations |

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

System Configuration

The Metals analysis-ICP was performed on a P E 4300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with a Burgener nebulizer, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 1.4L/min, argon gas flows of 15 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with a Burgener nebulizer, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 1.4L/min, argon gas flows of 15 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis-Mercury was performed on a Perkin-Elmer Flow Injection Mercury System (FIMS-100) automated mercury analyzer. The instrument consists of a cold vapor atomic absorption spectrometer set to detect mercury at a wavelength of 253.7 nm. Sample introduction through the flow injection system is performed via a peristaltic pump at 9 mL/min and nitrogen carrier gas rate of 80 mL/min.

Calibration Information

Instrument Calibration

All initial calibration requirements have been met for this sample delivery group (SDG).

CRDL Requirements

All CRDL standard(s) met the referenced advisory control limits.

ICSA/ICSAB Statement

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

Continuing Calibration Blank (CCB) Requirements

All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

Continuing Calibration Verification (CCV) Requirements

All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

Quality Control (QC) Information

Method Blank (MB) Statement

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following samples were selected as the quality control (QC) samples for this SDG: 214600001 (B298-BBB)-ICP and CVAA.

Matrix Spike (MS) Recovery Statement

The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The MS met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes, with the exception of mercury, as indicated by the "*" qualifier.

Matrix Spike Duplicate (MSD) Recovery Statement

The percent recovery (%R) obtained from the MSD analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The MSD met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes, with the exception of mercury, as indicated by the "*" qualifier.

MS/MSD Relative Percent Difference (RPD) Statement

The relative percent difference (RPD) obtained from the designated matrix spike duplicate (MSD) is evaluated based on acceptance criteria of 20%. The RPD between qualifying elements results in the MS and MSD were within the acceptance limits of 20%, with the exception of mercury, as indicated by the "*" qualifier.

Serial Dilution % Difference Statement

The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations that are 25X the IDL for CVAA, 50X the IDL for ICP, and 100X the IDL for ICP-MS analyses are applicable for serial dilution assessment. All applicable analytes met the acceptance criteria of less than 10% difference (%D).

Technical Information

Holding Time Specifications

GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days

expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. The samples in this SDG did not require dilutions.

Preparation Information

The samples and associated matrix QC were prepared at a 10x factor for ICP/ICPMS to minimize potential interferences arising from the high sodium content in the TCLP leaching solution. The samples and associated matrix QC were prepared at a 1000x factor for CVAA analysis because larger volumes of this matrix consume excessive amounts of potassium permanganate.

Miscellaneous Information

Nonconformance 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: 595864. A copy is included in the Miscellaneous Data section of this package.

Additional Comments

Additional comments were not required for this SDG.

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: _____ *By Davis* Date: *9-10-08* _____

**Metals Fractional Narrative
Lawrence Livermore National Labs (LLNL)
SDG 214909-2**

Sample Analysis

| Sample ID | Client ID |
|------------------|---|
| 214912001 | 212-1 |
| 214912002 | 212-2 |
| 214912003 | 212-5 |
| 1201659031 | Tumbling Blank (TB) |
| 1201660439 | Method Blank (MB) ICP |
| 1201660440 | Laboratory Control Sample (LCS) |
| 1201660443 | 214602001(B298-BBBL) Serial Dilution (SD) |
| 1201659027 | 214602001(B298-BBBS) Matrix Spike (MS) |
| 1201659029 | 214602001(B298-BBBS) Matrix Spike Duplicate (MSD) |
| 1201659031 | Tumbling Blank (TB) |
| 1201660421 | Method Blank (MB) CVAA |
| 1201660422 | Laboratory Control Sample (LCS) |
| 1201660426 | 214602001(B298-BBBL) Serial Dilution (SD) |
| 1201659028 | 214602001(B298-BBBS) Matrix Spike (MS) |
| 1201659030 | 214602001(B298-BBBS) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

Method/Analysis Information

| | |
|---------------------------------------|---|
| Analytical Batch: | 790921 and 790913 |
| Prep Batch : | 790919 and 790912 |
| TCLP Prep Batch : | 790318 |
| Standard Operating Procedures: | GL-MA-E-013 REV# 17, GL-MA-E-008 REV# 13, GL-LB-E-006 REV# 13 and GL-MA-E-010 REV# 18 |
| Analytical Method: | SW846 3010/6010B and SW846 7470A |
| Prep Method : | SW846 3010A and SW846 7470A Prep |
| TCLP Prep Method : | SW846 1311 |

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

System Configuration

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with a Burgener nebulizer, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 1.4L/min, argon gas flows of 15 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis-Mercury was performed on a Perkin-Elmer Flow Injection Mercury System (FIMS-100) automated mercury analyzer. The instrument consists of a cold vapor atomic absorption spectrometer set to detect mercury at a wavelength of 253.7 nm. Sample introduction through the flow injection system is performed via a peristaltic pump at 9 mL/min and nitrogen carrier gas rate of 80 mL/min.

Calibration Information

Instrument Calibration

All initial calibration requirements have been met for this sample delivery group (SDG).

CRDL Requirements

All CRDL standard(s) met the referenced advisory control limits.

ICSA/ICSAB Statement

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

Continuing Calibration Blank (CCB) Requirements

All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

Continuing Calibration Verification (CCV) Requirements

All continuing calibration verification (CCV) bracketing this SDG met the established acceptance criteria.

Quality Control (QC) Information

Method Blank (MB) Statement

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following samples were selected as the quality control (QC) samples for this SDG: 214602001 (B298-BBB)-ICP and CVAA.

Matrix Spike (MS) Recovery Statement

The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The MS met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes, with the exception of mercury, as indicated by the "*" qualifier.

Matrix Spike Duplicate (MSD) Recovery Statement

The percent recovery (%R) obtained from the MSD analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The MSD did not meet the recommended quality control acceptance criteria for percent recoveries for all applicable analytes.

MS/MSD Relative Percent Difference (RPD) Statement

The RPD(s) between the MS and MSD met the acceptance limits.

Serial Dilution % Difference Statement

The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations that are 25X the IDL for CVAA, 50X the IDL for ICP, and 100X the IDL for ICP-MS analyses are applicable for serial dilution assessment. All applicable analytes met the acceptance criteria of less than 10% difference (%D).

Technical Information**Holding Time Specifications**

GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. Sample 214912001 was diluted 10x for mercury in order to bring over range concentrations within the linear calibration range of the instrument.

Preparation Information

The samples and associated matrix QC were prepared at a 10x factor for ICP/ICPMS to minimize potential interferences arising from the high sodium content in the TCLP leaching solution. The samples and associated matrix QC were prepared at a 10x factor for CVAA analysis because larger volumes of this matrix consume excessive amounts of potassium permanganate.

Miscellaneous Information

Nonconformance 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: 595328. A copy is included in the Miscellaneous Data section of this package.

Additional Comments

Additional comments were not required for this SDG.

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: _____ *By Davis* Date: *9-10-08* _____

Radiochemistry Case Narrative
Lawrence Livermore National Labs (LLNL)
SDG 214909

Method/Analysis Information

Procedure: Dry Weight-Percent Moisture

Analytical Method:

Analytical Batch Number: 790363

| Sample ID | Client ID |
|------------------|---|
| 214909001 | 212-1 |
| 214909002 | 212-2 |
| 214909003 | 212-5 |
| 1201659147 | 214909001(212-1) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

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-OA-E-020 REV# 8.

Calibration Information:

Quality Control (QC) Information:

Designated QC

The following sample was used for QC: 214909001 (212-1).

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: | GFPC, Gross A/B, solid |
| Analytical Method: | EPA 900.0 Modified |
| Prep Method: | Dry Soil Prep |
| Analytical Batch Number: | 790537 |
| Prep Batch Number: | 790471 |

| Sample ID | Client ID |
|------------------|---|
| 214909001 | 212-1 |
| 214909002 | 212-2 |
| 214909003 | 212-5 |
| 1201659492 | Method Blank (MB) |
| 1201659493 | 214909001(212-1) Sample Duplicate (DUP) |
| 1201659494 | 214909001(212-1) Matrix Spike (MS) |
| 1201659495 | 214909001(212-1) Matrix Spike Duplicate (MSD) |
| 1201659496 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on a "dry weight" basis.

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-001B REV# 12.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. The discrimination settings are calibrated in beta discriminating mode to reduce beta to alpha crosstalk.

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: 214909001 (212-1).

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.

Chemical Recoveries

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

Gross Alpha/Beta Preparation Information

High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating.

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

The sample and the duplicate, 1201659493 (212-1) and 214909001 (212-1), did not meet the alpha relative percent difference requirement, however they do meet the relative error ratio requirement with value of 0.9787. The blank, 1201659492 (MB), did not meet the detection limit due to keeping the blank volume consistent with the other sample aliquots.

Qualifier information

Manual qualifiers were not required.

Method/Analysis Information

Product: LSC, Tritium Dist, Solid

Analytical Method: EPA 906.0 Modified

Analytical Batch Number: 790249

| Sample ID | Client ID |
|------------|---|
| 214909001 | 212-1 |
| 214909002 | 212-2 |
| 214909003 | 212-5 |
| 1201658840 | Method Blank (MB) |
| 1201658841 | 214909001(212-1) Sample Duplicate (DUP) |
| 1201658842 | 214909001(212-1) Matrix Spike (MS) |
| 1201658843 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

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# 16.

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: 214909001 (212-1).

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 1201658841 (212-1) and 214909001 (212-1) were recounted due to high relative percent difference/relative error ratio.

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:

Kath Bell 9/10/08

Sample Transportation Determination

Section I

Requester Doug Villela

Phone # 2-0927

Requisition # / Sample ID 212-1

Waste Type: Non-hazardous waste or retention tank (not DOT) – Print and sign below and process sample. No further action required.

Hazardous Radioactive Mixed CA Combined

Number of containers:

40 mL _____

125 mL _____

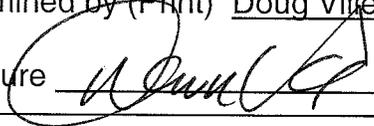
250 mL 4 = 250ml sqt jars @ 300gms ea

500 mL _____

1000 mL _____

Print and sign below and forward to Sample Team Lead for further review and Section II completion. Ensure WDR or other preliminary characterization information is submitted along with this form.

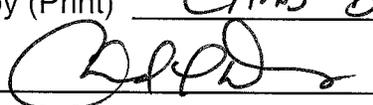
Determined by (Print) Doug Villela Date 8/28/08

Signature 

Section II (Sample Team Lead – complete and return to Requester if not DOT regulated)

DOT Regulated? Yes No

Determined by (Print) Chris Davis Date 8/28/08

Signature 

If DOT regulated forward to RHWM Disposal Office for completion of Section III.

Section III

DOT Information

Proper Shipping Name _____

Packaging _____

Rad Info. Attached

COC # 17485

Sample Transportation Determination

Section I

Requester Doug Villela

Phone # 2-0927

Requisition # / Sample ID 212-2

Waste Type: Non-hazardous waste or retention tank (not DOT) – Print and sign below and process sample. No further action required.

Hazardous Radioactive Mixed CA Combined

Number of containers:

40 mL _____

125 mL _____

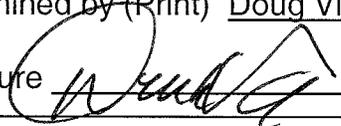
250 mL 4= 250ml sqt jars @ 300gms ea

500 mL _____

1000 mL _____

Print and sign below and forward to Sample Team Lead for further review and Section II completion. Ensure WDR or other preliminary characterization information is submitted along with this form.

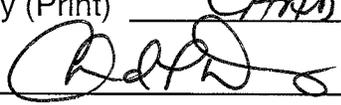
Determined by (Print) Doug Villela Date 8/28/08

Signature 

Section II (Sample Team Lead – complete and return to Requester if not DOT regulated)

DOT Regulated? Yes No

Determined by (Print) CHAD DAVIS Date 8/28/08

Signature 

If DOT regulated forward to RHWM Disposal Office for completion of Section III.

Section III

DOT Information

Proper Shipping Name _____

Packaging _____

Rad Info. Attached

COC # 17485

Sample Transportation Determination

Section I

Requester Doug Villela

Phone # 2-0927

Requisition # / Sample ID 212-5

Waste Type: Non-hazardous waste or retention tank (not DOT) – Print and sign below and process sample. No further action required.

Hazardous Radioactive Mixed CA Combined

Number of containers:

40 mL _____

125 mL _____

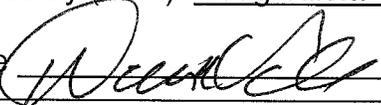
250 mL 4= 250ml sqt jars @ 300gms ea

500 mL _____

1000 mL _____

Print and sign below and forward to Sample Team Lead for further review and Section II completion. Ensure WDR or other preliminary characterization information is submitted along with this form.

Determined by (Print) Doug Villela Date 8/28/08

Signature 

Section II (Sample Team Lead – complete and return to Requester if not DOT regulated)

DOT Regulated? Yes No

Determined by (Print) CHAO DAVIS Date 8/28/08

Signature 

If DOT regulated forward to RHWM Disposal Office for completion of Section III.

Section III

DOT Information

Proper Shipping Name _____

Packaging _____

Rad Info. Attached

COC # 17485



SHA
Version 4.3
10/25/2005

Sample Hazard Assessment

Client Sample ID
212-1

For Authorized Reviewer Use Only

Qualifying Constituents

| Hazard Type | Yes | Comment | Hazard Type | Yes | Comment |
|---|-------------------------------------|-----------------|------------------|--------------------------|---------|
| Radiological | | | Solvents | <input type="checkbox"/> | |
| Alpha | <input checked="" type="checkbox"/> | <i>possible</i> | Corrosive | | |
| Beta | <input type="checkbox"/> | | Acid | <input type="checkbox"/> | |
| Tritium | <input checked="" type="checkbox"/> | | Base | <input type="checkbox"/> | |
| Inhalation | <input checked="" type="checkbox"/> | <i>Hg vapor</i> | Reactive | <input type="checkbox"/> | |
| Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be) | <input type="checkbox"/> | | Oxidizer | <input type="checkbox"/> | |
| Biologically Active Materials | <input type="checkbox"/> | | Ignitable | <input type="checkbox"/> | |
| Does the sample contain (Fed. or State-defined) Acutely or Extremely Hazardous Material? | | | | <input type="checkbox"/> | |
| Does the sample contain high explosives? | | | | <input type="checkbox"/> | |
| Does the sample contain <10 mg non-primary initiating or secondary explosives, or <25% high explosives by mass? | | | | <input type="checkbox"/> | |

None of the hazards listed above are present in the sample.

Check here, if WDR is not available (For RHWM use only).

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Reviewer (Print Name):

Chris DAVIS

Authorized Reviewer (Signature):

[Signature]

Date:

8/28/08

For Sampler Use Only

| Qualifying Constituents | YES | NO | Comments |
|--|-------------------------------------|--|---------------------------------------|
| Was Hazard Assessment Control (HAC) necessary? | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> <i>8/28/08</i> | |
| Per Sample Basis: Are rad levels detectable by meter? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> Check if N/A |
| Exceeds 30,000 CPM | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 5 mR/hr @ 30 cm (1 ft) | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 1 microCurie | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |

Comments:

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Sampler (Print Name):

DOUG VILLEVA

Authorized Sampler (Signature):

[Signature]

Date:

8-28-08

For CES Use Only

RHWM personnel must notify CES PEL, or designee, if rad levels exceed 1 microCurie for approval to submit sample.

SHA is not required for:
1. Berms
2. Retention Tanks
3. PE Samples
4. Field or Bulk Gamma

5. Research Samples
6. Preconstruction Soils
7. Environmental Soils
8. Trip or Field Blanks

SHA Received by (initials):

cd

Date:

8-28-08

CES COC #:

17485



SHA
Version 4.3
10/25/2005

Sample Hazard Assessment

Client Sample ID

212-2

For Authorized Reviewer Use Only

Qualifying Constituents

| Hazard Type | Yes | Comment | Hazard Type | Yes | Comment |
|---|-------------------------------------|----------|------------------|--------------------------|---------|
| Radiological | | | Solvents | <input type="checkbox"/> | |
| Alpha | <input checked="" type="checkbox"/> | | Corrosive | | |
| Beta | <input type="checkbox"/> | possible | Acid | <input type="checkbox"/> | |
| Tritium | <input checked="" type="checkbox"/> | | Base | <input type="checkbox"/> | |
| Inhalation | <input checked="" type="checkbox"/> | Hg vapor | Reactive | <input type="checkbox"/> | |
| Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be) | <input type="checkbox"/> | | Oxidizer | <input type="checkbox"/> | |
| Biologically Active Materials | <input type="checkbox"/> | | Ignitable | <input type="checkbox"/> | |
| Does the sample contain (Fed. or State-defined) Acutely or Extremely Hazardous Material? | | | | <input type="checkbox"/> | |
| Does the sample contain high explosives? | | | | <input type="checkbox"/> | |
| Does the sample contain <10 mg non-primary initiating or secondary explosives, or <25% high explosives by mass? | | | | <input type="checkbox"/> | |

None of the hazards listed above are present in the sample.

Check here, if WDR is not available (For RHWM use only).

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Reviewer (Print Name):

CHRIS DAVIS

Authorized Reviewer (Signature):

[Signature]

Date:

8/28/08

For Sampler Use Only

| Qualifying Constituents | YES | NO | Comments |
|--|-------------------------------------|---|---------------------------------------|
| Was Hazard Assessment Control (HAC) necessary? | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> 8/28/08 | |
| Per Sample Basis: Are rad levels detectable by meter? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> Check if N/A |
| Exceeds 30,000 CPM | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 5 mR/hr @ 30 cm (1 ft) | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 1 microCurie | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |

Comments:

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Sampler (Print Name):

DOUG VILLEA

Authorized Sampler (Signature):

[Signature]

Date:

8-28-08

For CES Use Only

RHWM personnel must notify CES PEL, or designee, if rad levels exceed 1 microCurie for approval to submit sample.

SHA is not required for:

- Berms
- Retention Tanks
- PE Samples
- Field or Bulk Gamma
- Research Samples
- Preconstruction Soils
- Environmental Soils
- Trip or Field Blanks

SHA Received by (initials):

cpd

Date:

8-28-08

CES COC #:

17485



SHA
Version 4.3
10/25/2005

Sample Hazard Assessment

Client Sample ID

212-5

For Authorized Reviewer Use Only

Qualifying Constituents

| Hazard Type | Yes | Comment | Hazard Type | Yes | Comment |
|---|-------------------------------------|----------|------------------|--------------------------|---------|
| Radiological | | | Solvents | <input type="checkbox"/> | |
| Alpha | <input checked="" type="checkbox"/> | possible | Corrosive | | |
| Beta | <input type="checkbox"/> | | Acid | <input type="checkbox"/> | |
| Tritium | <input checked="" type="checkbox"/> | | Base | <input type="checkbox"/> | |
| Inhalation | <input checked="" type="checkbox"/> | Hg VAPOR | Reactive | <input type="checkbox"/> | |
| Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be) | <input type="checkbox"/> | | Oxidizer | <input type="checkbox"/> | |
| Biologically Active Materials | <input type="checkbox"/> | | Ignitable | <input type="checkbox"/> | |
| Does the sample contain (Fed. or State-defined) Acutely or Extremely Hazardous Material? | | | | <input type="checkbox"/> | |
| Does the sample contain high explosives? | | | | <input type="checkbox"/> | |
| Does the sample contain <10 mg non-primary initiating or secondary explosives, or <25% high explosives by mass? | | | | <input type="checkbox"/> | |

None of the hazards listed above are present in the sample.

Check here, if WDR is not available (For RHWM use only).

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Reviewer (Print Name):

CHAS DAVIS

Authorized Reviewer (Signature):

[Signature]

Date:

8/28/08

For Sampler Use Only

| Qualifying Constituents | YES | NO | Comments |
|--|-------------------------------------|---|---------------------------------------|
| Was Hazard Assessment Control (HAC) necessary? | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> 8/28/08 | |
| Per Sample Basis: Are rad levels detectable by meter? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> Check if N/A |
| Exceeds 30,000 CPM | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 5 mR/hr @ 30 cm (1 ft) | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Exceeds 1 microCurie | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |

Comments:

I certify, to the best of my knowledge, that information provided above is accurate and complete.

Authorized Sampler (Print Name):

DOUG WILKIN

Authorized Sampler (Signature):

[Signature]

Date:

8-28-08

For CES Use Only

RHWM personnel must notify CES PEL, or designee, if rad levels exceed 1 microCurie for approval to submit sample.

SHA is not required for:

1. Berms
2. Retention Tanks
3. PE Samples
4. Field or Bulk Gamma
5. Research Samples
6. Preconstruction Soils
7. Environmental Soils
8. Trip or Field Blanks

SHA Received by
(initials):

CPD

Date:

8-28-08

CES COC #:

17425

Respiratory Protection

Air Purifying Respirators:

Activities: Describe work in each phase/activity in enough detail to justify respirator selection and avoid confusion with other activities.

| | Phase/Activity 1 | Phase/Activity 2 | Phase/Activity 3 |
|---|---|----------------------------|----------------------------|
| | Description of work: Soil removal & transference to hopper/barrel containment. | Description of work: NA | Description of work: NA |
| <i>Filter/Cartridge Type</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| P100/HEPA | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other: Combo. P 100/Mersorb | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Canister (specify type) | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <i>Configuration</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 1/2 Mask APR | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other: Full face (Mercury Canisters) HEPA/Activated Charcoal | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Frequency of respirator exchange (if not after eight hours that can be spread over up to five work days; also provide cartridge changeout schedule): | After 8 hours of use or as per end of service indicator on Mersorb | | |
| OK to reuse filter? No Dispose of filter as HW and clean masks before return? Yes. Note decontamination instructions in the following "Comments" section. | | | |
| For filtering facepiece respirators only: | | | |
| Is this respirator being used to prevent allergic reactions? No , | | | |
| Is this respirator being used for personal comfort/preference? No | | | |
| Comments: | | | |

Air Supplied Respirators

| | Phase/Activity 1 | Phase/Activity 2 | Phase/Activity 3 |
|----------------------------|--------------------------|--------------------------|--------------------------|
| <i>Operating Type</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Constant flow | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Pressure demand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <i>Type</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Abrasive blaster's hood | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other: | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <i>Air source/location</i> | | | |
| Comments: NA | | | |

| | | | |
|---------------------------|--|-----------|--|
| Issue Point Administrator | | Badge No. | |
| Issue Point Location | | | |

Other PPE

Personal Protective Equipment:

| For engineering controls - see IWS <input checked="" type="checkbox"/> See the IWS and this section of the HAC <input type="checkbox"/> See this section <input type="checkbox"/> | | | |
|---|--|--------------------------|--------------------------|
| | Phase/Activity 1 | Phase/Activity 2 | Phase/Activity 3 |
| Eye protection | <input checked="" type="checkbox"/> Full Face APR | <input type="checkbox"/> | <input type="checkbox"/> |
| Garments | <input checked="" type="checkbox"/> Disposable Tyvek | <input type="checkbox"/> | <input type="checkbox"/> |
| Gloves | <input checked="" type="checkbox"/> Work gloves over Nitrile | <input type="checkbox"/> | <input type="checkbox"/> |
| Head protection | <input checked="" type="checkbox"/> Hard Hat | <input type="checkbox"/> | <input type="checkbox"/> |
| Hearing protection | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Safety shoes | <input checked="" type="checkbox"/> Rubber Boots w/ toe protection | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | |
|--------------------|--------------------------|--------------------------|--------------------------|
| Shoe covers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other PPE controls | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Comments: | | | |

Engineering Controls

| For engineering controls - see IWS <input type="checkbox"/> See the IWS and this section of the HAC <input type="checkbox"/> See this section <input type="checkbox"/> | | | |
|--|--------------------------|--------------------------|--------------------------|
| | Phase/Activity 1 | Phase/Activity 2 | Phase/Activity 3 |
| Eyewash/Shower | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Glovebox | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Hood/fan number | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Interlocks | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Portable ventilation | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other engin. controls | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Comments: | | | |

Administrative Controls

| For administrative controls - see IWS <input type="checkbox"/> See the IWS and this section of the HAC <input checked="" type="checkbox"/> See this section <input type="checkbox"/> | | | |
|--|---|--------------------------|--------------------------|
| | Phase/Activity 1 | Phase/Activity 2 | Phase/Activity 3 |
| Training Requirements: | | | |
| Respirator-related | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| HAZCOM-related | <input checked="" type="checkbox"/> Mercury | <input type="checkbox"/> | <input type="checkbox"/> |
| Posting/labeling | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| HHC Poster | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other signs/labels | <input checked="" type="checkbox"/> Authorized Personnel Only | <input type="checkbox"/> | <input type="checkbox"/> |
| Other admin. controls | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Medical surveillance? Respirator: <input type="checkbox"/> Hearing protection: <input type="checkbox"/> Other: <input type="checkbox"/> | | | |
| Comments: | | | |

Additional Control Requirements

(Use Continuation Section if there are more than 10 comments)

General Comments

Emergency Procedures

Specify emergency measures, if applicable:

Continuation Section

Sample Data Summary

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Certificate of Analysis Report for

LLNL002 Lawrence Livermore National Labs (#H712000)

Client SDG: 214909 GEL Work Order: 214909

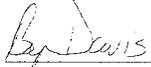
The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

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The designation ND, if present, appears in the result column when the analyte concentration is not detected above the detection limit.

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, Edith Kent.


