

Lawrence Livermore National Laboratory



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.

LLNL-AR-410444

Building 212 Soil Removal Project Status Report

February 13, 2009

Environmental Restoration Department

Table of Contents

1. Purpose	1
2. Project Chronology	1
3. Scope of Work Completed	2
4. Results	3
5. Waste Disposal	3
6. Issues	4
7. Future Work	4
8. Schedule	5

List of Figures

Figure 1	Location of Building 212 at the Livermore Site
I iguie I.	Location of Dunding 212 at the Elvermore 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.

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.

2. Project Chronology

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 Energy*Solutions*.

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 wastesoil 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



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.

LLNL-AR-405227

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 (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. 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 TTLC, 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

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

		005 100 07(5
Livermore Site DOE	Phil Wong	925-422-0765
Remedial Project Manager		phil.wong@oak.doe.gov
Environmental Restoration	Jesse Yow	925-422-3521
Department Leader		yow1@llnl.gov
Livermore Site CERCLA	Lindee Berg	925-422-0618
Project Leader		berg3@llnl.gov
Decontamination,	Mike Auble	925-422-8158
Decommissioning, and		auble2@llnl.gov
Demolition Project Leader		
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

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



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

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



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.



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Attachment B

Analytical data from confirmation sample analysis

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PAGE 2 OF 3

SOP-CES-P555 Addendum 2



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
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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 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#: <u>17500</u>

<u>Client ID</u>	CES ID	Requested Analyses
212-B-1	212-B-1	TTLC, STLC, TCLP metals, GAB and Tritium.
212-В-2	212-В-2	TTLC, STLC, TCLP metals, GAB and Tritium,
212-В-3	212-В-3	TTLC, STLC, TCLP metals, GAB and Tritium.
212-В-4	212-В-4	TTLC, STLC, TCLP metals, GAB and Tritium.
212-В-5	212-В-5	TTLC, STLC, TCLP metals, GAB and Tritium.
212-Е-1	212-E-1	TTLC, STLC, TCLP metals.
212-Е-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

SOP-CES-P555 Addendum 3



V/C Version 1.0 3/22/00

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 ($\sqrt{}$) 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	DB No/Matrix
GEL Laboratories LLC, Charleston, South Carolina.	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)	Report Level
GEL Labs LLC: TTLC, STLC, TCLP metals, GAB, Tritium.	Results and Summary QC

Parameters	Acceptable	Comments	
1. Precision	1	See Comments below.	
2. Accuracy	V	See Comments below.	
3. Representativeness	V	The acquired samples are representative of the waste stream.	
4. Completeness	V	All the requested analyses were reported.	
5. Comparability	V	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 Neutor Redou	ionto	Date October 21, 2008	

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



a member of The GEL Group INC



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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 M. Kent

Edith Kent Project Manager

Purchase Order: LDH0585 Chain of Custody: LDH0585 Enclosures
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:

Laboratory	Sample
Identification	Description
215963001	212-B-I
215963002	212-B-2
215963003	212-В-З
215963004	212-В-4
215963005	212-В-5
215963006	212-E-1
215963007	212-E-2
215963008	212-W-1
215963009	212-W-IRP
215963010	212-W-2
215963011	212-N-1
215963012	212-N-2
215963013	212 -N -3
215963014	212-N-4
215963015	212-N-5
215964 001	212-В-1
215964002	212-B-2
215964003	212-В-З
215964004	212-B-4
215964005	212-В-5
215964006	212-E-I
215964007	212-E-2

PO Box 30712 Charleston, SC 29417

2040 Savage Road Charleston, SC 29407

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
215966 001	212-B-I
215966002	212-B-2
215966003	212-B-3
215966004	212-В-4
215966005	212-В-5
215966006	212-E-1
215966007	212-E-2
215966008	212-W-I
215966009	212-W-IRP
215966010	212-W-2
215966011	212-N-I
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 M. Kent

Edith Kent Project Manager

PO Box 30712 Charleston, SC 29417

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</p>
- 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.

9

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

Sample Analysis

Client ID
212-B-1
212-B-2
212-B-3
212-B-4
212-B-5
212-Е-1
212-Е-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 Blank (MB) ICP
Laboratory Control Sample (LCS)
215963001(212-B-1L) Serial Dilution (SD)
215963001(212-B-1S) Matrix Spike (MS)
215963001(212-B-1SD) Matrix Spike Duplicate (MSD)
Method Blank (MB) CVAA
Laboratory Control Sample (LCS)
215963001(212-B-1L) Serial Dilution (SD)
215963001(212-B-1S) Matrix Spike (MS)
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	GL-MA-E-013 REV# 18, GL-MA-E-009 REV# 17 and GL-
Procedures:	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 an 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 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. 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.

<u>Certification Statement</u>

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	GL-MA-E-013 REV# 18, GL-MA-E-008 REV# 13, GL-LB-E-
Procedures:	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: By Davis Date: 10-14-08

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

Sample Analysis

Sample ID	Client ID
215966001	212-В-1
215966002	212-В-2
215966003	212-В-3
215966004	212-В-4
215966005	212-В-5
215966006	212-Е-1
215966007	212-Е-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	GL-MA-E-013 REV# 18, GL-MA-E-008 REV# 13, GL-LB-E-
Procedures:	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:

Davis _____ Date: 10-12-68 Reviewer:____ _____

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

Chent ID
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
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-В-1
215963002	212-В-2
215963003	212-В-3
215963004	212-В-4
215963005	212-В-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-В-3
215963004	212-B-4
215963005	212-В-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.

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.

ABbellt

10/mla

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

Reviewer/Date:___



Sample Hazard Assessment

212-6-1

For Authorized Reviewer Use Only							
		Q	ualifying	g Consti	ituents		
Hazard Type	Yes	Col	mment		Hazard Type	Yes	Comment
Radiological		的复数	1. 191 ²		Solvents		
Alpha	<u>ه</u>	Pr5516	a.		Corrosive		
Beta	Ŕ	1 vomisily	L		Acid		gin on year of a second se
Tritium	B -	10-55.1	le		Base		
Inhalation	R.	pocsh	h fé	HA.	Reactive		
Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be)	D				Oxidizer		
Biologically Active Materials					Ignitable	D	
Does the sample contain (Fed. or Sta	te-defin	ed) Acutel	y or Extre	mely Haza	ardous Material?	D	
Does the sample contain high explos Does the sample contain <10 mg nor high explosives by mass?	sives? 1-primary	/ initiating	or secon	dary expl	osives, or <25%		
☐ None of the hazards listed ab	ove are	present ir	the sam	ple.			
Check here, if WDR is not a	vailable	e (For RH	WM use	only).			
I certify, to the best of my know	ledge, t	hat infor	mation p	rovided	above is accurate	and com	plete.
Authorized Reviewer (Print Nar	ne):		Authori	zed Rev	iewer (Signature):		Date:
Cthas DAN	15		$(\downarrow$	<u>)-d1</u>	Vo		9/15/08
		Fo	r Samp	ler Use	Only		
Qualifying Consti	tuents	\$	YES	NO		Com	nents
Was Hazard Assessment Control (I	HAC) nec	essary?	X.				
Per Sample Basis: Are rad levels d	etectable	by meter?		R.	Check if N/A		
Exceeds 30	,000 CI	РМ		¥.			
Exceeds 5 r @ 30 cm (1	mR/hr ft)			×			
Exceeds 1 r	microCi	urie		X			
Comments:			I				
I certify, to the best of my knowledge, that information provided above is accurate and complete							
Authorized Sampler (Print Nam	e):		Authori	zed San	pler (Signature):		Date:
CLANDE CARSENAS (Joudalinde - 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. Research1. Berms6. Preconstr	n Samples ruction Sc	ils (ini	lA Recei	ved by	Date:	CE	ES COC #:
2. Retention Tanks 7. Environm 3. PE Samples 8. Trip or Fi 4. Field or Bulk Gamma 9. State	ental Soil eld Blank	s (m	Ĉ	[d	9/15/2	8	17500

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Sample Transportation Determination

Section I	
Requester Chad Davis	Phone # <u>3-4117</u>
Requisition # / Sample ID212-B-1	
Waste Type: Non-hazardous waste or resign below and process sample. No further ac Hazardous Radioactive Mixed Number of containers: 40 mL	etention tank (not DOT) – Print and ction required.] CA Combined
Print and sign below and forward to Sample T Section II completion. Ensure WDR or other p information is submitted along with this form.	eam Lead for further review and reliminary characterization
Determined by (Print) <u>Chad Davis</u>	Date <u>9/15/08</u>
Section II (Sample Team Lead – complete ar regulated) DOT Regulated?	nd return to Requester if not DOT
Determined by (Print) Chad Davis	Date <u>9/15/08</u>
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 Hazard Assessment

For Authorized Reviewer Use Only								
Qualifying Constituents								
Hazard Type	Hazard Type	Yes	Comment					
Radiological		har an Arabert Carlow Carlo	Solvents					
Alpha	Ŕ	we ll	Corrosive					
Beta	Ø	lere bl	Acid		nier zwei nie nie de kannen in zwei war war zwei de kannen in de kannen.			
Tritium	X	hause.	Base					
Inhalation	网	possible for the	Reactive					
Beryllium (powder sample <0.10% Be; slurry, liguid, or solid sample >0.10% Be)			Oxidizer					
Biologically Active Materials			Ignitable					
Does the sample contain (Fed. or Sta	te-defin	ed) Acutely or Extremely	Hazardous Material?					
Does the sample contain high explos Does the sample contain <10 mg nor high explosives by mass?	ives? I-primar	y initiating or secondary	explosives, or <25%					
☐ None of the hazards listed ab	ove are	present in the sample.						
Check here, if WDR is not a	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 Nar	ne):	Authorized	Reviewer (Signature):		Date:			
CHARD DAN	115	(5	Leffets		9/15/08			

For Sampler Use Only						
Qualifying Constituents YES NO Comments						
Was Hazard Assessment Control (HAC) necessary?	X.					
Per Sample Basis: Are rad levels detectable by meter?		Ø	Check if N/A			
Exceeds 30,000 CPM		X				
Exceeds 5 mR/hr @ 30 cm (1 ft)		X				
Exceeds 1 microCurie		K				
Comments:						
I certify, to the best of my knowledge, that inform	nation p	rovided	above is accurate and complete.			
Authorized Sampler (Print Name): Authorized Sampler (Signature): Date: CHAD DW1S 9/15/08						
For CES Use Only						
PHWM personnal must potify CES PEL or designed, if rad lovels exceed 1 micro Curis for approval to submit cample						

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. Berms2. Retention Tanks3. PE Samples4. Field or Bulk Gamma	 Research Samples Preconstruction Soils Environmental Soils Trip or Field Blanks 	SHA Received by (<i>initials</i>):	Date: 9/15/98	CES COC #: 17500				

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Sample Transportation Determination

Section I		
Requester	Chad Davis	Phone # <u>3-4117</u>
Requisition # / Sar	nple ID212-B-2	
Waste Type:	Non-hazardous waste or r ocess sample. No further a] Radioactive 🔀 Mixed [ers: 40 mL 125 mL 250 mL <u>4</u> 500 mL 1000 mL	retention tank (not DOT) – Print and action required. CA Combined
Print and sign belo Section II completi information is subn	w and forward to Sample on. Ensure WDR or other nitted along with this form.	Team Lead for further review and preliminary characterization
Determined by (Pri	nt) <u>Chad Davis</u>	Date <u>9/15/08</u>
Signature	Pland	
Section II (Sample regulated) DOT Regulated? [e Team Lead – complete a ☐ Yes ⊠ No	and return to Requester if not DOT
Determined by (Pri	nt) <u>Chad Davis</u>	Date <u>9/15/08</u>
Signature	QAS_	
If DOT regulated for	orward to RHWM Disposal	Office for completion of Section III.
Section III DOT Information		
Proper Shipping Na	ame	
Packaging		
Rad Info. Attach	ned	
COC #		

_



4. Field or Bulk Gamma

Sample Hazard Assessment

212-13-3

For Authorized Reviewer Use Only						
	Q	ualifying	g Consti	tuents		
Hazard Type	Yes Co	mment		Hazard Type	Yes	Comment
Radiological				Solvents		
Alpha	1 procept	с)		Corrosive		
Beta	R Jussed bl	La,		Acid		and a start water of a start of a
Tritium	Ø Asset	1.		Base		
Inhalation	N. S.W	e D I	h	Reactive		
Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be)				Oxidizer	D	
Biologically Active Materials	r D ri heerije o			Ignitable		
Does the sample contain (Fed. or Sta	ite-defined) Acutel	y or Extre	mely Haza	rdous Material?		
Does the sample contain high explos Does the sample contain <10 mg nor high explosives by mass?	ives? 1-primary initiating	l or secon	dary explo	sives, or <25%		
☐ None of the hazards listed ab	ove are present ir	n the sam	ple.			
Check here, if WDR is not a	vailable (For RH	WM use	only).			
I certify, to the best of my know	ledge, that infor	mation p	rovided	above is accurate	and com	plete.
Authorized Reviewer (Print Nar	ne): US	Authori	zed Rev	iewer (Signature):		Date: 9/15/08-
· · · · · · · · · · · · · · · · · · ·	Fo	r Samp	ler Use	Only		
Qualifying Consti	tuents	YES	NO		Com	ments
Was Hazard Assessment Control (I	HAC) necessary?	M				
Per Sample Basis: Are rad levels d	etectable by meter?	, 🗆	Ø	Check if N/A		
Exceeds 30	,000 CPM		R.			
Exceeds 5 r @ 30 cm (1	mR/hr ft)		X			
Exceeds 1 ı	microCurie		Ø			
Comments:		<u> </u>	<u> </u>			
I certify, to the best of my know	ledge, that infor	mation p	rovided	above is accurate	and com	plete.
Authorized Sampler (Print Nam	ie):	Authori	zed Sam	pler (Signature):		Date:
CLAUDE CARL	SENAS	Cha	ndr!	ardena	_	9/15/08
	F	or CES	Use C	Dnly		
SHA is not required for: 5. Research	SPEL, or desig	nee, it ra IA Recei	d leveis (ved by	Date:	ie for app Cl	proval to submit sample. FS COC #-
1. Berms 6. Preconstr 2. Retention Tanks 7. Environm 3. PE Samples 8. Trip or Fig. 4. Field or Bulk Gamma	ruction Soils nental Soils eld Blanks	itials): CPa	d	9/15/0	8	17500

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Sample Transportation Determination

Section I		
Requester	Chad Davis	Phone # <u>3-4117</u>
Requisition # / Sa	ample ID <u>212-B-3</u>	
Waste Type: sign below and p Hazardous Number of contain] Non-hazardous waste rocess sample. No furthe ☐ Radioactive ⊠ Mixed iners: 40 mL 125 mL 250 mL <u>4</u> 500 mL 1000 mL	or retention tank (not DOT) – Print and er action required. I CA Combined
Print and sign be Section II comple information is sub	low and forward to Samp tion. Ensure WDR or oth pmitted along with this fo	ole Team Lead for further review and ner preliminary characterization rm.
Determined by (F Signature	Print) Chad Davis	Date <u>9/15/08</u>
Section II (Samp regulated) DOT Regulated?	le Team Lead – complet □ Yes ⊠ No	te and return to Requester if not DOT
Determined by (F	rint) <u>Chad Davis</u>	Date <u>9/15/08</u>
If DOT regulated	forward to RHWM Dispo	osal Office for completion of Section III.
Section III DOT Information		
Proper Shipping I	Name	
Packaging		
Rad Info. Atta	ched	
COC #		



4. Field or Bulk Gamma

Sample Hazard Assessment

212-13-4

For Authorized Reviewer Use Only							
		Qı	ualifying	g Consti	tuents		
Hazard Type	Yes	Cor	mment		Hazard Type	Yes	Comment
Radiological		1.591	1		Solvents		
Alpha	Ď.	near bl			Corrosive		
Beta	X X	unite to			Acid		n de la calencie de la companya de l
Tritium		weed b	, lu		Base		
Inhalation		5.6	e for t		Reactive		
Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be)					Oxidizer		
Biologically Active Materials					Ignitable	D	
Does the sample contain (Fed. or Sta	ite-defined)	Acutely	y or Extre	mely Haza	ardous Material?		
Does the sample contain high explos Does the sample contain <10 mg non high explosives by mass?	ives? ı-primary ini	itiating	or secon	dary explo	osives, or <25%		
☐ None of the hazards listed abo	ove are pre	esent in	the sam	ple.			
🕺 Check here, if WDR is not a	vailable (F	or RH	WM use	only).			
I certify, to the best of my know	ledge, tha	t infor	mation p	orovided	above is accurate	and com	nplete.
Authorized Reviewer (Print Nan	ne): 15		Authori	zed Rev	iewer (Signature):		Date: 9/15/08
		Fo	r Samp	ler Use	Only		
Qualifying Constit	tuents		YES	NO		Com	ments
Was Hazard Assessment Control (H	HAC) necess	sary?	X,				
Per Sample Basis: Are rad levels de	etectable by	meter?		Ŕ	Check if N/A		
Exceeds 30	,000 CPM	[X			
Exceeds 5 r @ 30 cm (1	nR/hr ft)			Ø			
Exceeds 1 r	nicroCurie	•		X			
Comments:			1	I			
I certify, to the best of my know	ledge, that	t inforr	mation p	rovided	above is accurate	and com	nplete.
Authorized Sampler (Print Name): Authorized Sampler (Signature): Date: 9/15/08							
DUMM norsonnel must notify CE		Fo	or CES	S Use C	Only	- for on	
KHWW personnel must notify CE SHA is not required for: 5. Research 1. Berms 6. Preconstr 2. Retention Tanks 7. Environm 3. PE Samples 8. Trip or Fig	S PEL, or Samples ruction Soils iental Soils eld Blanks	SH (ini	itials):	ved by	Date:	le for ap C S	ES COC #: 7500

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Sample Transportation Determination

Occuon i

 Requester
 Chad Davis
 Phone # 3-4117

Requisition # / Sample ID ______

Waste Type: Non-hazardous waste or retention tank (not DOT) – Print and sign below and process sample. No further action required. Hazardous Radioactive X Mixed CA Combined Number of containers:
40 mL 125 mL 250 mL <u>4</u> 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) <u>Chad Davis</u> Date <u>9/15/08</u> Signature
Section II (Sample Team Lead – complete and return to Requester if not DOT regulated) DOT Regulated?
Determined by (Print) <u>Chad Davis</u> Date <u>9/15/08</u> 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 Hazard Assessment

212-85

For Authorized Reviewer Use Only									
Qualifying Constituents									
Hazard Type	Yes	Cor	nment		Hazard Type	Yes	Comment		
Radiological		- 	1.4.4.4		Solvents				
Alpha	X.	and di			Corrosive				
Beta	X	no bu	<u>v</u>		Acid				
Tritium	X	ا بارتین ا	د د		Base				
Inhalation	Ø	and its	L.I.I		Reactive				
Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be))	Oxidizer				
Biologically Active Materials					Ignitable				
Does the sample contain (Fed. or State-defined) Acutely or Extremely Hazardous Material?									
Does the sample contain high explosives? Does the sample contain <10 mg non-primary initiating or secondary explosives, or <25% high explosives by mass?									
None of the hazards listed ab	ove are	present in	the sam	ple.					
Check here, if WDR is not a	vailable	e (For RH	WM use	only).					
I certify, to the best of my know	ledge, t	hat infor	mation p	rovided	above is accurate	and comp	olete.		
Authorized Reviewer (Print Name):					iewer (Signature):		Date: 9/15/08		
For Sampler Use Only									
Qualifying Constituents			YES	NO		Comm	nents		
Was Hazard Assessment Control (HAC) necessary?		X							
Per Sample Basis: Are rad levels detectable by meter?				ø.	Check if N/A				
Exceeds 30,000 CPM				函					
Exceeds 5 mR/hr @ 30 cm (1 ft)				لم م					
Exceeds 1 microCurie				50					
Comments:									
I certify, to the best of my knowledge, that information provided above is accurate and complete.									
Authorized Sampler (Print Name): Authorized Sampler (Signature): Date:									
CLAVDE CARDENAS Gandy arden 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): 7. Environmental Soils
 8. Trip or Field Blanks 9/15/08 2. Retention Tanks 17500 PE Samples 3. 4. Field or Bulk Gamma

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Sample Transportation Determination

Section I

Requester Chad Davis

Phone # <u>3-4117</u>

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/___ 2 **Section II** (Sample Team Lead – complete and return to Requester if not DOT regulated) DOT Regulated? \Box Yes \boxtimes No Determined by (Print) Chad Davis Date 9/15/08 Signature / 2 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 Hazard Assessment

212-E-(

For Authorized Reviewer Use Only									
Qualifying Constituents									
Hazard Type	Yes	Col	mment		Hazard Type	Yes	Comment		
Radiological	1997 -	Nggan ti			Solvents				
Alpha	ГДÍ.	price li			Corrosive				
Beta	Ø	ALCZ AN	, ()		Acid		n an		
Tritium	Ø	ar as il	ė		Base				
Inhalation	፟፟፟፟፟.	isisisle	for H	x di	Reactive				
Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be)					Oxidizer				
Biologically Active Materials					Ignitable				
Does the sample contain (Fed. or Sta	ite-defin	ed) Acutel	y or Extre	mely Haza	ardous Material?				
Does the sample contain high explosives? Does the sample contain <10 mg non-primary initiating or secondary explosives, or <25% high explosives by mass?									
□ 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): Authorized Reviewer (Signature): Date: CHMO DAVIS Definition 9/15/08									
	· · · · · · · · · · · · · · · · · · ·	Fo	r Samp	ler Use	Only	<u> </u>			
Qualifying Constituents			YES			Com	ments		
Was Hazard Assessment Control (HAC) necessary?									
Per Sample Basis: Are rad levels detectable by meter?				ليم م	Check if N/A				
Exceeds 30,000 CPM				۲ X					
Exceeds 5 mR/hr @ 30 cm (1 ft)									
Exceeds 1 r	microC	urie		X					
Comments:									
I certify, to the best of my knowledge, that information provided above is accurate and complete.									
Authorized Sampler (Print Name): CLANDE CANDENAS Authorized Sampler (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 1. Berms 6. Preconstruction Soils 2. Retention Tanks 7. Environmental Soils 3. PE Samples 8. Trip or Field Blanks 4. Field or Bulk Gamma 8. Trip or Field Blanks									

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Section I	
Requester <u>Chad Davis</u>	Phone # <u>3-4117</u>
Requisition # / Sample ID <u>212-E-1</u>	
Waste Type: Non-hazardous waste or sign below and process sample. No further a Hazardous Radioactive Mixed Number of containers: 40 mL	retention tank (not DOT) – Print and action required. CA Combined
Print and sign below and forward to Sample Section II completion. Ensure WDR or other information is submitted along with this form	Team Lead for further review and preliminary characterization
Determined by (Print) <u>Chad-Davis</u> Signature	Date <u>9/15/08</u>
Section II (Sample Team Lead – complete a regulated) DOT Regulated?	and return to Requester if not DOT
Determined by (Print) <u>Chad Davis</u>	Date <u>9/15/08</u>
If DOT regulated forward to RHWM Disposa	I Office for completion of Section III.
Section III DOT Information	
Proper Shipping Name	
	· · · · · · · · · · · · · · · · · · ·
Packaging	
Rad Info. Attached	
COC #	