Reviewed by

9-10-08

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : Lawrence Livermore National
Security, LLC
Address : 7000 East Avenue
Mailstop L-620
Livermore, California 94551
Contact: Mr. Chad F. Davis
Project: **CES - Normal Deliverable**

Report Date: September 10, 2008

| | |
|-------------------------------|--------------------|
| Client Sample ID: 212-1 | Project: LLNL00306 |
| Sample ID: 214909001 | Client ID: LLNL002 |
| Matrix: SO | |
| Collect Date: 19-AUG-08 11:30 | |
| Receive Date: 30-AUG-08 | |
| Collector: Client | |
| Moisture: 2.32% | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | AnalystDate | Time | Batch | Method |
|--|-----------|--------|--------|-------|-------|-------|---------------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | |
| <i>7471 Cold Vapor Hg in Solid "Dry Weight Corrected"</i> | | | | | | | | | | |
| Mercury | | 2490 | 38.0 | 253 | mg/kg | 25000 | JXL1 09/04/08 | 1541 | 790539 | 1 |
| Metals Analysis-ICP | | | | | | | | | | |
| <i>6010 TAL Metals Soil Federal "Dry Weight Corrected"</i> | | | | | | | | | | |
| Arsenic | | 7.89 | 0.491 | 1.50 | mg/kg | 1 | JWJ 09/09/08 | 0329 | 790812 | 2 |
| Barium | | 190 | 0.0983 | 0.500 | mg/kg | 1 | | | | |
| Cadmium | | 52.9 | 0.0983 | 0.500 | mg/kg | 1 | | | | |
| Chromium | | 1020 | 0.0983 | 0.500 | mg/kg | 1 | | | | |
| Cobalt | | 19.4 | 0.197 | 0.500 | mg/kg | 1 | | | | |
| Molybdenum | | 32.9 | 0.197 | 1.00 | mg/kg | 1 | | | | |
| Nickel | | 201 | 0.0983 | 1.30 | mg/kg | 1 | | | | |
| Selenium | | 7.33 | 0.491 | 1.60 | mg/kg | 1 | | | | |
| Thallium | J | 1.98 | 0.491 | 3.00 | mg/kg | 1 | | | | |
| Vanadium | | 37.7 | 0.0983 | 0.500 | mg/kg | 1 | | | | |
| Antimony | U | -14.2 | 15.2 | 49.1 | mg/kg | 50 | HSC 09/09/08 | 0932 | 790812 | 3 |
| Beryllium | U | -9.44 | 4.91 | 24.6 | mg/kg | 50 | | | | |
| Copper | | 6020 | 14.7 | 49.1 | mg/kg | 50 | | | | |
| Lead | | 1920 | 12.3 | 49.1 | mg/kg | 50 | | | | |
| Silver | | 206 | 4.91 | 24.6 | mg/kg | 50 | | | | |
| Zinc | | 3850 | 9.83 | 49.1 | mg/kg | 50 | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|-----------------------------|---------|----------|------|------------|
| SW846 3050B | 846 3050BS PREP | CXS3 | 09/08/08 | 0832 | 790808 |
| SW846 7471A Prep | EPA 7471A Mercury Prep Soil | TXB3 | 09/04/08 | 0810 | 790538 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|-------------------|------------------|
| 1 | SW846 7471A | |
| 2 | SW846 3050B/6010B | |
| 3 | SW846 3050B/6010B | |

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Certificate of Analysis Report for

LLNL002 Lawrence Livermore National Labs (#H712000)

Client SDG: 214909-1 GEL Work Order: 214911

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

J Value is estimated

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

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.

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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, Edith Kent.

Ben Davis 9-10-08
Reviewed by

GEL LABORATORIES LLC

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Certificate of Analysis

Company : Lawrence Livermore National Security, LLC
 Address : 7000 East Avenue
 Mailstop L-620
 Livermore, California 94551
 Contact: Mr. Chad F. Davis
 Project: **CES - Normal Deliverable**

Report Date: September 10, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-1 | Project: | LLNL00306 |
| Sample ID: | 214911001 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 19-AUG-08 11:30 | | |
| Receive Date: | 30-AUG-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|-----------|----------|-------|-------|-------|----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>STLC Hg in Solid "As Received"</i> | | | | | | | | | | | |
| Mercury | | 1.93 | 0.030 | 0.200 | mg/L | 1 | JXL1 | 09/08/08 | 1216 | 791494 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>STLC ICP Metals for Solids "As Received"</i> | | | | | | | | | | | |
| Antimony | J | 0.825 | 0.030 | 1.00 | mg/L | 1 | JWJ | 09/05/08 | 2350 | 791414 | 2 |
| Arsenic | J | 0.111 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Barium | | 7.05 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Beryllium | U | -0.00338 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Cadmium | | 1.67 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Chromium | | 4.62 | 0.020 | 0.050 | mg/L | 1 | | | | | |
| Cobalt | | 0.486 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Copper | | 125 | 0.030 | 0.100 | mg/L | 1 | | | | | |
| Lead | | 92.0 | 0.025 | 0.100 | mg/L | 1 | | | | | |
| Molybdenum | | 0.379 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Nickel | | 0.737 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Selenium | J | 0.0632 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Silver | J | 0.0187 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Thallium | U | 0.0345 | 0.050 | 0.200 | mg/L | 1 | | | | | |
| Vanadium | | 0.286 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Zinc | | 58.7 | 0.020 | 0.100 | mg/L | 1 | HSC | 09/09/08 | 0850 | 791414 | 3 |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|-------------------------------|-------------------------------------|---------|----------|------|------------|
| California Code of Regulation | California Wet Method STLC Leaching | WXS1 | 09/02/08 | 1200 | 790317 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | AXG2 | 09/05/08 | 0805 | 791413 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 09/05/08 | 1435 | 791492 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |
| 3 | SW846 3010/6010B | |

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Certificate of Analysis Report for

LLNL002 Lawrence Livermore National Labs (#H712000)

Client SDG: 214909-2 GEL Work Order: 214912

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
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

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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, Edith Kent.

By Davis 9-10-08
Reviewed by

GEL LABORATORIES LLC

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Certificate of Analysis

Company : Lawrence Livermore National
 Security, LLC
 Address : 7000 East Avenue
 Mailstop L-620
 Livermore, California 94551
 Contact: Mr. Chad F. Davis
 Project: **CES - Normal Deliverable**

Report Date: September 10, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-1 | Project: | LLNL00306 |
| Sample ID: | 214912001 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 19-AUG-08 11:30 | | |
| Receive Date: | 30-AUG-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|-----------|-------|-------|-------|----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>TCLP Hg in Solid "As Received"</i> | | | | | | | | | | | |
| Mercury | | 0.343 | 0.003 | 0.020 | mg/L | 10 | JXL1 | 09/05/08 | 1200 | 790913 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>TCLP ICP Metals for Solid "As Received"</i> | | | | | | | | | | | |
| Antimony | U | 0.0286 | 0.030 | 0.100 | mg/L | 1 | HSC | 09/05/08 | 2129 | 790921 | 2 |
| Arsenic | U | 0.000768 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Barium | | 1.54 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Beryllium | U | -0.0017 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Cadmium | | 0.606 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Chromium | J | 0.045 | 0.020 | 0.050 | mg/L | 1 | | | | | |
| Cobalt | | 0.0591 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Copper | | 17.6 | 0.030 | 0.100 | mg/L | 1 | | | | | |
| Lead | | 10.2 | 0.025 | 0.100 | mg/L | 1 | | | | | |
| Molybdenum | U | -0.000799 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Nickel | | 0.145 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Silver | U | -0.0036 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Thallium | U | -0.0611 | 0.050 | 0.200 | mg/L | 1 | | | | | |
| Vanadium | U | -0.00643 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Zinc | | 14.3 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Selenium | U | 0.0294 | 0.050 | 0.150 | mg/L | 1 | HSC | 09/09/08 | 0948 | 790921 | 3 |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|------------------------------------|---------|----------|------|------------|
| SW846 1311 | SW846 1311 TCLP Leaching -FEDERAL | MTM1 | 09/02/08 | 1700 | 790318 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 09/04/08 | 0650 | 790919 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 09/04/08 | 1205 | 790912 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |
| 3 | SW846 3010/6010B | |



RD
Version 1.2
9/14/98

REVIEW of RADIOCHEMICAL DATA

CES COC# 17485 CES Sample # 212-1 Client Sample ID Mercury Contaminated Soil

Rad Dec # RHWM-RD-08-022-RD

| The sample was analyzed for : | | Subject was surveyed for: |
|--|---|--------------------------------------|
| <input checked="" type="checkbox"/> Bulk Gross Alpha | <input type="checkbox"/> Alpha TUPA | <input type="checkbox"/> Surface Rad |
| <input checked="" type="checkbox"/> Bulk Gross Beta | <input type="checkbox"/> Gamma Spec | |
| <input checked="" type="checkbox"/> Bulk Tritium | <input type="checkbox"/> Removable Rad α | |
| <input type="checkbox"/> Removable Rad H-3 | <input type="checkbox"/> Removable Rad β | |

| | \leq MDC | $>$ MDC | Check if by Limited Rad Declaration (LRD) |
|------------------------------|--------------------------|-------------------------------------|---|
| Bulk Contamination | | | |
| Gross Alpha | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Gross Beta | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Tritium | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Additional Analytical | | | |
| Gamma Spec | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Alpha TUPA | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Contamination | | | |
| Removable Rad H-3 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Removable Rad α | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Removable Rad β | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Rad α | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Rad β | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Radioactivity was was not can not say added to this sample.

Comments:

Gross alpha, gross beta and tritium activities were detected above their respective sample-specific MDCs and are above the Moratorium volumetric screening limits for NORM in non-suspect soils and soil-analogs.

Finding by: Philip Torretto Date: September 16, 2008
Philip Torretto, x2-5515

Criteria limits are those of "LLNL Criteria for Identifying Mixed Waste" for materials with the possibility of bulk contamination and DOE 5400.5 and 5480.11 for those with the possibility of fixed and removable surface contamination. For removable surface contamination from unknown radionuclides, the limits are 20 dpm/100 cm² for gross alpha, 200 dpm/cm² for gross beta and 1000 dpm/100 cm² for tritium.

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Certificate of Analysis Report for

LLNL002 Lawrence Livermore National Labs (#H712000)

Client SDG: 214909 GEL Work Order: 214909

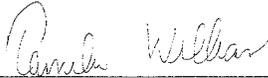
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This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Edith Kent.



Reviewed by _____

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : Lawrence Livermore National Security, LLC
 Address : 7000 East Avenue
 Mailstop L-620
 Livermore, California 94551
 Contact: Mr. Chad F. Davis
 Project: CES - Normal Deliverable

Report Date: September 9, 2008

| | | | |
|-------------------|-----------|------------|-----------|
| Client Sample ID: | 212-1 | Project: | LLNL00306 |
| Sample ID: | 214909001 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 19-AUG-08 | | |
| Receive Date: | 30-AUG-08 | | |
| Collector: | Client | | |
| Moisture: | 2.32% | | |

| Parameter | Qualifier | Result | Uncertainty | DL | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|--|-----------|--------|-------------|------|---------|-------|-------|----|---------|----------|------|--------|------|
| Gravimetric Solids | | | | | | | | | | | | | |
| <i>"As Received"</i> | | | | | | | | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i> | | | | | | | | | | | | | |
| Alpha | | 11.3 | +/-1.89 | 2.03 | +/-3.30 | 0.500 | pCi/g | | DXB5 | 09/06/08 | 1552 | 790537 | 2 |
| Beta | | 19.6 | +/-1.52 | 1.59 | +/-3.14 | 1.50 | pCi/g | | | | | | |
| Rad Liquid Scintillation Analysis | | | | | | | | | | | | | |
| <i>LSC, Tritium Dist, Solid "As Received"</i> | | | | | | | | | | | | | |
| Tritium | | 5.39 | +/-1.75 | 2.45 | +/-2.14 | 2.00 | pCi/g | | SXB4 | 09/08/08 | 1523 | 790249 | 3 |

The following Analytical Methods were performed

| Method | Description |
|--------|------------------------|
| 1 | ASTM D 2216 (Modified) |
| 2 | EPA 900.0 Modified |
| 3 | EPA 906.0 Modified |

Notes:

The Qualifiers in this report are defined as follows :

- ** 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 For General Chemistry and Organic analysis the 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
- E Metals--%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD

GEL LABORATORIES LLC

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Certificate of Analysis

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Livermore, California 94551
Contact: Mr. Chad F. Davis
Project: CES - Normal Deliverable

Report Date: September 9, 2008

Client Sample ID: 212-1
Sample ID: 214909001

Project: LLNL00306
Client ID: LLNL002

| Parameter | Qualifier | Result | Uncertainty | DL | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|-----------|-----------|--------|-------------|----|-----|----|-------|----|---------|------|------|-------|------|
|-----------|-----------|--------|-------------|----|-----|----|-------|----|---------|------|------|-------|------|

M Matrix Related Failure

N/A RPD or %Recovery limits do not apply.

ND Analyte concentration is not detected above the detection limit

NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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. Qualifier Not Applicable for Radiochemistry.

h Preparation or preservation holding time was exceeded

The above sample is reported on a dry weight basis.

RHWB ANALYSIS REPORT

| | | | |
|------------|-----------|------------------------|-----|
| WDR Number | Sample ID | Analytical Log Book ID | COC |
| N/A | 212-2 | 17485 | |

| | |
|---------------|------------|
| XRF | Analyst |
| Date Analyzed | Element |
| | Percentage |

| RADIOLOGICAL SCREENING REPORT | |
|-------------------------------|-------------------|
| Aliquot (mL or g) | Gross alpha, beta |
| Analyst | 1.0 |
| Date Analyzed | Chad Davis |
| Energy Window | 8/28/2008 |
| DPM | 0-18.6 keV |
| MDC | 18.6-2000 keV |
| Actual Result | 3.42 |
| Reportable Result | 3000 |
| Unit | 1500 |
| | Below MDC |
| | picocuries / kg |

| pH & NORMALITY | |
|-------------------------|------------|
| Analyst | Tritium |
| Date Analyzed | 1.0 |
| pH Result | Chad Davis |
| Normality Result (eq/L) | 8/28/2008 |

| HYDROMETER / SPECIFIC GRAVITY | |
|-------------------------------|-----------------|
| Analyst | DPM |
| Date Analyzed | 1.43 |
| Specific Gravity Result | 1000 |
| Hydrometer Result | 640 |
| | Below MDC |
| | picocuries / kg |

FLASH POINT (METHOD 1010)

| | |
|---------------|-----------------|
| Analyst | SAW GC |
| Date Analyzed | Analyst |
| MDL | Chemical |
| Result | Result |
| Unit | Detection Limit |

BOILING POINT

| | |
|--------|--|
| Result | |
| Unit | |

LIQUIFICATION TESTING

| | |
|-------------------|--|
| Vibration Testing | |
| Analyst | |
| Date Analyzed | |
| Result | |

Freeze / Thaw Testing

| | |
|---------------|--|
| Analyst | |
| Date Analyzed | |
| Result | |

Paint Filter Activity

| | |
|---------------|--|
| Analyst | |
| Date Analyzed | |
| Result | |

COMMENTS

| | |
|-------|--|
| Total | |
|-------|--|

| | |
|----------------|--|
| Date Completed | 8/28/2008 |
| Reviewed By |  |

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : Lawrence Livermore National
Security, LLC
Address : 7000 East Avenue
Mailstop L-620
Livermore, California 94551
Contact: Mr. Chad F. Davis
Project: **CES - Normal Deliverable**

Report Date: September 10, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-2 | Project: | LLNL00306 |
| Sample ID: | 214909002 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 19-AUG-08 14:30 | | |
| Receive Date: | 30-AUG-08 | | |
| Collector: | Client | | |
| Moisture: | 5.72% | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------|-------|-------|-----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>7471 Cold Vapor Hg in Solid "Dry Weight Corrected"</i> | | | | | | | | | | | |
| Mercury | | 23.8 | 0.707 | 4.71 | mg/kg | 500 | JXL1 | 09/04/08 | 1530 | 790539 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>6010 TAL Metals Soil Federal "Dry Weight Corrected"</i> | | | | | | | | | | | |
| Antimony | U | -0.432 | 0.329 | 1.50 | mg/kg | 1 | JWJ | 09/09/08 | 0358 | 790812 | 2 |
| Arsenic | | 5.30 | 0.530 | 1.59 | mg/kg | 1 | | | | | |
| Barium | | 170 | 0.106 | 0.530 | mg/kg | 1 | | | | | |
| Cadmium | U | -0.15 | 0.106 | 0.530 | mg/kg | 1 | | | | | |
| Chromium | | 37.5 | 0.106 | 0.530 | mg/kg | 1 | | | | | |
| Cobalt | | 10.5 | 0.212 | 0.530 | mg/kg | 1 | | | | | |
| Copper | | 37.2 | 0.318 | 2.00 | mg/kg | 1 | | | | | |
| Lead | | 26.9 | 0.265 | 1.50 | mg/kg | 1 | | | | | |
| Molybdenum | J | 0.698 | 0.212 | 1.06 | mg/kg | 1 | | | | | |
| Nickel | | 43.6 | 0.106 | 1.30 | mg/kg | 1 | | | | | |
| Selenium | | 8.94 | 0.530 | 1.60 | mg/kg | 1 | | | | | |
| Silver | | 0.598 | 0.106 | 0.530 | mg/kg | 1 | | | | | |
| Vanadium | | 29.9 | 0.106 | 0.530 | mg/kg | 1 | | | | | |
| Beryllium | U | -1.46 | 0.530 | 2.65 | mg/kg | 5 | HSC | 09/09/08 | 1002 | 790812 | 3 |
| Thallium | U | -3.56 | 2.65 | 10.6 | mg/kg | 5 | | | | | |
| Zinc | | 281 | 1.06 | 5.30 | mg/kg | 5 | | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|-----------------------------|---------|----------|------|------------|
| SW846 3050B | 846 3050BS PREP | CXS3 | 09/08/08 | 0832 | 790808 |
| SW846 7471A Prep | EPA 7471A Mercury Prep Soil | TXB3 | 09/04/08 | 0810 | 790538 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|-------------------|------------------|
| 1 | SW846 7471A | |
| 2 | SW846 3050B/6010B | |
| 3 | SW846 3050B/6010B | |

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 Livermore, California 94551
 Contact: Mr. Chad F. Davis
 Project: **CES - Normal Deliverable**

Report Date: September 10, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-2 | Project: | LLNL00306 |
| Sample ID: | 214911002 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 19-AUG-08 14:30 | | |
| Receive Date: | 30-AUG-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|-----------|----------|-------|-------|-------|----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>STLC Hg in Solid "As Received"</i> | | | | | | | | | | | |
| Mercury | J | 0.112 | 0.030 | 0.200 | mg/L | 1 | JXL1 | 09/08/08 | 1218 | 791494 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>STLC ICP Metals for Solids "As Received"</i> | | | | | | | | | | | |
| Antimony | U | 0.0129 | 0.030 | 1.00 | mg/L | 1 | JWJ | 09/05/08 | 2358 | 791414 | 2 |
| Arsenic | J | 0.125 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Barium | | 7.91 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Beryllium | U | -0.00499 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Cadmium | | 0.0623 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Chromium | | 0.228 | 0.020 | 0.050 | mg/L | 1 | | | | | |
| Cobalt | | 0.392 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Copper | | 1.30 | 0.030 | 0.100 | mg/L | 1 | | | | | |
| Lead | | 0.926 | 0.025 | 0.100 | mg/L | 1 | | | | | |
| Molybdenum | J | 0.0415 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Nickel | | 0.551 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Selenium | U | 0.00755 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Silver | U | 0.00113 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Thallium | U | 0.0356 | 0.050 | 0.200 | mg/L | 1 | | | | | |
| Vanadium | | 0.231 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Zinc | | 21.7 | 0.020 | 0.100 | mg/L | 1 | HSC | 09/09/08 | 0857 | 791414 | 3 |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|-------------------------------|-------------------------------------|---------|----------|------|------------|
| California Code of Regulation | California Wet Method STLC Leaching | WXS1 | 09/02/08 | 1200 | 790317 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | AXG2 | 09/05/08 | 0805 | 791413 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 09/05/08 | 1435 | 791492 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |
| 3 | SW846 3010/6010B | |

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Contact: Mr. Chad F. Davis
Project: **CES - Normal Deliverable**

Report Date: September 10, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-2 | Project: | LLNL00306 |
| Sample ID: | 214912002 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 19-AUG-08 14:30 | | |
| Receive Date: | 30-AUG-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|----------|--------|-------|-------|----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>TCLP Hg in Solid "As Received"</i> | | | | | | | | | | | |
| Mercury | | 0.00322 | 0.0003 | 0.002 | mg/L | 1 | JXL1 | 09/05/08 | 1148 | 790913 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>TCLP ICP Metals for Solid "As Received"</i> | | | | | | | | | | | |
| Antimony | U | 0.00415 | 0.030 | 0.100 | mg/L | 1 | HSC | 09/05/08 | 2136 | 790921 | 2 |
| Arsenic | U | 0.0284 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Barium | | 0.780 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Beryllium | U | -0.00109 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Cadmium | U | 0.00267 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Chromium | U | 0.018 | 0.020 | 0.050 | mg/L | 1 | | | | | |
| Cobalt | U | -0.00882 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Copper | U | 0.0123 | 0.030 | 0.100 | mg/L | 1 | | | | | |
| Lead | J | 0.0327 | 0.025 | 0.100 | mg/L | 1 | | | | | |
| Molybdenum | U | 0.00228 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Nickel | J | 0.0379 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Silver | U | -0.018 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Thallium | U | -0.108 | 0.050 | 0.200 | mg/L | 1 | | | | | |
| Vanadium | U | -0.0176 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Zinc | | 4.24 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Selenium | J | 0.0525 | 0.050 | 0.150 | mg/L | 1 | HSC | 09/09/08 | 0955 | 790921 | 3 |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|------------------------------------|---------|----------|------|------------|
| SW846 1311 | SW846 1311 TCLP Leaching -FEDERAL | MTM1 | 09/02/08 | 1700 | 790318 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 09/04/08 | 0650 | 790919 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 09/04/08 | 1205 | 790912 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |
| 3 | SW846 3010/6010B | |



RD
Version 1.2
9/14/98

REVIEW of RADIOCHEMICAL DATA

CES COC# 17485 CES Sample # 212-2 Client Sample ID Mercury Contaminated Soil

Rad Dec # RHWM-RD-08-023-RD

| The sample was analyzed for : | | Subject was surveyed for: |
|--|---|--------------------------------------|
| <input checked="" type="checkbox"/> Bulk Gross Alpha | <input type="checkbox"/> Alpha TUPA | <input type="checkbox"/> Surface Rad |
| <input checked="" type="checkbox"/> Bulk Gross Beta | <input type="checkbox"/> Gamma Spec | |
| <input checked="" type="checkbox"/> Bulk Tritium | <input type="checkbox"/> Removable Rad α | |
| <input type="checkbox"/> Removable Rad H-3 | <input type="checkbox"/> Removable Rad β | |

| | \leq MDC | $>$ MDC | Check if by Limited Rad Declaration (LRD) |
|------------------------------|-------------------------------------|-------------------------------------|---|
| Bulk Contamination | | | |
| Gross Alpha | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Gross Beta | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Tritium | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Additional Analytical | | | |
| Gamma Spec | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Alpha TUPA | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Contamination | | | |
| Removable Rad H-3 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Removable Rad α | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Removable Rad β | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Rad α | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Rad β | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Radioactivity was was not can not say added to this sample.

Comments:

Gross alpha and gross beta activities were detected above their respective sample-specific MDCs and are above the Moratorium volumetric screening limits for NORM in non-suspect soils and soil-analogs. Tritium was not detected above the sample-specific MDC.

Finding by: Philip Torretto Date: September 16, 2008
Philip Torretto, x2-5515

Criteria limits are those of "LLNL Criteria for Identifying Mixed Waste" for materials with the possibility of bulk contamination and DOE 5400.5 and 5480.11 for those with the possibility of fixed and removable surface contamination. For removable surface contamination from unknown radionuclides, the limits are 20 dpm/100 cm² for gross alpha, 200 dpm/cm² for gross beta and 1000 dpm/100 cm² for tritium.