212-8-2

For Authorized Reviewer Use Only								
		Qu	ualifying	g Const	ituent	S		
Hazard Type	Yes	Cor	mment		Haz	ard Type	Yes	Comment
Radiological			e qui		Solve	ents	Ð	
Alpha	Ø	main Li			Corro	sive		
Beta	Ņ.	Pari 60	der hei		Aci	d		a a standar († 1972) – 1994 - General Alfred, and Booking General Antonio († 1997) 1997 - Angel Ang
Tritium	Ķ	1255-66 6	1		Bas	se		
Inhalation	<u> </u>	1 20-55-64	a dir	Hz.	React	ive		
Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be)					Oxidi	zer		
Biologically Active Materials			6.92°		lgnita	ble		
Does the sample contain (Fed. or Sta	ate-defin	ed) Acutely	y or Extre	mely Haz	ardous	Material?		
Does the sample contain high explos Does the sample contain <10 mg nor high explosives by mass?	sives? 1-primar	y initiating	or secon	dary expl	osives,	or <25%		
☐ None of the hazards listed ab	ove are	present in	the sam	iple.				
Check here, if WDR is not a	availabl	e (For RH	WM use	only).				
I certify, to the best of my know	ledge,	that inform	mation p	provided	above	is accurate a	and cor	nplete.
Authorized Reviewer (Print Nar	ne):		Authori	zed Rev	/iewer	(Signature):		Date:
CHAD DAV	25		(Adlas 9/15/08				9/15/08	
					<u>``</u>			
		Foi	r Samp	ler Use	e Only	/		· · · · · · · · · · · · · · · · · · ·
Qualifying Consti	tuent	S	YES	NO			Com	ments
Was Hazard Assessment Control (H	HAC) ne	cessary?	ÌХ́					
Per Sample Basis: Are rad levels d	etectable	e by meter?		Ø.		Check if N/A		
Exceeds 30	,000 C	PM		X				
Exceeds 5 r @ 30 cm (1	mR/hr ft)			×				
Exceeds 1 r	microC	urie		X				
Comments:				1				
I certify, to the best of my know	ledge,	that inforr	mation p	rovided	above	is accurate a	and con	nplete.
Authorized Sampler (Print Name): CLANDE CARDENAS Authorized Sampler (Signature): Date: 9/15/08					Date: 9/15/08			
			1					
DUWM personnal must potify CE		Fo		S Use (Only	4 mioroCuri	- for an	
SHA is not required for: 5. Research	Sample:	s SH	A Recei	ved by	exceel	Date:		ES COC #:
1. Berms 6. Preconstr 2. Retention Tanks 7. Environm 3. PE Samples 8. Trip or Fig 4. Field or Bulk Gamma 1. Trip or Fig	ruction So tental Soi eld Blank	oils (ini ils (ini is	itials): C	fsl		9/15/28	ŝ	17500

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Se	ction	

Requester Chad Davis

Phone # <u>3-4117</u>

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 <u>3</u>_____ 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 X No Determined by (Print) Chad-Davis Date 9/15/08 Signature 6 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 #



Client Sample ID

212-10	-1	¥	a	-j	RP
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]	For Auth	norized	Review	er Use Only		
		Q	ualifying	Const	ituents		
	Yes	Col	mment		Hazard Type	Yes	Comment
Radiological					Solvents		Commente
Alpha	Ø	and the		12477.07794	Corrosive		[10] M. S. Martin, M. K. S. Martin, and K. S. Martin, and A. S. Martin, and and A. S. Martin, and and A. S. Martin, and
Beta	Ø	ber hi			Acid		
Tritium	Á	doc dala	<u>e.</u> 		Base		
Inhalation	Ø.	152.11.	- (Reactive		
Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be)					Oxidizer		
Biologically Active Materials			s de la c		Ignitable		
Does the sample contain (Fed. or Sta	te-define	d) Acutel	v or Extre	melv Haz	ardous Material?		
Does the sample contain high explosives? Image: Contain of the sample contain of the s							
None of the hazards listed ab	ove are p	oresent ir	the sam	ple.	1		
🕅 Check here, if WDR is not a	vailable	(For RH	WM use	only).			
I certify, to the best of my know	ledge, t	hat infor	mation p	rovided	above is accurate	and compl	ete.
Authorized Reviewer (Print Nar Cthr9 0 DAv	ne): (1,5		Authori		riewer (Signature):		Date: 9/15/08
		Fo	r Samp	ler Use	e Only		· · · · · · · · · · · · · · · · · · ·
Qualifying Consti	tuents	;	YES	NO		Comm	ents
Was Hazard Assessment Control (H	HAC) nec	essary?	X				*******
Per Sample Basis: Are rad levels d	etectable	by meter?		区	Check if N/A		
Exceeds 30	,000 CF	PM		X			
Exceeds 5 mR/hr @ 30 cm (1 ft)				X			
Exceeds 1 microCurie				Ă			
Comments:			1	L <u></u> ,,	I		
I certify, to the best of my know	ledge, tl	hat infor	mation p	rovided	above is accurate	and compl	ete.
Authorized Sampler (Print Nam	e): NSNA	's		zed Sar	npler (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): 2. Retention Tanks 7. Environmental Soils 68 17500 9 \mathcal{C} 3. PE Samples 8. Trip or Field Blanks ŮĽ 4. Field or Bulk Gamma

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Section I							
Requester C	had Davis	Phone # 3-4117					
Pequicities # / Comple ID040 M/ 4							
Requisition # / Sample	e ID <u>212-VV-1</u>						
Waste Type: Nor sign below and proces Hazardous Ra Number of containers 44 12 56 10	n-hazardous waste or reten ss sample. No further actior adioactive ⊠ Mixed □ CA : 0 mL	tion tank (not DOT) – Print and n required. A Combined					
Print and sign below a Section II completion. information is submitte	Ind forward to Sample Tear Ensure WDR or other prelined ad along with this form.	n Lead for further review and minary characterization					
Determined by (Print)	Chad Davis	Date <u>9/15/08</u>					
Signature	20						
Section II (Sample Te regulated) DOT Regulated?	am Lead – complete and re Yes 🛛 No	eturn to Requester if not DOT					
Determined by (Print)	Chad Davis	Date <u>9/15/08</u>					
Signature	No						
If DOT regulated forwa	ard to RHWM Disposal Offic	ce for completion of Section III.					
Section III DOT Information							
Proper Shipping Name	ə						
Packaging							
Rad Info. Attached							
COC #							

RequesterChad Da	ivis	Phone # <u>3-4117</u>
Requisition # / Sample ID _	212-W-1RP	
Waste Type: Non-hazar sign below and process sam Hazardous Radioact Number of containers: 40 mL_ 125 mL 250 mL 500 mL 1000 mL	rdous waste or ret ple. No further act tive ⊠ Mixed □ 3 	ention tank (not DOT) – Print and ion required. CA Combined
Section II completion. Ensure information is submitted alon	e WDR or other pr g with this form.	eliminary characterization
Determined by (Print) Chad	Davis	Date <u>9/15/08</u>
Signature	Do	
Section II (Sample Team Learegulated) DOT Regulated?	ad – complete and	return to Requester if not DOT
Determined by (Print) Chad	Davis	Date <u>9/15/08</u>
Signature		
If DOT regulated forward to F	RHWM Disposal C	ffice for completion of Section III.
Section III DOT Information		
Proper Shipping Name		
Packaging		



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For Authorized Reviewer Use Only								
		Q	ualifying	g Const	ituents			
Hazard Type	Yes	Col	mment		Hazard Type	Yes	Comment	
Radiological					Solvents	HE		
Alpha	لگ ۱	Ares 61	2		Corrosive			
Beta	Ø	Jac. Ll	5.)		Acid			
Tritium	Ø	15466			Base			
Inhalation	Щ	1945.66	i ha	4	Reactive			
Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be)					Oxidizer			
Biologically Active Materials	П.				Ignitable			
Does the sample contain (Fed. or Sta	ate-defin	ed) Acutel	y or Extre	mely Haza	ardous Material?			
Does the sample contain high explo Does the sample contain <10 mg nor high explosives by mass?	sives? n-primar	y initiating	or secon	dary expl	osives, or <25%			
☐ None of the hazards listed ab	ove are	present ir	n the sam	ple.				
🕺 Check here, if WDR is not a	available	e (For RH	WM use	only).				
I certify, to the best of my know	/ledge, *	that infor	mation p	orovided	above is accurate	and com	plete.	
Authorized Reviewer (Print Nar	ne):		Author	Zed Rev	iewer (Signature):		Date:	
CHAD DA	VIS		(Helf) 9/15/08				9/15/08	
		Fo	r Samp	ler Use	Only			
Qualifying Consti	tuents	5	YES	NO	Comments			
Was Hazard Assessment Control (HAC) neo	cessary?	X					
Per Sample Basis: Are rad levels d	etectable	by meter?		ø	Check if N/A		· · · · · · · · · · · · · · · · · · ·	
Exceeds 30),000 C	PM		X				
Exceeds 5 @ 30 cm (1	mR/hr ft)			<u>کا</u>				
Exceeds 1	microC	urie		X				
Comments:				1				
I certify, to the best of my knowledge, that information provided above is accurate and complete								
Authorized Sampler (Print Nam	ie):		Authori	zed San	npler (Signature):	······	Date:	
CLANDE CARD	ENA	8	Va	in la	Cardene	\sim	9/15/08	
RHWM personnel must notify CE	ES PEL,	F or desig	or CES	S Use C	Dnly exceed 1 microCur	ie for app	roval to submit sample.	
SHA is not required for.5. Research1. Berms6. Preconst2. Retention Tanks7. Environm3. PE Samples8. Trip or Fi	n Samples ruction So nental Soil eld Blanks	s SH bils ls (ini s	IA Recei itials):	ved by	Date: 9/15/c	CE VS	is coc #: 17500	
4. Field or Bulk Gamma			<u> </u>	d	" -1	v	•	

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Section I	
Requester Chad Davis	Phone # <u>3-4117</u>
Requisition # / Sample ID212-W-2	
Waste Type: Non-hazardous waste or ref sign below and process sample. No further ac Hazardous Radioactive Mixed Number of containers: 40 mL 125 mL 250 mL 3 500 mL 1000 mL	tention tank (not DOT) – Print and tion required. CA Combined
Section II completion. Ensure WDR or other pl information is submitted along with this form.	reliminary characterization
Determined by (Print) Chad Davis	Date <u>9/15/08</u>
Section II (Sample Team Lead – complete and regulated) DOT Regulated?	d return to Requester if not DOT
Determined by (Print) Chad Davis	Date <u>9/15/08</u>
If DOT regulated forward to RHWM Disposal C	Office for completion of Section III.
Section III DOT Information	
Proper Shipping Name	19. 21
Packaging	- A.F
Rad Info. Attached	
COC #	



212- N-1

		For Auth	norized	Reviewe	er Use Only		
		Qı	ualifying	g Consti	tuents		
Hazard Type	Yes	Cor	nment		Hazard Type	Yes	Comment
Radiological		g é es d	36 F F		Solvents		and the second second second
Alpha	Ø -	bergalala			Corrosive		
Beta	<u>j</u>	Posto lala	e		Acid		an <u>an an a</u>
Tritium	K.	Proph	r Ka		Base		
Inhalation	図	105- 20	for t	h	Reactive		a statistica da a
Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be)	D				Oxidizer		
Biologically Active Materials					Ignitable		
Does the sample contain (Fed. or Sta	te-defin	ed) Acutely	y or Extre	mely Haza	rdous Material?		
Does the sample contain high explos Does the sample contain <10 mg non high explosives by mass?	sives? 1-primary	y initiating	or secon	dary explo	osives, or <25%		
None of the nazards listed abo	ove are	present in	the sam	ple.	· · · · · · · · · · · · · · · · · · ·		
🔟 Check here, if WDR is not a	vailable	e (For RH	WM use	only).			
I certify, to the best of my know	ledge, t	that inform	mation p	rovided	above is accurate	and con	nplete.
Authorized Reviewer (Print Nan Cltrad ()AV	ne): 7/S		Authori	zed Rev	iewer (Signature):		Date: 9/15/08
				· · · · · · · · · ·			
Qualifying Constit		FO	r Samp	ler Use	Only	Com	
	tuent	5	TES TX			Com	ments
Was Hazard Assessment Control (r	HAC) nec	essary?					
Per Sample Basis: Are rad levels de	etectable	by meter?		₩L	Check if N/A		
Exceeds 30	,000 CI	PM)X			
Exceeds 5 r @ 30 cm (1	mR/hr ft)			×			
Exceeds 1 r	microCi	urie		X			
Comments:			•				
I certify, to the best of my know	ledge, 1	hat inform	mation p	rovided	above is accurate	and con	nplete.
Authorized Sampler (Print Nam	e):		Authori	zed Sam	pler (Signature):		Date:
CLAUDE CARD.	ENA	15	Ua	udi	anden	-	9/15/08
		F	or CES	Use C	Dnly		
SHA is not required for: 5. Research	S PEL,	or design	A Recei	d levels (ved by	Date:	rie for ap	proval to submit sample. ES COC # [.]
1. Berms 6. Preconstr 2. Retention Tanks 7. Environm 3. PE Samples 8. Trip or Field 4. Field or Bulk Gamma 9.	ruction So liental Soil eld Blanks	bils (ini Is s	itials): C	yd	9/15/2	8	17500

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Section I	
Requester <u>Chad Davis</u>	Phone # <u>3-4117</u>
Requisition # / Sample ID212-N-1	
Waste Type: Non-hazardous waste or a sign below and process sample. No further a Hazardous Radioactive Mixed Number of containers: 40 mL	retention tank (not DOT) – Print and action required. CA Combined
Print and sign below and forward to Sample Section II completion. Ensure WDR or other information is submitted along with this form	Team Lead for further review and preliminary characterization
Determined by (Print) Chad Davis	Date <u>9/15/08</u>
Signature	
Section II (Sample Team Lead – complete a regulated) DOT Regulated?	and return to Requester if not DOT
Determined by (Print) Chad Davis	Date <u>9/15/08</u>
Signature	
If DOT regulated forward to RHWM Disposa	Office for completion of Section III.
Section III DOT Information	
Proper Shipping Name	
Packaging	
Rad Info. Attached	
COC #	



212-N-2

	· · · · · · · · · · · · · · · · · · ·	For Auth	norized	Review	er Use Only				
Qualifying Constituents									
Hazard Type	Yes	Сог	mment		Hazard Type	Yes	Comment		
Radiological			e Por altrain		Solvents				
Alpha	Ň	march	,		Corrosive				
Beta	Ď,	00:00.61	t.	[#]	Acid		an a		
Tritium	Ø	w Soile	<u>к</u>		Base				
Inhalation		possibili	for the		Reactive				
Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be)	D				Oxidizer				
Biologically Active Materials					Ignitable				
Does the sample contain (Fed. or Sta	ate-defin	ed) Acutely	y or Extre	mely Haza	ardous Material?				
Does the sample contain high explo Does the sample contain <10 mg no high explosives by mass?	Does the sample contain high explosives? Does the sample contain <10 mg non-primary initiating or secondary explosives, or <25%								
☐ None of the hazards listed ab	ove are	present in	the sam	ple.					
Check here, if WDR is not a	availabl	e (For RH	WM use	only).					
I certify, to the best of my know	vledge,	that infor	mation p	rovided	above is accurate	and com	plete.		
Authorized Reviewer (Print Nar CHMAD DA	me): // JS		Authori	zed Rev	iewer (Signature):		Date: 9/15/05		
P									
		Fo	r Samp	ler Use	Only	<u>.</u>			
Qualifying Consti	tuent	S	YES	NO	en e	Com	ments		
Was Hazard Assessment Control (HAC) ne	cessary?	JKL I						
Per Sample Basis: Are rad levels of	letectable	e by meter?		Ą	Check if N/A				
Exceeds 30	0,000 C	РМ		X					
Exceeds 5 @ 30 cm (1	mR/hr I ft)			×					
Exceeds 1	microC	urie		X					
Comments:			1						
I certify, to the best of my know	/ledge,	that inforr	mation p	rovided	above is accurate	and com	plete.		
Authorized Sampler (Print Nam	1e):		Authori	zed Sam	pler (Signature):		Date:		
CLAUDE CARE	DEN-	15	(Up	und	Conden		9/15/08		
				<					
PUMM parconnol must notify CI		F	or CES	Use C	Only				
SHA is not required for. 5. Research	h Sample:	s SH	A Receiv	ved by	Date:	e for app	ES COC #:		
1. Berms 6. Preconst 2. Retention Tanks 7 Environn	truction S	^{oils} (ini	tials):	,					
	nental Sol	lis (`		~		00	the second se		

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Section I		
Requester	Chad Davis	Phone # <u>3-4117</u>
Requisition # / S	Sample ID <u>212-N-2</u>	
Waste Type: [sign below and p] Hazardous Number of conta Print and sign be Section II compl information is su	 Non-hazardous wast process sample. No furt □ Radioactive ⊠ Mixe ainers: 40 mL 125 mL 250 mL 3 500 mL 1000 mL elow and forward to Sar etion. Ensure WDR or coubmitted along with this 	e or retention tank (not DOT) – Print and ther action required. ed CA Combined
Determined by (Print) <u>Chad Davis</u>	Date <u>9/15/08</u>
Section II (Sam regulated) DOT Regulated	ple Team Lead – comp ?	lete and return to Requester if not DOT
Determined by (Print) Chad Davis	Date <u>9/15/08</u>
Signature	Japo-	
If DOT regulated	d forward to RHWM Dis	posal Office for completion of Section III.
Section III DOT Information	1	
Proper Shipping	Name	
Packaging		
Rad Info. Atta	ached	
COC #		



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100	Ës 1	10		3

		For Auth	norized	Review	er Use Only				
		Qı	ualifying	g Consti	tuents				
Hazard Type	Yes	Cor	nment		Hazard Type	Yes	Comment		
Radiological				astovit	Solvents				
Alpha	Ķ	preside	7		Corrosive				
Beta	M	passible	a ^y a		Acid				
Tritium	لکيا ا	بأ مذرخ م	(Base				
Inhalation	<u>ابر</u>	possibile	pr h		Reactive				
Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be)					Oxidizer				
Biologically Active Materials					Ignitable				
Does the sample contain (Fed. or Sta	te-defin	ed) Acutely	/ or Extre	mely Haza	ardous Material?				
Does the sample contain high explos Does the sample contain <10 mg nor high explosives by mass?	Does the sample contain high explosives? Does the sample contain <10 mg non-primary initiating or secondary explosives, or <25% high explosives by mass?								
None of the hazards listed ab	ove are	present in	the sam	ple.					
🕅 Check here, if WDR is not a	vailable	e (For RH	WM use	only).					
I certify, to the best of my know	ledge, t	that inform	mation p	rovided	above is accurate	and comp	lete.		
Authorized Reviewer (Print Nar	ne):		Authori	zed Rev	iewer (Signature):		Date:		
CHAD DAMS	•			Bel	for		9/15/08		
		Foi	r Samp	ler Use	Only				
Qualifying Consti	tuents	3	YES	NO		Comm	ents		
Was Hazard Assessment Control (i	HAC) nec	cessary?	Ø						
Per Sample Basis: Are rad levels d	etectable	by meter?		M	Check if N/A				
Exceeds 30	,000 CI	PM		Ŕ					
Exceeds 5 @ 30 cm (1	mR/hr ft)	•		Ŕ					
Exceeds 1 microCurie 🛛 🖉									
Comments:			I	1					
I certify, to the best of my know	ledge, f	that inform	mation p	rovided	above is accurate	and comp	lete.		
Authorized Sampler (Print Nam	e):		Authori	zed San	npler (Signature):		Date:		
CLANDE CARD.	ENA.	S	Ch	in Ir	Confer.		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	 Research Samples Preconstruction Soils 	SHA Received by (initials):	Date:	CES COC #:				
 Retention Tanks PE Samples Field or Bulk Gamma 	 Environmental Soils Trip or Field Blanks 	Ofd	9/15/08	17500				

For document control purposes, user <u>SHALL</u> ensure that all working copies are identical to current electronic version. http://www-cms.llnl.gov/llnl_only/ces/QA_docs/List_of_QA_Docs.html

Section I	
Requester <u>Chad Davis</u>	Phone # <u>3-4117</u>
Requisition # / Sample ID <u>212-N-3</u>	
Waste Type: Non-hazardous waste or resign below and process sample. No further a □ Hazardous Radioactive ⊠ Mixed Image: Comparison of containers: 40 mL 125 mL 125 mL 250 mL 3 500 mL 1000 mL 1000 mL 1000 mL 1000 mL Print and sign below and forward to Sample Section II completion. Ensure WDR or other print of submitted along with this form.	etention tank (not DOT) – Print and action required. CA Combined Team Lead for further review and preliminary characterization
Determined by (Print) <u>Chad Davis</u> Signature	Date <u>9/15/08</u>
Section II (Sample Team Lead – complete a regulated) DOT Regulated?	nd return to Requester if not DOT
Determined by (Print) Chad Davis	Date <u>9/15/08</u>
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 #	



212-15-4

1750

		For Aut	horized	Review	er Use Only			
Qualifying Constituents								
Hazard Type	Yes	Co	mment		Hazard Type	Yes	Comment	
Radiological		in dimension Professioner State State			Solvents			
Alpha	Į.	Sec. 6	<u> </u>		Corrosive			
Beta	X.	- marile	<u>kr.</u> 		Acid		3. A. T. LAND, Control (Magnetic Line), And Street St Street Street Stre Street Street Stre Street Street Stree	
Tritium	X.	masible	<i>العناي</i> اندا		Base			
Inhalation	凤	ha sadal	is for H		Reactive			
Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be)					Oxidizer			
Biologically Active Materials					Ignitable			
Does the sample contain (Fed. or Sta	ate-define	ed) Acutel	y or Extre	mely Hazi	ardous Material?			
Does the sample contain high explos Does the sample contain <10 mg nor high explosives by mass?	sives? n-primary	/ initiating	or secon	dary expl	osives, or <25%			
☐ None of the hazards listed ab	ove are	present ir	1 the sam	ple.	IF Second Assessments	114 - 1119patan - 119		
🕅 Check here, if WDR is not a	available) (For RH	WM use	only).				
I certify, to the best of my know	vledge, t	hat infor	mation p	rovided	above is accurate	and compl	lete.	
Authorized Reviewer (Print Nar	 me):		Authori	zed Rev	iewer (Signature):	:	Date: , 1.0	
CHAS DAVI	5		C	BA	PAL	5004 5	9/15/08	
			- Samp	tor lies				
Qualifying Consti	tuents	<u> </u>	VES		l Only	Comm	anta	
Was Hazard Assessment Control (· · · · · · · · · · · · · · · · · · · ·				Comm	ents	
Par Sampla Rasis: Are rad levels d		by motor?		 				
Fer Sample Dasis. Alerau lovoid a								
Exceeds 5	mR/hr							
@ 30 cm (1		-		<u>~</u>				
Exceeds 1 r	microCu	ırie		ليحر ا				
Comments.			·· <u>··</u> ·					
I certify, to the best of my know	/ledge, t	hat infori	mation p	rovided	above is accurate	and compl	ete.	
Authorized Sampler (Print Nam	ie):		Authori	zed Sam	pler (Signature):		Date:	
CLANDE CARD	ENAS	,)	<u> </u>	inde	Sonder-	~	4/13/08	
					<u> </u>			
RHWM personnel must notify CI		F	or CES	i Use (Only			
	S PEL.	or design	nee, if rau	d levels	exceed 1 microCu	rie for appro	wal to submit sample	

For document control purposes, user <u>SHALL</u> ensure that all working copies are identical to current electronic version. http://www-cms.llnl.gov/llnl_only/ces/QA_docs/List_of_QA_Docs.html

CRV

9/15/08

(initials):

2. Retention Tanks

4. Field or Bulk Gamma

PE Samples

3.

7. Environmental Soils

8. Trip or Field Blanks

Section I		
Requester <u>Chad Da</u>	vis	Phone # <u>3-4117</u>
Requisition # / Sample ID _	212-N-4	
Waste Type: Non-hazar sign below and process sam Hazardous Radioact Number of containers: 40 mL 125 mL 250 mL 500 mL 1000 mL Print and sign below and form Section II completion. Ensure information is submitted along	dous waste or retent ole. No further action ive ⊠ Mixed □ CA 3 ward to Sample Tean ward to Sample Tean word to sample Tean g with this form.	tion tank (not DOT) – Print and a required. A Combined
Determined by (Print) Chad I	Davis	Date <u>9/15/08</u>
Section II (Sample Team Lear regulated) DOT Regulated? Yes	ad – complete and re] No	eturn to Requester if not DOT
Determined by (Print) <u>Chad I</u> Signature	Davis	Date <u>9/15/08</u>
If DOT regulated forward to R	RHWM Disposal Offic	e for completion of Section III.
Section III DOT Information		
Proper Shipping Name		1
Packaging		
Rad Info. Attached		
COC #		



21		Ä	- 5
61	12	9U	- 7

For Authorized Reviewer Use Only									
Qualifying Constituents									
Hazard Type	Yes	Col	mment		Hazard	Туре	Yes	Comment	
Radiological					Solvents				
Alpha	K	arts. U.			Corrosive	9. <u>.</u>			
Beta	Ø	orsible			Acid				
Tritium	\boxtimes	posili	2		Base				
Inhalation	<u>ل</u> م	prisible	for H		Reactive				
Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be)					Oxidizer				
Biologically Active Materials					Ignitable		$ \Box\rangle$		
Does the sample contain (Fed. or Sta	ate-define	ed) Acutely	y or Extre	mely Haz	ardous Mate	rial?			
Does the sample contain high explos Does the sample contain <10 mg nor high explosives by mass?	sives? n-primary	/ initiating	or secon	dary expl	osives, or <2	25%			
□ None of the hazards listed ab	ove are	present ir	the sam	ple.					
🕅 Check here, if WDR is not a	available) (For RH	WM use	only).					
I certify, to the best of my know	/ledge, t	hat infor	mation p	provided	above is a	iccurate ar	nd corr	nplete.	
Authorized Reviewer (Print Nar	ne):		Authori		viewer (Sig	nature):	-	Date: 9/15/08	
								*/ 8	
		Fo	r Samp	ler Use	Only				
Qualifying Consti	tuents	;	YES	NO			Com	ments	
Was Hazard Assessment Control (H	HAC) nec	essary?	X						
Per Sample Basis: Are rad levels d	etectable	by meter?		jø.	Check if N/A				
Exceeds 30	,000 CF	ΡМ		Ø					
Exceeds 5 r @ 30 cm (1	nR/hr ft)			X				- Manta.	
Exceeds 1 r	microCu	urie		Ø			·		
Comments:			l	1	1				
I certify, to the best of my know	ledge, t	hat inforr	mation p	rovided	above is a	ccurate ar	nd com	plete.	
Authorized Sampler (Print Nam	e):		Authori	zed San	npler (Sign	ature):		Date:	
CLANDE CAROL	ENAS	5	Va	nd	and	enn		9/15/08	
			ľ			~			
DUMM percented must notify CE	-	Fo	or CES	GUse (Dnly	·	*		
SHA is not required for. 5. Research	Samples	or aesigi SH	nee, in rai A Recei	d levels ved by	Date	e:	for app Cl	proval to submit sample. ES COC #:	
1. Berms 6. Preconstr 2. Retention Tanks 7. Environm 3. PE Samples 8. Trip or Field 4. Field or Bulk Gamma 1. State S	ruction So lental Soils eld Blanks	ils s (ini	itials): (ofd	9	115/08		17500	

For document control purposes, user <u>SHALL</u> ensure that all working copies are identical to current electronic version. http://www-cms.llnl.gov/llnl_only/ces/QA_docs/List_of_QA_Docs.html

Section		
OCCHON	8	

Requester Chad Davis

Phone # <u>3-4117</u>

Requisition # / Sample ID _______

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 <u>3</u>_____ 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? \Box Yes \boxtimes 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

	ces	RD Version 1.2 9/14/98	REVIEW of RADIOCHEMICAL DATA							
CE Rac	CES COC# <u>17500</u> CES Sample # <u>212-B-1</u> Client Sample ID <u>Mercury</u> <u>Contaminated Soil</u> Rad Dec #RHWM-RD-08-0037-R									
	The sample was analyzed for : Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was surveyed for: Image: Subject was su									
	2		≤ MDC	> MDC		Check if by Limited Rad Declaration (LRD)				
-	<i>Bulk Conta</i> Gross A Gross B Tritium	<i>mination</i> Alpha Beta								
	<i>Additional 2</i> Gamma Alpha T	A <i>nalytical</i> Spec FUPA								
	Surface Contamination Removable Rad H-3 Removable Rad α Removable Rad β Surface Rad α Surface Rad β									
	Radioactiv	ity 🛛 wa	is 🗌 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:	Philip Torretto,	(unt) x2-5515	Date:	C	<u>)ctober 23, 2008</u> .				

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.

WIDD Mumbor			IALYSIS REPO	RI		
		Allalylical		<u>UUU</u>		XRF
N/A 21	12-B-1			17500	Analyst	
pH & NORMALITY		SC) RADIO	LOGICAL SCREEN	NG REPORT	Date Analyzed	
Analyst			Tritium	Gross alpha, beta		Percentage
Date Analyzed	Aliquot (m	nL or g)	1g	19		or tabler tak boom not kannaa ang kan gapang pang boom on table ta a mana kan kannaa mita kana ang kanna kan a m
pH Result	Analy	yst	Claude Cardenas	Claude Cardenas		NA YOO MAA MAANA MAANA MAANA MAANA MAANA MAANA MAADAA MAADAA MAAdaa Maada da da ahaa ahaa ahaa ahaa ahaa
Normality Result (eq/L)	Date An	alyzed	9/15/2008	9/15/2008		
HYDROMETER / SPECIEIC GRAVIT	V Energy V	Vindow	0-18.6 keV	18.6-2000 keV		
Analyst		M	0	0		*****
Date Analvzed		0	1000	3000		***************************************
Specific Gravity Result	Actual F	Result	0	0		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Hvdrometer Result		e Result	Below MDC	Below MDC		DO THE REPORT OF THE PARTY OF
		1	picocuries / kg	picocuries / kg		
FLASH POINT (METHOD 1010)			SAW GC			A CONTRACTOR OF
Analyst	Date Analyz	zed	Analyst			NANGARA DI MANJANJAN MANJANANA NA MANJANA MANJANA MANJANA MANJANANA MANJANA MANJANA MANJANA MANJANA MANJANA MAN
Date Analyzed		Chemical	Re	cult Detection Linit		NAMANANAN ANA AMIN'NA MANANANANANANANANANANANANANANANANANAN
MDC		521212				A CALIFORNIA DA LA CALIFORNIA A VIOLOGIA PARA PARA PARA PARA PARA PARA PARA PA
Result						SANA MANANA M
Unit						
BOILING POINT						
Result					Total	
Unit						MMENTS
LIQUIFICATION TESTING						
Vibration Testing						
Analyst						
Date Analyzed						
Result		NANANA NANANA MATU NA ANA ANA ANA ANA ANA ANA ANA ANA ANA				
Freeze / Thaw Testing						
Analyst						
Date Analyzed						
Result						
Paint Filter Activity					Data Completed	0/1 # 0000
Analyst						
Date Analyzed					Baviewed Bv	
structure of the source of the second s			A MARKAN A M			SAN 2

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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.

Davis

10-15-08

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Certificate of Analysis

Comp: Addre: Contac Projec	any : Lawrence Livern Security, LLC ss : 7000 East Avenu Mailstop L-620 Livermore, Califi ct: Mr. Chad F. Dav t: CES - Normal I	nore Nation le ornia 9455 is Deliverable	al 1			R	eport l	Date: Octo	ober 15, 2	2008	
								<u>.</u>			
	Client Sample Sample ID: Matrix: Collect Date: Receive Date: Collector: Moisture:	ID:	212-B-1 215963001 SO 15-SEP-08 10:45 17-SEP-08 Client 4.1%		Proi Clie	ect: nt ID:	LLN	IL00306 IL002			
Parameter	Qualifier	Result	DI	L RL	Units	DF	Ana	lystDate	Time	Batch	Method
Mercury Analysis-	CVAA										
7471 Cold Vapor Hg	g in Solid "Dry Weight C	Corrected"									
Mercury Metals Analysis-IC	P	32.2	0.171	1.14	mg/kg	100	ETL	09/29/08	1207 79	6414	1
6010 TAL Metals So	il Federal "Dry Weight	Corrected"									
Antimony	Ŭ ·	-0.229	0.318	1.50	mg/kg	1	HSC	10/12/08	1650 79	6830	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 79	6830	3
The following Pre	p Methods were perfor	med									
Method	Description			Analyst	Date	Time	e H	Prep Batch			
SW846 3050B	846 3050BS PR	REP		FGA	10/10/08	1430) 7	796829	1 1 1 1		
SW846 7471A Prep	EPA 7471A Me	ercury Prep	Soil	TXB3	09/26/08	1600) 7	796413			
The following Ana	lytical Methods were n	erformed									
Method	Description		· · ·		Analyst Comm	ents					
1	SW846 7471A				-						<u>-</u> -
2	SW846 3050B/	5010B									
3	SW846 3050B/6	5010B									

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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.

TeUIS

10-14-08

Reviewed by

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

Certificate of Analysis

Compan Address Contact: Project:	 y: Lawrence Liv Security, LLC 7000 East Av Mailstop L-62 Livermore, C Mr. Chad F. I CES - Norm: Client Samp Sample ID: 	vermore Natio C venue 20 alifornia 945 Davis al Deliverabl oble ID:	212-B-1 215964001		 	Proj	Re iect: nt ID:	eport Date: Octo LLNL00306 LLNL002	ober 14, 2008	
	Matrix: Collect Date Receive Dat Collector:	e: te:	SO 15-SEP-08 10 17-SEP-08 Client):45						
Parameter	Qualifier	Result		DL	RL	Units	DF	AnalystDate	Time Batch	Method
Mercury Analysis-CV	/AA									
STLC Hg in Solid "As J	Received"									
Mercury		0.565		0.030	0.200	mg/L	1	IXI.1 10/07/08	1324 801780	1
Metals Analysis-ICP						<u>8</u> -		10,0,,00	1521 001700	
STLC ICP Metals for S	Solids "As Received	<i>d"</i>								
Antimony	U	0.00363		0.030	1.00	mg/L	1	KDL 10/13/08	1227 801834	2
Arsenic	Ū	-0.00489	•	0.050	0.150	mg/L	1	10/10/00	1227 001054	24
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			
Thellium	U	0.00914		0.010	0.050	mg/L	1			
Vanadium	U	-0.0207		0.050	0.200	mg/L	1			
Zinc		4.16		0.010	0.030	mg/L mg/L	1			
The following Prep M	Aethods were per	formed								
Method	Description				Analyst	Date	Time	Prep Batch		
California Code of Res	ulati California W	/et Method S	FLC Leaching		CJP1	10/01/08	1000	800775		
SW846 3010A	ICP-TRACE	TCLP by SV	V846 30104		CXS3	10/06/08	0010	201222		
SW846 7470A Prep	EPA 7470A	Mercury Pre	p TCLP Liquid		TXB3	10/06/08	1140	801779		
The following Analyt	tical Methods wer	e performed								
Method	Description	- postormeu			ŀ	Analyst Comm	ents			<u> </u>
1	SW846 7470)A				•				
2	SW846 3010	/6010B								

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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.

10-12-08

Reviewed by

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

Certificate of Analysis

Contact: Mr. Chad E. Davis	
Project: CES - Normal Deliverable	
Client Sample ID:212-B-1Project:LLNL00306Sample ID:215966001Client ID:LLNL002Matrix:SOCollect Date:15-SEP-08 10:45Collect Date:17-SEP-08Collect Date:17-SEP-08Collector:ClientClientCollect Date:	
Parameter Qualifier Result DL RL Units DF AnalystDate Time Batch	Aethod
Mercury Analysis-CVAA	
TCLP Hg in Solid "As Received"	
Mercury 0.269 0.003 0.020 mg/L 10 JXL1 10/06/08 1203 801306	1
Metals Analysis-ICP	
TCLP ICP Metals for Solid "As Received"	
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 I	-
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 I	
Nickel 0.0829 0.010 0.050 mg/L 1	
Selenam $U = -0.00392$ 0.050 0.150 mg/L 1	
Shver U -0.00366 0.010 0.050 mg/L 1	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
$\frac{1}{2}$ $\frac{1}$	
0.039 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 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.

LAB bell t

Reviewed by

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

Certificate of Analysis

	Company :	Lawrence Li Security, LL	ivermore N .C	lational								
	Address :	7000 East A Mailstop L-6	venue 520 California	04551				J	Report Date: Od	ctober 17, 2008		
	Contact:	Mr. Chad F.	Davis	94551								
	Project:	CES - Norm	al Deliver	able								
		Client Sarr Sample ID Matrix: Collect Da Receive Da Collector: Moisture:	nple ID: : te: ate:		212-B-1 2159630 SO 15-SEP- 17-SEP- Client 4.1%	001 08 08		Project: Client ID:	LLNL00306 LLNL002			
Parameter		Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF Analys	st Date Time	Batch	Mtd.
Gravimetric	: Solids											
"As Receiv Rad Gas Flo	ved" o <mark>w Proporti</mark> o	nal Counting	ţ									
GFPC, Gre	oss A/B, solid	"Dry Weight	Corrected	"								
Alpha Bata			11.1	+/-1.81	1.66	+/-3.35	0.500	pCi/g	DXB5	10/07/08 2109	797363	2
Rad Lionid	Scintillation	Analysis	17.4	+/-1.51	1.69	+/-2.88	1.50	pCı/g				
LSC. Tritin	um Dist Solid	"As Received	<i>יי</i> ק									
Tritium		U	-0.348	+/-0.848	1.53	+/-0.848	2.00	pCi/g	SXL4	09/30/08 1153	798304	3
The follows	ng Analutios	1 1 ()	£									
Method	Descri	iption	ere periori	nea				,				
1	ASTM	- I D 2216 (Mo	dified)									
2	EPA 9	00.0 Modified	d									
3	EPA 9	06.0 Modified	đ									
Notes:												
The Quali	ifiers in this	report are de	efined as f	follows :								
** Ana	lvte is a sur	rogate comp	ound									
< Resu	ult is less that	in value repo	orted									
> Resi	ult is greater	than value r	reported									
A The	TIC is a sus	spected aldol	l-condens	ation product	_							
B For	General Che	emistry and (Organic a	nalysis the tar	get analyt	e was detec	ted in the a	issociated blar	ık.			
C Ana	lyte has bee	n confirmed	by GC/M	tracer recove	ry is low							
D Res	ults are repo	rted from a	diluted ali	cont of the sa	mple							
E Met	als%differ	ence of same	ple and SI	D is >10%. Sa	ample con	centration n	nust meet f	flagging criter	ia			
F Estin	mated Value	,						00001				
H Ana	lytical holdi	ng time was	exceeded	I								

- J Value is estimated
- M M if above MDC and less than LLD

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Certificate of Analysis

Parameter	Qualifier Result Uncertainty	DL TPU	RL	Units	DF Analyst Date Time Batch Mtd.
	Client Sample ID: Sample ID:	212-B-1 215963001	• •	Project: Client ID:	LLNL00306 LLNL002
Project:	CES - Normal Deliverable				
Contact:	Livermore, California 94551 Mr. Chad F. Davis			,	(c)
Address :	7000 East Avenue Mailstop L-620			1	Report Date: October 17 2008
Company :	Lawrence Livermore National Security, LLC		2		

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.

CES	RD Version 1.2 9/14/98	REVIEW	of RADIOC	CHEMICAL DATA
CES COC#	<u>17500</u> CE	S Sample # <u>212-B</u>	<u>-2</u> Client San	nple ID Mercury Contaminated Soil
Rad Dec #	<u>KF</u>	<u>I WIM-RD-08-0038-</u>	K	
The sample	was analyzed	for :	an a	Subject was surveyed for:
Bulk (Bulk (Bulk (Bulk (Remove	Gross Alpha Gross Beta Fritium vable Rad H-3	Alpha TU Gamma S Removab Removab	JPA Spec le Rad α le Rad β	Surface Rad
		≤ MDC	> MDC	Check if by Limited Rad Declaration (LRD)
<i>Bulk Conta</i> Gross A Gross B Tritium	<i>mination</i> Alpha Beta			
Additional A Gamma Alpha T	Analytical a Spec FUPA			
Surface Co Remova Remova Remova Surface Surface	ntamination able Rad H-3 able Rad α able Rad β e Rad α e Rad β			
Radioactiv	ity 🛛 wa	as 🗌 was not	🗌 can not	say added to this sample.
Comments: Gross alpha an above the scre	nd gross beta activ eening-levels speci	ities were detected abov fied in the Moratorium	ve the sample-spect for clean site soils. Date:	ific MDC's and at levels that are October 23, 2008
Finding by:	Philip Torretto,	<u> </u>	Date: _	October 23, 2008 .

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.

WDR Number	A Clample I	RHWM A	NALYSIS REPOI	RT COC		
		Som finnin /				XKF
N/A	212-8-2			17500	Analyst	
pH & NORMAI	UTY (LSC) RADIC	DLOGICAL SCREEN	NG REPORT	Date Analyzed	
Analyst			Tritium	Gross alpha, beta		rercentage
Date Analyzed	Aliguot (mL or g)	1g	19		101410 - 10147 - 11147 - 11147 - 1117 - 11
pH Result	Ana	alyst	Claude Cardenas	Claude Cardenas		U O MER MANANANANANANANANANANANANANANANANANANAN
Normality Result (eq/L)	Date Ar	nalyzed	9/15/2008	9/15/2008		9999 Burnama burna an a
HVDROMFTER//SPECI	FIC GRAVITY Energy /	Window	0-18.6 keV	18.6-2000 keV		OR CONTRACTOR AND A MADE OF THE OWNER AND
Analyst		W	0	0		****
Date Analvzed		 	1000	3000		A REAL FOR THE REAL PROPERTY AND A REAL
Specific Gravity Result	Actual	Result	0	0		1912 1913 1914 1914 1914 1914 1914 1914 1914
Hvdrometer Result		le Kesult	Below MDC	Below MDC		COMMUNICATION OF THE PROPERTY OF THE DAY OF THE STATE OF THE ST
		nit	picocuries / kg	picocuries / kg		n of the second seco
FLASH POINT (MET)	HOD 1010)		SAW GC			
Analyst	Date Analy	vzed	Analyst			NAMES AND ADDRESS OF A DESCRIPTION OF A DE
Date Analyzed		Chemica	Re Re	sult Detection Linit		ON MONTH ON THE OWNER AND
MDL						
Result						
Unit						лания и на полнование и на полнование и на полнование на полнование и на полнование на полнование на полнование В лати и на полнование на полнование на полнова
BOILING POI						
Result					Total	
Unit					CO	MMENTS
LIQUIFICATION T	ESTING	*****				
Vibration Test						
Analyst						
Date Analyzed				· · · · · · · · · · · · · · · · · · ·		
Result		and a second				
Freeze / Thaw Te	sting and the second					
Analyst						
Date Analyzed			· · · · ·			
Result						
Paint Filter Acti	ivity				Date Completed	Q/15/2008
Analyst						
Date Analyzed		***************************************			Reviewed BV	
Result						An CD

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Certificate of Analysis

Con	npany :	Lawrence Live	rmore Natio	nal								
		Security, LLC										
Add	iress :	7000 East Aver	nue						_			
		Mailstop L-620) ::::::::::::::::::::::::::::::::::::	- 1				R	eport l	Date: Octo	ober 15, 2008	
Con	tact:	Mr. Chad F. Da	itornia 945. ivis	51								
Proi	iect.	CES - Normal	Deliverabl	ρ								
		Client Sample	e ID:	212-B-2			Pro	iect:	LLN	IL00306		
		Sample ID:		215963002			Clie	ent ID:	LLN	IL002		
		Matrix:		SO								
		Collect Date:		15-SEP-08 10:45	; ;							
		Receive Date	:	17-SEP-08								
		Collector:		Client								
		Moisture:		4.18%								
Parameter		Qualifier	Result		DL	RL	Units	DF	Ana	lystDate	Time Batch	Method
Mercury Analysi	is-CVAA	A										
7471 Cold Vapor	Hg in So	olid "Dry Weight	Corrected"				_					
Mercury Motols Apolysis	ICD		131	1	.62	10.8	mg/kg	1000	ETL	09/29/08	1333 796414	1
6010 TAL Matala	ICI Soil Fad	lanal "Dm. Waigh	+ Corrected	"								
Antimony	son rea	erai Dry weign	0.212	· 0′	272	1.50	mallea	1	USC	10/12/09	1717 706920	2
Antimony		U	-0.313	0	323 501	1.50	mg/kg	1	пос	10/12/08	1/1/ /90830	Z
Arsenic			4.57	0	341 104	0.521	mg/kg	1				
Beryllium		TT	0.306	0.	104	0.521	mg/kg	1				
Cadmium		U I	-0.500	0.	104	0.521	mg/kg	1				
Chromium		J	33.6	0.	104	0.521	mg/kg	1				
Cobalt			10.2	0.	208	0.521	mg/kg	1				
Copper			56.0	0	312	2.00	mø/kø	î				
Lead			8.92	0.3	260	1.50	mg/kg	1				
Molybdenum		Ţ	0.436	0.3	208	1.04	mg/kg	ĩ				
Nickel		5	42.8	0.1	104	1.30	mg/kg	1				
Silver			0.727	0.	104	0.521	mg/kg	1				
Thallium		U	-1.89	0.:	521	3.00	mg/kg	1				
Vanadium			28.5	0.1	104	0.521	mg/kg	1				
Zinc			60.2	0.2	208	1.04	mg/kg	1				
Selenium		J	8.74	5	.21	15.6	mg/kg	10	HSC	10/14/08	1648 796830	3
The following P	rep Met	hods were perfo	ormed									
Method		Description				Analyst	Date	Tim	e I	Prep Batch		
SW846 3050B		846 3050BS I	PREP			FGA	10/10/08	1430) 7	796829		
SW846 7471A Pr	еp	EPA 7471A N	Mercury Pre	p Soil		TXB3	09/26/08	1600) 7	796413		
The following A	nalytica	al Methods were	performed	L								
Method	•	Description				A	analyst Comm	ents				
1		SW846 7471A	4									
2		SW846 3050E	3/6010B									