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 Mailstop L-620
 Livermore, California 94551
 Contact: Mr. Chad F. Davis
 Project: CES - Normal Deliverable

Report Date: September 9, 2008

| | | | |
|-------------------|-----------|------------|-----------|
| Client Sample ID: | 212-2 | Project: | LLNL00306 |
| Sample ID: | 214909002 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 19-AUG-08 | | |
| Receive Date: | 30-AUG-08 | | |
| Collector: | Client | | |
| Moisture: | 5.72% | | |

| Parameter | Qualifier | Result | Uncertainty | DL | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|--|-----------|--------|-------------|------|----------|-------|-------|----|---------|----------|------|--------|------|
| Gravimetric Solids | | | | | | | | | | | | | |
| <i>"As Received"</i> | | | | | | | | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i> | | | | | | | | | | | | | |
| Alpha | | 7.13 | +/-1.85 | 2.49 | +/-2.53 | 0.500 | pCi/g | | DXB5 | 09/06/08 | 1552 | 790537 | 2 |
| Beta | | 14.3 | +/-1.62 | 2.13 | +/-2.58 | 1.50 | pCi/g | | | | | | |
| Rad Liquid Scintillation Analysis | | | | | | | | | | | | | |
| <i>LSC, Tritium Dist, Solid "As Received"</i> | | | | | | | | | | | | | |
| Tritium | U | -0.386 | +/-0.962 | 1.79 | +/-0.962 | 2.00 | pCi/g | | SXB4 | 09/05/08 | 1050 | 790249 | 3 |

The following Analytical Methods were performed

| Method | Description |
|--------|------------------------|
| 1 | ASTM D 2216 (Modified) |
| 2 | EPA 900.0 Modified |
| 3 | EPA 906.0 Modified |

Notes:

The Qualifiers in this report are defined as follows :

- ** 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 For General Chemistry and Organic analysis the 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
- E Metals--%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure

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 Livermore, California 94551
 Contact: Mr. Chad F. Davis
 Project: **CES - Normal Deliverable**

Report Date: September 10, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-5 | Project: | LLNL00306 |
| Sample ID: | 214909003 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 28-AUG-08 11:25 | | |
| Receive Date: | 30-AUG-08 | | |
| Collector: | Client | | |
| Moisture: | 4.65% | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------|-------|-------|-----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>7471 Cold Vapor Hg in Solid "Dry Weight Corrected"</i> | | | | | | | | | | | |
| Mercury | | 9.26 | 0.787 | 5.24 | mg/kg | 500 | JXL1 | 09/04/08 | 1532 | 790539 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>6010 TAL Metals Soil Federal "Dry Weight Corrected"</i> | | | | | | | | | | | |
| Antimony | U | -0.467 | 0.324 | 1.50 | mg/kg | 1 | JWJ | 09/09/08 | 0405 | 790812 | 2 |
| Arsenic | | 4.95 | 0.522 | 1.57 | mg/kg | 1 | | | | | |
| Barium | | 164 | 0.104 | 0.522 | mg/kg | 1 | | | | | |
| Chromium | | 30.7 | 0.104 | 0.522 | mg/kg | 1 | | | | | |
| Cobalt | | 9.14 | 0.209 | 0.522 | mg/kg | 1 | | | | | |
| Copper | | 60.6 | 0.313 | 2.00 | mg/kg | 1 | | | | | |
| Lead | | 9.08 | 0.261 | 1.50 | mg/kg | 1 | | | | | |
| Molybdenum | J | 0.405 | 0.209 | 1.04 | mg/kg | 1 | | | | | |
| Nickel | | 40.4 | 0.104 | 1.30 | mg/kg | 1 | | | | | |
| Selenium | | 8.51 | 0.522 | 1.60 | mg/kg | 1 | | | | | |
| Silver | J | 0.284 | 0.104 | 0.522 | mg/kg | 1 | | | | | |
| Thallium | U | -1.64 | 0.522 | 3.00 | mg/kg | 1 | | | | | |
| Vanadium | | 27.9 | 0.104 | 0.522 | mg/kg | 1 | | | | | |
| Zinc | | 79.6 | 0.209 | 1.04 | mg/kg | 1 | | | | | |
| Beryllium | U | -1.25 | 0.522 | 2.61 | mg/kg | 5 | HSC | 09/09/08 | 1009 | 790812 | 3 |
| Cadmium | U | -0.919 | 0.522 | 2.61 | mg/kg | 5 | | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|-----------------------------|---------|----------|------|------------|
| SW846 3050B | 846 3050BS PREP | CXS3 | 09/08/08 | 0832 | 790808 |
| SW846 7471A Prep | EPA 7471A Mercury Prep Soil | TXB3 | 09/04/08 | 0810 | 790538 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|-------------------|------------------|
| 1 | SW846 7471A | |
| 2 | SW846 3050B/6010B | |
| 3 | SW846 3050B/6010B | |

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Project: **CES - Normal Deliverable**

Report Date: September 10, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-5 | Project: | LLNL00306 |
| Sample ID: | 214911003 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 28-AUG-08 11:25 | | |
| Receive Date: | 30-AUG-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|-----------|-----------|-------|-------|-------|----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>STLC Hg in Solid "As Received"</i> | | | | | | | | | | | |
| Mercury | J | 0.0907 | 0.030 | 0.200 | mg/L | 1 | JXL1 | 09/08/08 | 1220 | 791494 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>STLC ICP Metals for Solids "As Received"</i> | | | | | | | | | | | |
| Antimony | U | 0.00124 | 0.030 | 1.00 | mg/L | 1 | JWJ | 09/06/08 | 0005 | 791414 | 2 |
| Arsenic | J | 0.0908 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Barium | | 7.62 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Beryllium | U | -0.00365 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Cadmium | U | 0.00663 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Chromium | | 0.110 | 0.020 | 0.050 | mg/L | 1 | | | | | |
| Cobalt | | 0.286 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Copper | | 2.27 | 0.030 | 0.100 | mg/L | 1 | | | | | |
| Lead | | 0.192 | 0.025 | 0.100 | mg/L | 1 | | | | | |
| Molybdenum | J | 0.0271 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Nickel | | 0.365 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Selenium | U | 0.0433 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Silver | U | -0.000632 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Thallium | U | -0.000207 | 0.050 | 0.200 | mg/L | 1 | | | | | |
| Vanadium | | 0.181 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Zinc | | 1.45 | 0.020 | 0.100 | mg/L | 1 | HSC | 09/09/08 | 0904 | 791414 | 3 |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|-------------------------------|-------------------------------------|---------|----------|------|------------|
| California Code of Regulation | California Wet Method STLC Leaching | WXS1 | 09/02/08 | 1200 | 790317 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | AXG2 | 09/05/08 | 0805 | 791413 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 09/05/08 | 1435 | 791492 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |
| 3 | SW846 3010/6010B | |

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Project: **CES - Normal Deliverable**

Report Date: September 10, 2008

| | | | |
|-------------------|-----------------|------------|-----------|
| Client Sample ID: | 212-5 | Project: | LLNL00306 |
| Sample ID: | 214912003 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 28-AUG-08 11:25 | | |
| Receive Date: | 30-AUG-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|----------|--------|-------|-------|----|---------|----------|------|--------|--------|
| Mercury Analysis-CVAA | | | | | | | | | | | |
| <i>TCLP Hg in Solid "As Received"</i> | | | | | | | | | | | |
| Mercury | | 0.0541 | 0.0003 | 0.002 | mg/L | 1 | JXL1 | 09/05/08 | 1150 | 790913 | 1 |
| Metals Analysis-ICP | | | | | | | | | | | |
| <i>TCLP ICP Metals for Solid "As Received"</i> | | | | | | | | | | | |
| Antimony | U | 0.00542 | 0.030 | 0.100 | mg/L | 1 | HSC | 09/05/08 | 2143 | 790921 | 2 |
| Arsenic | U | -0.0267 | 0.050 | 0.150 | mg/L | 1 | | | | | |
| Barium | | 0.645 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Beryllium | U | -0.00105 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Cadmium | U | 0.000277 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Chromium | U | 0.0153 | 0.020 | 0.050 | mg/L | 1 | | | | | |
| Cobalt | U | -0.0171 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Copper | U | 0.0242 | 0.030 | 0.100 | mg/L | 1 | | | | | |
| Lead | J | 0.0364 | 0.025 | 0.100 | mg/L | 1 | | | | | |
| Molybdenum | U | -0.00412 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Nickel | J | 0.0128 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Silver | U | -0.0177 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Thallium | U | 0.00208 | 0.050 | 0.200 | mg/L | 1 | | | | | |
| Vanadium | U | 0.000703 | 0.010 | 0.050 | mg/L | 1 | | | | | |
| Zinc | J | 0.099 | 0.020 | 0.100 | mg/L | 1 | | | | | |
| Selenium | U | 0.0408 | 0.050 | 0.150 | mg/L | 1 | HSC | 09/09/08 | 1002 | 790921 | 3 |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|------------------|------------------------------------|---------|----------|------|------------|
| SW846 1311 | SW846 1311 TCLP Leaching -FEDERAL | MTM1 | 09/02/08 | 1700 | 790318 |
| SW846 3010A | ICP-TRACE TCLP by SW846 3010A | CXS3 | 09/04/08 | 0650 | 790919 |
| SW846 7470A Prep | EPA 7470A Mercury Prep TCLP Liquid | TXB3 | 09/04/08 | 1205 | 790912 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------|------------------|
| 1 | SW846 7470A | |
| 2 | SW846 3010/6010B | |
| 3 | SW846 3010/6010B | |



RD
Version 1.2
9/14/98

REVIEW of RADIOCHEMICAL DATA

CES COC# 17485 CES Sample # 212-5 Client Sample ID Mercury Contaminated Soil

Rad Dec # RHWM-RD-08-024-RD

| The sample was analyzed for : | | Subject was surveyed for: |
|--|---|--------------------------------------|
| <input checked="" type="checkbox"/> Bulk Gross Alpha | <input type="checkbox"/> Alpha TUPA | <input type="checkbox"/> Surface Rad |
| <input checked="" type="checkbox"/> Bulk Gross Beta | <input type="checkbox"/> Gamma Spec | |
| <input checked="" type="checkbox"/> Bulk Tritium | <input type="checkbox"/> Removable Rad α | |
| <input type="checkbox"/> Removable Rad H-3 | <input type="checkbox"/> Removable Rad β | |

| | \leq MDC | $>$ MDC | Check if by Limited Rad Declaration (LRD) |
|------------------------------|-------------------------------------|-------------------------------------|---|
| Bulk Contamination | | | |
| Gross Alpha | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Gross Beta | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Tritium | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Additional Analytical | | | |
| Gamma Spec | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Alpha TUPA | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Contamination | | | |
| Removable Rad H-3 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Removable Rad α | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Removable Rad β | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Rad α | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Rad β | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Radioactivity was was not can not say added to this sample.

Comments:

Gross alpha and gross beta activities were detected above their respective sample-specific MDCs and are above the Moratorium volumetric screening limits for NORM in non-suspect soils and soil-analogs. Tritium was not detected above the sample-specific MDC.

Finding by: Philip Torretto Date: September 16, 2008
Philip Torretto, x2-5515

Criteria limits are those of "LLNL Criteria for Identifying Mixed Waste" for materials with the possibility of bulk contamination and DOE 5400.5 and 5480.11 for those with the possibility of fixed and removable surface contamination. For removable surface contamination from unknown radionuclides, the limits are 20 dpm/100 cm² for gross alpha, 200 dpm/cm² for gross beta and 1000 dpm/100 cm² for tritium.

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : Lawrence Livermore National Security, LLC
 Address : 7000 East Avenue
 Mailstop L-620
 Livermore, California 94551
 Contact: Mr. Chad F. Davis
 Project: CES - Normal Deliverable

Report Date: September 9, 2008

| | | | |
|-------------------|-----------|------------|-----------|
| Client Sample ID: | 212-5 | Project: | LLNL00306 |
| Sample ID: | 214909003 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 28-AUG-08 | | |
| Receive Date: | 30-AUG-08 | | |
| Collector: | Client | | |
| Moisture: | 4.65% | | |

| Parameter | Qualifier | Result | Uncertainty | DL | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|--|-----------|--------|-------------|------|----------|-------|-------|----|---------|----------|------|--------|------|
| Gravimetric Solids | | | | | | | | | | | | | |
| <i>"As Received"</i> | | | | | | | | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i> | | | | | | | | | | | | | |
| Alpha | | 8.76 | +/-1.53 | 1.41 | +/-2.53 | 0.500 | pCi/g | | DXB5 | 09/06/08 | 1552 | 790537 | 2 |
| Beta | | 17.2 | +/-1.44 | 1.51 | +/-2.59 | 1.50 | pCi/g | | | | | | |
| Rad Liquid Scintillation Analysis | | | | | | | | | | | | | |
| <i>LSC, Tritium Dist, Solid "As Received"</i> | | | | | | | | | | | | | |
| Tritium | U | -0.376 | +/-0.936 | 1.74 | +/-0.936 | 2.00 | pCi/g | | SXB4 | 09/05/08 | 1138 | 790249 | 3 |

The following Analytical Methods were performed

| Method | Description |
|--------|------------------------|
| 1 | ASTM D 2216 (Modified) |
| 2 | EPA 900.0 Modified |
| 3 | EPA 906.0 Modified |

Notes:

The Qualifiers in this report are defined as follows :

- ** 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 For General Chemistry and Organic analysis the 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
- E Metals--%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Lawrence Livermore National Security, LLC
 7000 East Avenue
 Mailstop L-620
 Livermore, California

Report Date: September 10, 2008
 Page 1 of 4

Contact: Mr. Chad F. Davis

Workorder: 214909

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---------------------|--------------|--------|-------|---------|-------|-------|------|------------|-------|----------|-------|
| Metals Analysis-ICP | | | | | | | | | | | |
| Batch | 790812 | | | | | | | | | | |
| QC1201660209 | LCS | | | | | | | | | | |
| Antimony | 49.9 | | | 45.4 | mg/kg | | 91 | (80%-120%) | JWJ | 09/09/08 | 03:22 |
| Arsenic | 49.9 | | | 45.9 | mg/kg | | 92 | (80%-120%) | | | |
| Barium | 49.9 | | | 46.0 | mg/kg | | 92 | (80%-120%) | | | |
| Beryllium | 49.9 | | | 47.4 | mg/kg | | 95 | (80%-120%) | | | |
| Cadmium | 49.9 | | | 45.3 | mg/kg | | 91 | (80%-120%) | | | |
| Chromium | 49.9 | | | 45.1 | mg/kg | | 91 | (80%-120%) | | | |
| Cobalt | 49.9 | | | 45.7 | mg/kg | | 92 | (80%-120%) | | | |
| Copper | 49.9 | | | 46.4 | mg/kg | | 93 | (80%-120%) | | | |
| Lead | 49.9 | | | 45.0 | mg/kg | | 90 | (80%-120%) | | | |
| Molybdenum | 49.9 | | | 44.7 | mg/kg | | 90 | (80%-120%) | | | |
| Nickel | 49.9 | | | 44.7 | mg/kg | | 90 | (80%-120%) | | | |
| Selenium | 49.9 | | | 48.2 | mg/kg | | 97 | (80%-120%) | | | |
| Silver | 49.9 | | | 47.2 | mg/kg | | 95 | (80%-120%) | | | |
| Thallium | 49.9 | | | 44.9 | mg/kg | | 90 | (80%-120%) | | | |
| Vanadium | 49.9 | | | 46.2 | mg/kg | | 93 | (80%-120%) | | | |
| Zinc | 49.9 | | | 45.4 | mg/kg | | 91 | (80%-120%) | | | |
| QC1201660208 | MB | | | | | | | | | | |
| Antimony | | | U | 0.062 | mg/kg | | | | | 09/09/08 | 03:14 |
| Arsenic | | | J | 0.710 | mg/kg | | | | | | |
| Barium | | | U | 0.00499 | mg/kg | | | | | | |
| Beryllium | | | U | -0.0445 | mg/kg | | | | | | |
| Cadmium | | | U | 0.0058 | mg/kg | | | | | | |
| Chromium | | | U | 0.0195 | mg/kg | | | | | | |
| Cobalt | | | U | -0.0242 | mg/kg | | | | | | |
| Copper | | | U | 0.097 | mg/kg | | | | | | |
| Lead | | | U | 0.0583 | mg/kg | | | | | | |
| Molybdenum | | | U | -0.0109 | mg/kg | | | | | | |
| Nickel | | | U | 0.010 | mg/kg | | | | | | |
| Selenium | | | U | -0.235 | mg/kg | | | | | | |
| Silver | | | U | 0.0111 | mg/kg | | | | | | |
| Thallium | | | U | -0.328 | mg/kg | | | | | | |
| Vanadium | | | U | -0.0199 | mg/kg | | | | | | |
| Zinc | | | J | 0.212 | mg/kg | | | | | | |
| QC1201660210 | 214909001 MS | | | | | | | | | | |
| Antimony | 51.1 | U | -14.2 | J | 37.9 | mg/kg | 74* | (75%-125%) | HSC | 09/09/08 | 09:39 |
| Arsenic | 51.1 | | 7.89 | | 51.2 | mg/kg | 85 | (75%-125%) | JWJ | 09/09/08 | 03:36 |
| Barium | 51.1 | | 190 | | 218 | mg/kg | 55* | (75%-125%) | | | |

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QC Summary

Workorder: 214909

Page 2 of 4

| Paramname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|------------------------------|--------|--------|-------|---------|-------|------|------|------------|-------|----------|-------|
| Metals Analysis-ICP | | | | | | | | | | | |
| Batch | 790812 | | | | | | | | | | |
| Beryllium | 51.1 | U | -9.44 | 39.2 | mg/kg | | 77 | (75%-125%) | HSC | 09/09/08 | 09:39 |
| Cadmium | 51.1 | | 52.9 | 95.6 | mg/kg | | 84 | (75%-125%) | JWJ | 09/09/08 | 03:36 |
| Chromium | 51.1 | | 1020 | 1120 | mg/kg | | N/A | (75%-125%) | | | |
| Cobalt | 51.1 | | 19.4 | 62.4 | mg/kg | | 84 | (75%-125%) | | | |
| Copper | 51.1 | | 6020 | 3630 | mg/kg | | N/A | (75%-125%) | HSC | 09/09/08 | 09:39 |
| Lead | 51.1 | | 1920 | 1920 | mg/kg | | N/A | (75%-125%) | | | |
| Molybdenum | 51.1 | | 32.9 | 78.0 | mg/kg | | 88 | (75%-125%) | JWJ | 09/09/08 | 03:36 |
| Nickel | 51.1 | | 201 | 260 | mg/kg | | 114 | (75%-125%) | | | |
| Selenium | 51.1 | | 7.33 | 51.5 | mg/kg | | 86 | (75%-125%) | | | |
| Silver | 51.1 | | 206 | 353 | mg/kg | | N/A | (75%-125%) | HSC | 09/09/08 | 09:39 |
| Thallium | 51.1 | J | 1.98 | 43.6 | mg/kg | | 82 | (75%-125%) | JWJ | 09/09/08 | 03:36 |
| Vanadium | 51.1 | | 37.7 | 85.2 | mg/kg | | 93 | (75%-125%) | | | |
| Zinc | 51.1 | | 3850 | 2000 | mg/kg | | N/A | (75%-125%) | HSC | 09/09/08 | 09:39 |
| QC1201660211 214909001 MSD | | | | | | | | | | | |
| Antimony | 50.9 | U | -14.2 | J 31.6 | mg/kg | 18 | 62* | (0%-20%) | | 09/09/08 | 09:47 |
| Arsenic | 50.9 | | 7.89 | 52.5 | mg/kg | 3 | 88 | (0%-20%) | JWJ | 09/09/08 | 03:44 |
| Barium | 50.9 | | 190 | 210 | mg/kg | 4 | 40* | (0%-20%) | | | |
| Beryllium | 50.9 | U | -9.44 | 36.8 | mg/kg | 6 | 72* | (0%-20%) | HSC | 09/09/08 | 09:47 |
| Cadmium | 50.9 | | 52.9 | 92.4 | mg/kg | 3 | 78 | (0%-20%) | JWJ | 09/09/08 | 03:44 |
| Chromium | 50.9 | | 1020 | 871 | mg/kg | 25* | N/A | (0%-20%) | | | |
| Cobalt | 50.9 | | 19.4 | 59.4 | mg/kg | 5 | 79 | (0%-20%) | | | |
| Copper | 50.9 | | 6020 | 2260 | mg/kg | 47* | N/A | (0%-20%) | HSC | 09/09/08 | 09:47 |
| Lead | 50.9 | | 1920 | 2780 | mg/kg | 37* | N/A | (0%-20%) | | | |
| Molybdenum | 50.9 | | 32.9 | 75.6 | mg/kg | 3 | 84 | (0%-20%) | JWJ | 09/09/08 | 03:44 |
| Nickel | 50.9 | | 201 | 147 | mg/kg | 55* | 0* | (0%-20%) | | | |
| Selenium | 50.9 | | 7.33 | 51.7 | mg/kg | 0 | 87 | (0%-20%) | | | |
| Silver | 50.9 | | 206 | 221 | mg/kg | 46* | N/A | (0%-20%) | HSC | 09/09/08 | 09:47 |
| Thallium | 50.9 | J | 1.98 | 39.2 | mg/kg | 11 | 73* | (0%-20%) | JWJ | 09/09/08 | 03:44 |
| Vanadium | 50.9 | | 37.7 | 83.2 | mg/kg | 2 | 89 | (0%-20%) | | | |
| Zinc | 50.9 | | 3850 | 1780 | mg/kg | 12 | N/A | (0%-20%) | HSC | 09/09/08 | 09:47 |
| QC1201660212 214909001 SDILT | | | | | | | | | | | |
| Antimony | | U | -2.9 | U 0.574 | ug/L | N/A | | (0%-10%) | | 09/09/08 | 09:55 |
| Arsenic | | | 80.3 | 18.9 | ug/L | 17.3 | | (0%-10%) | JWJ | 09/09/08 | 03:51 |
| Barium | | | 1930 | 408 | ug/L | 5.7 | | (0%-10%) | | | |
| Beryllium | | U | -1.92 | U -1.8 | ug/L | N/A | | (0%-10%) | HSC | 09/09/08 | 09:55 |
| Cadmium | | | 539 | 113 | ug/L | 4.43 | | (0%-10%) | JWJ | 09/09/08 | 03:51 |
| Chromium | | | 10400 | 2190 | ug/L | 5.69 | | (0%-10%) | | | |
| Cobalt | | | 197 | 42.0 | ug/L | 6.36 | | (0%-10%) | | | |
| Copper | | | 1230 | 250 | ug/L | 1.87 | | (0%-10%) | HSC | 09/09/08 | 09:55 |
| Lead | | | 390 | 77.5 | ug/L | .709 | | (0%-10%) | | | |
| Molybdenum | | | 335 | 70.0 | ug/L | 4.5 | | (0%-10%) | JWJ | 09/09/08 | 03:51 |
| Nickel | | | 2050 | 437 | ug/L | 6.67 | | (0%-10%) | | | |

GEL LABORATORIES LLC

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

QC Summary

Workorder: 214909

Page 3 of 4

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time | |
|--------------------------------|-----------------|--------|------|--------|-------|----------|-------|-------|-------|------------|------|----------------|
| Metals Analysis-ICP | | | | | | | | | | | | |
| Batch | 790812 | | | | | | | | | | | |
| Selenium | | | | 74.6 | | 36.7 | ug/L | 146 | | (0%-10%) | | |
| Silver | | | | 42.0 | | 8.24 | ug/L | 1.85 | | (0%-10%) | HSC | 09/09/08 09:55 |
| Thallium | | J | U | 20.2 | | 4.44 | ug/L | N/A | | (0%-10%) | JWJ | 09/09/08 03:51 |
| Vanadium | | | | 383 | | 76.4 | ug/L | .311 | | (0%-10%) | | |
| Zinc | | | | 784 | | 158 | ug/L | .604 | | (0%-10%) | HSC | 09/09/08 09:55 |
| Metals Analysis-Mercury | | | | | | | | | | | | |
| Batch | 790539 | | | | | | | | | | | |
| QC1201659498 | LCS | | | | | | | | | | | |
| Mercury | | | | 0.0984 | | 0.104 | mg/kg | | 106 | (80%-120%) | JXL1 | 09/04/08 13:47 |
| QC1201659497 | MB | | | | | | | | | | | |
| Mercury | | | U | | | -0.00145 | mg/kg | | | | | 09/04/08 13:45 |
| QC1201659499 | 214909001 MS | | | | | | | | | | | |
| Mercury | | | | 0.102 | 2490 | 2800 | mg/kg | | N/A | (75%-125%) | | 09/04/08 15:43 |
| QC1201659500 | 214909001 MSD | | | | | | | | | | | |
| Mercury | | | | 0.102 | 2490 | 2540 | mg/kg | 10 | N/A | (0%-20%) | | 09/04/08 15:45 |
| QC1201659501 | 214909001 SDILT | | | | | | | | | | | |
| Mercury | | | | 1.96 | | 0.354 | ug/L | 9.9 | | (0%-10%) | | 09/04/08 15:47 |

Notes:

The Qualifiers in this report are defined as follows:

- ** 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 For General Chemistry and Organic analysis the 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
- E Metals--%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

GEL LABORATORIES LLC

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

QC Summary

Workorder: 214909

Page 4 of 4

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------|-----|--|------|----|-------|------|------|-------|-------|------|------|
| 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. Qualifier Not Applicable for Radiochemistry. | | | | | | | | | |
| 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.

^ 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.

* Indicates that a Quality Control parameter was not within specifications.

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.

COMPANY - WIDE NONCONFORMANCE REPORT

| | | | |
|---|--|---|-----------------------------|
| Mo. Day Yr. 09-SEP-08 | Division: Federal | Quality Criteria: Specifications | Type: Process |
| Instrument Type: ICP | Test / Method: SW846 3050B/6010B | Matrix Type: Solid | Client Code: LLNL |
| Batch ID: 790812 | Sample Numbers: See Below | | |
| Potentially affected work order(s)(SDG): 214909 | | | |
| Application Issues: Failed Recovery for MS/PS Failed RPD for MS/MSD, or PS/PSD Failed Recovery for MSD/PSD | | | |
| Specification and Requirements | | NRG Disposition: | |
| Nonconformance Description: | | | |
| 1. Failed Recovery for MS/PS: QC 1201660210MS 2. Failed RPD for MS/MSD, or PS/PSD: QC 1201660211MSD 3. Failed Recovery for MSD/PSD: QC 1201660211MSD | | 1. The matrix spike recovery failed for antimony, barium and silver while matrix spike duplicate failed for barium, antimony, nickel, thallium, beryllium and silver due to possible matrix interference. 2. The RPD failed on matrix spike duplicate for chromium, nickel, copper, lead and silver due to sample not homogeneous. Sample #214909001 is a brown soil with plant matter. Data are qualified and reported. | |

Originator's Name:
 Helen Camello 09-SEP-08

Data Validator/Group Leader:
 Bryan Davis 10-SEP-08

Quality Review:

Director:

GEL LABORATORIES LLC

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

QC Summary

Lawrence Livermore National Security, LLC
7000 East Avenue
Mailstop L-620
Livermore, California

Report Date: September 10, 2008
Page 1 of 4

Contact: Mr. Chad F. Davis

Workorder: 214911

| Paramname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---------------------|--------------|--------|---------|----------|-------|------|------|------------|-------|----------|-------|
| Metals Analysis-ICP | | | | | | | | | | | |
| Batch | 791414 | | | | | | | | | | |
| QC1201661526 | LCS | | | | | | | | | | |
| Antimony | 2.00 | | | 1.92 | mg/L | | 96 | (80%-120%) | JWJ | 09/05/08 | 23:13 |
| Arsenic | 5.00 | | | 4.82 | mg/L | | 96 | (80%-120%) | | | |
| Barium | 10.0 | | | 10.2 | mg/L | | 102 | (80%-120%) | | | |
| Beryllium | 2.00 | | | 1.96 | mg/L | | 98 | (80%-120%) | | | |
| Cadmium | 1.00 | | | 0.971 | mg/L | | 97 | (80%-120%) | | | |
| Chromium | 5.00 | | | 5.06 | mg/L | | 101 | (80%-120%) | | | |
| Cobalt | 2.00 | | | 2.06 | mg/L | | 103 | (80%-120%) | | | |
| Copper | 2.00 | | | 2.06 | mg/L | | 103 | (80%-120%) | | | |
| Lead | 5.00 | | | 4.96 | mg/L | | 99 | (80%-120%) | | | |
| Molybdenum | 2.00 | | | 2.02 | mg/L | | 101 | (80%-120%) | | | |
| Nickel | 2.00 | | | 2.04 | mg/L | | 102 | (80%-120%) | | | |
| Selenium | 1.00 | | | 0.910 | mg/L | | 91 | (80%-120%) | | | |
| Silver | 0.500 | | | 0.497 | mg/L | | 100 | (80%-120%) | | | |
| Thallium | 2.00 | | | 1.97 | mg/L | | 99 | (80%-120%) | | | |
| Vanadium | 2.00 | | | 2.07 | mg/L | | 104 | (80%-120%) | | | |
| Zinc | 2.00 | | | 2.04 | mg/L | | 102 | (80%-120%) | HSC | 09/09/08 | 08:15 |
| QC1201661525 | MB | | | | | | | | | | |
| Antimony | | | U | 0.0138 | mg/L | | | | JWJ | 09/05/08 | 22:58 |
| Arsenic | | | U | -0.0039 | mg/L | | | | | | |
| Barium | | | U | 0.000741 | mg/L | | | | | | |
| Beryllium | | | U | -0.00128 | mg/L | | | | | | |
| Cadmium | | | U | 0.00055 | mg/L | | | | | | |
| Chromium | | | U | 0.00265 | mg/L | | | | | | |
| Cobalt | | | U | -0.00176 | mg/L | | | | | | |
| Copper | | | U | -0.0012 | mg/L | | | | | | |
| Lead | | | U | 0.0195 | mg/L | | | | | | |
| Molybdenum | | | U | 0.00188 | mg/L | | | | | | |
| Nickel | | | U | -0.00164 | mg/L | | | | | | |
| Selenium | | | U | -0.0148 | mg/L | | | | | | |
| Silver | | | U | -0.0031 | mg/L | | | | | | |
| Thallium | | | U | -0.0129 | mg/L | | | | | | |
| Vanadium | | | U | 0.000221 | mg/L | | | | | | |
| Zinc | | | J | 0.0988 | mg/L | | | | HSC | 09/09/08 | 08:01 |
| QC1201659017 | 214600001 MS | | | | | | | | | | |
| Antimony | 2.11 | U | -0.0227 | 1.86 | mg/L | | 88 | (75%-125%) | JWJ | 09/05/08 | 23:28 |
| Arsenic | 5.26 | U | 0.0299 | 5.05 | mg/L | | 95 | (75%-125%) | | | |
| Barium | 10.5 | | 0.0534 | 9.68 | mg/L | | 92 | (75%-125%) | | | |

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QC Summary

Workorder: 214911

Page 2 of 4

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|------------------------------|--------|--------|----------|-------|--------|------|------|------------|-------|----------|-------|
| Metals Analysis-ICP | | | | | | | | | | | |
| Batch | 791414 | | | | | | | | | | |
| Beryllium | 2.11 | U | -0.0048 | 1.87 | mg/L | | 89 | (75%-125%) | | | |
| Cadmium | 1.05 | U | -0.0019 | 0.940 | mg/L | | 89 | (75%-125%) | JWJ | 09/05/08 | 23:28 |
| Chromium | 5.26 | U | 0.0193 | 4.95 | mg/L | | 94 | (75%-125%) | | | |
| Cobalt | 2.11 | U | -0.00282 | 1.83 | mg/L | | 87 | (75%-125%) | | | |
| Copper | 2.11 | J | 0.0576 | 2.12 | mg/L | | 98 | (75%-125%) | | | |
| Lead | 5.26 | J | 0.0799 | 4.69 | mg/L | | 88 | (75%-125%) | | | |
| Molybdenum | 2.11 | J | 0.0208 | 2.02 | mg/L | | 95 | (75%-125%) | | | |
| Nickel | 2.11 | | 0.0655 | 1.95 | mg/L | | 89 | (75%-125%) | | | |
| Selenium | 1.05 | U | 0.0438 | 1.02 | mg/L | | 93 | (75%-125%) | | | |
| Silver | 0.526 | U | -0.00291 | 0.472 | mg/L | | 90 | (75%-125%) | | | |
| Thallium | 2.11 | U | -0.0642 | 1.70 | mg/L | | 81 | (75%-125%) | | | |
| Vanadium | 2.11 | U | -0.00609 | 2.05 | mg/L | | 97 | (75%-125%) | | | |
| Zinc | 2.11 | | 1.02 | 2.90 | mg/L | | 89 | (75%-125%) | HSC | 09/09/08 | 08:29 |
| QC1201659019 214600001 MSD | | | | | | | | | | | |
| Antimony | 2.11 | U | -0.0227 | 1.82 | mg/L | 2 | 87 | (0%-20%) | JWJ | 09/05/08 | 23:35 |
| Arsenic | 5.26 | U | 0.0299 | 4.92 | mg/L | 3 | 93 | (0%-20%) | | | |
| Barium | 10.5 | | 0.0534 | 9.59 | mg/L | 1 | 91 | (0%-20%) | | | |
| Beryllium | 2.11 | U | -0.0048 | 1.85 | mg/L | 1 | 88 | (0%-20%) | | | |
| Cadmium | 1.05 | U | -0.0019 | 0.925 | mg/L | 2 | 88 | (0%-20%) | | | |
| Chromium | 5.26 | U | 0.0193 | 4.92 | mg/L | 1 | 93 | (0%-20%) | | | |
| Cobalt | 2.11 | U | -0.00282 | 1.79 | mg/L | 2 | 85 | (0%-20%) | | | |
| Copper | 2.11 | J | 0.0576 | 2.10 | mg/L | 1 | 97 | (0%-20%) | | | |
| Lead | 5.26 | J | 0.0799 | 4.59 | mg/L | 2 | 86 | (0%-20%) | | | |
| Molybdenum | 2.11 | J | 0.0208 | 1.98 | mg/L | 2 | 93 | (0%-20%) | | | |
| Nickel | 2.11 | | 0.0655 | 1.91 | mg/L | 2 | 88 | (0%-20%) | | | |
| Selenium | 1.05 | U | 0.0438 | 0.980 | mg/L | 4 | 89 | (0%-20%) | | | |
| Silver | 0.526 | U | -0.00291 | 0.472 | mg/L | 0 | 90 | (0%-20%) | | | |
| Thallium | 2.11 | U | -0.0642 | 1.68 | mg/L | 1 | 80 | (0%-20%) | | | |
| Vanadium | 2.11 | U | -0.00609 | 2.03 | mg/L | 1 | 96 | (0%-20%) | | | |
| Zinc | 2.11 | | 1.02 | 2.87 | mg/L | 1 | 88 | (0%-20%) | HSC | 09/09/08 | 08:36 |
| QC1201661529 214600001 SDILT | | | | | | | | | | | |
| Antimony | | U | -2.27 | U | -1.59 | ug/L | N/A | (0%-10%) | JWJ | 09/05/08 | 23:42 |
| Arsenic | | U | 2.99 | U | 2.89 | ug/L | N/A | (0%-10%) | | | |
| Barium | | | 5.34 | J | 1.16 | ug/L | 8.98 | (0%-10%) | | | |
| Beryllium | | U | -0.48 | U | -0.264 | ug/L | N/A | (0%-10%) | | | |
| Cadmium | | U | -0.19 | U | 0.0544 | ug/L | N/A | (0%-10%) | | | |
| Chromium | | U | 1.93 | U | 0.599 | ug/L | N/A | (0%-10%) | | | |
| Cobalt | | U | -0.282 | U | -0.238 | ug/L | N/A | (0%-10%) | | | |
| Copper | | J | 5.76 | U | 1.37 | ug/L | N/A | (0%-10%) | | | |
| Lead | | J | 7.99 | J | 3.45 | ug/L | 116 | (0%-10%) | | | |
| Molybdenum | | J | 2.08 | U | 0.529 | ug/L | N/A | (0%-10%) | | | |
| Nickel | | | 6.55 | U | 0.952 | ug/L | N/A | (0%-10%) | | | |

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QC Summary

Workorder: 214911

Page 3 of 4

| Parname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|--------------------------------|-----------------|--------|---------|----------|---------|------|------|---------------|-------|----------|-------|
| Metals Analysis-ICP | | | | | | | | | | | |
| Batch | 791414 | | | | | | | | | | |
| Selenium | U | 4.38 | U | -4.7 | ug/L | N/A | | (0%-10%) | | | |
| Silver | U | -0.291 | U | -0.242 | ug/L | N/A | | (0%-10%) | JWJ | 09/05/08 | 23:42 |
| Thallium | U | -6.42 | U | 1.87 | ug/L | N/A | | (0%-10%) | | | |
| Vanadium | U | -0.609 | U | -0.142 | ug/L | N/A | | (0%-10%) | | | |
| Zinc | | 102 | | 22.0 | ug/L | 7.41 | | (0%-10%) | HSC | 09/09/08 | 08:43 |
| QC1201659021 | TB | | | | | | | | | | |
| Antimony | | | U | -0.0456 | mg/L | | | | JWJ | 09/05/08 | 23:06 |
| Arsenic | | | U | 0.0359 | mg/L | | | | | | |
| Barium | | | J | 0.0128 | mg/L | | | | | | |
| Beryllium | | | U | -0.00651 | mg/L | | | | | | |
| Cadmium | | | U | -0.00378 | mg/L | | | | | | |
| Chromium | | | U | 0.0102 | mg/L | | | | | | |
| Cobalt | | | U | -0.0067 | mg/L | | | | | | |
| Copper | | | U | 0.0195 | mg/L | | | | | | |
| Lead | | | U | 0.0234 | mg/L | | | | | | |
| Molybdenum | | | J | 0.0328 | mg/L | | | | | | |
| Nickel | | | J | 0.0145 | mg/L | | | | | | |
| Selenium | | | J | 0.110 | mg/L | | | | | | |
| Silver | | | U | -0.00569 | mg/L | | | | | | |
| Thallium | | | U | -0.0774 | mg/L | | | | | | |
| Vanadium | | | U | -0.0102 | mg/L | | | | | | |
| Zinc | | | J | 0.0891 | mg/L | | | | HSC | 09/09/08 | 08:08 |
| Metals Analysis-Mercury | | | | | | | | | | | |
| Batch | 791494 | | | | | | | | | | |
| QC1201661774 | LCS | | | | | | | | | | |
| Mercury | 2.00 | | | 2.07 | mg/L | | 103 | (80%-120%) | JXL1 | 09/08/08 | 12:02 |
| QC1201661773 | MB | | | | | | | | | | |
| Mercury | | | U | -0.0224 | mg/L | | | | | 09/08/08 | 12:00 |
| QC1201659018 | 214600001 MS | | | | | | | | | | |
| Mercury | 0.020 | U | -0.0389 | U | -0.039 | mg/L | | 0* (75%-125%) | | 09/08/08 | 12:10 |
| QC1201659020 | 214600001 MSD | | | | | | | | | | |
| Mercury | 0.020 | U | -0.0389 | U | -0.0218 | mg/L | 57 * | 0* (0%-20%) | | 09/08/08 | 12:12 |
| QC1201661777 | 214600001 SDILT | | | | | | | | | | |
| Mercury | | U | -0.0389 | U | -0.0397 | ug/L | N/A | (0%-10%) | | 09/08/08 | 12:14 |
| QC1201659021 | TB | | | | | | | | | | |
| Mercury | | | U | -0.0186 | mg/L | | | | | 09/08/08 | 11:58 |

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported

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QC Summary

Workorder: 214911

Page 4 of 4

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------|--|--------|------|----|-------|------|------|-------|-------|------|------|
| A | The TIC is a suspected aldol-condensation product | | | | | | | | | | |
| B | For General Chemistry and Organic analysis the target analyte was detected in the associated blank. | | | | | | | | | | |
| C | Analyte has been confirmed by GC/MS analysis | | | | | | | | | | |
| D | Results are reported from a diluted aliquot of the sample | | | | | | | | | | |
| E | Metals--%difference of sample and SD is >10%. Sample concentration must meet flagging criteria | | | | | | | | | | |
| F | Estimated Value | | | | | | | | | | |
| H | Analytical holding time was exceeded | | | | | | | | | | |
| J | Value is estimated | | | | | | | | | | |
| M | Matrix Related Failure | | | | | | | | | | |
| N/A | RPD or %Recovery limits do not apply. | | | | | | | | | | |
| ND | Analyte concentration is not detected above the detection limit | | | | | | | | | | |
| NJ | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier | | | | | | | | | | |
| R | Sample results are rejected | | | | | | | | | | |
| U | Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. | | | | | | | | | | |
| 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. Qualifier Not Applicable for Radiochemistry. | | | | | | | | | | |
| 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.

^ 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.

* Indicates that a Quality Control parameter was not within specifications.

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.

COMPANY - WIDE NONCONFORMANCE REPORT

| | | | |
|------------------------------------|--------------------------------------|--|-----------------------------|
| Mo.Day Yr. 08-SEP-08 | Division: Federal | Quality Criteria: Specifications | Type: Process |
| Instrument Type: MERCURY | Test / Method: SW846 7470A | Matrix Type: Solid | Client Code: LLNL |
| Batch ID: 791494 | Sample Numbers: See Below | | |

Potentially affected work order(s)(SDG): 214600(214597-1),214911(214909-1)

Application Issues:

- Failed Recovery for MS/PS
- Failed RPD for MS/MSD, or PS/PSD
- Failed Recovery for MSD/PSD

**Specification and Requirements
 Nonconformance Description:**

NRG Disposition:

1. Failed Recovery for MS/PS:
 QC 1201659018MS
2. Failed RPD for MS/MSD, or PS/PSD:
 QC 1201659020MSD
3. Failed Recovery for MSD/PSD:
 QC 1201659020MSD

1. The MS and MSD recovered outside of their acceptance windows due to the prep factor of 1000x. Data reported as is.

Originator's Name:
 Jason Loy 08-SEP-08

Data Validator/Group Leader:
 Jamie Johnson 09-SEP-08

Quality Review:

Director:

GEL LABORATORIES LLC

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QC Summary

Report Date: September 10, 2008

Page 1 of 4

Lawrence Livermore National Security, LLC
7000 East Avenue
Mailstop L-620
Livermore, California

Contact: Mr. Chad F. Davis

Workorder: 214912

| Parname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---------------------------|-------|--------|--------|----------|-------|------|------|------------|-------|----------|-------|
| Metals Analysis-ICP | | | | | | | | | | | |
| Batch 790921 | | | | | | | | | | | |
| QC1201660440 LCS | | | | | | | | | | | |
| Antimony | 2.00 | | | 2.06 | mg/L | | 103 | (80%-120%) | HSC | 09/05/08 | 20:54 |
| Arsenic | 5.00 | | | 5.32 | mg/L | | 106 | (80%-120%) | | | |
| Barium | 10.0 | | | 10.5 | mg/L | | 105 | (80%-120%) | | | |
| Beryllium | 2.00 | | | 2.00 | mg/L | | 100 | (80%-120%) | | | |
| Cadmium | 1.00 | | | 0.985 | mg/L | | 99 | (80%-120%) | | | |
| Chromium | 5.00 | | | 5.16 | mg/L | | 103 | (80%-120%) | | | |
| Cobalt | 2.00 | | | 2.02 | mg/L | | 101 | (80%-120%) | | | |
| Copper | 2.00 | | | 2.11 | mg/L | | 105 | (80%-120%) | | | |
| Lead | 5.00 | | | 5.19 | mg/L | | 104 | (80%-120%) | | | |
| Molybdenum | 2.00 | | | 2.09 | mg/L | | 105 | (80%-120%) | | | |
| Nickel | 2.00 | | | 1.98 | mg/L | | 99 | (80%-120%) | | | |
| Selenium | 1.00 | | | 1.03 | mg/L | | 103 | (80%-120%) | | 09/09/08 | 09:42 |
| Silver | 0.500 | | | 0.490 | mg/L | | 98 | (80%-120%) | | 09/05/08 | 20:54 |
| Thallium | 2.00 | | | 2.01 | mg/L | | 101 | (80%-120%) | | | |
| Vanadium | 2.00 | | | 2.11 | mg/L | | 105 | (80%-120%) | | | |
| Zinc | 2.00 | | | 2.06 | mg/L | | 103 | (80%-120%) | | | |
| QC1201660439 MB | | | | | | | | | | | |
| Antimony | | | J | 0.0509 | mg/L | | | | | 09/05/08 | 20:40 |
| Arsenic | | | U | -0.0321 | mg/L | | | | | | |
| Barium | | | U | -0.00131 | mg/L | | | | | | |
| Beryllium | | | U | -0.00182 | mg/L | | | | | | |
| Cadmium | | | U | -0.00191 | mg/L | | | | | | |
| Chromium | | | U | 0.0101 | mg/L | | | | | | |
| Cobalt | | | U | -0.00635 | mg/L | | | | | | |
| Copper | | | U | 0.00429 | mg/L | | | | | | |
| Lead | | | U | 0.00987 | mg/L | | | | | | |
| Molybdenum | | | U | -0.00326 | mg/L | | | | | | |
| Nickel | | | U | -0.00262 | mg/L | | | | | | |
| Selenium | | | U | 0.0389 | mg/L | | | | | 09/09/08 | 09:28 |
| Silver | | | U | -0.00627 | mg/L | | | | | 09/05/08 | 20:40 |
| Thallium | | | U | -0.0111 | mg/L | | | | | | |
| Vanadium | | | U | -0.00689 | mg/L | | | | | | |
| Zinc | | | J | 0.0312 | mg/L | | | | | | |
| QC1201659027 214602001 MS | | | | | | | | | | | |
| Antimony | 2.11 | J | 0.0804 | 2.16 | mg/L | | 99 | (75%-125%) | | 09/05/08 | 21:08 |
| Arsenic | 5.26 | U | 0.016 | 5.49 | mg/L | | 104 | (75%-125%) | | | |
| Barium | 10.5 | J | 0.0395 | 10.2 | mg/L | | 97 | (75%-125%) | | | |

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QC Summary

Workorder: 214912

Page 2 of 4

| Paramname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|------------------------------|--------|--------|----------|-------|--------|------|------|------------|-------|----------|-------|
| Metals Analysis-ICP | | | | | | | | | | | |
| Batch | 790921 | | | | | | | | | | |
| Beryllium | 2.11 | U | -0.00293 | 1.98 | mg/L | | 94 | (75%-125%) | | | |
| Cadmium | 1.05 | U | -0.00446 | 1.02 | mg/L | | 97 | (75%-125%) | HSC | 09/05/08 | 21:08 |
| Chromium | 5.26 | J | 0.0223 | 5.10 | mg/L | | 97 | (75%-125%) | | | |
| Cobalt | 2.11 | U | -0.0118 | 1.95 | mg/L | | 93 | (75%-125%) | | | |
| Copper | 2.11 | U | 0.0282 | 2.23 | mg/L | | 105 | (75%-125%) | | | |
| Lead | 5.26 | U | 0.0194 | 5.25 | mg/L | | 99 | (75%-125%) | | | |
| Molybdenum | 2.11 | J | 0.0246 | 2.13 | mg/L | | 100 | (75%-125%) | | | |
| Nickel | 2.11 | J | 0.0259 | 2.02 | mg/L | | 95 | (75%-125%) | | | |
| Selenium | 1.05 | U | 0.0294 | 0.964 | mg/L | | 89 | (75%-125%) | | 09/09/08 | 10:38 |
| Silver | 0.526 | U | -0.00987 | 0.486 | mg/L | | 92 | (75%-125%) | | 09/05/08 | 21:08 |
| Thallium | 2.11 | U | -0.0404 | 2.07 | mg/L | | 99 | (75%-125%) | | | |
| Vanadium | 2.11 | U | -0.00808 | 2.10 | mg/L | | 100 | (75%-125%) | | | |
| Zinc | 2.11 | | 0.435 | 2.49 | mg/L | | 98 | (75%-125%) | | | |
| QC1201659029 214602001 MSD | | | | | | | | | | | |
| Antimony | 2.11 | J | 0.0804 | 2.20 | mg/L | 2 | 101 | (0%-20%) | | 09/05/08 | 21:15 |
| Arsenic | 5.26 | U | 0.016 | 5.68 | mg/L | 3 | 108 | (0%-20%) | | | |
| Barium | 10.5 | J | 0.0395 | 10.5 | mg/L | 2 | 99 | (0%-20%) | | | |
| Beryllium | 2.11 | U | -0.00293 | 2.01 | mg/L | 2 | 96 | (0%-20%) | | | |
| Cadmium | 1.05 | U | -0.00446 | 1.06 | mg/L | 4 | 100 | (0%-20%) | | | |
| Chromium | 5.26 | J | 0.0223 | 5.18 | mg/L | 2 | 98 | (0%-20%) | | | |
| Cobalt | 2.11 | U | -0.0118 | 2.03 | mg/L | 4 | 96 | (0%-20%) | | | |
| Copper | 2.11 | U | 0.0282 | 2.27 | mg/L | 2 | 107 | (0%-20%) | | | |
| Lead | 5.26 | U | 0.0194 | 5.41 | mg/L | 3 | 103 | (0%-20%) | | | |
| Molybdenum | 2.11 | J | 0.0246 | 2.22 | mg/L | 4 | 104 | (0%-20%) | | | |
| Nickel | 2.11 | J | 0.0259 | 2.09 | mg/L | 3 | 98 | (0%-20%) | | | |
| Selenium | 1.05 | U | 0.0294 | 0.973 | mg/L | 1 | 90 | (0%-20%) | | 09/09/08 | 10:45 |
| Silver | 0.526 | U | -0.00987 | 0.471 | mg/L | 3 | 90 | (0%-20%) | | 09/05/08 | 21:15 |
| Thallium | 2.11 | U | -0.0404 | 2.10 | mg/L | 1 | 100 | (0%-20%) | | | |
| Vanadium | 2.11 | U | -0.00808 | 2.13 | mg/L | 1 | 101 | (0%-20%) | | | |
| Zinc | 2.11 | | 0.435 | 2.54 | mg/L | 2 | 100 | (0%-20%) | | | |
| QC1201660443 214602001 SDILT | | | | | | | | | | | |
| Antimony | | J | 8.04 | U | -0.844 | ug/L | N/A | (0%-10%) | | 09/05/08 | 21:22 |
| Arsenic | | U | 1.60 | U | 3.40 | ug/L | N/A | (0%-10%) | | | |
| Barium | | J | 3.95 | U | 0.832 | ug/L | N/A | (0%-10%) | | | |
| Beryllium | | U | -0.293 | U | -0.261 | ug/L | N/A | (0%-10%) | | | |
| Cadmium | | U | -0.446 | U | -0.633 | ug/L | N/A | (0%-10%) | | | |
| Chromium | | J | 2.23 | U | 0.844 | ug/L | N/A | (0%-10%) | | | |
| Cobalt | | U | -1.18 | U | -1.03 | ug/L | N/A | (0%-10%) | | | |
| Copper | | U | 2.82 | U | 1.31 | ug/L | N/A | (0%-10%) | | | |
| Lead | | U | 1.94 | J | 3.05 | ug/L | N/A | (0%-10%) | | | |
| Molybdenum | | J | 2.46 | U | -0.404 | ug/L | N/A | (0%-10%) | | | |
| Nickel | | J | 2.59 | U | -0.68 | ug/L | N/A | (0%-10%) | | | |

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QC Summary

Workorder: 214912

Page 3 of 4

| Parname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|--------------------------------|-----------------|--------|-----------|-----------|-------|------|------|------------|-------|----------|-------|
| Metals Analysis-ICP | | | | | | | | | | | |
| Batch | 790921 | | | | | | | | | | |
| Selenium | U | 2.94 | U | -4.06 | ug/L | N/A | | (0%-10%) | | 09/09/08 | 10:52 |
| Silver | U | -0.987 | U | 0.0708 | ug/L | N/A | | (0%-10%) | HSC | 09/05/08 | 21:22 |
| Thallium | U | -4.04 | U | -2.26 | ug/L | N/A | | (0%-10%) | | | |
| Vanadium | U | -0.808 | U | -0.71 | ug/L | N/A | | (0%-10%) | | | |
| Zinc | | 43.5 | J | 9.23 | ug/L | 6.19 | | (0%-10%) | | | |
| QC1201659031 | TB | | | | | | | | | | |
| Antimony | | | J | 0.0405 | mg/L | | | | | 09/05/08 | 20:47 |
| Arsenic | | | U | -0.0209 | mg/L | | | | | | |
| Barium | | | U | -0.000057 | mg/L | | | | | | |
| Beryllium | | | U | -0.00388 | mg/L | | | | | | |
| Cadmium | | | U | -0.00645 | mg/L | | | | | | |
| Chromium | | | U | 0.0125 | mg/L | | | | | | |
| Cobalt | | | U | -0.0131 | mg/L | | | | | | |
| Copper | | | U | 0.0177 | mg/L | | | | | | |
| Lead | | | U | 0.0225 | mg/L | | | | | | |
| Molybdenum | | | U | 0.00171 | mg/L | | | | | | |
| Nickel | | | | 0.0718 | mg/L | | | | | | |
| Selenium | | | U | 0.0395 | mg/L | | | | | 09/09/08 | 10:24 |
| Silver | | | U | -0.00627 | mg/L | | | | | 09/05/08 | 20:47 |
| Thallium | | | U | -0.0714 | mg/L | | | | | | |
| Vanadium | | | U | -0.0135 | mg/L | | | | | | |
| Zinc | | | J | 0.0988 | mg/L | | | | | | |
| Metals Analysis-Mercury | | | | | | | | | | | |
| Batch | 790913 | | | | | | | | | | |
| QC1201660422 | LCS | | | | | | | | | | |
| Mercury | 0.020 | | | 0.0215 | mg/L | | 108 | (80%-120%) | JXL1 | 09/05/08 | 11:19 |
| QC1201660421 | MB | | | | | | | | | | |
| Mercury | | | U | -0.000894 | mg/L | | | | | 09/05/08 | 11:17 |
| QC1201659028 | 214602001 MS | | | | | | | | | | |
| Mercury | 0.020 | U | -0.000992 | 0.0145 | mg/L | | 73 * | (75%-125%) | | 09/05/08 | 11:23 |
| QC1201659030 | 214602001 MSD | | | | | | | | | | |
| Mercury | 0.020 | U | -0.000992 | 0.015 | mg/L | 3 | 75 | (0%-20%) | | 09/05/08 | 11:29 |
| QC1201660426 | 214602001 SDILT | | | | | | | | | | |
| Mercury | | U | -0.0992 | -0.106 | ug/L | N/A | | (0%-10%) | | 09/05/08 | 11:31 |
| QC1201659031 | TB | | | | | | | | | | |
| Mercury | | | U | -0.00103 | mg/L | | | | | 09/05/08 | 11:15 |

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported

QC Summary

Workorder: 214912

Page 4 of 4

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------|-----|--|------|----|-------|------|------|-------|-------|------|------|
| A | | The TIC is a suspected aldol-condensation product | | | | | | | | | |
| B | | For General Chemistry and Organic analysis the target analyte was detected in the associated blank. | | | | | | | | | |
| C | | Analyte has been confirmed by GC/MS analysis | | | | | | | | | |
| D | | Results are reported from a diluted aliquot of the sample | | | | | | | | | |
| E | | Metals--%difference of sample and SD is >10%. Sample concentration must meet flagging criteria | | | | | | | | | |
| F | | Estimated Value | | | | | | | | | |
| H | | Analytical holding time was exceeded | | | | | | | | | |
| J | | Value is estimated | | | | | | | | | |
| M | | Matrix Related Failure | | | | | | | | | |
| N/A | | RPD or %Recovery limits do not apply. | | | | | | | | | |
| ND | | Analyte concentration is not detected above the detection limit | | | | | | | | | |
| NJ | | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier | | | | | | | | | |
| R | | Sample results are rejected | | | | | | | | | |
| U | | Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. | | | | | | | | | |
| 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. Qualifier Not Applicable for Radiochemistry. | | | | | | | | | |
| 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.

^ 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.

* Indicates that a Quality Control parameter was not within specifications.

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.