SW846 3050B/6010B

3

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Certificate of Analysis

C	ompany :	Lawrence Live	ermore Natio	onal							
٨	ddroop .	7000 Fact Ave	200								
A	duress :	Mailston L 62	nue					_			
		Livermore Co	U lifornia 045	51				R	eport Date: Oct	ober 14, 2008	
C	ontact:	Mr. Chad F. D	avis	51							
Pr	oject:	CES - Norma	l Deliverab	le							
										an	
		Client Sample Sample ID: Matrix: Collect Date:	le ID:	212-B-2 215964002 SO 15-SEP-08 10).45		Proj Clie	iect: int ID:	LLNL00306 LLNL002		
		Receive Date	2:	17-SEP-08							· .
Parameter		Qualifier	Result	t	DL	RL	Units	DF	AnalystDate	Time Batch	Method
Mercury Analy	sis-CVA	1						~~		vinit Dutch	
STLC Hg in Soli	id "As Rec	eived"									
Mercury		U	-0.0362		0.030	0.200	mg/L	1	JXL1 10/07/08	1326 801780	1
Metals Analysis	s-ICP				01000	0.200			10/0//00	1520 001700	1
STLC ICP Meta	ls for Solid	ds "As Received"	"								
Antimony	-	U	0.0226		0.030	1.00	mg/L	1	KDL 10/13/08	1257 801834	2
Arsenic		Ū	-0.0257		0.050	0.150	mg/L	1	10,10,00		-
Barium			9.04		0.010	0.050	mg/L	1			
Beryllium		U	0.00271		0.010	0.050	mg/L	1			
Cadmium		U	0.00419		0.010	0.050	mg/L	1			
Chromium			0.0958		0.020	0.050	mg/L	1			
Cobalt			0.264		0.010	0.050	mg/L	1			
Copper			2.06		0.030	0.100	mg/L	1			
Lead			0.132		0.025	0.100	mg/L	1			
Molybdenum		U	0.015		0.020	0.100	mg/L	1			
Nickel			0.355	•	0.010	0.050	mg/L	1			
Selenium			0.224		0.050	0.150	mg/L	1			
Thellium		U, U	0.00653		0.010	0.050	mg/L	1			
Vonodium		U	0.00155		0.050	0.200	mg/L	1			
Zinc			1.18		0.010	0.050	mg/L mg/L	1			
The following	Pren Met	hods were perf	ormed								
Method	- rep inter	Description	vi meu			Analyst	Date	Time	Prep Batch		
California Code	of Regula	ti California W	et Method S	TLC Leaching		CJP1	10/01/08	1000	800775		
SW846 3010A	-	ICP-TRACE	TCLP by S	W846 3010A		CXS3	10/06/08	0810	801833		
SW846 7470A I	Prep	EPA 7470A 1	Mercury Pre	p TCLP Liquid		TXB3	10/06/08	1140	801779	· -	
The following	Analytica	l Methods were	performed	1							
Method		Description				A	Analyst Comm	ents			·
1		SW846 7470A	ł				······				
2		SW846 3010/	6010B								

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Certificate of Analysis

Company	: Lawrence Liver	rmore Natio	nal							
	Security, LLC									
Address :	7000 East Aver	nue								
	Mailstop L-620) _					Re	port Date: Octo	ober 13, 2008	
Contact:	Mr. Chad F. Da	itornia 945 ivis	51							÷ •
Project:	CES - Normal	Deliverabl	5							
	Client Sample Sample ID: Matrix: Collect Date: Receive Date:	e ID: :	212-B-2 215966002 SO 15-SEP-08 10:4 17-SEP-08	45		Proi Clie	ect: nt ID:	LLNL00306 LLNL002	-	
Donomistor			Client						· · · ·	
raraineter	Qualifier	Result		DL	RL	Units	DF	AnalystDate	Time Batch	Method
Mercury Analysis-CVA	AA 									
TCLP Hg in Solia As K	eceivea	0.0700		0.000	0.000	π	10	1 10106100	1011 001000	
Mercury		0.0799		0.003	0.020	mg/L	10.	JXL1 10/06/08	1211 801306	I
Metals Analysis-ICP	Jid "As Dessived"									
Antimony	ua As Keceivea	0.00112		0.020	0.100	mall	1		1702 001227	2
Antiniony	· U	0.00112		0.050	0.100	mg/L	1.	KDL - 10/0//08	1/25 801557	2
Barium	0	0.00957		0.050	0.150	mg/L	1			
Berullium	ŢŢ	0.091		0.010	0.050	mg/L	· 1			
Cadmium	U U O	0.00044		0.010	0.050	mg/L	1			
Chromium	U -0.	0.0215		0.010	0.050	mg/L	1			
Cobalt	3	0.0213		0.020	0.050	mg/L mg/I	1			
Copper		0.432		0.030	0.100	mg/L	1			
Lead	I	0.0193		0.025	0.100	mg/L	1			
Molybdenum	U U	0.00133		0.020	0.100	mg/L	î			
Nickel	Ũ	0 1 1 0		0.010	0.050	mg/L	î			
Selenium	IJ	-0.0766		0.050	0.150	mg/L	1			
Silver	U -(0.00214		0.010	0.050	mg/L	1			
Thallium	Ū 0	0.000923		0.050	0.200	mg/L	1			
Vanadium	Ŭ	0.00926		0.010	0.050	mg/L	1			
Zinc		0.183		0.020	0.100	mg/L	1			
The following Prep M	ethods were perfo	ormed								
Method	Description				Analyst	Date	Time	Prep Batch		
SW846 1311	SW846 1311	TCLP Leac	hing -FEDERAL		CXW3	10/01/08	1600	800777		
SW846 3010A	ICP-TRACE	TCLP by SV	W846 3010A		CXS3	10/06/08	0810	801335		÷
SW846 7470A Prep	EPA 7470A N	Mercury Pre	p TCLP Liquid		TXB3	10/03/08	1155	801305		
The following Analyti	col Methode word	norformod								
Method	Description	. per tor met			Aı	alyst Comm	ents			
1	SW846 7470A	ł		<u> </u>		-				
2	SW846 3010/6	6010B				• - •				

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Certificate of Analysis

	Company : Address : Contact:	Lawrence Li Security, LL 7000 East A Mailstop L-6 Livermore, O Mr. Chad F.	vermore N C venue 520 California 9 Davis	lational 94551				I	Report Date: Oc	tober 17,	2008	
	Project:	CES - Norm	al Delivera	ıble								
		Client Sam Sample ID Matrix: Collect Da Receive Da Collector: Moisture:	aple ID: : te: ate:		212-B-2 2159630 SO 15-SEP- 17-SEP- Client 4.18%	002		Project: Client ID:	LLNL00306 LLNL002			
Parameter		Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF Analys	t Date	Time Bate	h Mtd.
Gravimetric "As Receiv Rad Gas Flo	: Solids ved" w Proportio	nal Counting					-		•			
GFPC, Gra Alpha Beta Rad Liquid	oss A/B, solid Scintillation	l "Dry Weight Analysis	<i>Corrected</i> 9.43 19.9	" +/-1.45 +/-1.49	0.929 1.45	+/-2.61 +/-3.20	0.500 1.50	pCi/g pCi/g	DXB5	10/07/0	8 2108 7973	363 2
LSC, Tritiu Tritium	ım Dist, Solid	l "As Received	-0 373	+/-0.825	1.50	+/-0.825	2.00	pCi/g	SXL4	09/30/0	8 1239 7983	304 3
								1 0				÷ *
The fellows	na Anolutioo	Mathadaw		mod								
Method	Descr	iption	ere periors	ineu								<u></u>
1 2 3 Notes:	ASTN EPA 9 EPA 9	4 D 2216 (Mo 200.0 Modifie 206.0 Modifie	dified) d d									
The Qual	ifiers in this	report are de	efined as t	follows :								
** Ana < Ress > Ress A The B For BD Res C Ana D Ress E Met F Esti H Ana J Valu M M	alyte is a sur ult is less th ult is greater TIC is a su General Ch esults are eit alyte has bee sults are repo tals%differ mated Value alytical hold ue is estimat if above MI utrix Related	rrogate comp an value report than value report spected aldo emistry and ther below the enconfirmed ported from a rence of sample ling time was ed DC and less the Failure	oound orted reported l-condens Organic a e MDC or by GC/M diluted al ple and Sl s exceeded han LLD	ation product malysis the tar r tracer recove IS analysis iquot of the sa D is >10%. S d	get analyt ry is low mple ample con	te was detect	ted in the a	associated bla flagging crite	nk. ria			
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Certificate of Analysis

Parameter		Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF Analyst Date	Time Batch Mtd.
-		Client Sam Sample ID:	ple ID:		212-B-2 21596300	2		Project: Client ID:	LLNL00306 LLNL002	
Р	roject:	CES - Norma	al Deliver:	able						
С	Contact:	Livermore, C Mr. Chad F.	California Davis	94551				ł	Report Date: October 17	, 2008
А	Address :	7000 East A	venue 20					Ŧ	Papart Datas October 17	2008
C	Company :	Lawrence Li Security, LL	vermore N C	lational						

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 RADIO	CHF	EMICAL DATA
CI Ra	ES COC# ad Dec #	<u>17500</u> Sam RH	nple # <u>212-B-3</u> IWM-RD-08-0039-	Client Sample I	D <u>1</u>	Mercury Contaminated Soil
ſ	The comple	was analwood	far •		Siih	iect was surveyed for:
	Bulk C	Gross Alpha Gross Beta Fritium vable Rad H-3	Alpha TU Alpha TU Gamma S Removab Removab	JPA Spec le Rad α le Rad β		Surface Rad
			≤ MDC	> MDC		Check if by Limited Rad Declaration (LRD)
	Bulk Conta Gross A Gross E Tritium	<i>mination</i> Alpha Beta 1				
	Additional 2 Gamma Alpha 7	<i>Analytical</i> a Spec FUPA				
	Surface Co Remova Remova Remova Surface Surface	<i>ntamination</i> able Rad H-3 able Rad α able Rad β e Rad α e Rad β				
	Radioactiv	ity 🛛 wa	as 🗌 was not	an not	t say	added to this sample.
	Comments: Gross alpha as above the scre	nd gross beta activ eening-levels speci	ities were detected abo ified in the Moratorium	ve the sample-spec for clean site soils	cific N 5.	IDC's and at levels that are
	Finding by:	Philip Torretto,	(cm/H x2-5515	Date:	WARTY DOUTS THE POST OF	October 23, 2008

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.

		RHWM A	NALYSIS REPOI	RT		
WDR Number	Sample II	D Analytic	al Log Book ID	coc		XRF
N/A	212-B-3			17500	Analyst	
pH & NORMA	ШТҮ	(LSC) RADI	OLOGICAL SCREEN	NG REPORT	Date Analyzed	
Analyst			Tritium	Gross alpha, beta	Liemen	rercentage
Date Analyzed		Aliquot (mL or g)	1g	19		an bar na
pH Result		Analyst	Claude Cardenas	Claude Cardenas		NALINA MANANANANANANANANANANANANANANANANANAN
Normality Result (eq/L)		Date Analyzed	9/15/2008	9/15/2008		NORMAN AND AND AND AN ANY METAL AND
HVDROMETER / SPEC	EIC CRAVITY	Energy Window	0-18.6 keV	18.6-2000 keV		THE CONTRACT OF A REAL AND A
Analvst		DPM	0	0.23		**************************************
Date Analyzed		MDC	1000	3000		
Sherifir Gravity Result		Actual Result	0	100		
Protectio Clavity 130301		Reportable Result	Below MDC	Below MDC		
		Unit	picocuries / kg	picocuries / kg		
FLASH POINT (MET	HOD 1010)		SAW GC			A CARACTERISTIC CONTRACTOR OF A CARACTERISTIC CONTRACTERISTIC CONTRACTERIS
Analyst		Date Analvzed	Analyst			
Date Analyzed		Chemic		artifi Dataction Linit		
MDL						
Unit						
BOILING PO	INT					
Result					Total	DI DI MUMUMUMUMUMUMUMUMUMUMUMUMUMUMUMUMUMUMU
Unit					CON	MENTS
LIQUIFICATION T	ESTING					
Vibration Test	ing					
Analyst						
Date Analyzed		*****	*****			
Result		n oo daal daal daal daal daal daal daal d	NA 12 YO 14 YO			
Freeze / Thaw Tu	esting					
and Analyst						
Date Analyzed						
Result						analanana kata ana ana ana ana ana ana ana ana ana
Paint Filter Act	ivity				Date Completed	9/15/2008
Analyst						
Date Analyzed					Reviewed Rv	2 D
Result		a terrar en				Ta W-1

Comp	any :	Lawrence Liver Security, LLC	more Natio	onal								
Addre	ess :	7000 East Aven Mailstop L-620	ue					R	eport	Date: Octo	ober 15-2008	
Conta	ict:	Livermore, Cali Mr. Chad F. Da	fornia 945 vis	51					opon	Duit. Oth	10, 2000	
Projec	ct:	CES - Normal	Deliverabl	e								
		Client Sample Sample ID: Matrix: Collect Date: Receive Date: Collector: Moisture:	ID:	212-B-3 215963003 SO 15-SEP-08 1 17-SEP-08 Client 4.55%	.0:45		Pro Clie	iect: ent ID:	LLN	NL00306 NL002		
Parameter		Qualifier	Result		DL	RL	Units	DF	Ana	alystDate	Time Batch	Method
Mercury Analysis-	CVAA											
7471 Cold Vapor H	'g in Sol	id "Dry Weight	Corrected"								· · · · ·	
Mercury Metals Analysis-IC	Р		7.58		0.165	1.10	mg/kg	100	ETL	09/29/08	1221 796414	1
6010 TAL Metals Sc	oil Fede	ral "Dry Weight	Corrected	"								
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				
Molybaenum		J	0.721		0.200	1.00	mg/kg	1				
Silver			44.0		0.0998	1.50	mg/kg	- 1				
Thallium		ŢŢ	0.070		0.0998	2.00	mg/kg	1		•		
Vapadium		U	-1.70		0.499	0.500	mg/kg	1				
Zinc			71.8		0.0220	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 Pre	p Meth	ods were perfo	rmed									
Method		Description				Analyst	Date	Time	e I	Prep Batch		
SW846 3050B		846 3050BS P	REP			FGA	10/10/08	1430) 7	796829		
SW846 7471A Prep)	EPA 7471A M	lercury Pre	p Soil		TXB3	09/26/08	1600) 7	796413		
The following Ana	alytical	Methods were	performed	[
Method		Description				A	Analyst Comm	ents			-	
1		SW846 7471A								···· ·		
2		SW846 3050B	/6010B									
3		SW846 3050B	/6010B									

Company :	Lawrence Li Security, LL	ivermore Nati .C	onal							
Address :	7000 East A	venue								
	Mailstop L-6	620					Re	eport Date: Oct	ober 14, 2008	
Contact:	Livermore, 0 Mr. Chad F.	California 94. Davis	551					•		
Project:	CES - Norn	nal Deliverab	le							
					<u></u>					
	Client Sam Sample ID Matrix: Collect Da Receive Da Collector:	nple ID: : te: ate:	212-B-3 215964003 SO 15-SEP-08 10 17-SEP-08 Client):45		Proi Clie	ect: nt ID:	LLNL00306 LLNL002		
Parameter	Qualifie	er Resul	t	DL	RL	Units	DF	AnalystDate	Time Batch	Method
Mercury Analysis-CVA	A									
STLC Hg in Solid "As Re	ceived"									
Mercury	U	-0.0561		0.030	0.200	mg/L	1	JXL1 10/07/08	1334 801780	1
Metals Analysis-ICP		111								
SILC ICP Metals for Sol	ids "As Receive	ed"		0.020	1.00	Л	1	XDI 10/12/00	1217 001024	0
Antimony	U	0.0276		0.030	0.150	mg/L	1	KDL 10/13/08	131/ 801834	2
Barium	U	13.0		0.050	0.150	mg/L	1			
Bervllium	11	0.00464		0.010	0.050	mg/L	1			
Cadmium	0	0.0911		0.010	0.050	mg/L	1			
Chromium		0.328		0.020	0.050	mg/L	1			
Cobalt		0.490		0.010	0.050	mg/L	1			
Copper		3.15		0.030	0.100	mg/L	1			
Lead		5.72		0.025	0.100	mg/L	1			
Molybdenum	U	0.000988		0.020	0.100	mg/L	1			
Nickel		0.609		0.010	0.050	mg/L	1			
Selenium		0.294		0.050	0.150	mg/L	1			
Silver	U	0.00844		0.010	0.050	mg/L	1			
Thallium	U	-0.000934		0.050	0.200	mg/L	1			
Vanadium		0.242		0.010	0.050	mg/L	1			
Zaic	·	10.1		0.020	0.100	шg/L	1			
The following Prep Me	thods were pe	erformed								
Method	Description	n			Analyst	Date	Time	Prep Batch	l	
California Code of Regul	lati California	Wet Method S	STLC Leaching		CJP1	10/01/08	1000	800775		
SW846 3010A	ICP-TRAC	CE TCLP by S	W846 3010A		CXS3	10/06/08	0810	801833	-	
SW846 7470A Prep	EPA 7470/	A Mercury Pr	ep TCLP Liquid		TXB3	10/06/08	-1140	801779		
The following Analytic	al Methods we	ere performe	d							
		-								
Method	Description	n			A	Analyst Comm	ents			
Method 1	Description SW846 747	n 70A				Analyst Comm	ents			

	Company :	Lawrence	Livermore Nat	ional							
		Security, L	.LC								
	Address :	7000 East	Avenue								
		Mailstop L	620					R	eport Date: Oct	ober 13, 2008	
	Contact:	Livermore, Mr. Chad I	, California 94 F. Davis	551							
	Project:	CES - Nor	mal Delivera	hle							
		Client Sa Sample II Matrix: Collect D Receive I Collector	mple ID: D: vate: Date: :	212-B-3 215966003 SO 15-SEP-08 10 17-SEP-08 Client):45		Pro Clie	iect: ent ID:	LLNL00306 LLNL002		
Parameter	·	Qualif	ier Resu	lt	DL	, RL	Units	DF	AnalystDate	Time Batch	Method
Mercury An	alysis-CVA	4									
TCLP Hg in	Solid "As Ree	ceived"									
Mercury			0.0105		0.0003	0.002	mg/L	1	JXL1 10/06/08	1258 801306	1
Metals Anal	lysis-ICP										
TCLP ICP M	letals for Soli	d "As Receiv	ved"								
Antimony		U	-0.00505		0.030	0.100	mg/L	1	KDL 10/07/08	1730 801337	2
Arsenic		\mathbf{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			
Copan		U	-0.000032		0.010	0.050	mg/L	1			
Lead		J	0.0796		0.030	0.100	mg/L	1			
Molybdanum		U	0.0136		0.025	0.100	mg/L	1			
Nickel	1	U	0.002		0.020	0.100	mg/L	1			
Selenium		J	0.0379		0.010	0.050	mg/L	1			
Silver		U	-0.0469		0.050	0.150	mg/L	1			
Thallium		U	-0.00373		0.010	0.000	mg/L	1			
Vanadium			-0.0237		0.030	0.200	mg/L	1			
Zinc		U	0.276		0.010	0.100	mg/L mg/L	1			
The followi	ng Prep Met	hods were p	erformed								
Method		Descriptio)n			Analyst	Date	Time	Prep Batch		
SW846 1311		SW846 1	311 TCLP Lea	ching -FEDERAL	,	CXW3	10/01/08	1600	800777		
SW846 3010)A	ICP-TRA	CE TCLP by S	SW846 3010A		CXS3	10/06/08	0810	801335		
SW846 7470	A Prep	EPA 747()A Mercury Pr	ep TCLP Liquid		TXB3	10/03/08	1155	801305		
The following	ng Analytica	l Methods v	vere performe	d							
Method		Descriptio)n			A	Analyst Comm	ents			
1		SW846 74	70A								
2	,	SW846 30)10/6010B								

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Certificate of Analysis

	Company : Address : Contact: Project:	Lawrence Li Security, LL 7000 East A Mailstop L-6 Livermore, C Mr. Chad F. CES - Norm	vermore N C venue 520 California (Davis al Delivera	lational 94551 ıble				I	Report D	ate: Oc	ctober 17,	2008		
		Client Sam Sample ID Matrix: Collect Dat Receive Da Collector: Moisture:	nple ID: : te: ate:		212-B-3 2159630 SO 15-SEP- 17-SEP- Client 4.55%	003 08 08		Project: Client ID:	LLNL LLNL	.00306 .002			4 ° .	
Parameter		Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analys	t Date	Time	Batch M	Mtd.
Gravimetrico "As Receiv Rad Gas Flo GFPC, Gro Alpha Beta	Solids ved" ow Proportion oss A/B, solid	nal Counting "Dry Weight	<i>Corrected</i> 8.95 17.2	" +/-1.55 +/-1.44	1.36 1.52	+/-2.79 +/-2.80	0.500 1.50	pCi/g pCi/g		DXB5	10/07/08	3 2155	797363	2
Rad Liquid	Scintillation	Analysis "An Received	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,										÷ .	
Tritium	in Disi, Solia	U U	-0.19	+/-0.826	1.48	+/-0.826	2.00	pCi/g		SXL4	09/30/08	3 1325	798304	3
The followin Method	ng Analytical Descri	Methods we ption	re perform	ned										
2	EPA 9	00.0 Modified	l											
3	EPA 9	06.0 Modified	1											
Notes:														
The Quali ** Ana	ifiers in this : ilyte is a suri	report are de rogate compo	fined as f	ollows :										
 < Rest > Rest A The B For BD Rest C Ana D Rest E Meta 	It is less that It is greater TIC is a sus General Che sults are eith lyte has been ults are repo- als%differe	n value repo than value re pected aldol mistry and C er below the n confirmed tted from a c ence of samp	rted eported -condens: Drganic au MDC or by GC/M liluted ali ole and SI	ation product halysis the tary tracer recover S analysis quot of the sar D is >10%. Sa	get analyte ry is low mple umple cone	e was detect	ted in the as	ssociated blar	k.					

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

120

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Certificate of Analysis

Parameter	Qualifier Result Uncertainty	DL TPU	RL Units	DF Analyst Date Time Batch Mtd.
	Client Sample ID: Sample ID:	212-B-3 215963003	Proiect: Client ID:	LLNL00306 LLNL002
Project:	CES - Normal Deliverable			
Contact:	Livermore, California 94551 Mr. Chad F. Davis			
Address	Mailstop L-620]	Report Date: October 17, 2008
Compan	Security, LLC			
Compan	y: Lawrence Livermore National			

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	
A CONTROL OF	

<u>17500</u> Sample # <u>212-B-4</u> Client Sample ID <u>Mercury Contaminated Soil</u> CES COC#

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

The sample was analyzed	for :	Su	bject was surveyed for:				
Bulk Gross Alpha	Alpha TU		Surface Rad				
Bulk Tritium	Removab	le Rad α					
Removable Rad H-3	Removable Rad β						
	≤ MDC	> MDC	Check if by Limited Rad Declaration (LRD)				
<i>Bulk Contamination</i> Gross Alpha Gross Beta Tritium							
<i>Additional Analytical</i> Gamma Spec Alpha TUPA							
Surface Contamination Removable Rad H-3 Removable Rad α Removable Rad β Surface Rad α Surface Rad β							
Radioactivity 🛛 wa	as 🗌 was not	🗌 can not sa	y added to this sample.				
Comments: Gross alpha and gross beta activ above the screening-levels speci	ities were detected abo ified in the Moratorium	ve the sample-specific for clean site soils.	MDC's and at levels that are				
Finding by: <u>Hillip</u> Philip Torretto,	x2-5515	Date:	October 23, 2008				

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.