COMPANY - WIDE NONCONFORMANCE REPORT

| | | | |
|------------------------------------|--------------------------------------|--|-----------------------------|
| Mo.Day Yr. 05-SEP-08 | Division: Federal | Quality Criteria: Specifications | Type: Process |
| Instrument Type: MERCURY | Test / Method: SW846 7470A | Matrix Type: Solid | Client Code: LLNL |
| Batch ID: 790913 | Sample Numbers: See Below | | |

Potentially affected work order(s)(SDG): 214602(214597-2),214912(214909-2)

Application Issues:

Failed Recovery for MS/PS
 Failed Recovery for MSD/PSD

Specification and Requirements Nonconformance Description:

1. Failed Recovery for MS/PS:
 QC 1201659028MS
2. Failed Recovery for MSD/PSD:
 QC 1201659030MSD

NRG Disposition:

1. The MS recovered outside of its acceptance window. The MSD confirms the MS failure. Possible sample matrix interference. Data reported as is.

Originator's Name:

Jason Loy 05-SEP-08

Data Validator/Group Leader:

Eric Lawson 05-SEP-08

Quality Review:

Director:

GEL LABORATORIES LLC

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

QC Summary

Report Date: September 9, 2008
Page 1 of 3

Client : Lawrence Livermore National
Security, LLC
7000 East Avenue
Mailstop L-620
Livermore, California
Contact: Mr. Chad F. Davis
Workorder: 214909

| Parname | NOM | Sample Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---------------------------------|---------|-------------|----------|-------|------|------|-------------|-------|---------------|
| Rad Gas Flow | | | | | | | | | |
| Batch | 790537 | | | | | | | | |
| QC1201659493 214909001 DUP | | | | | | | | | |
| Alpha | | 11.3 | 9.22 | pCi/g | 21* | | (0% - 20%) | DXB5 | 09/06/0815:53 |
| | Uncert: | +/-1.89 | +/-1.56 | | | | | | |
| | TPU: | +/-3.30 | +/-2.62 | | | | | | |
| Beta | | 19.6 | 20.2 | pCi/g | 3 | | (0% - 20%) | | |
| | Uncert: | +/-1.52 | +/-1.49 | | | | | | |
| | TPU: | +/-3.14 | +/-2.94 | | | | | | |
| QC1201659496 LCS | | | | | | | | | |
| Alpha | 107 | | 114 | pCi/g | | 106 | (75%-125%) | | 09/07/0808:00 |
| | Uncert: | | +/-11.9 | | | | | | |
| | TPU: | | +/-29.4 | | | | | | |
| Beta | 376 | | 376 | pCi/g | | 100 | (75%-125%) | | |
| | Uncert: | | +/-14.6 | | | | | | |
| | TPU: | | +/-54.2 | | | | | | |
| QC1201659492 MB | | | | | | | | | |
| Alpha | | U | 0.690 | pCi/g | | | | | 09/06/0815:52 |
| | Uncert: | | +/-0.478 | | | | | | |
| | TPU: | | +/-0.507 | | | | | | |
| Beta | | U | 0.751 | pCi/g | | | | | |
| | Uncert: | | +/-0.584 | | | | | | |
| | TPU: | | +/-0.594 | | | | | | |
| QC1201659494 214909001 MS | | | | | | | | | |
| Alpha | 108 | 11.3 | 121 | pCi/g | | 102 | (75%-125%) | | 09/07/0807:59 |
| | Uncert: | +/-1.89 | +/-14.1 | | | | | | |
| | TPU: | +/-3.30 | +/-32.1 | | | | | | |
| Beta | 379 | 19.6 | 427 | pCi/g | | 108 | (75%-125%) | | |
| | Uncert: | +/-1.52 | +/-16.6 | | | | | | |
| | TPU: | +/-3.14 | +/-61.6 | | | | | | |
| QC1201659495 214909001 MSD | | | | | | | | | |
| Alpha | 107 | 11.3 | 119 | pCi/g | 2 | 100 | (0%-20%) | | 09/07/0807:59 |
| | Uncert: | +/-1.89 | +/-13.9 | | | | | | |
| | TPU: | +/-3.30 | +/-31.4 | | | | | | |
| Beta | 376 | 19.6 | 366 | pCi/g | 15 | 92 | (0%-20%) | | |
| | Uncert: | +/-1.52 | +/-14.9 | | | | | | |
| | TPU: | +/-3.14 | +/-52.9 | | | | | | |
| Rad Liquid Scintillation | | | | | | | | | |
| Batch | 790249 | | | | | | | | |
| QC1201658841 214909001 DUP | | | | | | | | | |
| Tritium | | 5.39 | 10.4 | pCi/g | 64 | | (0% - 100%) | SXB4 | 09/08/0815:56 |
| | Uncert: | +/-1.75 | +/-2.10 | | | | | | |
| | TPU: | +/-2.14 | +/-3.16 | | | | | | |
| QC1201658843 LCS | | | | | | | | | |

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QC Summary

Workorder: 214909

Page 2 of 3

| Parmname | NOM | Sample Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---------------------------------|---------|-------------|----------|---------|------|------|------------|-------|---------------|
| Rad Liquid Scintillation | | | | | | | | | |
| Batch | 790249 | | | | | | | | |
| Tritium | 22.6 | | 22.2 | pCi/g | | 98 | (75%-125%) | | |
| | Uncert: | | +/-2.07 | | | | | | |
| | TPU: | | +/-5.44 | | | | | | |
| QC1201658840 MB | | | | | | | | | |
| Tritium | | U | 0.0892 | pCi/g | | | | | 09/05/0812:26 |
| | Uncert: | | +/-0.970 | | | | | | |
| | TPU: | | +/-0.970 | | | | | | |
| QC1201658842 214909001 MS | | | | | | | | | |
| Tritium | 46.6 | 5.39 | 55.7 | pCi/g | | 108 | (75%-125%) | | 09/05/0814:02 |
| | Uncert: | | +/-1.75 | +/-3.14 | | | | | |
| | TPU: | | +/-2.14 | +/-13.0 | | | | | |

Notes:

The Qualifiers in this report are defined as follows:

- ** 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 For General Chemistry and Organic analysis the 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
- E Metals--%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- 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. Qualifier Not Applicable for Radiochemistry.
- h Preparation or preservation holding time was exceeded

GEL LABORATORIES LLC

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QC Summary

Workorder: 214909

Page 3 of 3

| Parmname | NOM | Sample Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------|-----|-------------|----|-------|------|------|-------|-------|------|------|
|----------|-----|-------------|----|-------|------|------|-------|-------|------|------|

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.



COC
Version 6.0
10/12/2006

CES Chain of Custody

CES COC #
17499



Send Results to:

LISA CRAWFORD

L- 626 phone 2-6343

Copy:

L- _____

Turnaround

Time

E
 R
 N

CES

DQO:

N/A

Field Contact

TIIM FULLER

LLNL Account #

1418 - 08

Project Name

B212 SAT PROJECT

Tank Volume

N/A liters

Data Package Required: Normal CLP

Reporting level: Level 1 Level 2 Level 3

RETURN UNUSED SAMPLE TO CLIENT

EDD Required (data from off-site labs only)

Client ID SAT

FOR CES USE ONLY

Condition Upon Receipt: No Discrepancies

Condition/Variance

Tests / Preservation Codes

Circle Preservation Code for On-site Analyses

| Client Sample Identification | Date Sampled | Time Sampled | RAD (Y/N) | Matrix Code | Gen Code | # of Bottles | Circle Preservation Code for On-site Analyses | | Additional Instructions: |
|------------------------------|--------------|--------------|-----------|-------------|----------|--------------|---|------|---------------------------|
| | | | | | | | GAMMASPEC | TUPA | |
| 212-1 | 8/19/08 | 1130 | Y | SO | WS | 2 | R | R | Mercury contaminated soil |
| 212-2 | 8/19/08 | 1430 | Y | SO | WS | 2 | R | R | Mercury contaminated soil |
| 212-5 | 8/28/08 | 1125 | Y | SO | WS | 2 | R | R | Mercury contaminated soil |
| 4 | | | | | | | | | Sample Composition |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |

Sampled and Relinquished by: *[Signature]* Date: 8/12/08 Time: 1000

Relinquished by: *[Signature]* Date: 9/12/08 Time: 1000

Received by: _____ Date: _____ Time: _____

Received by: _____ Date: _____ Time: _____

Received by: _____ Date: _____ Time: _____

CES phone # (925) 422-6605 or (925) 422-2060

See page 2 for codes and additional instructions.

ELAP Certifications #1554

"The worker certifies that the Standard ES&H Roles, Responsibilities and Authorities defined by Service Category 1 described by Section 4.3.1 of Document 2.1 "Laboratory and ES&H Policies, General Worker Responsibilities and Integrated Safety Management," apply and that the IWS or IWSs authorizing the work have the appropriate controls for the hazards involved in the task/analysis."

For document control purposes, user SHALL ensure that all working copies are identical to current electronic version, http://cms.inl.gov/ces/QA_Docs/QA_Docs.html



CSF
6/4/08

CES CASE SUMMARY FORM

Laboratory Identification:

C&MS Environmental Services
Lawrence Livermore National Laboratory
7000 East Avenue, L-Code 232
Livermore, CA 94550-9234
(925) 423-6008
ELAP Certification No. 1554

Packet Completion Date

10-21-08

Client:

Lisa Crawford / Tim Fuller

Sample Receipt:

Three samples (212-1 (0"-6"), 212-2 (6"-12"), 212-5 (24"-30") are all "Mercury contaminated soil" samples) (6 bottles total) were received on September 12, 2008 by CES for analysis. The sample was delivered with CES chain of custody, SHA, and RHWM CCR documentation. The sample containers were intact and without any visible sign of tampering.

Project Name: Normal Sampling

CES DQO #: N/A

Client DQO #: N/A

Client COC #: N/A

CES COC#: 17499

Client ID

212-1

212-2

212-5

CES ID

212-1

212-2

212-5

Requested Analyses

GAMMA spec, TUPA

GAMMA spec, TUPA

GAMMA spec, TUPA

Case Narrative:

Re: COC # 17499: GAMMA spec, TUPA tests were performed by GEL Labs LLC, Charleston, South Carolina.

Result for these analyses are deemed acceptable.

I certify that this data package is complete as per the customer's request and compliant with technical and administrative requirements. All analytical work performed by outside contract laboratories is reported on their letterhead and released by the associated laboratory, independent of CES. The Laboratory Director (or designee) as verified by the following signature authorizes release of this data package:


Hector Pedemonte

October 21, 2008

Date

| | | |
|---|--|--|
|  | <p align="center">V/C Version 1.0 3/22/00</p> | <p align="center">Off-Site Laboratory Report Validation Checklist</p> |
|---|--|--|

This form should be used to ensure that the precision, accuracy, representativeness, completeness, and comparability criteria as specified in the Waste Disposal Requisition.

The checklist should be complete by placing a check (√) in the “Acceptable” column if the item is present. An explanation should be stated in the “Comments” column if the item is not present. A copy of this report should be maintained with the associated data package.

| | |
|--|--|
| <p>Outside Lab Name GEL Laboratories LLC, Charleston, South Carolina.</p> | <p>DB No/Matrix COC # 17499 (three samples: 212-1 (0"-6"), 212-2 (6"-12"), 212-5 (24"-30"): all three samples are Mercury contaminated soil).</p> |
| <p>Method No(s) GEL Labs LLC: GAMMA spec, TUPA</p> | <p>Report Level Results and Summary QC</p> |

| Parameters | Acceptable | Comments |
|--|---|--|
| 1. Precision | √ | See Comments below. |
| 2. Accuracy | √ | See Comments below. |
| 3. Representativeness | √ | The acquired samples are representative of the waste stream. |
| 4. Completeness | √ | All the requested analyses were reported. |
| 5. Comparability | √ | The acquired samples are comparable to the waste matrix. |
| <p>Additional Comments: Re: COC # 17499 (three samples: 212-1 (0"-6"), 212-2 (6"-12"), 212-5 (24"-30"): all three samples are Mercury contaminated soil); GAMMA spec and TUPA tests were performed by GEL Labs, LLC, Charleston, South Carolina. Even though there are some tailing issues from Cm-243/244 the results are still acceptable. The samples were brown soil.</p> | | |
| <p>Signature <i>Hector Redemonte</i></p> | <p>Date October 21, 2008</p> | |



Laboratories LLC

a member of The GEL Group INC



PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407

P 843.556.8171 F 843.766.1178

www.gel.com

October 06, 2008

Mr. Chad F. Davis
Lawrence Livermore National Security, LLC
7000 East Avenue
Mailstop L-620
Livermore, California 94551

Re: CES - Normal Deliverable
Work Order: 215722

Dear Mr. Davis:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on August 30, 2008. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4453.

Sincerely,

Edith Kent
Project Manager

Purchase Order: LDH0584
Chain of Custody: LDH0584
Enclosures

problem solved

**General Narrative
for
Lawrence Livermore National Labs (#H712000)
CES - Normal Deliverable
SDG: 215722**

October 06, 2008

Laboratory Identification:

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

Summary

Sample receipt

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on August 30, 2008, 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. There are no additional comments concerning sample receipt.

Items of Note Per telephone call, this SDG was a client requested relog. The client faxed the lab a new chain of custody for LDH0584.

Sample Identification

The laboratory received the following samples:

| Laboratory Identification | Sample Description |
|--------------------------------------|-------------------------------|
| 215722001 | 212-1 |
| 215722002 | 212-2 |
| 215722003 | 212-5 |

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.

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: Radiochemistry. This package, to the best of my knowledge, is in compliance with technical and administrative requirements.

Edith M. Kent

Edith Kent

Project Manager

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. |

**Radiochemistry Case Narrative
Lawrence Livermore National Labs (LLNL)
SDG 215722**

Method/Analysis Information

Product: Alphaspec Am243, solid
Analytical Method: DOE EML HASL-300, Am-05-RC Modified
Prep Method: Dry Soil Prep
Analytical Batch Number: 801994
Prep Batch Number: 794495

| Sample ID | Client ID |
|------------------|---|
| 215722001 | 212-1 |
| 215722002 | 212-2 |
| 215722003 | 212-5 |
| 1201685705 | Method Blank (MB) |
| 1201685706 | 215722001(212-1) Sample Duplicate (DUP) |
| 1201685707 | 215722001(212-1) Matrix Spike (MS) |
| 1201685708 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on a "dry weight" basis.

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# 16.

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: 215722001 (212-1).

QC Information

Refer to Non-Conformance Report.

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 1201685705 (MB) and 215722002 (212-2) were recounted due to high MDAs. Samples were recounted due to high relative percent difference/relative error ratio.

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 613402 was generated due to Method Blank contamination and Failed RPD for DUP. 1. The QC and the DUP, 215722001 and 1201685706, failed to meet RPD or RER requirements for Am 243 due to tailing from the Cm 243/244 tracer ROI. Results qualified accordingly. 2. The Method Blank, 1201685705, failed to meet the requirement of having activity less than RDL for Am 243 due to tailing from the Cm 243/244 tracer ROI. Results qualified accordingly. 1. Reporting results 2. Reporting results

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

| Qualifier | Reason | Analyte | Sample | Client Sample |
|-----------|--|---------------|------------|---------------------|
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier | Americium-243 | 1201685705 | MB for batch 801994 |
| X | Results rejected due to tailing from the Cm 243/244 tracer ROI | | 215722002 | 212-2 |
| | | | 1201685706 | 212-1(215722001DUP) |

Method/Analysis Information

Product: Alphaspec Pu, solid
Analytical Method: DOE EML HASL-300, Pu-11-RC Modified
Prep Method: Dry Soil Prep
Analytical Batch Number: 801995
Prep Batch Number: 794495

| Sample ID | Client ID |
|------------|---|
| 215722001 | 212-1 |
| 215722002 | 212-2 |
| 215722003 | 212-5 |
| 1201685709 | Method Blank (MB) |
| 1201685710 | 215722001(212-1) Sample Duplicate (DUP) |
| 1201685711 | 215722001(212-1) Matrix Spike (MS) |
| 1201685712 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on a "dry weight" basis.

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# 16.

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: 215722001 (212-1).

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 Th, solid
Analytical Method: DOE EML HASL-300, Th-01-RC Modified
Prep Method: Dry Soil Prep
Analytical Batch Number: 801996
Prep Batch Number: 794495

| Sample ID | Client ID |
|------------------|---|
| 215722001 | 212-1 |
| 215722002 | 212-2 |
| 215722003 | 212-5 |
| 1201685713 | Method Blank (MB) |
| 1201685714 | 215722001(212-1) Sample Duplicate (DUP) |
| 1201685715 | 215722001(212-1) Matrix Spike (MS) |
| 1201685716 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on a "dry weight" basis.

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-038 REV# 11.

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: 215722001 (212-1).

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

The blank did not meet the detection limit for Th 228 due to keeping the blank volume consistent with the other sample aliquots. All other samples met the detection limits.

Qualifier information

Manual qualifiers were not required.

Method/Analysis Information

| | |
|--------------------------|------------------------------------|
| Product: | Alphaspec U, solid |
| Analytical Method: | DOE EML HASL-300, U-02-RC Modified |
| Prep Method: | Dry Soil Prep |
| Analytical Batch Number: | 801997 |
| Prep Batch Number: | 794495 |

| Sample ID | Client ID |
|------------------|---|
| 215722001 | 212-1 |
| 215722002 | 212-2 |
| 215722003 | 212-5 |
| 1201685717 | Method Blank (MB) |
| 1201685718 | 215722001(212-1) Sample Duplicate (DUP) |
| 1201685719 | 215722001(212-1) Matrix Spike (MS) |
| 1201685720 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on a "dry weight" basis.

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# 16.

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: 215722001 (212-1).

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

The blank result is greater than the MDA but less than the detection limit for U-233/234. The sample and the duplicate, 1201685718 (212-1) and 215722001 (212-1), did not meet the relative percent difference requirement for U-238, however they do meet the relative error ratio requirement with value of 1.26.

Qualifier information

Manual qualifiers were not required.

Method/Analysis Information

Product: **Gammasec, Gamma, Solid (Long List)**
Analytical Method: EML HASL 300, 4.5.2.3
Prep Method: Dry Soil Prep
Analytical Batch Number: 797779
Prep Batch Number: 794495

| Sample ID | Client ID |
|------------------|---|
| 215722001 | 212-1 |
| 215722002 | 212-2 |
| 215722003 | 212-5 |
| 1201676586 | Method Blank (MB) |
| 1201676587 | 215722001(212-1) Sample Duplicate (DUP) |
| 1201676588 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on a "dry weight" basis.

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# 16.

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: 215722001 (212-1).

QC Information

Refer to Non-Conformance Report.

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 610389 was generated due to Failed RPD for DUP. 1. The relative percent difference for Pb-212 for sample 1201676587 does not meet the acceptance limits. 1. Reporting results.

Additional Comments

The sample and the duplicate, 1201676587 (212-1) and 215722001 (212-1), did not meet the relative percent difference requirement for Ac-228 and Ra-228, however they do meet the relative error ratio requirement with value of 2.36.

Qualifier information

Sample Data Summary

| | | |
|---|-------------------------------------|-------------------------------------|
|  | RD Version 1.2 9/14/98 | REVIEW of RADIOCHEMICAL DATA |
|---|-------------------------------------|-------------------------------------|

CES COC# 17499 CES Sample # 212-1 Client Sample ID Mercury Contaminated Soil

Rad Dec # RHWM-RD-08-0034-R

| | |
|--|--------------------------------------|
| The sample was analyzed for : | Subject was surveyed for: |
| <input type="checkbox"/> Bulk Gross Alpha <input checked="" type="checkbox"/> Alpha TUPA <input type="checkbox"/> Bulk Gross Beta <input checked="" type="checkbox"/> Gamma Spec <input type="checkbox"/> Bulk Tritium <input type="checkbox"/> Removable Rad α <input type="checkbox"/> Removable Rad H-3 <input type="checkbox"/> Removable Rad β | <input type="checkbox"/> Surface Rad |

| | ≤ MDC | > MDC | Check if by Limited Rad Declaration (LRD) |
|------------------------------|--------------------------|-------------------------------------|---|
| Bulk Contamination | | | |
| Gross Alpha | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Gross Beta | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Tritium | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Additional Analytical | | | |
| Gamma Spec | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Alpha TUPA | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Surface Contamination | | | |
| Removable Rad H-3 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Removable Rad α | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Removable Rad β | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Rad α | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Rad β | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Radioactivity was was not can not say added to this sample.

Comments:

Alpha TUPA and gamma spec results indicate the presence of man-made radioisotopes Cs-137 and uranium isotopes that are above the screening levels specified in the Moratorium for clean site soils. Furthermore, the isotopic ratio for U-238/U-234 may be indicative of slightly depleted uranium or a mixture of Dep-U and Nat-U.

Finding by:  Date: October 23, 2008
 Philip Torretto, x2-5515

Criteria limits are those of "LLNL Criteria for Identifying Mixed Waste" for materials with the possibility of bulk contamination and DOE 5400.5 and 5480.11 for those with the possibility of fixed and removable surface contamination. For removable surface contamination from unknown radionuclides, the limits are 20 dpm/100 cm² for gross alpha, 200 dpm/cm² for gross beta and 1000 dpm/100 cm² for tritium.

GEL LABORATORIES LLC

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

Certificate of Analysis Report for

LLNL002 Lawrence Livermore National Labs (#H712000)

Client SDG: 215722 GEL Work Order: 215722

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
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the detection limit.

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, Edith Kent.



Reviewed by _____

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : Lawrence Livermore National Security, LLC
 Address : 7000 East Avenue
 Mailstop L-620
 Livermore, California 94551
 Contact: Mr. Chad F. Davis
 Project: CES - Normal Deliverable

Report Date: October 17, 2008

| | | | |
|-------------------|-----------|------------|-----------|
| Client Sample ID: | 212-1 | Project: | LLNL00306 |
| Sample ID: | 215722001 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 19-AUG-08 | | |
| Receive Date: | 30-AUG-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | Uncertainty | DL | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|---|-----------|----------|-------------|--------|------------|-------|-------|----|---------|----------|------|--------|------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | | |
| <i>Alphaspec Am243, solid "Dry Weight Corrected"</i> | | | | | | | | | | | | | |
| Americium-241 | U | -0.0187 | +/-0.0282 | 0.0916 | +/-0.0282 | 0.100 | pCi/g | | AXD3 | 10/15/08 | 2314 | 801994 | 1 |
| Americium-243 | U | 0.0142 | +/-0.0369 | 0.090 | +/-0.0369 | 0.100 | pCi/g | | | | | | |
| <i>Alphaspec Pu, solid "Dry Weight Corrected"</i> | | | | | | | | | | | | | |
| Plutonium-238 | U | 0.000856 | +/-0.0329 | 0.0864 | +/-0.0329 | 0.100 | pCi/g | | AXD3 | 10/12/08 | 1041 | 801995 | 3 |
| Plutonium-239/240 | U | 0.0483 | +/-0.0474 | 0.0592 | +/-0.0477 | 0.100 | pCi/g | | | | | | |
| <i>lphaspec Th, solid "Dry Weight Corrected"</i> | | | | | | | | | | | | | |
| Thorium-228 | | 0.740 | +/-0.265 | 0.0742 | +/-0.303 | 0.200 | pCi/g | | AXD3 | 10/12/08 | 1042 | 801996 | 4 |
| Thorium-230 | | 0.678 | +/-0.248 | 0.112 | +/-0.282 | 0.200 | pCi/g | | | | | | |
| Thorium-232 | | 0.649 | +/-0.243 | 0.112 | +/-0.275 | 0.200 | pCi/g | | | | | | |
| <i>Alphaspec U, solid "Dry Weight Corrected"</i> | | | | | | | | | | | | | |
| Uranium-233/234 | | 0.672 | +/-0.223 | 0.105 | +/-0.241 | 0.200 | pCi/g | | AXD3 | 10/12/08 | 1041 | 801997 | 5 |
| Uranium-235/236 | U | 0.0646 | +/-0.0802 | 0.112 | +/-0.0807 | 0.200 | pCi/g | | | | | | |
| Uranium-238 | | 0.862 | +/-0.252 | 0.105 | +/-0.278 | 0.200 | pCi/g | | | | | | |
| Rad Gamma Spec Analysis | | | | | | | | | | | | | |
| <i>Gammasespec, Gamma, Solid (Long List) "Dry Weight Corrected"</i> | | | | | | | | | | | | | |
| Actinium-228 | | 0.697 | +/-0.0873 | 0.124 | +/-0.0873 | | pCi/g | | MJHI | 10/09/08 | 0649 | 797779 | 6 |
| Americium-241 | U | -0.0119 | +/-0.0614 | 0.218 | +/-0.0614 | | pCi/g | | | | | | |
| Antimony-124 | U | 0.0435 | +/-0.0392 | 0.141 | +/-0.0392 | | pCi/g | | | | | | |
| Antimony-125 | U | -0.0164 | +/-0.0296 | 0.100 | +/-0.0296 | | pCi/g | | | | | | |
| Barium-133 | U | -0.00402 | +/-0.0157 | 0.0448 | +/-0.0157 | | pCi/g | | | | | | |
| Barium-140 | U | 0.0391 | +/-0.521 | 1.76 | +/-0.521 | | pCi/g | | | | | | |
| Beryllium-7 | U | -0.0302 | +/-0.165 | 0.559 | +/-0.165 | | pCi/g | | | | | | |
| Bismuth-212 | UI | 0.00 | +/-0.187 | 0.401 | +/-0.187 | | pCi/g | | | | | | |
| Bismuth-214 | | 0.506 | +/-0.0499 | 0.0725 | +/-0.0499 | | pCi/g | | | | | | |
| Cerium-139 | U | -0.00709 | +/-0.0111 | 0.0387 | +/-0.0111 | | pCi/g | | | | | | |
| Cerium-141 | U | -0.0542 | +/-0.0421 | 0.135 | +/-0.0421 | | pCi/g | | | | | | |
| Cerium-144 | U | 0.00149 | +/-0.072 | 0.242 | +/-0.072 | | pCi/g | | | | | | |
| Cesium-134 | U | 0.0379 | +/-0.0147 | 0.0528 | +/-0.0147 | | pCi/g | | | | | | |
| Cesium-136 | U | 0.156 | +/-0.227 | 0.769 | +/-0.227 | | pCi/g | | | | | | |
| Cesium-137 | | 0.588 | +/-0.0356 | 0.0368 | +/-0.0356 | 0.100 | pCi/g | | | | | | |
| Chromium-51 | U | 0.411 | +/-0.289 | 1.01 | +/-0.289 | | pCi/g | | | | | | |
| Cobalt-56 | U | -0.0102 | +/-0.0167 | 0.0547 | +/-0.0167 | | pCi/g | | | | | | |
| Cobalt-57 | U | 0.0019 | +/-0.00885 | 0.0302 | +/-0.00885 | | pCi/g | | | | | | |
| Cobalt-58 | U | -0.0425 | +/-0.0155 | 0.0412 | +/-0.0155 | | pCi/g | | | | | | |
| Cobalt-60 | U | 0.016 | +/-0.0119 | 0.0426 | +/-0.0119 | | pCi/g | | | | | | |

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Certificate of Analysis

Company : Lawrence Livermore National
Security, LLC
Address : 7000 East Avenue
Mailstop L-620
Livermore, California 94551
Contact: Mr. Chad F. Davis
Project: CES - Normal Deliverable

Report Date: October 17, 2008

Client Sample ID: 212-1
Sample ID: 215722001

Project: LLNL00306
Client ID: LLNL002

| Parameter | Qualifier | Result | Uncertainty | DL | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|--|-----------|----------|-------------|--------|-----------|----|-------|----|---------|------|------|-------|------|
| Rad Gamma Spec Analysis | | | | | | | | | | | | | |
| <i>Gammascpec, Gamma, Solid (Long List) "Dry Weight Corrected"</i> | | | | | | | | | | | | | |
| Europium-152 | U | -0.0212 | +/-0.0346 | 0.0976 | +/-0.0346 | | pCi/g | | | | | | |
| Europium-154 | U | -0.119 | +/-0.0369 | 0.0993 | +/-0.0369 | | pCi/g | | | | | | |
| Europium-155 | U | 0.0887 | +/-0.0341 | 0.124 | +/-0.0341 | | pCi/g | | | | | | |
| Iridium-192 | U | 0.0169 | +/-0.015 | 0.052 | +/-0.015 | | pCi/g | | | | | | |
| Iron-59 | U | -0.0287 | +/-0.050 | 0.159 | +/-0.050 | | pCi/g | | | | | | |
| Lead-210 | U | -2.62 | +/-2.11 | 7.13 | +/-2.11 | | pCi/g | | | | | | |
| Lead-212 | | 0.625 | +/-0.0397 | 0.0599 | +/-0.0397 | | pCi/g | | | | | | |
| Lead-214 | | 0.547 | +/-0.0522 | 0.070 | +/-0.0522 | | pCi/g | | | | | | |
| Manganese-54 | U | 0.00399 | +/-0.0133 | 0.0454 | +/-0.0133 | | pCi/g | | | | | | |
| Mercury-203 | U | 0.00212 | +/-0.0221 | 0.0751 | +/-0.0221 | | pCi/g | | | | | | |
| Neodymium-147 | U | 1.61 | +/-1.48 | 5.21 | +/-1.48 | | pCi/g | | | | | | |
| Neptunium-239 | U | 0.0559 | +/-0.0604 | 0.210 | +/-0.0604 | | pCi/g | | | | | | |
| Niobium-94 | U | 0.00913 | +/-0.0101 | 0.0343 | +/-0.0101 | | pCi/g | | | | | | |
| Niobium-95 | U | 0.0836 | +/-0.0313 | 0.105 | +/-0.0313 | | pCi/g | | | | | | |
| Potassium-40 | | 13.2 | +/-0.654 | 0.293 | +/-0.654 | | pCi/g | | | | | | |
| Promethium-144 | U | -0.00395 | +/-0.0117 | 0.0361 | +/-0.0117 | | pCi/g | | | | | | |
| Promethium-146 | U | 0.00513 | +/-0.0135 | 0.0468 | +/-0.0135 | | pCi/g | | | | | | |
| Radium-228 | | 0.697 | +/-0.0873 | 0.124 | +/-0.0873 | | pCi/g | | | | | | |
| Ruthenium-106 | U | 0.0579 | +/-0.106 | 0.359 | +/-0.106 | | pCi/g | | | | | | |
| Silver-110m | U | 0.000923 | +/-0.0148 | 0.0417 | +/-0.0148 | | pCi/g | | | | | | |
| Sodium-22 | U | -0.0411 | +/-0.0133 | 0.0365 | +/-0.0133 | | pCi/g | | | | | | |
| Thallium-208 | | 0.211 | +/-0.0279 | 0.0345 | +/-0.0279 | | pCi/g | | | | | | |
| Thorium-230 | | 0.506 | +/-0.0499 | 0.0725 | +/-0.0499 | | pCi/g | | | | | | |
| Thorium-234 | U | 0.248 | +/-0.519 | 1.85 | +/-0.519 | | pCi/g | | | | | | |
| Tin-113 | U | 0.0339 | +/-0.0172 | 0.0604 | +/-0.0172 | | pCi/g | | | | | | |
| Uranium-235 | U | 0.053 | +/-0.0696 | 0.232 | +/-0.0696 | | pCi/g | | | | | | |
| Uranium-238 | U | 0.248 | +/-0.519 | 1.85 | +/-0.519 | | pCi/g | | | | | | |
| Yttrium-88 | U | 0.0104 | +/-0.0124 | 0.0442 | +/-0.0124 | | pCi/g | | | | | | |
| Zinc-65 | U | -0.0597 | +/-0.0381 | 0.0943 | +/-0.0381 | | pCi/g | | | | | | |
| Zirconium-95 | U | 0.0466 | +/-0.0291 | 0.106 | +/-0.0291 | | pCi/g | | | | | | |

The following Analytical Methods were performed

| Method | Description |
|--------|-------------------------------------|
| 1 | DOE EML HASL-300, Am-05-RC Modified |
| 2 | DOE EML HASL-300, Am-05-RC Modified |
| 3 | DOE EML HASL-300, Pu-11-RC Modified |
| 4 | DOE EML HASL-300, Th-01-RC Modified |



RD
Version 1.2
9/14/98

REVIEW of RADIOCHEMICAL DATA

CES COC# 17499 Sample # 212-2 Client Sample ID Mercury Contaminated Soil

Rad Dec # RHWM-RD-08-0035-R

| The sample was analyzed for : | | Subject was surveyed for: |
|--|---|--------------------------------------|
| <input type="checkbox"/> Bulk Gross Alpha | <input checked="" type="checkbox"/> Alpha TUPA | <input type="checkbox"/> Surface Rad |
| <input type="checkbox"/> Bulk Gross Beta | <input checked="" type="checkbox"/> Gamma Spec | |
| <input type="checkbox"/> Bulk Tritium | <input type="checkbox"/> Removable Rad α | |
| <input type="checkbox"/> Removable Rad H-3 | <input type="checkbox"/> Removable Rad β | |

| | \leq MDC | $>$ MDC | Check if by Limited Rad Declaration (LRD) |
|------------------------------|--------------------------|-------------------------------------|---|
| Bulk Contamination | | | |
| Gross Alpha | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Gross Beta | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Tritium | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Additional Analytical | | | |
| Gamma Spec | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Alpha TUPA | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Surface Contamination | | | |
| Removable Rad H-3 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Removable Rad α | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Removable Rad β | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Rad α | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Rad β | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Radioactivity was was not can not say added to this sample.

Comments:

Alpha TUPA and gamma spec results indicate the presence of man-made radioisotopes Cs-137 and Pu-239 and uranium isotopes that are above the screening levels specified in the Moratorium for clean site soils. Furthermore, the isotopic ratio for U-238/U-234 may be indicative of slightly depleted uranium or a mixture of Dep-U and Nat-U.

Finding by: Philip Torretto Date: October 23, 2008
Philip Torretto, x2-5515

Criteria limits are those of "LLNL Criteria for Identifying Mixed Waste" for materials with the possibility of bulk contamination and DOE 5400.5 and 5480.11 for those with the possibility of fixed and removable surface contamination. For removable surface contamination from unknown radionuclides, the limits are 20 dpm/100 cm² for gross alpha, 200 dpm/cm² for gross beta and 1000 dpm/100 cm² for tritium.

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Certificate of Analysis

Company : Lawrence Livermore National Security, LLC
 Address : 7000 East Avenue
 Mailstop L-620
 Livermore, California 94551
 Contact: Mr. Chad F. Davis
 Project: CES - Normal Deliverable

Report Date: October 17, 2008

| | | | |
|-------------------|-----------|------------|-----------|
| Client Sample ID: | 212-2 | Project: | LLNL00306 |
| Sample ID: | 215722002 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 19-AUG-08 | | |
| Receive Date: | 30-AUG-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | Uncertainty | DL | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|--|-----------|---------|-------------|--------|-----------|-------|-------|----|---------|----------|------|--------|------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | | |
| <i>Alphaspec Am243, solid "Dry Weight Corrected"</i> | | | | | | | | | | | | | |
| Americium-241 | U | 0.0304 | +/-0.0468 | 0.0822 | +/-0.047 | 0.100 | pCi/g | | AXD3 | 10/17/08 | 0807 | 801994 | 1 |
| Americium-243 | X | 0.105 | +/-0.0646 | 0.0775 | +/-0.0653 | 0.100 | pCi/g | | | | | | |
| <i>Alphaspec Pu, solid "Dry Weight Corrected"</i> | | | | | | | | | | | | | |
| Plutonium-238 | U | 0.00558 | +/-0.0299 | 0.0737 | +/-0.0299 | 0.100 | pCi/g | | AXD3 | 10/12/08 | 1041 | 801995 | 5 |
| Plutonium-239/240 | | 0.0871 | +/-0.0587 | 0.0477 | +/-0.0594 | 0.100 | pCi/g | | | | | | |
| <i>Alphaspec Th, solid "Dry Weight Corrected"</i> | | | | | | | | | | | | | |
| Thorium-228 | | 1.03 | +/-0.330 | 0.165 | +/-0.394 | 0.200 | pCi/g | | AXD3 | 10/12/08 | 1042 | 801996 | 6 |
| Thorium-230 | | 0.984 | +/-0.319 | 0.198 | +/-0.379 | 0.200 | pCi/g | | | | | | |
| Thorium-232 | | 0.848 | +/-0.292 | 0.156 | +/-0.342 | 0.200 | pCi/g | | | | | | |
| <i>Alphaspec U, solid "Dry Weight Corrected"</i> | | | | | | | | | | | | | |
| Uranium-233/234 | | 0.469 | +/-0.204 | 0.151 | +/-0.214 | 0.200 | pCi/g | | AXD3 | 10/12/08 | 1041 | 801997 | 7 |
| Uranium-235/236 | U | 0.0266 | +/-0.0522 | 0.0798 | +/-0.0523 | 0.200 | pCi/g | | | | | | |
| Uranium-238 | | 0.646 | +/-0.231 | 0.0646 | +/-0.248 | 0.200 | pCi/g | | | | | | |
| Rad Gamma Spec Analysis | | | | | | | | | | | | | |
| <i>Gammascpec, Gamma, Solid (Long List) "Dry Weight Corrected"</i> | | | | | | | | | | | | | |
| Actinium-228 | | 0.652 | +/-0.137 | 0.221 | +/-0.137 | | pCi/g | | MJH1 | 10/09/08 | 0649 | 797779 | 8 |
| Americium-241 | U | -0.0269 | +/-0.0238 | 0.0797 | +/-0.0238 | | pCi/g | | | | | | |
| Antimony-124 | U | 0.035 | +/-0.0519 | 0.190 | +/-0.0519 | | pCi/g | | | | | | |
| Antimony-125 | U | -0.0163 | +/-0.0458 | 0.150 | +/-0.0458 | | pCi/g | | | | | | |
| Barium-133 | U | 0.00636 | +/-0.0235 | 0.0698 | +/-0.0235 | | pCi/g | | | | | | |
| Barium-140 | U | -0.916 | +/-0.905 | 2.78 | +/-0.905 | | pCi/g | | | | | | |
| Beryllium-7 | U | -0.0614 | +/-0.275 | 0.903 | +/-0.275 | | pCi/g | | | | | | |
| Bismuth-212 | U | 0.353 | +/-0.166 | 0.648 | +/-0.166 | | pCi/g | | | | | | |
| Bismuth-214 | | 0.556 | +/-0.0858 | 0.105 | +/-0.0858 | | pCi/g | | | | | | |
| Cerium-139 | U | 0.0119 | +/-0.0146 | 0.052 | +/-0.0146 | | pCi/g | | | | | | |
| Cerium-141 | U | 0.0182 | +/-0.0576 | 0.193 | +/-0.0576 | | pCi/g | | | | | | |
| Cerium-144 | U | -0.165 | +/-0.0915 | 0.287 | +/-0.0915 | | pCi/g | | | | | | |
| Cesium-134 | U | 0.0039 | +/-0.0244 | 0.083 | +/-0.0244 | | pCi/g | | | | | | |
| Cesium-136 | U | -0.347 | +/-0.386 | 1.20 | +/-0.386 | | pCi/g | | | | | | |
| Cesium-137 | | 0.124 | +/-0.0292 | 0.0707 | +/-0.0292 | 0.100 | pCi/g | | | | | | |
| Chromium-51 | U | -0.0491 | +/-0.435 | 1.47 | +/-0.435 | | pCi/g | | | | | | |
| Cobalt-56 | U | 0.0155 | +/-0.0277 | 0.0962 | +/-0.0277 | | pCi/g | | | | | | |
| Cobalt-57 | U | 0.00144 | +/-0.0105 | 0.0354 | +/-0.0105 | | pCi/g | | | | | | |
| Cobalt-58 | U | 0.0153 | +/-0.0264 | 0.0923 | +/-0.0264 | | pCi/g | | | | | | |
| Cobalt-60 | U | 0.00514 | +/-0.0256 | 0.0846 | +/-0.0256 | | pCi/g | | | | | | |
| Europium-152 | U | 0.0332 | +/-0.0767 | 0.157 | +/-0.0767 | | pCi/g | | | | | | |

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Contact: Mr. Chad F. Davis
Project: CES - Normal Deliverable

Report Date: October 17, 2008

Client Sample ID: 212-2
Sample ID: 215722002

Project: LLNL00306
Client ID: LLNL002

| Parameter | Qualifier | Result | Uncertainty | DL | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|--|-----------|----------|-------------|--------|-----------|----|-------|----|---------|------|------|-------|------|
| Rad Gamma Spec Analysis | | | | | | | | | | | | | |
| <i>Gammascpec, Gamma, Solid (Long List) "Dry Weight Corrected"</i> | | | | | | | | | | | | | |
| Europium-154 | U | -0.0631 | +/-0.067 | 0.202 | +/-0.067 | | pCi/g | | | | | | |
| Europium-155 | U | 0.102 | +/-0.0401 | 0.142 | +/-0.0401 | | pCi/g | | | | | | |
| Iridium-192 | U | 0.00983 | +/-0.0238 | 0.082 | +/-0.0238 | | pCi/g | | | | | | |
| Iron-59 | U | 0.069 | +/-0.0825 | 0.288 | +/-0.0825 | | pCi/g | | | | | | |
| Lead-210 | U | 0.330 | +/-0.210 | 0.754 | +/-0.210 | | pCi/g | | | | | | |
| Lead-212 | | 0.684 | +/-0.0531 | 0.0852 | +/-0.0531 | | pCi/g | | | | | | |
| Lead-214 | | 0.612 | +/-0.0884 | 0.115 | +/-0.0884 | | pCi/g | | | | | | |
| Manganese-54 | U | 0.051 | +/-0.0221 | 0.083 | +/-0.0221 | | pCi/g | | | | | | |
| Mercury-203 | U | 0.0589 | +/-0.0323 | 0.116 | +/-0.0323 | | pCi/g | | | | | | |
| Neodymium-147 | U | -5.65 | +/-2.81 | 7.71 | +/-2.81 | | pCi/g | | | | | | |
| Neptunium-239 | U | 0.0312 | +/-0.0727 | 0.247 | +/-0.0727 | | pCi/g | | | | | | |
| Niobium-94 | U | -0.0139 | +/-0.0191 | 0.0624 | +/-0.0191 | | pCi/g | | | | | | |
| Niobium-95 | UI | 0.00 | +/-0.0562 | 0.208 | +/-0.0562 | | pCi/g | | | | | | |
| Potassium-40 | | 14.4 | +/-0.897 | 0.474 | +/-0.897 | | pCi/g | | | | | | |
| Promethium-144 | U | 0.0298 | +/-0.0215 | 0.0773 | +/-0.0215 | | pCi/g | | | | | | |
| Promethium-146 | U | -0.0319 | +/-0.023 | 0.0716 | +/-0.023 | | pCi/g | | | | | | |
| Radium-228 | | 0.652 | +/-0.137 | 0.221 | +/-0.137 | | pCi/g | | | | | | |
| Ruthenium-106 | U | 0.000312 | +/-0.190 | 0.620 | +/-0.190 | | pCi/g | | | | | | |
| Silver-110m | U | -0.00786 | +/-0.0244 | 0.070 | +/-0.0244 | | pCi/g | | | | | | |
| Sodium-22 | U | -0.0337 | +/-0.0254 | 0.074 | +/-0.0254 | | pCi/g | | | | | | |
| Thallium-208 | | 0.306 | +/-0.0425 | 0.0752 | +/-0.0425 | | pCi/g | | | | | | |
| Thorium-230 | | 0.556 | +/-0.0858 | 0.105 | +/-0.0858 | | pCi/g | | | | | | |
| Thorium-234 | UI | 0.00 | +/-0.258 | 0.884 | +/-0.258 | | pCi/g | | | | | | |
| Tin-113 | U | -0.0499 | +/-0.0271 | 0.0838 | +/-0.0271 | | pCi/g | | | | | | |
| Uranium-235 | U | -0.0532 | +/-0.0906 | 0.297 | +/-0.0906 | | pCi/g | | | | | | |
| Uranium-238 | UI | 0.00 | +/-0.258 | 0.884 | +/-0.258 | | pCi/g | | | | | | |
| Yttrium-88 | U | -0.0265 | +/-0.0237 | 0.0643 | +/-0.0237 | | pCi/g | | | | | | |
| Zinc-65 | U | -0.0565 | +/-0.0708 | 0.186 | +/-0.0708 | | pCi/g | | | | | | |
| Zirconium-95 | U | 0.144 | +/-0.059 | 0.223 | +/-0.059 | | pCi/g | | | | | | |

The following Analytical Methods were performed

| Method | Description |
|--------|-------------------------------------|
| 1 | DOE EML HASL-300, Am-05-RC Modified |
| 2 | DOE EML HASL-300, Am-05-RC Modified |
| 3 | DOE EML HASL-300, Am-05-RC Modified |
| 4 | DOE EML HASL-300, Am-05-RC Modified |
| 5 | DOE EML HASL-300, Pu-11-RC Modified |

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Project: CES - Normal Deliverable

Report Date: October 17, 2008

Client Sample ID: 212-2
Sample ID: 215722002

Project: LLNL00306
Client ID: LLNL002

| Parameter | Qualifier | Result | Uncertainty | DL | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|-----------|-----------|--------|-------------|----|-----|----|-------|----|---------|------|------|-------|------|
|-----------|-----------|--------|-------------|----|-----|----|-------|----|---------|------|------|-------|------|

The above sample is reported on a dry weight basis.

| | | |
|---|-------------------------------------|-------------------------------------|
|  | RD Version 1.2 9/14/98 | REVIEW of RADIOCHEMICAL DATA |
|---|-------------------------------------|-------------------------------------|

CES COC# 17499 CES Sample # 212-5 Client Sample ID Mercury Contaminated Soil

Rad Dec # RHWM-RD-08-0036-R

| | | |
|--|---|--------------------------------------|
| The sample was analyzed for : | | Subject was surveyed for: |
| <input type="checkbox"/> Bulk Gross Alpha | <input checked="" type="checkbox"/> Alpha TUPA | <input type="checkbox"/> Surface Rad |
| <input type="checkbox"/> Bulk Gross Beta | <input checked="" type="checkbox"/> Gamma Spec | |
| <input type="checkbox"/> Bulk Tritium | <input type="checkbox"/> Removable Rad α | |
| <input type="checkbox"/> Removable Rad H-3 | <input type="checkbox"/> Removable Rad β | |

| | \leq MDC | $>$ MDC | Check if by Limited Rad Declaration (LRD) |
|------------------------------|--------------------------|-------------------------------------|---|
| Bulk Contamination | | | |
| Gross Alpha | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Gross Beta | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Tritium | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Additional Analytical | | | |
| Gamma Spec | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Alpha TUPA | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Surface Contamination | | | |
| Removable Rad H-3 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Removable Rad α | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Removable Rad β | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Rad α | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Surface Rad β | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Radioactivity was was not can not say added to this sample.

Comments:

Alpha TUPA and gamma spec results indicate the presence of uranium isotopes that are above the screening levels specified in the Moratorium for clean site soils. Furthermore, the isotopic ratio for U-238/U-234 may be indicative of slightly depleted uranium or a mixture of Dep-U and Nat-U.

Finding by:  Date: October 23, 2008
 Philip Torreto, x2-5515

Criteria limits are those of "LLNL Criteria for Identifying Mixed Waste" for materials with the possibility of bulk contamination and DOE 5400.5 and 5480.11 for those with the possibility of fixed and removable surface contamination. For removable surface contamination from unknown radionuclides, the limits are 20 dpm/100 cm² for gross alpha, 200 dpm/cm² for gross beta and 1000 dpm/100 cm² for tritium.

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Project: CES - Normal Deliverable

Report Date: October 17, 2008

| | | | |
|-------------------|-----------|------------|-----------|
| Client Sample ID: | 212-5 | Project: | LLNL00306 |
| Sample ID: | 215722003 | Client ID: | LLNL002 |
| Matrix: | SO | | |
| Collect Date: | 28-AUG-08 | | |
| Receive Date: | 30-AUG-08 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | Uncertainty | DL | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|---|-----------|----------|-------------|--------|------------|-------|-------|----|---------|----------|------|--------|------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | | |
| <i>Alphaspec Am243, solid "Dry Weight Corrected"</i> | | | | | | | | | | | | | |
| Americium-241 | U | 0.022 | +/-0.0406 | 0.0781 | +/-0.0407 | 0.100 | pCi/g | | AXD3 | 10/15/08 | 2314 | 801994 | 1 |
| Americium-243 | U | 0.0699 | +/-0.0612 | 0.0857 | +/-0.0617 | 0.100 | pCi/g | | | | | | |
| <i>Alphaspec Pu, solid "Dry Weight Corrected"</i> | | | | | | | | | | | | | |
| Plutonium-238 | U | -0.0196 | +/-0.0242 | 0.0826 | +/-0.0243 | 0.100 | pCi/g | | AXD3 | 10/12/08 | 1041 | 801995 | 3 |
| Plutonium-239/240 | U | -0.00736 | +/-0.0217 | 0.0624 | +/-0.0217 | 0.100 | pCi/g | | | | | | |
| <i>Alphaspec Th, solid "Dry Weight Corrected"</i> | | | | | | | | | | | | | |
| Thorium-228 | | 0.773 | +/-0.301 | 0.203 | +/-0.347 | 0.200 | pCi/g | | AXD3 | 10/12/08 | 1042 | 801996 | 4 |
| Thorium-230 | | 0.771 | +/-0.289 | 0.153 | +/-0.337 | 0.200 | pCi/g | | | | | | |
| Thorium-232 | | 1.05 | +/-0.334 | 0.0829 | +/-0.408 | 0.200 | pCi/g | | | | | | |
| <i>Alphaspec U, solid "Dry Weight Corrected"</i> | | | | | | | | | | | | | |
| Uranium-233/234 | | 0.637 | +/-0.211 | 0.0546 | +/-0.229 | 0.200 | pCi/g | | AXD3 | 10/12/08 | 1041 | 801997 | 5 |
| Uranium-235/236 | | 0.090 | +/-0.0882 | 0.0675 | +/-0.0891 | 0.200 | pCi/g | | | | | | |
| Uranium-238 | | 0.655 | +/-0.214 | 0.0546 | +/-0.232 | 0.200 | pCi/g | | | | | | |
| Rad Gamma Spec Analysis | | | | | | | | | | | | | |
| <i>Gammasespec, Gamma, Solid (Long List) "Dry Weight Corrected"</i> | | | | | | | | | | | | | |
| Actinium-228 | | 0.828 | +/-0.103 | 0.137 | +/-0.103 | | pCi/g | | MJH1 | 10/09/08 | 0851 | 797779 | 6 |
| Americium-241 | U | -0.0569 | +/-0.0631 | 0.220 | +/-0.0631 | | pCi/g | | | | | | |
| Antimony-124 | U | 0.00257 | +/-0.0388 | 0.130 | +/-0.0388 | | pCi/g | | | | | | |
| Antimony-125 | U | -0.016 | +/-0.0277 | 0.0933 | +/-0.0277 | | pCi/g | | | | | | |
| Barium-133 | U | 0.00897 | +/-0.0146 | 0.0435 | +/-0.0146 | | pCi/g | | | | | | |
| Barium-140 | U | -0.213 | +/-0.316 | 1.03 | +/-0.316 | | pCi/g | | | | | | |
| Beryllium-7 | U | -0.103 | +/-0.140 | 0.464 | +/-0.140 | | pCi/g | | | | | | |
| Bismuth-212 | | 0.549 | +/-0.132 | 0.309 | +/-0.132 | | pCi/g | | | | | | |
| Bismuth-214 | | 0.505 | +/-0.0536 | 0.0726 | +/-0.0536 | | pCi/g | | | | | | |
| Cerium-139 | U | -0.0127 | +/-0.0104 | 0.0359 | +/-0.0104 | | pCi/g | | | | | | |
| Cerium-141 | U | -0.00422 | +/-0.0371 | 0.123 | +/-0.0371 | | pCi/g | | | | | | |
| Cerium-144 | U | 0.0253 | +/-0.0727 | 0.246 | +/-0.0727 | | pCi/g | | | | | | |
| Cesium-134 | U | 0.00553 | +/-0.0152 | 0.052 | +/-0.0152 | | pCi/g | | | | | | |
| Cesium-136 | U | 0.136 | +/-0.145 | 0.496 | +/-0.145 | | pCi/g | | | | | | |
| Cesium-137 | U | -0.00258 | +/-0.0118 | 0.0385 | +/-0.0118 | 0.100 | pCi/g | | | | | | |
| Chromium-51 | U | 0.227 | +/-0.235 | 0.811 | +/-0.235 | | pCi/g | | | | | | |
| Cobalt-56 | U | 0.0129 | +/-0.0163 | 0.0567 | +/-0.0163 | | pCi/g | | | | | | |
| Cobalt-57 | U | -0.0104 | +/-0.00896 | 0.0293 | +/-0.00896 | | pCi/g | | | | | | |
| Cobalt-58 | U | -0.053 | +/-0.0162 | 0.0461 | +/-0.0162 | | pCi/g | | | | | | |
| Cobalt-60 | U | 0.0134 | +/-0.0123 | 0.0434 | +/-0.0123 | | pCi/g | | | | | | |
| Europium-152 | U | 0.0186 | +/-0.0334 | 0.0997 | +/-0.0334 | | pCi/g | | | | | | |