WDR Niimher		Analotica	NALYSIS REPOR	T		
	2					XRT
N/A 212-	-B-4			17500	Analyst	
ph & NORMALITY	(FS	C) RADIC	DLOGICAL SCREENII	NG REPORT	Date Analyzed	
Analyst			Tritium	Gross alpha, beta		Percentage
Date Analyzed	Aliquot (mL	or g) 🔨	1g	1g		
pH Result	Analys	t	Claude Cardenas	Claude Cardenas		
Normality Result (eq/L)	Date Analy	/zed	9/15/2008	9/15/2008		S DANA TATA NA VANANA MANA MANA MANA MANA MANA MAN
HYDROMFTER / SPECIEIC GRAVITY	Energy Wir	wopu	0-18.6 keV	18.6-2000 keV		
Analyst			0	0.47		1999/1999/1999/1999/1999/1999/1999/199
Date Analyzed			1000	3000		
Specific Gravity Result	Actual Ke	sult	0	210		
Hydrometer Result		Xesuit	Below MUC	Below MDC		
FI ASH POINT (METHOD 1010)				birocuites / vg		
Analyst			SAW GC			
Date Analyzed			Analyst			
MDL		Chemical	Kes			
Result						
Unit						
BOILING POINT						
Result					Total	
Unit					CO	MMENTS
LIQUIFICATION TESTING						
Vibration Testing						
Analyst Analyst						
Date Analyzed						
Result						
Freeze / Thaw Testing						
Analyst						
Date Analyzed						- -
Result						
Paint Filter Activity					Date Completed	9/15/2008
Analyst		*****				
Date Analyzed					Reviewed By	1 ANG
Result						Leve 0

Certificate of Analysis

Comp	any: Lawr	ence Live	rmore Natic	mal									
Addre	Secur	Tity, LLU	200										
Auur	SS. 7000 Maile	ton L-62)					_					
	Liver	more, Cal	, ifornia 945	51			-	R	eport	Date: Oct	ober 15, 2	2008	
Conta	ct: Mr. C	Chad F. Da	avis										
Projec	ct: CES	- Normal	Deliverabl	e									
	Clier Sam Matr	nt Sampl ple ID: ix:	e ID:	212-B-4 215963004 SO			Proi Clie	ect: nt ID:	LLN LLN	NL00306 NL002			
	Colle Rece	ect Date: vive Date	:	15-SEP-08 17-SEP-08	10:45								
	Mois	sture:		Client 4.37%			1 a.						
Parameter	Q	ualifier	Result		DL	RL	Units	DF	Ana	lystDate	Time	Batch	Method
Mercury Analysis-	CVAA												
7471 Cold Vapor H	g in Solid "Di	ry Weight	Corrected"										
Mercury			7.83		0.0888	0.592	mg/kg	50	ETL	09/29/08	1411 79	6414	1
Metals Analysis-IC	Р												
6010 TAL Metals Sc	oil Federal "L	Dry Weigh	t Corrected	"				÷					
Antimony		U	-0.505		0.310	1.50	mg/kg	1	HSC	10/12/08	1731 79	6830	2
Arsenic			4.57		0.500	1.50	mg/kg	1				0000	~
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	$\mathbf{x} = \mathbf{x}$	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 79	6830	3
The following Pre	p Methods w	ere perfo	rmed										
Method	Desc	ription				Analyst	Date	Time	e P	rep Batch			
SW846 3050B	846	3050BS P	REP			FGA	10/10/08	1430) 7	96829	·· ·· <u>-</u>		·
SW846 7471A Prep	EPA	.7471A M	lercury Prep	o Soil		TXB3	09/26/08	1600) 7	96413			
The following Ana	lytical Meth	ods were	performed										
Method	Desc	ription				ł	Analyst Comme	ents					
1	SW8	46 7471A											
2	SW8	46 3050B	/6010B										

SW846 3050B/6010B

3

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	Company :	Lawrence Liv Security, LLC	ermore Nati	onal							
	Address :	7000 East Ave Mailstop L-62	enue 20					R	enort Date: Oct	ober 14, 2008	
	Contact:	Livermore, Ca Mr. Chad F. E	alifornia 945 Davis	551				~			
	Project:	CES - Norma	l Deliverab	le							
		Client Samp Sample ID: Matrix: Collect Date Receive Date Collector:	le ID: :: e:	212-B-4 215964004 SO 15-SEP-08 1 17-SEP-08 Client	0:45		Pro Clie	iect: ent ID:	LLNL00306 LLNL002		
Parameter		Qualifier	Result	ł	DL	RL	Units	DF	AnalystDate	Time Batch	Method
Mercury An	alysis-CVA	4									
STLC Hg in S	Solid "As Rec	reived"							. ·		
Mercury		U	-0.0598		0.030	0.200	mg/L	1	JXL1 10/07/08	1336 801780	1
Metals Analy	ysis-ICP						U				•
STLC ICP Me	etals for Solid	ds "As Received	m								
Antimony		U	0.0266		0.030	1.00	mg/L	1	KDL 10/13/08	1325 801834	2
Arsenic		\mathbf{U}	-0.0635		0.050	0.150	mg/L	1	100 10,000	1525 001051	2
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			
NICKEI Salanium			0.606		0.010	0.050	mg/L	1			
Selenium			0.258		0.050	0.150	mg/L	1			
Thellium		U	0.010		0.010	0.050	mg/L	1			
Vanadium		0	0.0227		0.050	0.200	mg/L	1		•	
Zipc			0.240		0.010	0.050	. mg/L	1			
2			9.02		0.020	0.100	mg/L	1			
The followin	ng Prep Metl	hods were perf	ormed								
Method		Description				Analyst	Date	Time	e Prep Batch		
California Co	de of Regula	ti [,] California W	et Method S	TLC Leaching		CJP1	10/01/08	1000	800775	-	
SW846 3010/	4	ICP-TRACE	TCLP by SV	V846 3010A		CXS3	10/06/08	0810	801833		
SW846 74704	A Prep	EPA 7470A 1	Mercury Pre	p TCLP Liquid		TXB3	10/06/08	1140	801779		
The follow-	a Anolation] Moth c 3									
Method	ig Analytica	Description	e performed			Δ	nalyst Comm	ents			
1		SW846 7470	۰. ۱		<u> </u>						····
- 2		SW046 2010									
4		SW846 3010/	6010B								

Compa Addres Contac Project	ny : Lawrence Security, s : 7000 Eas Mailstop Livermor t: Mr. Chad : CES - No	e Livermore Nat LLC t Avenue L-620 re, California 94 t F. Davis prmal Delivera	tional 4551 ble	Report Date: October 13, 2008							
	Client S Sample Matrix: Collect Receive Collect	ample ID: ID: Date: Date: or:	212-B-4 215966004 SO 15-SEP-08 10:45 17-SEP-08 Client		Proi Clie	ect: nt ID:	LLNL00306 LLNL002				
Parameter	Qual	ifier Rest	ilt DI	, RL	Units	DF	AnalystDate	Time Batch	Method		
Mercury Analysis-C	CVAA										
TCLP Hg in Solid "A	s Received"										
Mercury	U	-0.000669	0.0003	0.002	mg/L	1 J	XL1 10/06/08	1300 801306	1		
Metals Analysis-ICI											
TCLP ICP Metals for	r Solid "As Rece	rived"									
Antimony	U	-0.00913	0.030	0.100	mg/L	1 F	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	1	0.037	0.010	0.050	mg/L	i 1					
Lood	11	0.445	0.030	0.100	mg/L	1					
Molubdonum	U	0.00989	0.023	0.100	mg/L	1					
Nickel	U	0.00384	0.020	0.100	mg/L	1					
Selenium	TT	-0.103	0.010	0.050	mg/L	1					
Silver		-0.103	0.030	0.150	mg/L mg/l	1					
Thallium	U U	0.0273	0.010	0.000	mg/L	1					
Vanadium	U	0.000478	0.010	0.050	mg/L	1					
Zinc	U	0.163	0.020	0.100	mg/L	ĩ					
The following Prop	Mathada war	norformod									
Method	Descrip	tion		Analyst	Date	Time	Prep Batch		<u> </u>		
SW846 1311	SW/8/W	1311 TCI PI	aching_FFDFR A1	CXW3	10/01/08	1600	800777				
SW846 3010A		ACE TO P by	SW846 3010A	CYS3	10/04/08	0010	801225				
SW846 7470A Pren	EPA 74	70A Mercury P	ren TCLP Liquid	TXB3	10/03/08	1155	801333				
2.1010 / 1/0/11/0		, or a more out y a	op i obi biqui		10,00,00	1100	001303				
The following Anal	ytical Methods	were perform	ed		A			· · · ·			
Niethod	Descrip	tion			Analyst Comm	ents					
1	SW846	7470A									
2	SW846	3010/6010B									

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	Company :	Lawrence Li	vermore N	Vational									
		Security, LL	C										
	Address :	Mailston L-f	venue 520						Domont D		-1 17	2009	
	Contact	Livermore, C	California Davis	94551					Report D	ate: Octo	ober 17	, 2008	
	Project:	CES - Norm	al Deliver	able									
		Client Sam Sample ID Matrix: Collect Da Receive Da Collector: Moisture:	nple ID: : te: ate:	* .	212-B-4 2159630 SO 15-SEP- 17-SEP- Client 4.37%	004 08 08		Project: Client ID:	LLNI LLNI	.00306 .002			
Parameter		Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time Batch N	Mtd.
Gravimetri	c Solids												
"As Recei	ived"												
Rad Gas Fl	ow Proportio	nal Counting								1997 - A.			
GFPC, Gr	ross A/B, solid	"Dry Weight	Corrected	. 1 50	1 70		0.500	C 14					
Alpha Beta			9.39	+/-1.73	1.72	+/-2.78 +/-2.66	0.500	pCi/g pCi/g		DXB5	10/07/0	8 2155 797363	2
Rad Liquid	Scintillation	Analysis	17.2		1.70	17 2.00	1.50	PC12					
LSC, Tritit	um Dist, Solid	"As Received	"										
Tritium		U	0.209	+/-0.882	1.54	+/-0.883	2.00	pCi/g		SXL4	09/30/0	8 1412 798304	3 ·
			c	mod									
The followi Method	ing Analytica Descri	l Methods we iption	ere perior	incu									
The followi Method	ing Analytica Descri ASTM	l Methods we iption 1 D 2216 (Mo	dified)	intu								<u></u>	
The followi Method 1 2	ing Analytica Descri ASTM EPA 9	l Methods we iption 1 D 2216 (Mo 00.0 Modified	dified)										
The followi Method 1 2 3	ing Analytica Descri ASTM EPA 9 EPA 9	I Methods we iption I D 2216 (Mo 00.0 Modified 06.0 Modified	dified) dified)										
The following Method 1 2 3 Notes:	ing Analytica Descri ASTM EPA 9 EPA 9	l Methods we iption 1 D 2216 (Moo 00.0 Modified 06.0 Modified	dified) 1 1										
The following Method 1 2 3 Notes: The Qual	ing Analytica Descri ASTM EPA 9 EPA 9	1 Methods we iption 1 D 2216 (Moo 000.0 Modified 06.0 Modified report are de	dified) d d d	follows :									

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Certificate of Analysis

Parameter		Onalifier Result	Uncortainty	DI	TDU	DI	Unite	DE Analyst Data	There Detail here's
		Client Sample ID: Sample ID:		212-B-4 215963004	1		Project: Client ID:	LLNL00306 LLNL002	
P	roject:	CES - Normal Deliveral	ble						
С	contact:	Livermore, California 94 Mr. Chad F. Davis	4551				1		, 2008
C A	company : Address :	Lawrence Livermore Na Security, LLC 7000 East Avenue Mailstop L-620	ational				ī	Report Date: October 17	2008

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	

<u>17500</u> Sample # <u>212-B-5</u> Client Sample ID <u>Mercury Contaminated Soil</u> CES COC#

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

The sample was analyzed	for :	Sı	Subject was surveyed for:			
🛛 Bulk Gross Alpha	🗌 Alpha TU	JPA C	Surface Rad			
Bulk Gross Beta	🗌 Gamma S	Spec				
🛛 🛛 Bulk Tritium	🗌 Removab	le Rad α				
Removable Rad H-3	Removab	le Rad β				
	≤ MDC	> MDC	Check if by Limited Rad Declaration (LRD)			
Bulk Contamination						
Gross Alpha						
Gross Beta Tritium						
<i>Additional Analytical</i> Gamma Spec Alpha TUPA						
Surface Contamination Removable Rad H-3 Removable Rad α Removable Rad β Surface Rad α Surface Rad β						
Radioactivity 🛛 wa	as 🗌 was not	🗌 can not sa	y added to this sample.			
Comments:	n en in den fan Annander en geskaansk kommen en de de gener de geskere fan de sekere fan de sekere fan de seke	n na	nn an a			
Gross alpha and gross beta activ above the screening-levels speci	ities were detected abov fied in the Moratorium	ve the sample-specific for clean site soils.	MDC's and at levels that are			
Finding by: <u>Julij</u> Philip Torretto,	Canth x2-5515	Date:	October 23, 2008 .			

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.

	R	HWM AN	MALYSIS REPO	RT		
WDR Number	mple ID	Analytical	Log Book ID	COC		XRF
N/A 21	2-B-5			17500	Analyst	
pH & NORMALITY		SC) RADIO	LOGICAL SCREEN	ING REPORT	Date Analyzed	-
Analyst			Tritium	Gross alpha, beta	Element	Percentage
Date Analyzed	Aliquot (m	nL or g)	1g	1g		
pH Result	Analy	yst	Claude Cardenas	Claude Cardenas		
Normality Result (eq/L)	Date An	alyzed	9/15/2008	9/15/2008		
HYDROMETER / SPECIEIC GRAVIT	V Energy W	Vindow	0-18.6 keV	18.6-2000 keV		
		W	0	1.49		
Date Analyzed		J	1000	3000		
Sbecific Gravity Result	Actual F	Result	0	670		
Hvdrometer Result	Reportable	e Result	Below MDC	Below MDC		
		it constants	picocuries / kg	picocuries / kg		
FLASH POINT (METHOD 1010)			SAW GC			
Analyst	Date Analyz	zed	Analvst			
Date Analyzed		Chemical		sult Detection Linit		AND MANY AND
MOL						
Result						
BOILING POINT						
Result					Total	
Unit					COL	MENTS
LIQUIFICATION TESTING						
Vibration Testing						-
Analyst						
Date Analyzed						
Result						
Freeze / Thaw Testing						
Analyst						
Date Analyzed						
Result						
Paint Filter Activity					Data Completed	0/15/2008
Analyst						
Date Analyzed					Reviewed Bv	A CAL
Result						AN 2
					1	

Address : 7000 East Aremie Maission J-620 Report Date: October 15, 2008 Livermore, California 94551 Stanple ID: 212-B-5 Project: Client Sample ID: 213963005 Marrix: SO Somple ID: 212-B-5 Project: LLNL00306 Collect Date: 15-SEP-08 10:45 Client ID: LLNL002 Collector Date: 15-SEP-08 10:45 Client ID: LLNL002 Collector Date: 15-SEP-08 10:45 Client ID: LLNL002 Parameter Qaalifier Resolt DL RL Units DF AnalystDate Time Batch Method Mercury Analysis-CVAA 7471 Cold Voyne Hg in Solid "Dry Weight Corrected" Mercury Analysis-CP	Company :	Lawrence Liver Security, LLC	more Natio	nal								
Repair Net: Cube: C	Address :	7000 East Aven Mailston L-620	ue				R	enort I	Date: Octo	ober 15	2008	
Project: CES Normal Deliverable Project: CES Normal Deliverable Client Sample ID: 212-B-5 Sample ID: Project: LLNL00306 Client ID: Matrix: SO Collect Date: 17-SEP-08 10-45 Receive Date: Freiext: LLNL002 Parameter Qualifier Result DL RL Units DF AnalystDate Time Batch Method Mercury Analysis-CYAA Moisture: 3.32 0.158 1.06 mg/kg 10 ETL O/P2908 1225 796414 1 Mercury Analysis-CYAA Marcury 3.32 0.158 1.06 mg/kg 1 Batch Method Mercury 3.32 0.158 1.06 mg/kg 1 HSC 10/12/08 123 796830 2 Attimony U -0.172 0.310 1.50 mg/kg 1 HSC 10/12/08 173 796830 2 Attimony U -0.172 0.310 1.50 mg/kg 1 HSC 10/12/08 173 796830 2 Attimony U -0.317 0.3998 <	Contact:	Livermore, Cali Mr Chad F Da	fornia 945: vis	51			, in the second s	eport	Jule. Oeld	JUCI 15,	2000	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Project:	CES - Normal	Deliverabl	e								
Client Sample ID: 212-B-5 215963005 Protect: LLN.00.936 Client ID: LLN.00.936 LLN.002 Matrix: SO Collect Date: 17-SEP-08 Collector: So So Parameter Qualifier Result DL RL Units DF AnalystDate Time Batch Method Mercury Analysis-CVAA 3.69% No RL Units DF AnalystDate Time Batch Method Mercury Analysis-CVA 3.32 0.158 1.06 mg/kg 100 ETL 09/29/08 1225 796414 1 Metals Analysis-CP Metals Analysis-CP 0.150 mg/kg 100 ETL 09/29/08 1225 796434 1 Metals Analysis-CP 0.150 mg/kg 1											··· ·· ···	
Parameter Qualifie Result DL RL Units DF Analysto, T Time Batch Method Mercury Analysis-CVAA 3.32 0.158 1.06 mg/kg 10 ETL 09/29/08 12.55 76414 1 Metals Analysis-ICF 3.32 0.158 1.06 mg/kg 10 ETL 09/29/08 12.55 796414 1 Old 7AL Metals Soil Federal "Dry Weight Corrected" 0.150 mg/kg 1 HSC 0/12/08 17.95 796830 2 Arsenic 3.80 0.499 0.500 mg/kg 1 HSC 10/12/08 17.97 796830 2 Baryllium U -0.317 0.0998 0.500 mg/kg 1 U -0.478 0.000 0.000 mg/kg 1 Choronium 3.26 0.0000 mg/kg 1 Choronium 3.26 0.000 mg/kg 1 Start N Start N Start N Start N Start <td< th=""><th></th><th>Client Sample Sample ID: Matrix: Collect Date: Receive Date: Collector: Moisture:</th><th>) ID:</th><th>212-B-5 215963005 SO 15-SEP-08 10:45 17-SEP-08 Client 3.69%</th><th></th><th>Proi Clie</th><th>ect: nt ID:</th><th>LLN</th><th>IL00306 IL002</th><th></th><th></th><th></th></td<>		Client Sample Sample ID: Matrix: Collect Date: Receive Date: Collector: Moisture:) ID:	212-B-5 215963005 SO 15-SEP-08 10:45 17-SEP-08 Client 3.69%		Proi Clie	ect: nt ID:	LLN	IL00306 IL002			
Mercury Analysis-CVAA 7471 Cold Vapor Hg in Solid "Dry Weight Corrected" Mercury 3.32 0.158 1.06 mg/kg 100 ETL 09/29/08 1225 796414 1 Metals Analysis-ICP 010 0.172 0.310 1.50 mg/kg 1 HSC 10/12/08 1739 796830 2 Ansenic 3.80 0.499 1.50 mg/kg 1 1 1 Barium 174 0.0998 0.500 mg/kg 1 1 1 Cadmium J 0.478 0.0998 0.500 mg/kg 1 1 1 Cobalt 10.0 0.200 0.500 mg/kg 1	Parameter	Qualifier	Result	DI	RL	Units	DF	Ana	lystDate	Time	Batch	Method
7471 Cold Vapor Hg in Solid "Dry Weight Corrected" Mercury 3.32 0.158 1.06 mg/kg 100 ETL 09/29/08 1225 796414 1 Metals Analysis-ICP 60/10 TAL Metals Soil Federal "Dry Weight Corrected" Antimony U -0.172 0.310 1.50 mg/kg 1 HSC 10/12/08 1739 796830 2 Arsenic 3.80 0.449 1.50 mg/kg 1 HSC 10/12/08 1739 796830 2 Arsenic 3.80 0.449 0.0998 0.500 mg/kg 1 Gold TAL Metals Soil Federal "Dry Weight Corrected" Arsenic 3.80 0.449 0.0998 0.500 mg/kg 1 Barium U -0.317 0.0998 0.500 mg/kg 1 Cadmium J 0.478 0.400 Mg/kg 1 Colspan 0.665	Mercury Analysis-CVA	A										
Mercury 3.32 0.158 1.06 mg/kg 100 ETL 09/29/08 1225 796414 1 Metals Analysis-ICP 0010 TAL Metals Soil Federal "Dry Weight Corrected" 3.80 0.499 1.50 mg/kg 1 HSC 10/12/08 1739 796830 2 Arsenic 3.80 0.499 1.50 mg/kg 1 HSC 10/12/08 1739 796830 2 Barium 174 0.0998 0.500 mg/kg 1 Science 2 Cadmium J 0.478 0.0998 0.500 mg/kg 1 1 5 2 1 2 2 3 2 3 3 2 3 2 3 3 2 3 3 2 3 3 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 <t< td=""><td>7471 Cold Vapor Hg in S</td><td>Solid "Dry Weight</td><td>Corrected"</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	7471 Cold Vapor Hg in S	Solid "Dry Weight	Corrected"									
	Mercury Metals Analysis-ICP		3.32	0.158	1.06	mg/kg	100	ETL	09/29/08	1225 7	96414	1
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 1 Arsenic 3.80 0.499 1.50 mg/kg 1 1 Arsenic 3.80 0.499 1.50 mg/kg 1 1 Arsenic 1 0.0998 0.500 mg/kg 1 1 Cadmium J 0.478 0.0998 0.500 mg/kg 1 Cobalt 1 0.0 0.200 0.500 mg/kg 1 Cobalt 10.0 0.200 0.500 mg/kg 1 Lacid 1 Cobalt 1.00 0.200 0.500 mg/kg 1 Lacid 16.5 0.250 1.50 mg/kg 1 Lacid 1.00 mg/kg 1 Siver 0.900 0.0998 0.500 mg/kg 1 Siver 0.900 0.0998 0.500 mg/kg 1 Siver 1.01/14/08 1709 796830 3 3 Thallium U -0.905 4.99	6010 TAL Metals Soil Fe	deral "Dry Weight	Corrected	"								
Arsenic 3.80 0.499 1.50 mg/kg 1 Barium 174 0.0998 0.500 mg/kg 1 Cadmium U -0.317 0.0998 0.500 mg/kg 1 Cadmium J 0.478 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 0.200 1.00 mg/kg 1 Nickel 40.4 0.0998 0.500 mg/kg 1 Silver 0.900 0.9998 0.500 mg/kg 1 Zanc 188 0.200 1.00 mg/kg 1 Zhenium J 7.88 4.99 1.0 HSC 10/14/08 1709	Antimony	U	-0.172	0.310	1.50	mg/kg	1	HSC	10/12/08	1739 7	96830	2
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 Lead 16.5 0.250 1.50 mg/kg 1 Lead 16.5 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 Silver 0.900 0.0998 0.500 mg/kg 1 Zinc 188 0.200 1.00 mg/kg 1 Zinc 188 0.200 1.00 mg/kg 1 Selenium J 7.88 4.99 15.0 mg/kg 10 Hsto U -0.905 4.99 20.0 mg/kg 10 SW846 3050B 846 3050B S PREP FGA 10/10/08 1430 796829 SW846 7471A Prep EPA 7471A Mercury Prep Soil <td< td=""><td>Arsenic</td><td></td><td>3.80</td><td>0.499</td><td>1.50</td><td>mg/kg</td><td>1</td><td></td><td></td><td></td><td></td><td></td></td<>	Arsenic		3.80	0.499	1.50	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 Chronium 32.6 0.0998 0.500 mg/kg 1 Cobalt 10.0 0.200 0.500 mg/kg 1 Cobalt 10.0 0.200 0.500 mg/kg 1 Cobalt 16.5 0.200 1.00 mg/kg 1 Molybdenum J 0.665 0.200 1.00 mg/kg 1 Nickel 40.4 0.0998 0.500 mg/kg 1 1 Vanadium 29.7 0.0998 0.500 mg/kg 1 1 Zinc 188 0.200 1.00 mg/kg 1 1 Zinc 188 0.200 mg/kg 1 1 10 10/14/08 1709 796830 3 Thallium U -0.905 4.99 20.0 mg/kg 10 10/14/08 796829 SW846 3050B 846 3050BS PREP <td>Barium</td> <td></td> <td>174</td> <td>0.0998</td> <td>0.500</td> <td>mg/kg</td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td>	Barium		174	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 0.200 1.50 mg/kg 1 Molydenum 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 Zinc 188 0.200 1.00 mg/kg 1 Selenium J 7.88 4.99 15.0 mg/kg 10 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	Beryllium	U	-0.317	0.0998	0.500	mg/kg	1					
Chromum 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 0.500 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 The following Prep Methods were performed	Cadmium	J	0.478	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 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 Hallium U -0.905 4.99 20.0 mg/kg 1 Sw846 3050B 846 3050BS PREP FGA 10/10/08 1430 796829 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 1 Sw846 3050B/6	Chromium		32.6	0.0998	0.500	mg/kg	1					
Copper 618 0.300 2.00 Ing/kg 1 Lead 16.5 0.250 1.50 mg/kg 1 Nickel 40.4 0.0998 0.30 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 Selenium U -0.905 4.99 20.0 mg/kg 10 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 Inte following Analytical Methods were performed Method Description Analyst Comments 1 SW846 7471A 2 SW846 3050B/6010B 3 SW846 3050B/6010B 3 <td< td=""><td>Cobalt</td><td></td><td>10.0</td><td>0.200</td><td>0.500</td><td>mg/kg</td><td>1</td><td></td><td></td><td></td><td></td><td></td></td<>	Cobalt		10.0	0.200	0.500	mg/kg	1					
Lead 16.5 0.200 1.30 11g/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 Selenium J 7.88 4.99 15.0 mg/kg 10 HSC 10/14/08 1709 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 3050B 846 3050BS PREP FGA 10/10/08 1430 796829 SW846 7471A Prep EPA 7471A Mercury Prep Soil TXB3 09/26/08 1600 796413 In	Copper		618	0.300	2.00	mg/kg	1					
Molydelulii J 0.003 0.200 1.00 Ing/kg 1 Nickel 40.4 0.0998 0.300 mg/kg 1 Nickel 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 Kethod 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 Image: SW846 7471A Image: SW846 3050B/6010B Image: SW846 3050B/6010B Image: SW846 3050B/6010B 3 SW846 3050B/6010B SW846 3050B/6010B Image: SW846 3050B/6010B </td <td>Leau</td> <td>т</td> <td>10.5</td> <td>0.230</td> <td>1.30</td> <td>mg/kg</td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td>	Leau	т	10.5	0.230	1.30	mg/kg	1					
Nicket 40.4 0.0976 1.50 Ingrkg 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 Hethod J 7.88 4.99 20.0 mg/kg 10 HSC 10/14/08 1709 796830 3 Thallium U -0.905 4.99 20.0 mg/kg 10 10 1709 796830 3 SW846 3050B 846 3050BS PREP FGA 10/10/08 1430 796829 508 508 508 508 508 508 509 509 509 500 796413 500 796413 500 508 <t< td=""><td>Nickel</td><td>J</td><td>40.4</td><td>0.200</td><td>1.00</td><td>mg/kg</td><td>1</td><td></td><td></td><td></td><td></td><td></td></t<>	Nickel	J	40.4	0.200	1.00	mg/kg	1					
Bit Cl 0.000 0.007/st 0.009/st 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 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 Image: State St	Silver		40.4	0.0998	0.500	mg/kg	1					
The following Analytical Methods were performed FGA 10/10/08 1430 796829 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 Date Time Prep Batch 5W846 3050B 846 3050BS PREP FGA 10/10/08 1430 796829 SW846 7471A Prep EPA 7471A Mercury Prep Soil TXB3 09/26/08 1600 796413 1 SW846 7471A SW846 3050B/6010B 3 SW846 3050B/6010B 3 SW846 3050B/6010B	Vanadium		20.7	0.0998	0.500	mg/kg	1					
Line 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 HSC 10/14/08 1709 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 Mercury Prep Soil TXB3 09/26/08 1600 796413 The following Analytical Methods were performed Method Description Analyst Comments 1 SW846 3050B/6010B 3 SW846 3050B/6010B 3 SW846 3050B/6010B	Zinc		188	0.0200	1.00	mg/kg	î					
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 SW846 7471A 3 SW846 3050B/6010B 3 SW846 3050B/6010B 5	Selenium	T	7.88	4.99	15.0	mg/kg	10	HSC	10/14/08	1709 7	96830	3
The following Prep Methods were performedMethodDescriptionAnalystDateTimePrep BatchSW846 3050B846 3050BS PREPFGA10/10/081430796829SW846 7471A PrepEPA 7471A Mercury Prep SoilTXB309/26/081600796413The following Analytical Methods were performedMethodDescriptionAnalyst Comments1SW846 7471ASW846 7471A2SW846 3050B/6010BSW846 3050B/6010B3SW846 3050B/6010BSW846 3050B/6010B	Thallium	Ŭ	-0.905	4.99	20.0	mg/kg	10					
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 Analyst Comments Image: Comment State	The following Prep Mo	thods were perfo	rmed									
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 Analyst Comments Image: Comment state sta	Method	Description			Analyst	Date	Tim	e I	Prep Batch			
SW846 7471A Prep EPA 7471A Mercury Prep Soil TXB3 09/26/08 1600 796413 The following Analytical Methods were performed Analyst Comments Method Description Analyst Comments 1 SW846 7471A SW846 3050B/6010B Image: Comments Image: Comments 2 SW846 3050B/6010B Image: Comments Image: Comments Image: Comments 3 SW846 3050B/6010B Image: Comments Image: Comments Image: Comments	SW846 3050B	846 3050BS P	REP		FGA	10/10/08	143	0 1	796829			
The following Analytical Methods were performedMethodDescriptionAnalyst Comments1SW846 7471A2SW846 3050B/6010B3SW846 3050B/6010B	SW846 7471A Prep	EPA 7471A M	fercury Pre	p Soil	TXB3	09/26/08	160	0 1	796413			
Method Description Analyst Comments 1 SW846 7471A 2 SW846 3050B/6010B 3 SW846 3050B/6010B	The following Analytic	al Methods were	performed	I								
1 SW846 7471A 2 SW846 3050B/6010B 3 SW846 3050B/6010B	Method	Description				Analyst Comm	ents					_
2 SW846 3050B/6010B 3 SW846 3050B/6010B	1	SW846 7471A	· · · · · · · · · · · · · · · · · · ·									
3 SW846 3050B/6010B	2	SW846 3050B	/6010B									
	3	SW846 3050B	/6010B									