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Report Date: October 17, 2008

Client Sample ID: 212-5
Sample ID: 215722003

Project: LLNL00306
Client ID: LLNL002

| Parameter | Qualifier | Result | Uncertainty | DL | TPU | RL | Units | DF | Analyst | Date | Time Batch | Mtd. |
|--|-----------|----------|-------------|--------|-----------|----|-------|----|---------|------|------------|------|
| Rad Gamma Spec Analysis | | | | | | | | | | | | |
| <i>Gammascpec, Gamma, Solid (Long List) "Dry Weight Corrected"</i> | | | | | | | | | | | | |
| Europium-154 | U | -0.0669 | +/-0.0421 | 0.130 | +/-0.0421 | | pCi/g | | | | | |
| Europium-155 | U | 0.0431 | +/-0.0372 | 0.131 | +/-0.0372 | | pCi/g | | | | | |
| Iridium-192 | U | -0.0233 | +/-0.0144 | 0.0455 | +/-0.0144 | | pCi/g | | | | | |
| Iron-59 | U | -0.0711 | +/-0.0476 | 0.144 | +/-0.0476 | | pCi/g | | | | | |
| Lead-210 | U | -2.01 | +/-2.16 | 7.36 | +/-2.16 | | pCi/g | | | | | |
| Lead-212 | | 0.679 | +/-0.0405 | 0.0616 | +/-0.0405 | | pCi/g | | | | | |
| Lead-214 | | 0.603 | +/-0.052 | 0.0698 | +/-0.052 | | pCi/g | | | | | |
| Manganese-54 | U | 0.0106 | +/-0.0131 | 0.0456 | +/-0.0131 | | pCi/g | | | | | |
| Mercury-203 | U | -0.0203 | +/-0.0201 | 0.0662 | +/-0.0201 | | pCi/g | | | | | |
| Neodymium-147 | U | -0.909 | +/-0.869 | 2.80 | +/-0.869 | | pCi/g | | | | | |
| Neptunium-239 | U | 0.0515 | +/-0.0618 | 0.214 | +/-0.0618 | | pCi/g | | | | | |
| Niobium-94 | U | -0.0192 | +/-0.0111 | 0.0337 | +/-0.0111 | | pCi/g | | | | | |
| Niobium-95 | U | 0.0324 | +/-0.0232 | 0.083 | +/-0.0232 | | pCi/g | | | | | |
| Potassium-40 | | 15.2 | +/-0.701 | 0.295 | +/-0.701 | | pCi/g | | | | | |
| Promethium-144 | U | 0.0113 | +/-0.0132 | 0.043 | +/-0.0132 | | pCi/g | | | | | |
| Promethium-146 | U | 0.0025 | +/-0.0135 | 0.0464 | +/-0.0135 | | pCi/g | | | | | |
| Radium-228 | | 0.828 | +/-0.103 | 0.137 | +/-0.103 | | pCi/g | | | | | |
| Ruthenium-106 | U | 0.0894 | +/-0.105 | 0.361 | +/-0.105 | | pCi/g | | | | | |
| Silver-110m | U | -0.0245 | +/-0.0123 | 0.0357 | +/-0.0123 | | pCi/g | | | | | |
| Sodium-22 | U | -0.0268 | +/-0.0154 | 0.0471 | +/-0.0154 | | pCi/g | | | | | |
| Thallium-208 | | 0.196 | +/-0.0231 | 0.0368 | +/-0.0231 | | pCi/g | | | | | |
| Thorium-230 | | 0.505 | +/-0.0536 | 0.0726 | +/-0.0536 | | pCi/g | | | | | |
| Thorium-234 | U | 0.0629 | +/-0.554 | 1.96 | +/-0.554 | | pCi/g | | | | | |
| Tin-113 | U | 0.012 | +/-0.0176 | 0.059 | +/-0.0176 | | pCi/g | | | | | |
| Uranium-235 | U | 0.0197 | +/-0.0744 | 0.245 | +/-0.0744 | | pCi/g | | | | | |
| Uranium-238 | U | 0.0629 | +/-0.554 | 1.96 | +/-0.554 | | pCi/g | | | | | |
| Yttrium-88 | U | -0.00125 | +/-0.012 | 0.0393 | +/-0.012 | | pCi/g | | | | | |
| Zinc-65 | U | 0.00513 | +/-0.0382 | 0.107 | +/-0.0382 | | pCi/g | | | | | |
| Zirconium-95 | U | 0.0621 | +/-0.0257 | 0.0963 | +/-0.0257 | | pCi/g | | | | | |

The following Analytical Methods were performed

| Method | Description |
|--------|-------------------------------------|
| 1 | DOE EML HASL-300, Am-05-RC Modified |
| 2 | DOE EML HASL-300, Am-05-RC Modified |
| 3 | DOE EML HASL-300, Pu-11-RC Modified |
| 4 | DOE EML HASL-300, Th-01-RC Modified |
| 5 | DOE EML HASL-300, U-02-RC Modified |

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: October 17, 2008
Page 1 of 14

Client : Lawrence Livermore National Security, LLC
7000 East Avenue
Mailstop L-620
Livermore, California
Contact: Mr. Chad F. Davis
Workorder: 215722

| Parname | NOM | Sample Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time | |
|-------------------|-----------|-------------|-----------|-------|-----------|-------|-------|-------------|---------------|--|
| Rad Alpha Spec | | | | | | | | | | |
| Batch | 801994 | | | | | | | | | |
| QC1201685706 | 215722001 | DUP | | | | | | | | |
| Americium-241 | | U | -0.0187 | U | 0.0211 | pCi/g | 3320 | N/A AXD3 | 10/15/0823:14 | |
| | | Uncert: | +/-0.0282 | | +/-0.0439 | | | | | |
| | | TPU: | +/-0.0282 | | +/-0.044 | | | | | |
| Americium-243 | | U | 0.0142 | X | 0.346 | pCi/g | 184* | (0% - 100%) | | |
| | | Uncert: | +/-0.0369 | | +/-0.0976 | | | | | |
| | | TPU: | +/-0.0369 | | +/-0.101 | | | | | |
| QC1201685708 | LCS | | | | | | | | | |
| Americium-241 | 5.27 | | | | 4.66 | pCi/g | 88 | (75%-125%) | 10/15/0823:14 | |
| | | Uncert: | | | +/-0.473 | | | | | |
| | | TPU: | | | +/-0.752 | | | | | |
| Americium-243 | | | | | 7.55 | pCi/g | | (75%-125%) | | |
| | | Uncert: | | | +/-0.599 | | | | | |
| | | TPU: | | | +/-1.12 | | | | | |
| QC1201685705 | MB | | | | | | | | | |
| Americium-241 | | | | U | 0.0138 | pCi/g | | | 10/17/0808:07 | |
| | | Uncert: | | | +/-0.0269 | | | | | |
| | | TPU: | | | +/-0.027 | | | | | |
| Americium-243 | | | | X | 0.151 | pCi/g | | | | |
| | | Uncert: | | | +/-0.0778 | | | | | |
| | | TPU: | | | +/-0.0791 | | | | | |
| QC1201685707 | 215722001 | MS | | | | | | | | |
| Americium-241 | 5.31 | U | -0.0187 | | 5.77 | pCi/g | 109 | (75%-125%) | 10/15/0823:14 | |
| | | Uncert: | +/-0.0282 | | +/-0.543 | | | | | |
| | | TPU: | +/-0.0282 | | +/-0.912 | | | | | |
| Americium-243 | | U | 0.0142 | | 7.61 | pCi/g | | (75%-125%) | | |
| | | Uncert: | +/-0.0369 | | +/-0.622 | | | | | |
| | | TPU: | +/-0.0369 | | +/-1.15 | | | | | |
| Batch | 801995 | | | | | | | | | |
| QC1201685710 | 215722001 | DUP | | | | | | | | |
| Plutonium-238 | | U | 0.000856 | U | 0.00 | pCi/g | 0 | N/A AXD3 | 10/12/0810:41 | |
| | | Uncert: | +/-0.0329 | | +/-0.0215 | | | | | |
| | | TPU: | +/-0.0329 | | +/-0.0215 | | | | | |
| Plutonium-239/240 | | U | 0.0483 | | 0.0907 | pCi/g | 61 | (0% - 100%) | | |
| | | Uncert: | +/-0.0474 | | +/-0.065 | | | | | |
| | | TPU: | +/-0.0477 | | +/-0.0658 | | | | | |
| QC1201685712 | LCS | | | | | | | | | |
| Plutonium-238 | | | | U | 0.0161 | pCi/g | | (75%-125%) | 10/12/0810:41 | |
| | | Uncert: | | | +/-0.0258 | | | | | |
| | | TPU: | | | +/-0.0258 | | | | | |
| Plutonium-239/240 | 5.48 | | | | 4.61 | pCi/g | 84 | (75%-125%) | | |
| | | Uncert: | | | +/-0.403 | | | | | |

GEL LABORATORIES LLC

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QC Summary

Workorder: 215722

Page 2 of 14

| Parmname | NOM | Sample Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|-----------------------|-----------|-------------|-----------|---------|-----------|-------|----------------|-------|---------------|
| Rad Alpha Spec | | | | | | | | | |
| Batch | 801995 | | | | | | | | |
| QC1201685709 | MB | | | | | | | | |
| Plutonium-238 | | TPU: | +/-0.630 | | | | | | |
| | | | U | -0.0121 | pCi/g | | | | 10/12/0810:41 |
| | | Uncert: | +/-0.0252 | | | | | | |
| | | TPU: | +/-0.0253 | | | | | | |
| Plutonium-239/240 | | | U | 0.00 | pCi/g | | | | |
| | | Uncert: | +/-0.0205 | | | | | | |
| | | TPU: | +/-0.0205 | | | | | | |
| QC1201685711 | 215722001 | MS | | | | | | | |
| Plutonium-238 | | U | 0.000856 | U | 0.0402 | pCi/g | (75%-125%) | | 10/12/0810:41 |
| | | Uncert: | +/-0.0329 | | +/-0.0454 | | | | |
| | | TPU: | +/-0.0329 | | +/-0.0456 | | | | |
| Plutonium-239/240 | 5.53 | U | 0.0483 | | 5.67 | pCi/g | 102 (75%-125%) | | |
| | | Uncert: | +/-0.0474 | | +/-0.499 | | | | |
| | | TPU: | +/-0.0477 | | +/-0.800 | | | | |
| Batch | 801996 | | | | | | | | |
| QC1201685714 | 215722001 | DUP | | | | | | | |
| Thorium-228 | | | 0.740 | | 0.615 | pCi/g | 19 (0% - 100%) | AXD3 | 10/12/0810:42 |
| | | Uncert: | +/-0.265 | | +/-0.242 | | | | |
| | | TPU: | +/-0.303 | | +/-0.271 | | | | |
| Thorium-230 | | | 0.678 | | 0.643 | pCi/g | 5 (0% - 20%) | | |
| | | Uncert: | +/-0.248 | | +/-0.238 | | | | |
| | | TPU: | +/-0.282 | | +/-0.270 | | | | |
| Thorium-232 | | | 0.649 | | 0.644 | pCi/g | 1 (0% - 20%) | | |
| | | Uncert: | +/-0.243 | | +/-0.237 | | | | |
| | | TPU: | +/-0.275 | | +/-0.269 | | | | |
| QC1201685716 | LCS | | | | | | | | |
| Thorium-228 | | | | | 8.06 | pCi/g | (75%-125%) | | 10/12/0810:42 |
| | | Uncert: | | | +/-0.759 | | | | |
| | | TPU: | | | +/-1.73 | | | | |
| Thorium-230 | | | | | 3.41 | pCi/g | (75%-125%) | | |
| | | Uncert: | | | +/-0.493 | | | | |
| | | TPU: | | | +/-0.820 | | | | |
| Thorium-232 | 6.91 | | | | 7.32 | pCi/g | 106 (75%-125%) | | |
| | | Uncert: | | | +/-0.721 | | | | |
| | | TPU: | | | +/-1.58 | | | | |
| QC1201685713 | MB | | | | | | | | |
| Thorium-228 | | | U | 0.0413 | pCi/g | | | | 10/12/0810:42 |
| | | Uncert: | | | +/-0.0981 | | | | |
| | | TPU: | | | +/-0.0985 | | | | |
| Thorium-230 | | | U | 0.0862 | pCi/g | | | | |
| | | Uncert: | | | +/-0.0997 | | | | |
| | | TPU: | | | +/-0.102 | | | | |
| Thorium-232 | | | U | 0.0537 | pCi/g | | | | |
| | | Uncert: | | | +/-0.0752 | | | | |
| | | TPU: | | | +/-0.0762 | | | | |
| QC1201685715 | 215722001 | MS | | | | | | | |
| Thorium-228 | | | | | 0.740 | pCi/g | (75%-125%) | | 10/12/0810:42 |
| | | Uncert: | | | +/-0.265 | | | | |
| | | | | | +/-1.07 | | | | |

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QC Summary

Workorder: 215722

Page 3 of 14

| Parmname | NOM | Sample Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|-----------------------|-----------|---------------|----------------|-------|------|------|-------------|-------|---------------|
| Rad Alpha Spec | | | | | | | | | |
| Batch | 801996 | | | | | | | | |
| Thorium-230 | TPU: | +/-0.303 | +/-2.40 | | | | | | |
| | | 0.678 | 3.73 | pCi/g | | | (75%-125%) | | |
| | Uncert: | +/-0.248 | +/-0.635 | | | | | | |
| Thorium-232 | TPU: | +/-0.282 | +/-1.03 | | | | | | |
| | 7.60 | 0.649 | 8.86 | pCi/g | | 108 | (75%-125%) | | |
| | Uncert: | +/-0.243 | +/-0.977 | | | | | | |
| | TPU: | +/-0.275 | +/-2.16 | | | | | | |
| Batch | 801997 | | | | | | | | |
| QC1201685718 | 215722001 | DUP | | | | | | | |
| Uranium-233/234 | | 0.672 | 0.533 | pCi/g | 23 | | (0% - 100%) | AXD3 | 10/12/0810:41 |
| | Uncert: | +/-0.223 | +/-0.254 | | | | | | |
| Uranium-235/236 | U | TPU: +/-0.241 | +/-0.267 | pCi/g | 0 | | N/A | | |
| | | 0.0646 | 0.00 | | | | | | |
| | Uncert: | +/-0.0802 | +/-0.0737 | | | | | | |
| Uranium-238 | TPU: | +/-0.0807 | +/-0.0739 | pCi/g | 35* | | (0% - 20%) | | |
| | | 0.862 | 0.608 | | | | | | |
| | Uncert: | +/-0.252 | +/-0.267 | | | | | | |
| | TPU: | +/-0.278 | +/-0.282 | | | | | | |
| QC1201685720 | LCS | | | | | | | | |
| Uranium-233/234 | | | 9.19 | pCi/g | | | (75%-125%) | | 10/12/0810:41 |
| | Uncert: | | +/-0.978 | | | | | | |
| Uranium-235/236 | | | TPU: +/-1.71 | pCi/g | | | (75%-125%) | | |
| | | | 0.260 | | | | | | |
| | Uncert: | | +/-0.186 | | | | | | |
| Uranium-238 | TPU: | +/-0.191 | | pCi/g | | 108 | (75%-125%) | | |
| | 8.90 | | 9.61 | | | | | | |
| | Uncert: | | +/-1.00 | | | | | | |
| | TPU: | | +/-1.78 | | | | | | |
| QC1201685717 | MB | | | | | | | | |
| Uranium-233/234 | | | 0.132 | pCi/g | | | | | 10/12/0810:41 |
| | Uncert: | | +/-0.0914 | | | | | | |
| Uranium-235/236 | | | TPU: +/-0.0932 | pCi/g | | | | | |
| | | U | 0.0408 | | | | | | |
| | Uncert: | | +/-0.0565 | | | | | | |
| Uranium-238 | | | TPU: +/-0.0568 | pCi/g | | | | | |
| | | U | 0.0125 | | | | | | |
| | Uncert: | | +/-0.0332 | | | | | | |
| | TPU: | | +/-0.0333 | | | | | | |
| QC1201685719 | 215722001 | MS | | | | | | | |
| Uranium-233/234 | | 0.672 | 11.5 | pCi/g | | | (75%-125%) | | 10/12/0810:41 |
| | Uncert: | +/-0.223 | +/-1.21 | | | | | | |
| Uranium-235/236 | | TPU: +/-0.241 | +/-2.18 | pCi/g | | | (75%-125%) | | |
| | | U | 0.0646 | | | | | | |
| | Uncert: | +/-0.0802 | +/-0.265 | | | | | | |
| Uranium-238 | TPU: | +/-0.0807 | +/-0.274 | pCi/g | | 117 | (75%-125%) | | |
| | 9.80 | 0.862 | 12.3 | | | | | | |
| | Uncert: | +/-0.252 | +/-1.25 | | | | | | |
| | TPU: | +/-0.278 | +/-2.32 | | | | | | |

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QC Summary

Workorder: 215722

Page 4 of 14

| Parname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------------------------|-----|-------------------|------|-----------|-------|------|------|-------------|-------|---------------|------|
| Rad Gamma Spec | | | | | | | | | | | |
| Batch 797779 | | | | | | | | | | | |
| QC1201676587 215722001 DUP | | | | | | | | | | | |
| Actinium-228 | | 0.697 | | 0.541 | pCi/g | 25 | | (0% - 100%) | MJH1 | 10/09/0809:17 | |
| | | Uncert: +/-0.0873 | | +/-0.0957 | | | | | | | |
| | | TPU: +/-0.0873 | | +/-0.0957 | | | | | | | |
| Americium-241 | U | -0.0119 | U | 0.0585 | pCi/g | 302 | | | N/A | | |
| | | Uncert: +/-0.0614 | | +/-0.0556 | | | | | | | |
| | | TPU: +/-0.0614 | | +/-0.0556 | | | | | | | |
| Antimony-124 | U | 0.0435 | U | 0.0139 | pCi/g | 103 | | | N/A | | |
| | | Uncert: +/-0.0392 | | +/-0.0439 | | | | | | | |
| | | TPU: +/-0.0392 | | +/-0.0439 | | | | | | | |
| Antimony-125 | U | -0.0164 | U | -0.00687 | pCi/g | 82 | | | N/A | | |
| | | Uncert: +/-0.0296 | | +/-0.0312 | | | | | | | |
| | | TPU: +/-0.0296 | | +/-0.0312 | | | | | | | |
| Barium-133 | U | -0.00402 | U | 0.0272 | pCi/g | 269 | | | N/A | | |
| | | Uncert: +/-0.0157 | | +/-0.0174 | | | | | | | |
| | | TPU: +/-0.0157 | | +/-0.0174 | | | | | | | |
| Barium-140 | U | 0.0391 | U | -0.143 | pCi/g | 350 | | | N/A | | |
| | | Uncert: +/-0.521 | | +/-0.667 | | | | | | | |
| | | TPU: +/-0.521 | | +/-0.667 | | | | | | | |
| Beryllium-7 | U | -0.0302 | U | -0.0509 | pCi/g | 51 | | | N/A | | |
| | | Uncert: +/-0.165 | | +/-0.195 | | | | | | | |
| | | TPU: +/-0.165 | | +/-0.195 | | | | | | | |
| Bismuth-212 | UI | 0.00 | UI | 0.00 | pCi/g | 4 | | | N/A | | |
| | | Uncert: +/-0.187 | | +/-0.186 | | | | | | | |
| | | TPU: +/-0.187 | | +/-0.186 | | | | | | | |
| Bismuth-214 | | 0.506 | | 0.569 | pCi/g | 12 | | (0% - 20%) | | | |
| | | Uncert: +/-0.0499 | | +/-0.0628 | | | | | | | |
| | | TPU: +/-0.0499 | | +/-0.0628 | | | | | | | |
| Cerium-139 | U | -0.00709 | U | 0.0276 | pCi/g | 338 | | | N/A | | |
| | | Uncert: +/-0.0111 | | +/-0.0125 | | | | | | | |
| | | TPU: +/-0.0111 | | +/-0.0125 | | | | | | | |
| Cerium-141 | U | -0.0542 | U | -0.0171 | pCi/g | 104 | | | N/A | | |
| | | Uncert: +/-0.0421 | | +/-0.048 | | | | | | | |
| | | TPU: +/-0.0421 | | +/-0.048 | | | | | | | |
| Cerium-144 | U | 0.00149 | U | -0.0171 | pCi/g | 238 | | | N/A | | |
| | | Uncert: +/-0.072 | | +/-0.0716 | | | | | | | |
| | | TPU: +/-0.072 | | +/-0.0716 | | | | | | | |
| Cesium-134 | U | 0.0379 | U | 0.0191 | pCi/g | 66 | | | N/A | | |
| | | Uncert: +/-0.0147 | | +/-0.0175 | | | | | | | |
| | | TPU: +/-0.0147 | | +/-0.0175 | | | | | | | |
| Cesium-136 | U | 0.156 | U | -0.189 | pCi/g | 2090 | | | N/A | | |
| | | Uncert: +/-0.227 | | +/-0.263 | | | | | | | |
| | | TPU: +/-0.227 | | +/-0.263 | | | | | | | |
| Cesium-137 | | 0.588 | | 0.613 | pCi/g | 4 | | (0% - 20%) | | | |
| | | Uncert: +/-0.0356 | | +/-0.038 | | | | | | | |
| | | TPU: +/-0.0356 | | +/-0.038 | | | | | | | |
| Chromium-51 | U | 0.411 | U | 0.206 | pCi/g | 67 | | | N/A | | |
| | | Uncert: +/-0.289 | | +/-0.361 | | | | | | | |
| | | TPU: +/-0.289 | | +/-0.361 | | | | | | | |

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QC Summary

Workorder: 215722

Page 5 of 14

| Parname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|-----------------------|--------|--------------------|------|------------|-------|------|------|-------------|-------|------|------|
| Rad Gamma Spec | | | | | | | | | | | |
| Batch | 797779 | | | | | | | | | | |
| Cobalt-56 | U | -0.0102 | U | 0.00178 | pCi/g | 284 | | | N/A | | |
| | | Uncert: +/-0.0167 | | +/-0.0197 | | | | | | | |
| | | TPU: +/-0.0167 | | +/-0.0197 | | | | | | | |
| Cobalt-57 | U | 0.0019 | U | -0.00619 | pCi/g | 377 | | | N/A | | |
| | | Uncert: +/-0.00885 | | +/-0.00907 | | | | | | | |
| | | TPU: +/-0.00885 | | +/-0.00907 | | | | | | | |
| Cobalt-58 | U | -0.0425 | U | -0.0444 | pCi/g | 4 | | | N/A | | |
| | | Uncert: +/-0.0155 | | +/-0.0202 | | | | | | | |
| | | TPU: +/-0.0155 | | +/-0.0202 | | | | | | | |
| Cobalt-60 | U | 0.016 | U | 0.00951 | pCi/g | 51 | | | N/A | | |
| | | Uncert: +/-0.0119 | | +/-0.0162 | | | | | | | |
| | | TPU: +/-0.0119 | | +/-0.0162 | | | | | | | |
| Europium-152 | U | -0.0212 | U | -0.00397 | pCi/g | 137 | | | N/A | | |
| | | Uncert: +/-0.0346 | | +/-0.0498 | | | | | | | |
| | | TPU: +/-0.0346 | | +/-0.0498 | | | | | | | |
| Europium-154 | U | -0.119 | U | -0.00959 | pCi/g | 170 | | | N/A | | |
| | | Uncert: +/-0.0369 | | +/-0.0374 | | | | | | | |
| | | TPU: +/-0.0369 | | +/-0.0374 | | | | | | | |
| Europium-155 | U | 0.0887 | U | -0.0386 | pCi/g | 509 | | | N/A | | |
| | | Uncert: +/-0.0341 | | +/-0.0332 | | | | | | | |
| | | TPU: +/-0.0341 | | +/-0.0332 | | | | | | | |
| Iridium-192 | U | 0.0169 | U | -0.0148 | pCi/g | 3070 | | | N/A | | |
| | | Uncert: +/-0.015 | | +/-0.0197 | | | | | | | |
| | | TPU: +/-0.015 | | +/-0.0197 | | | | | | | |
| Iron-59 | U | -0.0287 | U | -0.0461 | pCi/g | 47 | | | N/A | | |
| | | Uncert: +/-0.050 | | +/-0.0451 | | | | | | | |
| | | TPU: +/-0.050 | | +/-0.0451 | | | | | | | |
| Lead-210 | U | -2.62 | U | -1.37 | pCi/g | 63 | | | N/A | | |
| | | Uncert: +/-2.11 | | +/-1.25 | | | | | | | |
| | | TPU: +/-2.11 | | +/-1.25 | | | | | | | |
| Lead-212 | | 0.625 | UI | 0.00 | pCi/g | 23 | | (0% - 100%) | | | |
| | | Uncert: +/-0.0397 | | +/-0.046 | | | | | | | |
| | | TPU: +/-0.0397 | | +/-0.046 | | | | | | | |
| Lead-214 | | 0.547 | UI | 0.00 | pCi/g | 18 | | (0% - 100%) | | | |
| | | Uncert: +/-0.0522 | | +/-0.0718 | | | | | | | |
| | | TPU: +/-0.0522 | | +/-0.0718 | | | | | | | |
| Manganese-54 | U | 0.00399 | U | -0.0252 | pCi/g | 275 | | | N/A | | |
| | | Uncert: +/-0.0133 | | +/-0.0142 | | | | | | | |
| | | TPU: +/-0.0133 | | +/-0.0142 | | | | | | | |
| Mercury-203 | U | 0.00212 | U | 0.0316 | pCi/g | 175 | | | N/A | | |
| | | Uncert: +/-0.0221 | | +/-0.0257 | | | | | | | |
| | | TPU: +/-0.0221 | | +/-0.0257 | | | | | | | |
| Neodymium-147 | U | 1.61 | U | -0.355 | pCi/g | 313 | | | N/A | | |
| | | Uncert: +/-1.48 | | +/-2.10 | | | | | | | |
| | | TPU: +/-1.48 | | +/-2.10 | | | | | | | |
| Neptunium-239 | U | 0.0559 | U | 0.109 | pCi/g | 64 | | | N/A | | |
| | | Uncert: +/-0.0604 | | +/-0.0606 | | | | | | | |
| | | TPU: +/-0.0604 | | +/-0.0606 | | | | | | | |

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QC Summary

Workorder: 215722

Page 6 of 14

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|-----------------------|---------|-----------|------|-----------|-------|------|------|-------------|-------|------|------|
| Rad Gamma Spec | | | | | | | | | | | |
| Batch | 797779 | | | | | | | | | | |
| Niobium-94 | U | 0.00913 | U | -0.0138 | pCi/g | 975 | | | N/A | | |
| | Uncert: | +/-0.0101 | | +/-0.013 | | | | | | | |
| | TPU: | +/-0.0101 | | +/-0.013 | | | | | | | |
| Niobium-95 | U | 0.0836 | U | 0.000998 | pCi/g | 195 | | | N/A | | |
| | Uncert: | +/-0.0313 | | +/-0.039 | | | | | | | |
| | TPU: | +/-0.0313 | | +/-0.039 | | | | | | | |
| Potassium-40 | | 13.2 | | 11.5 | pCi/g | 14 | | (0% - 20%) | | | |
| | Uncert: | +/-0.654 | | +/-0.680 | | | | | | | |
| | TPU: | +/-0.654 | | +/-0.680 | | | | | | | |
| Promethium-144 | U | -0.00395 | U | 0.0122 | pCi/g | 391 | | | N/A | | |
| | Uncert: | +/-0.0117 | | +/-0.0142 | | | | | | | |
| | TPU: | +/-0.0117 | | +/-0.0142 | | | | | | | |
| Promethium-146 | U | 0.00513 | U | 0.0223 | pCi/g | 125 | | | N/A | | |
| | Uncert: | +/-0.0135 | | +/-0.018 | | | | | | | |
| | TPU: | +/-0.0135 | | +/-0.018 | | | | | | | |
| Radium-228 | | 0.697 | | 0.541 | pCi/g | 25 | | (0% - 100%) | | | |
| | Uncert: | +/-0.0873 | | +/-0.0957 | | | | | | | |
| | TPU: | +/-0.0873 | | +/-0.0957 | | | | | | | |
| Ruthenium-106 | U | 0.0579 | U | 0.131 | pCi/g | 77 | | | N/A | | |
| | Uncert: | +/-0.106 | | +/-0.120 | | | | | | | |
| | TPU: | +/-0.106 | | +/-0.120 | | | | | | | |
| Silver-110m | U | 0.000923 | U | -0.00017 | pCi/g | 290 | | | N/A | | |
| | Uncert: | +/-0.0148 | | +/-0.0156 | | | | | | | |
| | TPU: | +/-0.0148 | | +/-0.0156 | | | | | | | |
| Sodium-22 | U | -0.0411 | U | -0.00271 | pCi/g | 175 | | | N/A | | |
| | Uncert: | +/-0.0133 | | +/-0.0137 | | | | | | | |
| | TPU: | +/-0.0133 | | +/-0.0137 | | | | | | | |
| Thallium-208 | | 0.211 | | 0.225 | pCi/g | 6 | | (0% - 100%) | | | |
| | Uncert: | +/-0.0279 | | +/-0.031 | | | | | | | |
| | TPU: | +/-0.0279 | | +/-0.031 | | | | | | | |
| Thorium-230 | | 0.506 | | 0.569 | pCi/g | 12 | | (0% - 20%) | | | |
| | Uncert: | +/-0.0499 | | +/-0.0628 | | | | | | | |
| | TPU: | +/-0.0499 | | +/-0.0628 | | | | | | | |
| Thorium-234 | U | 0.248 | U | 1.12 | pCi/g | 127 | | | N/A | | |
| | Uncert: | +/-0.519 | | +/-0.569 | | | | | | | |
| | TPU: | +/-0.519 | | +/-0.569 | | | | | | | |
| Tin-113 | U | 0.0339 | U | 0.0097 | pCi/g | 111 | | | N/A | | |
| | Uncert: | +/-0.0172 | | +/-0.0222 | | | | | | | |
| | TPU: | +/-0.0172 | | +/-0.0222 | | | | | | | |
| Uranium-235 | U | 0.053 | U | -0.023 | pCi/g | 507 | | | N/A | | |
| | Uncert: | +/-0.0696 | | +/-0.0772 | | | | | | | |
| | TPU: | +/-0.0696 | | +/-0.0772 | | | | | | | |
| Uranium-238 | U | 0.248 | U | 1.12 | pCi/g | 127 | | | N/A | | |
| | Uncert: | +/-0.519 | | +/-0.569 | | | | | | | |
| | TPU: | +/-0.519 | | +/-0.569 | | | | | | | |
| Yttrium-88 | U | 0.0104 | U | 0.00929 | pCi/g | 11 | | | N/A | | |
| | Uncert: | +/-0.0124 | | +/-0.0142 | | | | | | | |
| | TPU: | +/-0.0124 | | +/-0.0142 | | | | | | | |

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QC Summary

Workorder: 215722

Page 7 of 14

| Parname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|-----------------------|---------|-----------|------|-----------|-------|------|------|------------|-------|---------------|------|
| Rad Gamma Spec | | | | | | | | | | | |
| Batch | 797779 | | | | | | | | | | |
| Zinc-65 | U | -0.0597 | U | 0.016 | pCi/g | 347 | | N/A | | | |
| | Uncert: | +/-0.0381 | | +/-0.0419 | | | | | | | |
| | TPU: | +/-0.0381 | | +/-0.0419 | | | | | | | |
| Zirconium-95 | U | 0.0466 | U | 0.106 | pCi/g | 78 | | N/A | | | |
| | Uncert: | +/-0.0291 | | +/-0.0396 | | | | | | | |
| | TPU: | +/-0.0291 | | +/-0.0396 | | | | | | | |
| QC1201676588 | LCS | | | | | | | | | | |
| Actinium-228 | | | | 1.52 | pCi/g | | | | | 10/09/0809:18 | |
| | Uncert: | | | +/-0.300 | | | | | | | |
| | TPU: | | | +/-0.300 | | | | | | | |
| Americium-241 | 15.9 | | | 14.2 | pCi/g | | 89 | (75%-125%) | | | |
| | Uncert: | | | +/-0.626 | | | | | | | |
| | TPU: | | | +/-0.626 | | | | | | | |
| Antimony-124 | | | U | -0.0787 | pCi/g | | | | | | |
| | Uncert: | | | +/-0.0512 | | | | | | | |
| | TPU: | | | +/-0.0512 | | | | | | | |
| Antimony-125 | | | U | 0.131 | pCi/g | | | | | | |
| | Uncert: | | | +/-0.0916 | | | | | | | |
| | TPU: | | | +/-0.0916 | | | | | | | |
| Barium-133 | | | U | 0.0367 | pCi/g | | | | | | |
| | Uncert: | | | +/-0.0425 | | | | | | | |
| | TPU: | | | +/-0.0425 | | | | | | | |
| Barium-140 | | | U | -0.295 | pCi/g | | | | | | |
| | Uncert: | | | +/-0.354 | | | | | | | |
| | TPU: | | | +/-0.354 | | | | | | | |
| Beryllium-7 | | | U | 0.213 | pCi/g | | | | | | |
| | Uncert: | | | +/-0.362 | | | | | | | |
| | TPU: | | | +/-0.362 | | | | | | | |
| Bismuth-212 | | | U | 0.862 | pCi/g | | | | | | |
| | Uncert: | | | +/-0.277 | | | | | | | |
| | TPU: | | | +/-0.277 | | | | | | | |
| Bismuth-214 | | | | 0.526 | pCi/g | | | | | | |
| | Uncert: | | | +/-0.100 | | | | | | | |
| | TPU: | | | +/-0.100 | | | | | | | |
| Cerium-139 | | | | 0.191 | pCi/g | | | | | | |
| | Uncert: | | | +/-0.039 | | | | | | | |
| | TPU: | | | +/-0.039 | | | | | | | |
| Cerium-141 | | | U | -0.00109 | pCi/g | | | | | | |
| | Uncert: | | | +/-0.052 | | | | | | | |
| | TPU: | | | +/-0.052 | | | | | | | |
| Cerium-144 | | | U | -0.252 | pCi/g | | | | | | |
| | Uncert: | | | +/-0.179 | | | | | | | |
| | TPU: | | | +/-0.179 | | | | | | | |
| Cesium-134 | | | U | -0.00114 | pCi/g | | | | | | |
| | Uncert: | | | +/-0.0457 | | | | | | | |
| | TPU: | | | +/-0.0457 | | | | | | | |
| Cesium-136 | | | U | -0.11 | pCi/g | | | | | | |
| | Uncert: | | | +/-0.178 | | | | | | | |

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QC Summary

Workorder: 215722

Page 8 of 14

| Parmname | NOM | Sample Qual | QC | Units | RPD% | REC% | Range Anlst | Date Time |
|-----------------------|--------|-------------|--|-------|------|------|-------------|-----------|
| Rad Gamma Spec | | | | | | | | |
| Batch | 797779 | | | | | | | |
| Cesium-137 | 5.99 | | TPU: +/-0.178 6.14 Uncert: +/-0.288 | pCi/g | | 102 | (75%-125%) | |
| Chromium-51 | | U | TPU: +/-0.288 0.385 Uncert: +/-0.408 | pCi/g | | | | |
| Cobalt-56 | | U | TPU: +/-0.408 -0.0349 Uncert: +/-0.0442 | pCi/g | | | | |
| Cobalt-57 | | | TPU: +/-0.0442 0.797 Uncert: +/-0.0517 | pCi/g | | | | |
| Cobalt-58 | | U | TPU: +/-0.0517 0.0394 Uncert: +/-0.042 | pCi/g | | | | |
| Cobalt-60 | 7.69 | | TPU: +/-0.042 7.23 Uncert: +/-0.277 | pCi/g | | 94 | (75%-125%) | |
| Europium-152 | | U | TPU: +/-0.277 -0.0278 Uncert: +/-0.0925 | pCi/g | | | | |
| Europium-154 | | U | TPU: +/-0.0925 0.0483 Uncert: +/-0.0663 | pCi/g | | | | |
| Europium-155 | | U | TPU: +/-0.0663 0.00778 Uncert: +/-0.0781 | pCi/g | | | | |
| Iridium-192 | | U | TPU: +/-0.0781 0.0416 Uncert: +/-0.033 | pCi/g | | | | |
| Iron-59 | | U | TPU: +/-0.033 0.018 Uncert: +/-0.111 | pCi/g | | | | |
| Lead-210 | | U | TPU: +/-0.111 0.583 Uncert: +/-2.30 | pCi/g | | | | |
| Lead-212 | | | TPU: +/-2.30 0.858 Uncert: +/-0.0878 | pCi/g | | | | |
| Lead-214 | | | TPU: +/-0.0878 0.674 Uncert: +/-0.0977 | pCi/g | | | | |
| Manganese-54 | | U | TPU: +/-0.0977 0.0247 Uncert: +/-0.0364 | pCi/g | | | | |
| Mercury-203 | | U | TPU: +/-0.0364 -0.0273 Uncert: +/-0.0394 | pCi/g | | | | |

GEL LABORATORIES LLC

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

QC Summary

Workorder: 215722

Page 9 of 14

| Parmname | NOM | Sample Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|----------------|-----|-------------|---------|-------|------|------|-----------|-------|-----------|
| Rad Gamma Spec | | | | | | | | | |
| Batch 797779 | | | | | | | | | |
| Neodymium-147 | | | TPU: | | | | | | |
| | | | | U | | | 1.22 | | pCi/g |
| Neptunium-239 | | | Uncert: | | | | +/-0.837 | | |
| | | | TPU: | | | | +/-0.837 | | |
| Niobium-94 | | | | U | | | -0.0347 | | pCi/g |
| | | | Uncert: | | | | +/-0.168 | | |
| Niobium-95 | | | TPU: | | | | +/-0.168 | | |
| | | | Uncert: | | | | +/-0.0282 | | |
| Potassium-40 | | | TPU: | | | | -0.0178 | | pCi/g |
| | | | Uncert: | | | | +/-0.049 | | |
| Promethium-144 | | | TPU: | | | | +/-0.049 | | |
| | | | Uncert: | | | | 1.44 | | pCi/g |
| Promethium-146 | | | TPU: | | | | +/-0.273 | | |
| | | | Uncert: | | | | +/-0.273 | | |
| Radium-228 | | | TPU: | | | | -0.00494 | | pCi/g |
| | | | Uncert: | | | | +/-0.0286 | | |
| Ruthenium-106 | | | TPU: | | | | +/-0.0286 | | |
| | | | Uncert: | | | | -0.0676 | | pCi/g |
| Silver-110m | | | TPU: | | | | +/-0.0466 | | |
| | | | Uncert: | | | | +/-0.0466 | | |
| Sodium-22 | | | TPU: | | | | 1.52 | | pCi/g |
| | | | Uncert: | | | | +/-0.300 | | |
| Thallium-208 | | | TPU: | | | | +/-0.300 | | |
| | | | Uncert: | | | | 0.728 | | pCi/g |
| Thorium-230 | | | TPU: | | | | +/-0.294 | | |
| | | | Uncert: | | | | +/-0.294 | | |
| Thorium-234 | | | TPU: | | | | 0.000475 | | pCi/g |
| | | | Uncert: | | | | +/-0.0404 | | |
| Tin-113 | | | TPU: | | | | +/-0.0404 | | |
| | | | Uncert: | | | | 0.0174 | | pCi/g |
| Uranium-235 | | | TPU: | | | | +/-0.0238 | | |
| | | | Uncert: | | | | +/-0.0238 | | |
| Uranium-235 | | | TPU: | | | | 0.381 | | pCi/g |
| | | | Uncert: | | | | +/-0.0659 | | |
| Uranium-235 | | | TPU: | | | | +/-0.0659 | | |
| | | | Uncert: | | | | 0.526 | | pCi/g |
| Uranium-235 | | | TPU: | | | | +/-0.100 | | |
| | | | Uncert: | | | | +/-0.100 | | |
| Uranium-235 | | | TPU: | | | | -0.325 | | pCi/g |
| | | | Uncert: | | | | +/-1.04 | | |
| Uranium-235 | | | TPU: | | | | +/-1.04 | | |
| | | | Uncert: | | | | 0.330 | | pCi/g |
| Uranium-235 | | | TPU: | | | | +/-0.0625 | | |
| | | | Uncert: | | | | +/-0.0625 | | |
| Uranium-235 | | | TPU: | | | | -0.0627 | | pCi/g |
| | | | Uncert: | | | | +/-0.146 | | |

GEL LABORATORIES LLC

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

QC Summary

Workorder: 215722

Page 10 of 14

| Parmname | NOM | Sample Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|-----------------------|--------|-------------|-------------------------------|-------|------|------|-------|-------|---------------|
| Rad Gamma Spec | | | | | | | | | |
| Batch | 797779 | | | | | | | | |
| Uranium-238 | | | TPU: +/-0.146 U -0.325 | pCi/g | | | | | |
| | | | Uncert: +/-1.04 | | | | | | |
| Yttrium-88 | | | TPU: +/-1.04 0.235 | pCi/g | | | | | |
| | | | Uncert: +/-0.0465 | | | | | | |
| Zinc-65 | | | TPU: +/-0.0465 U -0.198 | pCi/g | | | | | |
| | | | Uncert: +/-0.0962 | | | | | | |
| Zirconium-95 | | | TPU: +/-0.0962 U 0.0933 | pCi/g | | | | | |
| | | | Uncert: +/-0.0691 | | | | | | |
| QC1201676586 MB | | | | | | | | | |
| Actinium-228 | | | U -0.0217 | pCi/g | | | | | 10/09/0808:51 |
| | | | Uncert: +/-0.0477 | | | | | | |
| Americium-241 | | | TPU: +/-0.0477 U -0.00583 | pCi/g | | | | | |
| | | | Uncert: +/-0.0105 | | | | | | |
| Antimony-124 | | | TPU: +/-0.0105 U -0.0205 | pCi/g | | | | | |
| | | | Uncert: +/-0.0359 | | | | | | |
| Antimony-125 | | | TPU: +/-0.0359 U -2.30E-05 | pCi/g | | | | | |
| | | | Uncert: +/-0.0274 | | | | | | |
| Barium-133 | | | TPU: +/-0.0274 U -0.0449 | pCi/g | | | | | |
| | | | Uncert: +/-0.0147 | | | | | | |
| Barium-140 | | | TPU: +/-0.0147 U 0.0436 | pCi/g | | | | | |
| | | | Uncert: +/-0.141 | | | | | | |
| Beryllium-7 | | | TPU: +/-0.141 U 0.0312 | pCi/g | | | | | |
| | | | Uncert: +/-0.107 | | | | | | |
| Bismuth-212 | | | TPU: +/-0.107 U -0.0503 | pCi/g | | | | | |
| | | | Uncert: +/-0.098 | | | | | | |
| Bismuth-214 | | | TPU: +/-0.098 U -0.0316 | pCi/g | | | | | |
| | | | Uncert: +/-0.0322 | | | | | | |
| Cerium-139 | | | TPU: +/-0.0322 U -0.00035 | pCi/g | | | | | |
| | | | Uncert: +/-0.00717 | | | | | | |
| Cerium-141 | | | TPU: +/-0.00717 U -0.0107 | pCi/g | | | | | |
| | | | Uncert: +/-0.017 | | | | | | |
| Cerium-144 | | | TPU: +/-0.017 U -0.000337 | pCi/g | | | | | |

GEL LABORATORIES LLC

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

QC Summary

Workorder: 215722

Page 12 of 14

| Parmname | NOM | Sample Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------------|---------|-------------|------------|-------|------|------|-------|-------|------|------|
| Rad Gamma Spec | | | | | | | | | | |
| Batch | 797779 | | | | | | | | | |
| Manganese-54 | Uncert: | | +/-0.0257 | | | | | | | |
| | TPU: | | +/-0.0257 | | | | | | | |
| | | U | -0.00383 | pCi/g | | | | | | |
| Mercury-203 | Uncert: | | +/-0.0115 | | | | | | | |
| | TPU: | | +/-0.0115 | | | | | | | |
| | | U | 0.0113 | pCi/g | | | | | | |
| Neodymium-147 | Uncert: | | +/-0.013 | | | | | | | |
| | TPU: | | +/-0.013 | | | | | | | |
| | | U | -0.146 | pCi/g | | | | | | |
| Neptunium-239 | Uncert: | | +/-0.321 | | | | | | | |
| | TPU: | | +/-0.321 | | | | | | | |
| | | U | -0.0553 | pCi/g | | | | | | |
| Niobium-94 | Uncert: | | +/-0.0341 | | | | | | | |
| | TPU: | | +/-0.0341 | | | | | | | |
| | | U | -0.00864 | pCi/g | | | | | | |
| Niobium-95 | Uncert: | | +/-0.0122 | | | | | | | |
| | TPU: | | +/-0.0122 | | | | | | | |
| | | U | 0.0455 | pCi/g | | | | | | |
| Potassium-40 | Uncert: | | +/-0.0184 | | | | | | | |
| | TPU: | | +/-0.0184 | | | | | | | |
| | | U | -0.0912 | pCi/g | | | | | | |
| Promethium-144 | Uncert: | | +/-0.168 | | | | | | | |
| | TPU: | | +/-0.168 | | | | | | | |
| | | U | 0.0112 | pCi/g | | | | | | |
| Promethium-146 | Uncert: | | +/-0.0134 | | | | | | | |
| | TPU: | | +/-0.0134 | | | | | | | |
| | | U | -0.0219 | pCi/g | | | | | | |
| Radium-228 | Uncert: | | +/-0.0135 | | | | | | | |
| | TPU: | | +/-0.0135 | | | | | | | |
| | | U | -0.0217 | pCi/g | | | | | | |
| Ruthenium-106 | Uncert: | | +/-0.0477 | | | | | | | |
| | TPU: | | +/-0.0477 | | | | | | | |
| | | U | 0.185 | pCi/g | | | | | | |
| Silver-110m | Uncert: | | +/-0.128 | | | | | | | |
| | TPU: | | +/-0.128 | | | | | | | |
| | | U | 1.31E-05 | pCi/g | | | | | | |
| Sodium-22 | Uncert: | | +/-0.0124 | | | | | | | |
| | TPU: | | +/-0.0124 | | | | | | | |
| | | U | 0.00627 | pCi/g | | | | | | |
| Thallium-208 | Uncert: | | +/-0.00976 | | | | | | | |
| | TPU: | | +/-0.00976 | | | | | | | |
| | | U | 0.0053 | pCi/g | | | | | | |
| Thorium-230 | Uncert: | | +/-0.014 | | | | | | | |
| | TPU: | | +/-0.014 | | | | | | | |
| | | U | -0.0316 | pCi/g | | | | | | |
| Thorium-234 | Uncert: | | +/-0.0322 | | | | | | | |
| | TPU: | | +/-0.0322 | | | | | | | |
| | | U | 0.118 | pCi/g | | | | | | |

GEL LABORATORIES LLC

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

QC Summary

Workorder: 215722

Page 13 of 14

| Parmname | NOM | Sample Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------------|---------|-------------|----|-------|------|------|-------|-------|------|------|
| Rad Gamma Spec | | | | | | | | | | |
| Batch | 797779 | | | | | | | | | |
| | Uncert: | | | | | | | | | |
| | TPU: | | | | | | | | | |
| Tin-113 | | U | | pCi/g | | | | | | |
| | Uncert: | | | | | | | | | |
| | TPU: | | | | | | | | | |
| Uranium-235 | | U | | pCi/g | | | | | | |
| | Uncert: | | | | | | | | | |
| | TPU: | | | | | | | | | |
| Uranium-238 | | U | | pCi/g | | | | | | |
| | Uncert: | | | | | | | | | |
| | TPU: | | | | | | | | | |
| Yttrium-88 | | U | | pCi/g | | | | | | |
| | Uncert: | | | | | | | | | |
| | TPU: | | | | | | | | | |
| Zinc-65 | | U | | pCi/g | | | | | | |
| | Uncert: | | | | | | | | | |
| | TPU: | | | | | | | | | |
| Zirconium-95 | | U | | pCi/g | | | | | | |
| | Uncert: | | | | | | | | | |
| | TPU: | | | | | | | | | |

Notes:

The Qualifiers in this report are defined as follows:

- ** 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 For General Chemistry and Organic analysis the 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
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- 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

GEL LABORATORIES LLC

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

QC Summary

Workorder: 215722

Page 14 of 14

| Parmname | NOM | Sample Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------|-----|--|----|-------|------|------|-------|-------|------|------|
| Y | | QC Samples were not spiked with this compound | | | | | | | | |
| ^ | | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry. | | | | | | | | |
| b | | 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.

| COMPANY - WIDE NONCONFORMANCE REPORT | | | |
|--|--|--|-----------------------------|
| Mo.Day Yr. 10-OCT-08 | Division: Radiochemistry | Quality Criteria: Specifications | Type: Product |
| Instrument Type: GAMMA SPECTROMETER | Test / Method: EML HASL 300, 4.5.2.3 | Matrix Type: Solid | Client Code: LLNL |
| Batch ID: 797779 | Sample Numbers: See Below | | |
| Potentially affected work order(s)(SDG): 215722 | | | |
| Application Issues: Failed RPD for DUP | | | |
| Specification and Requirements | | NRG Disposition: | |
| Nonconformance Description: | | | |
| 1. The relative percent difference for Pb-212 for sample 1201676587 does not meet the acceptance limits. | | 1. Reporting results. | |

Originator's Name:
 Heather McCarty 10-OCT-08

Data Validator/Group Leader:
 Shenise Euland 10-OCT-08

Quality Review:

Director:

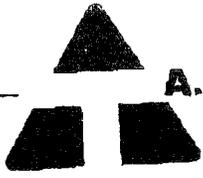
Attachment D

Clean Fill Certification

8609 Jackson Road, Bldg #101
Sacramento, CA 95826-9713
P.O. Box 15002

Sacramento, CA 95851-1002
(916) 386-6974 - FAX (916) 386-8455

FOR B 212



A. TEICHERT & SON, INC.

Established 1887

January 12, 2009

RC Readymix
1227 Greenville Road
Livermore, CA 94550

Attention: Mr. Rob Costa

Re: Lawrence Livermore National Laboratory - CERTIFICATE OF COMPLIANCE

Dear Rob,

The attached materials evaluation sheet represents current production of 3/4" Aggregate Base Class II produced at our Vernalis Rock Plant.

The 3/4" AB Class II material complies with Caltrans Standard Specifications, Section 26. Teichert Aggregates certifies this material to be contaminant free.

Should your project requirements differ from the aforementioned specifications, this material may not be suitable for the intended application. In this instance, we recommend you contact your Teichert Aggregates salesperson to find a product which will meet your specific needs.

If you have any questions, please do not hesitate to contact me at (916) 386-6977. Fax number is (916) 386-8455.

Sincerely,
TEICHERT AGGREGATES

John R. Schmidt
Quality Assurance Supervisor
Aggregates & Hot Mix Asphalt

11 25

TEICHERT AGGREGATES
Material Evaluation

Plant: Vernalis

Product: 3/4" AB Class 2

| Sieve Size | | Percent Passing | | Specific Gravity | |
|--------------------------|--------|-----------------|--|------------------------------|-------|
| 75mm | 3" | | | Apparent Coarse | 2.769 |
| 63mm | 2 1/2" | | | Apparent Fine | 2.745 |
| 50mm | 2" | | | Absorption % | 2.1 |
| 37.5mm | 1 1/2" | | | | |
| 25mm | 1" | 100 | | Min Resistivity ohm-cm | 3700 |
| 19mm | 3/4" | 95 | | pH | 8.00 |
| 12.5mm | 1/2" | 75 | | Chloride Cl ppm | 15.7 |
| 9.5mm | 3/8" | 63 | | Sulphate SO ₄ ppm | 23.1 |
| 4.75mm | #4 | 44 | | | |
| 2.36mm | #8 | 32 | | Crushed Particle Count | |
| 1.18mm | #16 | 23 | | 1 face | 96.0 |
| 600µm | #30 | 15 | | 2 face | 80.0 |
| 300µm | #50 | 12 | | 3 face | 63.0 |
| 150µm | #100 | 8 | | | |
| 75µm | #200 | 5.8 | | C.A. Rattler (abrasion loss) | |
| | | | | Loss @ 100 revs | 3.7 |
| | | | | Loss @ 500 revs | 21.2 |
| Sand Equivalent | | 27 | | | |
| Durability Index | | 43 | | Max Wet Density CTM 216 | |
| Coarse | | 70 | | Caltrans PCF | 146.7 |
| Fine | | 43 | | Optimum Moisture % | 6.5 |
| Plasticity Index | | NP | | Max Dry Density ASTM D1557 | |
| Liquid Limit | | | | ASTM PCF | 140.5 |
| Plastic Limit | | Np | | Optimum Moisture % | 5.5 |
| R-Value | | 82 | | Unit Weight | |
| | | | | Dry Loose (PCF) | 100.5 |
| California Bearing Ratio | | | | Dry Rodded (PCF) | 114.3 |



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NATIONAL LABORATORY**

Lawrence Livermore National Security, LLC • Livermore, California • 94551