Cor Ado Cor Pro	npany : lress : ntact: ject:	Lawrence Live Security, LLC 7000 East Ave Mailstop L-62 Livermore, Ca Mr. Chad F. E CES - Norma	ermore Natio enue 0 llifornia 945 Davis I Deliverab	onal 551 Ie				Re	port Date: Octo	ober 14, 2008	
		Client Samp Sample ID: Matrix: Collect Date Receive Date Collector:	le ID: : ::	212-B-5 215964005 SO 15-SEP-08 10 17-SEP-08 Client):45		Proj Clie	ect: nt ID:	LLNL00306 LLNL002		
Parameter		Qualifier	Resul	t	DL	RL	Units	DF	AnalystDate	Time Batch	Method
Mercury Analysi	is-CVAA	L .									
STLC Hg in Solid	"As Rece	eived"									
Mercury		J	0.112		0.030	0.200	mg/L	1	JXL1 10/07/08	1338 801780	1
Metals Analysis-	ICP										
STLC ICP Metals	for Solia	ls "As Received									
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			
Coppor			0.384		0.010	0.050	mg/L	1			
Lead			0.570		0.030	0.100	mg/L	1			
Molyhdenum		Т	0.237		0.025	0.100	mg/L mg/I	1			
Nickel		3	0.0214		0.020	0.050	mg/L	1			
Selenium			0.176		0.010	0.050	mg/L	1			
Silver		U	0.00815		0.010	0.050	mg/L	1			
Thallium		- Ŭ	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 P	rep Metl	10ds were perf	ormed								
Method		Description				Analyst	Date	Time	Prep Batch		
California Code o	f Regula	i California W	et Method S	TLC Leaching		CJP1	10/01/08	1000	800775		
SW846 3010A	-	ICP-TRACE	TCLP by S	W846 3010A		CXS3	10/06/08	0810	801833		
SW846 7470A Pr	ер	EPA 7470A	Mercury Pre	p TCLP Liquid		TXB3	10/06/08	1140	801779		
The following A	nalytical	Methods were	e performed	1							
Method		Description	Performet	•		A	Analyst Comm	ents			
1		SW846 7470.	4								
2		SW846 3010/	6010B								

Com Addr Cont Proje	pany : ess : act: ct:	Lawrence Security, I 7000 East Mailstop L Livermore Mr. Chad I CES - Nor Client Sa Sample I Matrix: Collect D Receive I Collector	Livermore N LC Avenue -620 , California F. Davis rmal Deliver mple ID: D: Date: Date: :	ational 94551 212-B-5 215966005 SO 15-SEP-08 10 17-SEP-08 Client	0:45		Pr Cl	ober 13, 2008			
Parameter		Qualif	ier Re	sult	DL	, RL	Units	DF	AnalystDate	Time Batch	Method
Mercury Analysis-	CVAA					_ ·					
TCLP Hg in Solid "	'As Rece	ived"									
Mercury Metals Analysis-I(CP	J	0.000675	5	0.0003	0.002	mg/L	1	JXL1 10/06/08	1302 801306	1
TCLP ICP Metals f	or Solid	"As Receiv	ved"								
Antimony		U	-0.00791		0.030	0.100	mg/L	1	KDL 10/07/08	1759 801337	2
Arsenic		U	0.014	Ļ	0.050	0.150	mg/L	1			
Barium			1.24	ļ	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		-	
Copper		J	0.0486)	0.010	0.050	mg/L	1			
Lead		TT	0.00720		0.030	0.100	mg/L	1			
Molyhdenum			0.00735		0.025	0.100	mg/L	1			
Nickel		0	0.00099		0.020	0.100	mg/L	1			•
Selenium		I	-0.0129		0.010	0.050	mg/L	1			
Silver		Ŭ	-0.000487		0.010	0.050	mg/L	• 1			
Thallium		Ŭ	-0.00733		0.050	0.200	mg/L	1			
Vanadium		U	-0.000606		0.010	0.050	mg/L	1.	· .		
Zinc			0.974	Ļ	0.020	0.100	mg/L	· · 1			
The following Pre	p Meth	ods were p	performed								·
Method		Description	on			Analyst	Date	Time	Prep Batch		
SW846 1311		SW846 1	311 TCLP L	eaching -FEDERAI		CXW3	10/01/08	1600	800777		
SW846 3010A		ICP-TRA	CE TCLP b	y SW846 3010A		CXS3	10/06/08	0810	801335		
SW846 7470A Prep)	EPA 7470	0A Mercury	Prep TCLP Liquid		TXB3	10/03/08	1155	801305		
The following Ana	alytical	Methods v	vere perfori	ned							
Method		Description	on			A	Analyst Com	nents			
1		SW846 74	470A	<u> </u>							
2		SW846 3(010/6010B								

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	Company :	Lawrence Li Security, LL	vermore N C	ational								
	Address :	7000 East A Mailstop L-6	venue 520 Dalifa mia (1651				1	Report D	ate: Octobe	er 17, 2008	
	Contact:	Mr. Chad F.	Davis	4551								
	Project:	CES - Norm	al Delivera	ıble								
		Client Sam Sample ID Matrix: Collect Da Receive Da Collector: Moisture:	nple ID: : te: nte:		212-B-5 2159630 SO 15-SEP 17-SEP Client 3.69%	005 08 08		Project: Client ID:		.00306 .002		
Parameter		Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst Da	ate Time Batch	Mtd.
Gravimetric	c Solids										· · ·	
"As Recei	ved" over Proportio	nal Counting										-
GEPC Gr	oss A/R solid	nai Counting	Corrected	<i>n</i>								
Alpha	055100, 50114	Dry neight	9.96	+/-1.54	1.14	+/-2.78	0.500	pCi/g		DXB5 10/	07/08 2155 79736	3 2
Beta	C.t. m		17.7	+/-1.47	1.53	+/-2.88	1.50	pCi/g				
Kad Liquid	Scintilation	Analysis "An Beneiwed										
Tritium	im Disi, solia	As Received U	-0.115	+/-0.854	1.52	+/-0.854	2.00	pCi/g		SXL4 09/	30/08 1458 79830	4 3
The followi Method	ng Analytica Descri	l Methods we	re perfori	ned								
1	ASTM	I D 2216 (Mo	dified)									-
2	EPA 9	00.0 Modified	i									
3	EPA 9	06.0 Modified	1									
Notes:												
The Qual	ifiers in this	report are de	fined as f	ollows :								
** Ana < Rest > Rest A The B For BD Res C Ana D Res E Met F Estin H Ana J Valu	alyte is a sur ult is less tha ult is greater TIC is a sus General Cha sults are eith lyte has bee ults are repo .als%differ mated Value alytical holdi ie is estimate	rogate compo in value repo than value r spected aldol emistry and (are below the n confirmed rted from a c ence of samp ing time was	ound orted eported -condenss Organic an MDC or by GC/M diluted ali ole and SI exceeded	ation product nalysis the tar tracer recove S analysis quot of the sa D is >10%. Sa	get analyte ry is low mple ample cone	e was detec centration r	ted in the a nust meet f	ssociated blar lagging criter	ık. ia			

- M If above MDC and less than LLD
- M Matrix Related Failure

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Certificate of Analysis

Parameter		Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF Analyst Date	Time Batch Mtd.
		Client Sam Sample ID:	ple ID:		212-B-5 21596300	5		Project: Client ID:	LLNL00306 LLNL002	
I	Project:	CES - Norma	al Deliver:	able						
(Contact:	Livermore, C Mr. Chad F.	California Davis	94551				1	report Date. October 17	, 2008
1	Address :	7000 East Av Mailstop L-6	venue 520					ĩ	Report Date: October 17	2008
(Company :	Lawrence Li Security, LL	vermore N C	Vational						

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.

	Ľ.	KHWM AN	VALYSIS REPO	RT		
WDR Number	Sample ID	Analytica	I Log Book ID	COC TOC		XRF
N/A	212-E-1			17500	Analyst	
pH & NORMALIT		LSC) RADIO	LOGICAL SCREEN	NG REPORT	Date Analyzed	
Analyst			Tritium	Gross alpha, beta		Percentage
Date Analyzed	Aliquot (n	nL or g)	1g	19		
pH Result	Anal	yst	Claude Cardenas	Claude Cardenas		
Normality Result (eq/L)	Date An	alyzed	9/15/2008	9/15/2008		
HYDROMETER / SBECIEIC	C CDANITY Energy V	Vindow	0-18.6 keV	18.6-2000 keV		
Analyst		M	0	0		
Date Analyzed		0	1000	3000		
Shecific Gravity Result	Actual F	Result	0	0		
Hydrometer Result	Reportable	e Result	Below MDC	Below MDC		
		it is some the	picocuries / kg	picocuries / kg		
FLASH POINT (METHO	DD 1010)	All South and a second s	SAMIC			
Analyst	Date Analy		Analyst			
Date Analyzed	fine conc	Chomical		Datadian Part		
MDL		OIGHICAL				
Result						
Unit						
BOILING POINT						
Result					Total	
						AMENTS
LIQUIFICATION TES	STING					
Vibration Testing						
Analyst		****				
Date Analyzed						
Result						
Freeze / Thaw Testi						
Analyst						
Date Analyzed						
Result						
Paint Filter Activit	With the second s				Date Commeted	0/15/2000
Analyst		***************************************				
Date Analyzed		********			Reviewed Rv	And I
						24724 6

Comp Addre: Contac Projec	any : ss : ct: t:	Lawrence Liver Security, LLC 7000 East Aver Mailstop L-620 Livermore, Cal Mr. Chad F. Da CES - Normal Client Sample Sample ID: Matrix:	rmore Natio nue ifornia 945. vvis Deliverable e ID:	nal 51 212-E-1 215963006 SO			Pro Clie	F iect: ent ID:	LLN LLN	Date: Octo 1100306 11002	ober 15, 2008	
		Collect Date: Receive Date Collector: Moisture:	:	15-SEP-08 10 17-SEP-08 Client 2.37%):45							
Parameter		Qualifier	Result		DL	RL	Units	DF	Ana	alystDate	Time Batch	Method
Mercury Analysis-	CVAA											
7471 Cold Vapor Hg	g in So	lid "Dry Weight	Corrected"									
Mercury Metals Analysis-IC	Р		69.4		0.355	2.36	mg/kg	200	ETL	09/29/08	1337 796414	1
6010 TAL Metals So	il Fede	eral "Dry Weigh	t Corrected	"								
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 Maluh damum		Ŧ	94.6		0.249	1.50	mg/kg	1				
Norybuenum		J	0.969		0.199	1.00	mg/kg	1				
Silver			42.2		0.0994	1.50	mg/kg	1				
Thallium		T	1.21		0.0994	3.00	mg/kg	1				
Vanadium		0	20.0		0.497	0.500	mg/kg	1				
Zinc			397		0.0994	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 Pre	o Meth	ods were perfo	rmed									
Method		Description				Analyst	Date	Tim	e F	Prep Batch		
SW846 3050B		846 3050BS P	REP			FGA	10/10/08	1430	0 7	796829		
SW846 7471A Prep		EPA 7471A N	fercury Prep	o Soil		TXB3	09/26/08	1600	5 7	796413		
The following Ana	lytical	Methods were	performed									
Method		Description				A	analyst Comm	ents				
1		SW846 7471A									<u> </u>	
2		SW846 3050B	/6010B									
3		SW846 3050B	/6010B									

Comp	any :	Lawrence Liv	ermore Natio	onal								
		Security, LLC										
Addre	ess :	7000 East Ave	enue									
		Mailstop L-62	.0 1:5	C1				Rep	port Date: Oct	ober 14, 2008		
Conta	ct:	Mr. Chad F. D	liifornia 945 Davis	51						k		
Projec	et:	CES - Norma	l Deliverabl	e								
		Client Samp	le ID:	212-E-1			Pro	ect:]	LLNL00306			
		Sample ID: Matrix		213904000			Che	m ID.	LLINL002			
		Collect Date	.•	15 CED 00 10).45							
		Receive Date	e:	13-SEF-00 IU	1.45							
		Collector:		Client					-			
Parameter		Oualifier	Result		DI	RI.	Units	DF	AnalystDate	Time Batch	Matho	 A
Mercury Analysis-	CVAA									Inne baten	Micino	<u> </u>
STLC Hg in Solid "A	As Reci	eived"										
Mercury	10 1100	I	-0.0573		0.030	0.200	maЛ	· 1 · T	XT 1 10/07/08	1340 801780	1	
Metals Analysis-IC	Р	0	-0.0575		0.050	0.200	mgrt	1 J.	ALI 10/07/08	1340 801780	1	
STLC ICP Metals fo	or Solic	ls "As Received	"									
Antimony		U	0.0252		0.030	1.00	mg/L	- 1 K	KDL 10/13/08	1340 801834	2	
Arsenic		· Ū	0.0222		0.050	0.150	mg/L	1			-	
Barium			10.2		0.010	0.050	mg/L	1				
Beryllium		U	0.0029		0.010	0.050	mg/L	1				
Cadmium		U	0.00207		0.010	0.050	mg/L	1				
Chromium			0.101		0.020	0.050	mg/L	1				
Cobalt			0.297		0.010	0.050	mg/L	1				
Copper			3.60		0.030	0.100	mg/L	1				
Lead			0.157		0.025	0.100	mg/L	1				
Nickel		U	0.0063		0.020	0.100	mg/L	1				
Selenium			0.399		0.010	0.050	mg/L	1				
Silver		τī	0.550		0.030	0.150	mg/L	1				
Thallium		U	0.00508		0.010	0.050	mg/L	1				
Vanadium		U	-0.0118		0.050	0.200	mg/L	1		· ·		
Zinc			1.50	-	0.010	0.100	mg/L	1				
The following Pre	n Meti	hods were nerf	ormed									
Method	p men	Description	ormed			Analyst	Date	Time	Prep Batch		<u> </u>	
California Code of I	Regula	ti [,] California W	et Method S	TLC Leaching		CJP1	10/01/08	1000	800775			
SW846 3010A	~	ICP-TRACE	TCLP by SV	W846 3010A		CXS3	10/06/08	0810	801833			
SW846 7470A Prep	,	EPA 7470A	Mercury Pre	p TCLP Liquid		TXB3	10/06/08	1140	801779			
The following Ana	lytica	Methods wer	e performed	ł					,			
Method		Description	- periormeu			A	Analyst Comm	ents				
1		SW846 7470	A									
2		SW846 3010	/6010B									

Company	: Lawrence Livermore Nat	ional						
	Security, LLC							
Address :	7000 East Avenue							
	Malistop L-620				Rep	ort Date: Octo	ober 13, 2008	
Contact:	Mr. Chad F. Davis	1551						
Project:	CES - Normal Delivera	ble						
-								
	Client Sample ID: Sample ID: Matrix: Collect Date: Receive Date: Collector:	212-E-1 215966006 SO 15-SEP-08 10:45 17-SEP-08		Proi Clie	ect: I nt ID: I	LLNL00306 LLNL002		
Parameter	Onalifier Resu	lt DI	DI	Unito	DE	AmalwatData	Time Detal	
Mercury Analysis_CV			KL	Units	Df	AnalysiDate	ттте ватся	Methoa
TCLP Hg in Solid "As H	Received"							
Mercury	0.0162	0.0003	0.002	mg/I	1 Г	XT 1 10/06/08	1304 801306	1
Metals Analysis-ICP	0.0102	0.0005	0.002	шg/L	1 34	ALI 10/00/08	1504 801500	1
TCLP ICP Metals for So	olid "As Received"							
Antimony	U 0.010	0.030	0.100	mø/L	1 K	DL 10/07/08	1806 801337	2
Arsenic	U 0.00107	0.050	0.150	mg/L	1		1000 001557	2
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 M	lethods were performed							
Method	Description		Analyst	Date	Time	Prep Batch		
SW846 1311	SW846 1311 TCLP Lea	ching -FEDERAL	CXW3	10/01/08	1600	800777		
SW846 3010A	ICP-TRACE TCLP by S	SW846 3010A	CXS3	10/06/08	0810	801335	. •	
SW846 7470A Prep	EPA 7470A Mercury Pr	ep TCLP Liquid	TXB3	10/03/08	1155	801305		
The following Analyti	ical Mathada wara narfarm	ъđ						
Method	Description	5 u		Analyst Comm	ents			
1	SW846 7470A							
2	SW846 3010/6010B							
-	5.1010 J010/0010D							

WDR Number S	ample ID Analvti	cal Loa Book ID	COC		XDC
			2		ARE
N/A	212-E-2		17500	Analyst	
DH & NORMALITY	(I SC) BAD	IOI OGICAL SCREENI	NG REPORT	Date Analyzed	
Analyst		Tritium	Gross alpha, beta	Element	Percentage
Date Analyzed	Aliquot (mL or g)	1g	1g		
pH Result	Analyst	Claude Cardenas	Claude Cardenas		
Normality Result (eq/L)	Date Analyzed	9/15/2008	9/15/2008		
HYDROMETER / SPECIEIC GRAVI	TV Energy Window	0-18.6 keV	18.6-2000 keV		
Analvst	DPM	0	0		
Date Analvzed	MDC	1000	3000		
Specific Gravity Result	Actual Result	0	0		*****
Hvdrometer Result	Reportable Result	Below MDC	Below MDC		NORMAN CONTRACTOR OF A STATE
	Unit	picocuries / kg	picocuries / kg		
FLASH POINT (METHOD 1010)		SAWIGC			
Analyst	Date Analyzed	Analyst			
Date Analyzed			Detection Linit		
MDL					
Result					
Unit					
BOILING POINT					
Result				Total	
Unit				CON CONTRACTOR	NENTS
LIQUIFICATION TESTING					
Vibration Testing					
Analyst					
Date Analyzed					
Result					
Freeze / Thaw Testing					
Analyst					
Date Analyzed					
Result					
Paint Filter Activity				Data Completed	014 E 19000
Analyst					
Date Analyzed				Devisioned By	Ze
Result					227

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

	Company :	Lawrence Live Security, LLC	rmore Natio	nal								
	Address :	7000 East Aver Mailston L-620	nue)					D	lan out 1	Datas Oat	-h 15 2000	
	Contact:	Livermore, Cal Mr. Chad F. Da	ifornia 945 ivis	51				r	lepon I	Date: Oct	ober 15, 2008	
	Project:	CES - Normal	Deliverabl	e								
							01 000100mA					
	•	Client Sample Sample ID: Matrix: Collect Date: Receive Date Collector: Moisture:	e ID:	212-E-2 215963007 SO 15-SEP-08 1 17-SEP-08 Client 4.9%	0:45		Pro Clie	iect: ent ID:	LLN	IL00306 IL002		
Parameter		Qualifier	Result		DL	RL	Units	DF	Ana	lystDate	Time Batch	1 Method
Mercury A	nałysis-CVA	4						·				
7471 Cold V	/apor Hg in So	olid "Dry Weight	Corrected"									
Mercury Metals Ana	lysis-ICP		291		3.62	24.1	mg/kg	2000	ETL	09/29/08	1403 796414	1
6010 TAL M	letals Soil Fea	leral "Dry Weigh	t Corrected	"								
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				
Coppor			11.0		0.208	0.520	mg/kg	1				
Lead			20.1		0.512	2.00	mg/kg	1				
Molyhdenun	n	т	0.636		0.200	1.50	mg/kg	1				
Nickel	11	J	0.050 AA 6		0.208	1.04	mg/kg	1				
Silver			0.992		0.104	0.520	mg/kg	1				
Thallium		T	-2.05		0.520	3.00	mg/kg	1				
Vanadium		Ŭ,	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 follow	ing Prep Met	hods were perfo	ormed						-			
Method		Description				Analyst	Date	Tim	e P	rep Batch		
SW846 3050	0B	846 3050BS F	REP			FGA	10/10/08	1430) 7	96829		
SW846 747	1A Prep	EPA 7471A N	fercury Prej	o Soil		TXB3	09/26/08	1600) 7	96413		
The follow	ing Analytica	l Methods were	performed									
Method		Description				1	Analyst Comm	ents				
1		SW846 7471A	.				·····					
2		SW846 3050B	/6010B									
3		SW846 3050B	/6010B									

(Company :	Lawrence	Livermore Nat	ional							
		Security, L	TC								
L.	Address :	7000 East	Avenue								
		Mailstop L	620					Re	port Date: Oct	ober 14, 2008	
(Contact:	Livermore Mr. Chad I	, California 94 F. Davis	-551							
]	Project:	CES - Nor	rmal Deliveral	ole							
	 	Client Sa Sample I Matrix: Collect D Receive I Collector	mple ID: D: Date: Date:	212-E-2 215964007 SO 15-SEP-08 10 17-SEP-08 Client	0:45		Pro Clie	iect: ent ID:	LLNL00306 LLNL002		· · ·
Parameter		Qualif	ier Resu	lt	DL	RL	Units	DF	AnalystDate	Time Batch	Method
Mercury Ana	lysis-CVA	4	· · · · · · · · · · · · · · · · · · ·					x		<u></u>	
STLC Hg in Sc	olid "As Rec	eived"									
Mercury		U	-0.0519		0.030	0.200	mg/L	1	JXL1 10/07/08	1342 801780	1 .
Metals Analys	sis-ICP						U				`
STLC ICP Met	als for Soli	ds "As Recei	ved"								
Antimony		U	-0.0153		0.030	1.00	í 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		1	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			
Nickei			0.502		0.010	0.050	mg/L	1			
Selenium		**	0.267		0.050	0.150	mg/L	1			
Sliver Thallium		U	-0.000962		0.010	0.050	mg/L	1			
Manut		U	0.00209		0.050	0.200	mg/L	1			
Vanadium			0.213		0.010	0.050	mg/L	1			
ZIIK			0.02		0.020	0.100	mg/L	1			
The following	g Prep Met	hods were p	performed								
Method		Descriptio	on			Analyst	Date	Time	Prep Batch		
California Cod	e of Regula	ati California	a Wet Method	STLC Leaching		CJP1	10/01/08	1000	800775		
SW846 3010A		ICP-TRA	CE TCLP by S	W846 3010A		CXS3	10/06/08	0810	801833		
SW846 7470A	Prep	EPA 7470	OA Mercury Pr	ep TCLP Liquid		TXB3	10/06/08	1140	801779		
The following	z Analvtica	d Methods v	vere performe	d							
Method	<u></u>	Descriptio	on	•		1	Analyst Comm	ents			
1		SW846 74	470A				-				
2		SW846 30	010/6010B								

Address : 1000 Basit Avenue Maitory L-620 Livermore, California 94551 Context: Mr. Chad F. Davis Report Date: October 13, 2008 Project: CBS Normal Deliverable Project: LLNL00306 CollectD: 215966007 Collecto: Client Di: 15-SEP-08 10:455 Receive Date: 17-SEP-08 Parameter Quilifier Result D Time Batch Method Mercury Analysis-CYAA TCLP 1CP Metals for Solid 'As Received" Autimony 0.0765 0.003 0.020 mg/L 10 JXL1 10/06/08 1225 801306 1 Client Di: 10.002/08 0.003 0.020 mg/L 10 JXL1 10/06/08 1225 801306 Mercury 0.0765 0.003 0.020 mg/L 10 JXL1 10/06/08 1225 801306 1 0.0030 <th co<="" th=""><th>Company :</th><th>Lawrence Livern</th><th>ore Natio</th><th>onal</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></th>	<th>Company :</th> <th>Lawrence Livern</th> <th>ore Natio</th> <th>onal</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>	Company :	Lawrence Livern	ore Natio	onal							
Report Date: October 13, 2008 Nalistop L-620 Devenoe Califormia 94551 Contact: Mr. Chad F. Davis Project: CES - Normal Deliverable Client Sample ID: 212-B-2 Project: LLNL00306 Client Sample ID: 215966007 Client ID: LLNL00306 Collect Date: IT-SEP-08 10:45 Collector: Client DL RL Units DF AnalystDate Time Batch Method Mercury Analysis-CYAA TCLP Hor Metals for Solid 'As Received' Andimony 0.0765 0.0030 0.100 mgL 1 Note: Califormia VI 10/07/08 ISI3 801337 2 Project: Client DL RL Units Time Batch Method Mercury Analysis-CYA TCLP IGP Metals for Solid 'As Received' Andimony U 0.030 0.100 mgL I <th col<="" th=""><th>Address :</th><th>7000 East Avenu</th><th>е</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></th>	<th>Address :</th> <th>7000 East Avenu</th> <th>е</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>	Address :	7000 East Avenu	е								
Keput Date: October 15, 4008 Contact: Mr. Chad F. Davis Project: CES Annal Deliverable Client Sample ID: 212-E-2 Project: LLNL00306 Sample ID: 212-B-08 Project: LLNL00306 Collect Date: SS-SEP-08 10:45 Client ID: LLNL0032 Parameter Qualifier Resolve Date: IT-SEP-08 Client ID: LLNL0032 Mercury Analysis-CVAA Collector: Client DL RL Units DF AnalystDate Time Batch Method Mercury Analysis-CVAA O0765 0.003 0.020 mg/L 10 JXL1 1006/08 1225 \$01306 1 Metals Analysis-CP Out-000019 0.003 0.020 mg/L 1 JXL1 1006/08 1225 \$01306 1 Barvin 0.400426 0.030 0.100 mg/L 1 KDL 100708 1813 801337 2 Gamiun 0.40266 0.030 0.100 mg/L 1 Collector		Mailstop L-620	•					מ	an aut Datas Ost	-h 12 0000		
Contact: Mr. Chad F. Davis Project: CES - Normal Deliverable Client Sample ID: 212966007 Project: LLNL00306 Sample ID: 213966007 Client ID: LLNL002 Matrix Date: SO Collect Date: 15-SEP-08 Collect Date: 17-SEP-08 DL RL Units DF AnalystDate Time Batch Method Mercury Analysis-CVAA Collector: Client DL RL Units DF AnalystDate Time Batch Method Mercury Analysis-CVAA 0.0765 0.003 0.020 mg/L 10 JXL1 10/06/08 1225 801306 1 Mercury Analysis-CVA U -0.000478 0.030 0.100 mg/L 1 KDL 10/07/08 1813 801337 2 Arismic U 0.00026 0.030 0.010 mg/L 1 KDL 10/07/08 1813 801337 2 Arismic U 0.00247 0.010 0.050 mg/L 1 KDL		Livermore, Calife	ornia 945	51				к	eport Date: Oct	ober 15, 2008		
Project: CES - Normal Deliverable Cilient Sample ID: 212-E-2 Sample ID: 212-E-2 Sample ID: 212-E-2 Sample ID: SO Collect Date: 15-SEP-08 15-SEP-08 Usin: Parameter Qualifier Receive Date: 17-SEP-08 Collector: Client TCLP Hg in Solid 'As Received'' Mercury Analysis-CVAA Metals Analysis-ICP TCLP ICP Metals for Solid 'As Received'' Ansenic 0.000476 0.030 0.020 mg/L 10 JXL1 10/06/08 1225 501306 1 Adetais Analysis-ICP 0.000476 0.030 0.020 mg/L 1 KDL 10/07/08 1813 801337 2 Adetais Analysis-ICP 0.000476 0.030 0.100 mg/L 1 KDL 10/07/08 1813 801337 2 Adetais Analysis-ICP 0.000427 0.010 0.050 mg/L 1 KDL 10/07/08 <th>Contact:</th> <th>Mr. Chad F. Davi</th> <th>is</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>	Contact:	Mr. Chad F. Davi	is									
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Project:	CES - Normal D	eliverabl	e								
Client Sample ID: 212:Fe-2 Project: LLNL00306 Matrix: SO Collect Date: 17-SEP-08 Client ID: LLNL002 Parameter Qualifier Result DL RL Units DF AnalystDate Time Batch Method Mercury Analysis-CVAA TCLP Hg in Solid "As Received" Mercury 0.0765 0.003 0.020 mg/L 10 JXL1 10/06/08 1225 801306 1 Mercury Analysis-CVAA TCLP Hg in Solid "As Received" Analyst 0.0765 0.003 0.020 mg/L 10 JXL1 10/06/08 1225 801306 1 Mercury Analysis-CVA 0.0765 0.030 0.100 mg/L 1 KDL 10/07/08 1813 801337 2 Antimony 0 0.00426 0.050 mg/L 1 KDL 10/07/08 1813 801337 2 Arsenic U 0.00426 0.010 0.050 mg/L 1 Cdmium												
Matrix: Storonov Ender Do Ender Do Ender Do Matrix: So So So So So Collect: 15-SEP.08 Collector: Client DL RL Units DF AnalystiDate Time Batch Method Matrix: Analysis-CVAA Client DL RL Units DF AnalystiDate Time Batch Method Mercury Analysis-CVAA 0.0765 0.003 0.020 mg/L 10 JXL1 10/06/08 1225 801306 1 Metals Analysis-CP 0.00426 0.050 0.150 mg/L 1 KDL 10/07/08 1813 801337 2 Arisenic U 0.00426 0.050 mg/L 1 Extra to		Client Sample I	ID:	212-E-2			Pro	ject:	LLNL00306			
Collect Date: Collector: 15-SEP-08 10:45 (T-SEP-08) Parameter Qualifier Result DL RL Units DF AnalystDate Time Batch Method Mercury Analysis-CVA Client DL RL Units DF AnalystDate Time Batch Method Mercury Analysis-CP 0.0765 0.003 0.020 mg/L 10 JXL1 10/05/08 122.5 801.306 1 Metals Analysis-ICP 0.0765 0.003 0.010 mg/L 1 KDL 10/05/08 122.5 801.307 2 Ansenic U 0.00426 0.050 mg/L 1 KDL 10/07/08 1813 801.337 2 Barium U 0.00427 0.010 0.050 mg/L 1 Cobatt U 0.0206 0.030 0.100 mg/L 1 Cobatt U 0.0205 0.030 0.100 mg/L 1 Cobatt U <td></td> <td>Matrix:</td> <td></td> <td>SO</td> <td></td> <td></td> <td>Cin</td> <td>cm iD.</td> <td>LLIUL002</td> <td></td> <td></td>		Matrix:		SO			Cin	cm iD.	LLIUL002			
Receive Date: Collector: 17.SEP-08 Client Parameter Qualifier Result DL RL Units DF AnalystDate Time Batch Method Mercury Analysis-CVAA TCLP Hg in Solid "As Received" 0.0765 0.003 0.020 mg/L 10 JXL1 10/06/08 1225 801306 1 Metals Analysis-ICP TCLP ICP Metals for Solid "As Received" 0.00426 0.030 0.100 mg/L 1 KDL 10/07/08 1813 801337 2 Antimony U -0.000478 0.030 0.100 mg/L 1 KDL 10/07/08 1813 801337 2 Antimony U -0.000477 0.010 0.050 mg/L 1 Statis 801337 2 Barium 0.344 0.010 0.050 mg/L 1 I I I I I I I I I I I I I I I I <thi< th=""></thi<>		Collect Date:		15-SEP-08 10	:45							
Collector: Client Parameter Qualifier Result DL RL Units DF AnalystDate Time Batch Method Mercury Analysis-CVAA TCLP Hg in Solid "As Received" 0.0765 0.003 0.020 mg/L 10 JXL1 10/06/08 12.25 801306 1 Metak Analysis-ICP 0.0765 0.003 0.100 mg/L 1 KDL 10/07/08 12.5 801306 1 Metak Analysis-ICP 0.0764 0.050 mg/L 1 KDL 10/07/08 1813 801337 2 Ansenic U 0.00426 0.050 mg/L 1 KDL 10/07/08 1813 801337 2 Gadmium U 0.00427 0.010 0.050 mg/L 1 C 1 2 6 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0		Receive Date:		17-SEP-08								
Parameter Qualifier Result DL RL Units DF Analystone Time Batch Method Hercury Analysis-CVAA TCLP Hg in Solid "As Received" 0.0765 0.003 0.020 mg/L 10 JXL 1 10/06/08 1225 801306 1 Metals Analysis-ICP TCLP ICP Metals for Solid "As Received" mg/L 1 KDL 10/07/08 1813 801337 2 Antimony U -0.000478 0.030 0.100 mg/L 1 KDL 10/07/08 1813 801337 2 Arsenic U 0.00427 0.010 0.050 mg/L 1 1 5 <td< th=""><th></th><th>Collector:</th><th></th><th>Client</th><th></th><th></th><th></th><th></th><th></th><th></th><th>,</th></td<>		Collector:		Client							,	
Mercury 0.0765 0.003 0.020 mg/L 10 JXL1 10/06/08 1225 8013/06 1 Mercury 0.0765 0.003 0.020 mg/L 10 JXL1 10/06/08 1225 8013/06 1 Metals Analysis-ICP TCLP ICP Metals for Solid "As Received" Antimony 0 -0.000478 0.030 0.100 mg/L 1 KDL 10/07/08 1813 801337 2 Arsenic U -0.000478 0.010 0.050 mg/L 1 Barium 0.844 0.010 0.050 mg/L 1 Commun 1 Cobolt 0.0000 mg/L 1 Cobolt 1 Cobolt 0.000 mg/L 1 Cobolt 1 0.0036 0.010 mg/L 1 Cobolt 1 0.00434 0.010 mg/L 1 Cobolt 1 Cobolt 1 Cobolt 0.010 mg/L 1 Cobolt 0.020 0.0100 <th>Parameter</th> <th>Qualifier</th> <th>Result</th> <th></th> <th>DL</th> <th>RL</th> <th>Units</th> <th>. DF</th> <th>AnalystDate</th> <th>Time Batch</th> <th>Method</th>	Parameter	Qualifier	Result		DL	RL	Units	. DF	AnalystDate	Time Batch	Method	
TCLP Hg in Solid "As Received" Mercury 0.0765 0.003 0.020 mg/L 10 JXL1 10/06/08 1225 801306 1 Metak Analysis-ICP TCLP ICP Metals for Solid "As Received" Antimony U -0.000478 0.030 0.100 mg/L 1 KDL 10/07/08 1813 801337 2 Arsenic U 0.000478 0.030 0.100 mg/L 1 KDL 10/07/08 1813 801337 2 Barium 0.844 0.010 0.050 mg/L 1 I Colority 2 Cabrium U 0.000019 0.010 0.050 mg/L 1 Cabrium U 0.00166 0.020 0.050 mg/L 1 Cabrium U 0.0026 0.010 mg/L 1 Cabrium U 0.0026 0.100 mg/L 1 Lead U 0.0206	Mercury Analysis-CVA	A										
Mercury 0.0765 0.003 0.020 mg/L 10 JXL1 10/06/08 1225 801306 1 Metals Analysis-ICP CLP ICP Received" Item Solid No 10 JXL1 10/06/08 1225 801306 1 Antimony U -0.000478 0.030 0.100 mg/L 1 KDL 10/07/08 1813 801337 2 Arsenic U 0.00426 0.050 mg/L 1 KDL 10/07/08 1813 801337 2 Barium U 0.00427 0.010 0.050 mg/L 1 <th1< th=""> 1 <th1< th=""> 1</th1<></th1<>	TCLP Hg in Solid "As Rea	ceived"										
TCLP ICP Metals for Solid "As Received" 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 Cadmium U 0.00427 0.010 0.050 mg/L 1 Cadmium U 0.00427 0.010 0.050 mg/L 1 Cobalt U 0.00426 0.030 0.100 mg/L 1 Cobalt U 0.0026 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 Stiver U 0.0018 0.010 0.050 mg/L 1 Stiver U -0.00158 0.010 0.050 mg/L 1 Zine 0.837 0.020 0.100	Mercury Metals Analysis-ICP	().0765		0.003	0.020	mg/L	10	JXL1 10/06/08	1225 801306	1	
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 Cadmium U 0.00427 0.010 0.050 mg/L 1 Cadmium U 0.00427 0.010 0.050 mg/L 1 Cadmium U 0.00336 0.010 0.050 mg/L 1 Cobalt U 0.0206 0.030 0.100 mg/L 1 Lead U 0.0248 0.022 0.100 mg/L 1 Molybdenum U 0.00179 0.020 0.100 mg/L 1 Seleniam U -0.0419 0.050 mg/L 1 1 Silver U -0.00158 0.010 0.050 mg/L 1 Yanadium <td>TCLP ICP Metals for Soli</td> <td>id "As Received"</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>. •</td> <td></td>	TCLP ICP Metals for Soli	id "As Received"								. •		
Arsenic U 0.00426 0.050 0.150 mg/L 1 Barium 0.844 0.010 0.050 mg/L 1 Cadmium U 0.00027 0.010 0.050 mg/L 1 Cadmium U 0.00427 0.010 0.050 mg/L 1 Cadmium U 0.00427 0.010 0.050 mg/L 1 Cadmium U 0.0026 0.020 0.050 mg/L 1 Cobalt U 0.0248 0.025 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 Sliver U -0.00158 0.010 0.050 mg/L 1 Thallium U -0.00641 0.010 0.050 mg/L 1 Yanadium U -0.00641 0.010 0.050	Antimony	U -0.00	0478		0.030	0.100	mg/L	1	KDL 10/07/08	1813 801337	2	
Barlum 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 0.0036 0.020 0.050 mg/L 1 Cobalt U 0.0036 0.010 mg/L 1 1 Cobalt 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 mg/L 1 Nickel J 0.0434 0.010 0.050 mg/L 1 Silver U -0.00174 0.050 mg/L 1 Yanadium U -0.0174 0.050 mg/L 1 Zine 0.837 0.020 mg/L 1 Wandium I -0.00641 <	Arsenic	U 0.	00426		0.050	0.150	mg/L	1	1000100	1015 001557	4	
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 0.0206 0.030 0.010 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 -0.0174 0.050 mg/L 1 Yanadium U -0.0174 0.050 mg/L 1 Vanadium U -0.00641 0.010 mg/L 1 Zinc 0.837 0.020 0.100 mg/L 1 SW846 3111 SW846 3111 TCLP baching -FEDERAL CXW3 10/01/08 1600 800777 <tr< td=""><td>Barium</td><td></td><td>0.844</td><td></td><td>0.010</td><td>0.050</td><td>mg/L</td><td>ĩ</td><td></td><td></td><td></td></tr<>	Barium		0.844		0.010	0.050	mg/L	ĩ				
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 Lead U 0.0248 0.025 0.100 mg/L 1 Lead U 0.00179 0.020 0.100 mg/L 1 Molybdenum U 0.00434 0.010 0.050 mg/L 1 Selenium U -0.0419 0.050 0.150 mg/L 1 Silver U -0.0174 0.050 0.020 mg/L 1 Yanadium U -0.000641 0.010 mg/L 1 1 Zinc 0.837 0.020 0.100 mg/L 1 Zinc 0.837 0.020 0.100 mg/L 1 SW846 1311 SW846 1311 TCLP Leaching -FEDERAL CXW3 10/01/08 1600 800	Beryllium	U -0.00	0019		0.010	0.050	mg/L	1				
Chromium U 0.0106 0.020 0.050 mg/L 1 Cobalt U 0.0036 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 0.0434 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 Yanadium U -0.0014 0.010 0.050 mg/L 1 Zinc 0.837 0.020 0.100 mg/L 1 Zinc 0.837 0.020 0.100 mg/L 1 SW846 1311 SW846 1311 TCLP Leaching -FEDERAL CXW3 10/01/08 1600 800777 SW846 3010A ICP-TRACE TCLP by SW846 3010A CXS3 10/03/08 1155	Cadmium	U 0.	00427		0.010	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 mg/L 1 - Silver U -0.00158 0.010 0.050 mg/L 1 - Thallium U -0.00541 0.010 0.050 mg/L 1 - Vanadum U -0.006641 0.010 mg/L 1 - Zinc 0.837 0.020 0.100 mg/L 1 SW846 1311 SW846 1311 TCLP Leaching -FEDERAL CXW3 10/01/08 1600 800777 SW846 3010A ICP-TRACE TCLP by SW846 3010A	Chromium	U C	0.0106		0.020	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 Vanadium U -0.00641 0.010 mg/L 1 1 Zinc 0.837 0.020 0.100 mg/L 1 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 I	Cobalt	U 0.0	00336		0.010	0.050	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 -0.0158 0.010 0.050 mg/L 1 Yanadium U -0.00641 0.010 0.050 mg/L 1 Zinc 0.837 0.020 0.100 mg/L 1 Wethod 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 Item to the secret performed Item to the secret performed Item to the secret performed	Copper	UQ).0206		0.030	0.100	mg/L	1				
Molydenum 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 mg/L 1 Silver U -0.00158 0.010 0.050 mg/L 1 Thallium U -0.00641 0.010 0.050 mg/L 1 Vanadium U -0.00641 0.010 0.050 mg/L 1 Zinc 0.837 0.020 0.100 mg/L 1 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 Italian Italian Italian Italian Italian Italian Wethod Description Analyst Comments Italian Italian Italian Italian	Lead	U C	0.0248		0.025	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 mg/L 1 Vanadium U -0.006641 0.010 0.050 mg/L 1 Zinc 0.837 0.020 0.100 mg/L 1 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 Image: SW846 3010/6010B Analyst Comments Image: SW846 3010/6010B Image: SW846 3010/6010B	Molybdenum	U 0.0	00179		0.020	0.100	mg/L	1				
Scientian U -0.0419 0.050 0.150 mg/L 1 Silver U -0.00158 0.010 0.050 mg/L 1 Silver U -0.00158 0.010 0.050 mg/L 1 Vanadium 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 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 Image: State	NICKEI Salamiuuu	J C	0.0434		0.010	0.050	mg/L	1				
Silvet 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 SW846 3010/6010B SW846 3010/6010B 2	Selemum	U -0.	.0419		0.050	0.150	mg/L	1				
Infantini U -0.01/4 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 SW846 3010/6010B SW846 3010/6010B SW846 3010/6010B	Thellium	U -0.0	0158		0.010	0.050	mg/L	1				
Valuation O -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 Analyst Comments Image: Comments Image: Comments Image: Comments 1 SW846 7470A SW846 3010/6010B SW846 3010/6010B Image: Comments	Vanadium	U -0.	.0174		0.050	0.200	mg/L	1	•			
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 Analyst Comments Image: Comment state st	Zinc	0 -0.00	0.837		0.010	0.050	mg/L mg/L	1				
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 Image: Comments 1 SW846 7470A SW846 3010/6010B SW846 3010/6010B SW846 3010/6010B SW846 3010/6010B	The following Prep Met	hods were perform	ned									
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 SW846 3010/6010B SW846 3010/6010B SW846 3010/6010B	Method	Description				Analyst	Date	Time	Prep Batch			
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 SW846 3010/6010B SW846 3010/6010B	SW846 1311	SW846 1311 TC	CLP Leac	ning -FEDERAL		CXW3	10/01/08	1600	800777			
SW846 7470A Prep EPA 7470A Mercury Prep TCLP Liquid TXB3 10/03/08 1155 801305 The following Analytical Methods were performed Analyst Comments Analyst Comments Method Description Analyst Comments 1 SW846 7470A SW846 3010/6010B SW846 3010/6010B	SW846 3010A	ICP-TRACE TO	LP by SV	V846 3010A		CXS3	10/06/08	0810	801335			
The following Analytical Methods were performed Method Description Analyst Comments 1 SW846 7470A SW846 3010/6010B	SW846 7470A Prep	EPA 7470A Mer	rcury Pre	o TCLP Liquid		TXB3	10/03/08	1155	801305			
Method Description Analyst Comments 1 SW846 7470A 2 SW846 3010/6010B	The following Analytica	l Methods were no	erformed									
1 SW846 7470A 2 SW846 3010/6010B	Method	Description				A	Analyst Comm	ents				
2 SW846 3010/6010B	1	SW846 7470A										
	2	SW846 3010/601	0B									

		RHWM AP	VALYSIS REPO	RT		
WDR Number	Sample ID	Analytica	I Log Book ID	COC		XRF
N/A	212-W-1			17500	Analyst	
pH & NORMALIT		(LSC) RADIC	COGICAL SCREEN	ING REPORT	Date Analyzed	·
Analyst			Tritium	Gross alpha, beta		Percentage
Date Analyzed	Aliquot	(mL or g)	1g	19		
pH Result	An	alyst	Claude Cardenas	Claude Cardenas		
Normality Result (eq/L)	Date A	halyzed	9/15/2008	9/15/2008		
	C CD AVITY	Window	0-18.6 keV	18.6-2000 keV		
Analyst		PM	0	0		
Date Analyzed		UC:	1000	3000		
Specific Gravity Result	Actua	l Result	0	0		
Hydrometer Result	Reportat	ble Result	Below MDC	Below MDC		
		Int	picocuries / kg	picocuries / kg		
FLASH POINT (METHC	OD 1010)		SAW GC			
Analyst	Date Ana	lvzed	Analyst			
Date Analyzed		<u>Chemical</u>		seult Detection Linit		
MDL			2			
Result						
BOILING POIN						
Result					Total	
					eol	AMENTS
LIQUIFICATION TES	STING					
Vibration Testing						
Analyst and the second						
Date Analyzed						
Result						
Freeze / Thaw Test						
Analyst						
Date Analyzed						
Result						
Paint Filter Activit					Date Completed	9/15/2008
Analyst						
Date Analyzed					Reviewed Bv	1 all
Result						Nor O

C	Company :	Lawrence Live Security, LLC	rmore Natio	nal								
A	Address :	7000 East Aven Mailstop L-620	nue)					R	enort	Date: Oct	ober 15, 2008	
C	Contact:	Livermore, Cal Mr. Chad F. Da	ifornia 945. avis	51				-	oport		0001 10, 2000	
F	roject:	CES - Normal	Deliverabl	e								
		Client Sample Sample ID: Matrix: Collect Date: Receive Date Collector: Moisture:	e ID:	212-W-1 215963008 SO 15-SEP-08 1 17-SEP-08 Client 2.32%	.0:45		Proj Clie	iect: ent ID:	LLN	IL00306 IL002		
Parameter		Qualifier	Result		DL	RL	Units	DF	Ana	lystDate	Time Batch	Method
Mercury Anal	ysis-CVA	ł										
7471 Cold Vap	or Hg in Sc	olid "Dry Weight	Corrected"									
Mercury Metals Analys	is-ICP		2.35		0.159	1.06	mg/kg	100	ETL	09/29/08	1231 796414	1
6010 TAL Meta	ıls Soil Fed	leral "Dry Weigh	t Corrected									
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		1	0.379		0.102	0.509	mg/kg	1				
Chromium			28.9		0.102	0.509	mg/kg	1				
Copper			9.09		0.204	0.509	mg/kg	1				
Lead			21.3		0.305	2.00	mg/kg	1				
Molybdenum		T	0.436		0.254	1.50	mg/kg	1				
Nickel		J	36.8		0.204	1.02	mg/kg	1				
Silver			0.705		0.102	0.509	mg/kg	1				
Thallium		II	-15		0.102	3.00	mg/kg	1				
Vanadium		Ũ	26.1		0.102	0.509	mg/kg	1				
Zinc			220		0.204	1.02	mg/kg	î				
Selenium		U	3.15		5.09	15.3	mg/kg	. 10	HSC	10/14/08	1745 796830	3
The following	Prep Met	hods were perfo	ormed									
Method		Description				Analyst	Date	Time	e F	Prep Batch		
SW846 3050B		846 3050BS F	PREP			FGA	10/10/08	1430) 7	96829		
SW846 7471A	Prep	EPA 7471A N	Aercury Prep	o Soil		TXB3	09/26/08	1600) 7	96413		
The following	Analytica	l Methods were	performed									
Method		Description				I	Analyst Comm	ents				
1		SW846 7471A										
2		SW846 3050B	/6010B									
3		SW846 3050B	/6010B									

Compar	ny: Lawrence	Livermore Nat	ional							
	Security,	LLC								
Address	: 7000 East	Avenue								
	Mailstop 1	L-620					R	eport Date: Oct	ober 14, 2008	
Contact	Livermore : Mr. Chad	e, California 94 F. Davis	551							
Project:	CES - No	rmal Delivera	hle							
	CES - 110									
	Client Sample J Matrix: Collect I Receive Collector	ample ID: ID: Date: Date: r:	212-W-1 215964008 SO 15-SEP-08 10 17-SEP-08 Client):45		Pro Clie	iect: ent ID:	LLNL00306 LLNL002		
Parameter	Quali	fier Resu	lt	DL	RL	Units	DF	AnalystDate	Time Batch	Method
Mercury Analysis-C	VAA									
STLC Hg in Solid "As	Received"									
Mercury	U	-0.0556		0.030	0.200	mg/L	1	JXL1 10/07/08	1348 801780	1
Metals Analysis-ICP										
STLC ICP Metals for	Solids "As Rece	rived"								
Antimony	U	0.00242		0.030	1.00	mg/L	1	KDL 10/13/08	1405 801834	2
Arsenic	U	-0.00419		0.050	0.150	mg/L	1			
Barium		8.75		0.010	0.050	mg/L	1			
Beryllium	U	0.003		0.010	0.050	mg/L	1			
Cadmium	U	0.00208		0.010	0.050	mg/L	1			
Chromium		0.0959		0.020	0.050	mg/L	1			
Cobalt		0.298		0.010	0.050	mg/L	. 1			
Copper		4.04		0.030	0.100	mg/L	1			
Lead		0.119		0.025	0.100	mg/L	1			
Molybdenum	U	0.000119		0.020	0.100	mg/L	1			
Nickel		0.366		0.010	0.050	mg/L	1			
Selenium		0.166		0.050	0.150	mg/L	1			
Sliver Thalling	U	0.00624		0.010	0.050	mg/L	1			
Vonodium	U	-0.0107		0.050	0.200	mg/L	1			
Zinc		0.178		0.010	0.050	mg/L	1			
Zinc		1.42		0.020	0.100	mg/L	1			
The following Prep	Methods were	performed								
Method	Descript	ion			Analyst	Date	Time	Prep Batch		
California Code of Re	gulati Californi	ia Wet Method	STLC Leaching		CJP1	10/01/08	1000	800775		
SW846 3010A	ICP-TRA	ACE TCLP by S	SW846 3010A		CXS3	10/06/08	0810	801833		
SW846 7470A Prep	EPA 747	70A Mercury Pr	ep TCLP Liquid		TXB3	10/06/08	1140	801779		
The following Analy	tical Methods	were perform	ed							
Method	Descripti	ion			Ā	Analyst Comm	ents			
1	SW846 7	'470A								
2	SW846 3	010/6010B								

Comp	pany : ess :	Lawrenc Security, 7000 Eas	e Liver LLC st Aven	more Nati ue	onal							
Conta	act:	Mailstop Livermo Mr. Chao	L-620 re, Calii 1 F. Dav	fornia 94. vis	551				R	eport Date: Oct	ober 13, 2008	
Proje	ct:	CES - N	ormal	Deliverab	le							
-		Client S Sample Matrix: Collect Receive Collect	Sample ID: Date: Date: Date: Date:	ID:	212-W-1 215966008 SO 15-SEP-08 17-SEP-08 Client	10:45		Pro Cli	viect: ent ID:	LLNL00306 LLNL002	- -	
Parameter		Qual	ifier	Resul	t	DL	RL	Units	DF	AnalystDate	Time Batch	Method
Mercury Analysis-	CVAA											
TCLP Hg in Solid ".	As Rec	eived"										
Mercury		U	-0.0	000725		0.0003	0.002	mg/L	1	JXL1 10/06/08	1306 801306	1
Metals Analysis-IC	P							_				
TCLP ICP Metals for	or Solid	l "As Rece	eived"									
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	-0.0	00207		0.010	0.050	mg/L	1			
Cadmium		U	C).00276		0.010	0.050	mg/L	1			
Chromium		U		0.0102		0.020	0.050	mg/L	1			
Conner		U	C	0.00153		0.010	0.050	mg/L	1			
Lood		U		0.0001		0.030	0.100	mg/L	1			
Molubdonum		U	0	0.0143		0.025	0.100	mg/L	1			
Nickel		U	U	0.00457		0.020	0.100	mg/L	1			
Selenium		J	,	0.02/1		0.010	0.050	mg/L	1			
Silver		U	-	0.0547		0.050	0.150	mg/L	1			
Thallium		U U	-0.	0.0351		0.010	0.030	mg/L	1			
Vanadium		U U	-	0.0331		0.050	0.200	mg/L	1			
Zinc		U	0.0	0.697		0.010	0.100	mg/L	1			
The following Pre	n Meth	nods were	nerfor	med								
Method	F 1.101	Descrip	tion				Analyst	Date	Time	Prep Batch	<u> </u>	· · · · · · · · · · · · · · · · · · ·
SW846 1311		SW846	1311 T	CLPLeac	hing -FFDFR A	J.	CXW3	10/01/02	1600	800777		
SW846 30104						. L	CXWJ	10/01/08	1000	800777		
SW846 7470A Prep)	EPA 74	70A M	ercury Pre	p TCLP Liquid		TXB3	10/03/08	1155	801335		
				,	*			10,00,00	1100	001303		
The following Ana Method	alytical	Methods	were p	performe	1			An almat Ca				
t		Descrip					<i>I</i>	analyst Comm	ients			
1		SW8467	/470A									
2		SW846	3010/60)10B								

WDR Number	Cample ID					
	Calibic ID			000		XRF
NA	212-W-1RP			17500	Analyst	
pH & NORMAL	Τ	(LSC) RADIO	DLOGICAL SCREENI	NG REPORT	Date Analyzed	
Analyst			Tritium	Gross alpha, beta	Element	Percentage
Date Analyzed		Aliquot (mL or g)	1g	1g		A DOURNEL ON THE A REAL PARTY OF A REAL PARTY OF A DOURNEL AND A DOURNEL A
pH Result		Analyst	Claude Cardenas	Claude Cardenas		00 111 - 211 - 2
Normality Result (eq/L)		Date Analyzed	9/15/2008	9/15/2008		A A A A A A A A A A A A A A A A A A A
HYDROMETER / SPECH		Energy Window	0-18.6 keV	18.6-2000 keV		AND AND AN A REPORT OF A DATA AND A
Analyst		MAO	0	0.97		
Date Analvzed		MUC	1000	3000		
Specific Gravity Result		Actual Result	0	440		01140-141-001-00-077-077-0777-07770000000000
Hydrometer Result		keportable Kesult	Below MDC	Below MDC		decide un der mannen voor machteren also anderen also over als over als maar die het de taken also also also au
		Unit	picocuries / kg	picocuries / kg		CONSISTENCE AND
FLASH POINT (METH	HOD 1010)		SAW GC			
Analyst	De	ate Analyzed	Analvst			
Date Analyzed		Chemica	Rev Rev	sult Detection Linit		AND THE REAL PROPERTY AND
MDL						A REAL OF A
Result		****				
And the second se						*****
BOILING POI						
Result					Total	
Unit					GOI	IMENTS
	-STING					
Vibration Testi					91110-11211-1121	
Analyst						
Date Analyzed						
Result			тр т е на на ток и и и и и и и и и и и и и и и и и и и			
Freeze / Thaw Te	sting					
Analyst						
Date Analyzed						
Result						
Paint Filter Acti	vity				Date Completed	9/15/2008
Analyst						
Date Analyzed	*****				Reviewed Rv	1 VOV
						D2120

Company Address Contact: Project:	Security, LLC 7000 East Avenue Mailstop L-620 Livermore, California 94551 Mr. Chad F. Davis CES - Normal Deliverable Client Sample ID: 212-V Sample ID: 21596 Matrix: SO Collect Date: 15-SF Receive Date: 17-SF Collector: Clien Moisture: 1.979		51 e 212-W-1RP 215963009 SO 15-SEP-08 10:45 17-SEP-08 Client 1.97%		Report Date: October 15, 2008 Project: LLNL00306 Client ID: LLNL002				i				
Parameter	Qualifier	Result	DI	, RL	Units	DF	Ana	lystDate	Time Batch	Method			
Mercury Analysis-CV	AA				· · · · · · · · · · · · · · · · · · ·			•					
7471 Cold Vapor Hg in	Solid "Dry Weight	Corrected"											
Mercury Metals Analysis-ICP	2 0	5.15	0.184	1.22	mg/kg	100	ETL	09/29/08	1233 796414	1			
6010 TAL Metals Soil I	Federal "Dry Weight	Corrected	"										
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	т	24.7	0.245	1.50	mg/kg	1							
Niekol	J	0.458	0.196	1.00	mg/kg	1							
Silver		42.5	0.0979	1.50	mg/kg	1							
Vanadium		20.9	0.0979	0.300	mg/kg	1							
Zinc		153	0.0979	1.00	mg/kg	1							
Selenium	ĩ	6.45	4 90	1.00	mg/kg	10	Hec	10/17/08	1752 706830	3			
Thallium	Ŭ	0.993	4.90	19.6	mg/kg	10	nsc	10/14/08	1752 790850	5			
The following Prep M	lethods were perfo	rmed											
Method	Description			Analyst	Date	Tim	e F	rep Batch					
SW846 3050B	846 3050BS P	REP		FGA	10/10/08	1430) 7	96829					
SW846 7471A Prep	EPA 7471A M	lercury Prej	p Soil	TXB3	09/26/08	1600) 7	796413					
The following Analyt	ical Methods were	performed											
Method	Description	Description			Analyst Comments								
1	SW846 7471A												
2	SW846 3050B/	6010B											
3	SW846 3050B/	6010B											
	Company :	Lawrence Live Security LLC	ermore Natio	onal									
------------------------	----------------------	--	-----------------------	---	-------	---------	-------	--------------	----------------	----------------	--------------------	---------------------------------------	--------
	Address :	7000 East Ave	enue										
		Mailstop L-62	0						R	eport Dat	e [,] Oct	ober 14-2008	
	Contact:	Livermore, Ca Mr. Chad F. D	lifornia 945 Pavis	51						-p			
	Project:	CES - Norma	l Deliverab	le									
		Client Samp Sample ID: Matrix: Collect Date Receive Date Collector:	le ID: : e:	212-W-1RP 215964009 SO 15-SEP-08 10 17-SEP-08 Client):45			Proi Clie	ect: nt ID:	LLNL(LLNL()0306)02		
Parameter		Qualifier	Result	t	DL	RL		Units	DF	Analys	tDate	Time Batch	Method
Mercury An	alysis-CVA	A 											
SILC Hg in	Solid "As Rec	reived"						_					
Mercury Metals Anal	lysis-ICP	U	-0.0405		0.030	0.200		mg/L	1	JXL1 1	0/07/08	1350 801780	1
STLC ICP M	- letals for Soli	ds "As Received	"										
Antimony		. U	0.0103		0.030	1.00		mg/L	1	KDL 1	0/13/08	1412 801834	2
Arsenic		U	0.00418		0.050	0.150		mg/L	1				
Barium			11.7		0.010	0.050		mg/L	1				
Beryllium		U	0.0039		0.010	0.050		mg/L	1				
Cadmium		U	0.00434		0.010	0.050		mg/L	1				
Chromium			0.122		0.020	0.050		mg/L	1				
Cobalt			0.446		0.010	0.050		mg/L	1				
Copper			0.738		0.030	0.100		mg/L	1				
Lead			0.291		0.025	0.100		mg/L	1				
Molybdenum	n	U	0.00403		0.020	0.100		mg/L	1				
Nickel			0.596		0.010	0.050		mg/L	1				
Selenium			0.212		0.050	0.150		mg/L	- 1				
Silver		U	0.00644		0.010	0.050		mg/L	1				
Thallium		U	-0.0108		0.050	0.200		mg/L	1				
v anadium			0.239		0.010	0.050		mg/L	1				
Zhic			1.63		0.020	0.100		mg/L	1				
The followi	ing Prep Met	hods were perf	ormed									· · · · · · · · · · · · · · · · · · ·	
Method		Description				Analyst	Da	ate	Time	e Prej	p Batch	l	
California Co	ode of Regula	ati California W	et Method S	TLC Leaching		CJP1	1(0/01/08	1000	800	775		
SW846 3010)A	ICP-TRACE	TCLP by S	W846 3010A		CXS3	1(0/06/08	0810	801	833		
SW846 7470)A Prep	EPA 7470A	Mercury Pre	p TCLP Liquid		TXB3	10	0/06/08	1140	801	779		
The followi	ing Analytica	l Methods wer	e performed	I									
Method		Description					Analy	st Comm	ents				
1		SW846 7470.	4										
2		SW846 3010/	6010B										

Compar	ny: L	awrence	Liverm	ore Natio	onal	•							
Address	. 7	000 Fast	Avenue	9									
Address). / N	Apileton I	620	C C									
	1	ivormoro	-020 Colife	omia 045	51				R	eport I	Date: Oct	ober 13, 2008	
Contact	: N	Ar. Chad l	, Canic F. Davi	is is	51								
Project:	C	CES - Noi	rmal D	eliverabl	e								
	(S M C F C	Client Sa Sample I Matrix: Collect D Receive I Collector	mple I D: Date: Date: :	ID:	212-W-1H 21596600 SO 15-SEP-0 17-SEP-0 Client	RP 9 8 10:45 8		Pro Clie	iect: ent ID:	LLN LLN	L00306 L002		
Parameter		Qualif	ier	Result		DL	RL	Units	DF	Anal	ystDate	Time Batch	Method
Mercury Analysis-C	VAA												
TCLP Hg in Solid "As	Receiv	ved"											
Mercury		U	-0.00	0875		0.0003	0.002	mg/L	1	JXL1	10/06/08	1308 801306	1
Metals Analysis-ICP								U					<u>^</u>
TCLP ICP Metals for	Solid "	'As Receiv	ved"										
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	î		10.01.00		~
Barium				1.10		0.010	0.050	mg/L	1				
Beryllium		U	-0.00	0116		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	0.0	00339		0.010	0.050	mg/L	1				
Copper		U	-0.	.0025		0.030	0.100	mg/L	1				
Lead		U	0.0	00276		0.025	0.100	mg/L	1				
Molybdenum		U	-0.00	0365		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				
Thellium		U	-0.0	0596		0.010	0.050	mg/L	1		÷		
Vonadium		U	-0.	.0319		0.050	0.200	mg/L	1				
Zinc		U	-0.0	0626		0.010	0.050	mg/L	1				
Zinc				0.030		0.020	0.100	mg/L	ł				
The following Prep	Metho	ds were p	perform	ned									
Method	Ι	Description	on				Analyst	Date	Time	PI	rep Batch		
SW846 1311	1	SW846 1	311 TC	LP Leacl	hing -FEDE	RAL	CXW3	10/01/08	· 1600	80	00777		
SW846 3010A		ICP-TRA	CE TC	LP by SV	V846 3010A		CXS3	10/06/08	0810	80	01335		
SW846 7470A Prep]	EPA 747(DA Mei	rcury Pre	p TCLP Liq	uid	TXB3	10/03/08	1155	. 80	01305		
The following Analy Mothod	tical N	1ethods v	vere pe	erformed									
	1	Jescriptio)II		<u> </u>		1	Analyst Comm	ents				
1	5	SW846 74	470A										
2	S	SW846 30)10/601	10B									

MDR Number	F Samula ID	AHWM AN	ALYSIS REPOI	RT 500		
		- Vilaiyucal				XRF
N/A	212-W-2			17500	Analyst	
pH & NORMALITY		(LSC) RADIOI	OGICAL SCREEN	NG REPORT	Date Analyzed	
Analyst			Tritium	Gross alpha, beta	Element	Percentage
Date Analyzed	Aliquot (mL or g)	19	1g		
pH Result	Ana	alyst	Claude Cardenas	Claude Cardenas		namu ucu na
Normality Result (eq/L)	Date Ar	nalyzed	9/15/2008	9/15/2008		
HYDROMETER / SPECIEIC (SRAVITY Energy	Window	0-18.6 keV	18.6-2000 keV		
Analyst		We	0	0.92		
Date Analyzed		 	1000	3000		**************************************
Specific Gravity Result	Actual	Kesult	0	410		
Hydrometer Result			Below MDC	Below MDC		
FLASH POINT (METHOD			bicocalles / kg	picocuries / kg		
Analyst			SAW GC			
Date Analvzed	Date Analy	yzed	Analyst			
MDL MD		Chemical	Re	sult Detection Linit		
Result						
Unit was been under the second se						
BOILING POINT						
Result					Total	
Unit						IMENTS
LIQUIFICATION TESTI	NG					
Vibration Testing		*****				
Analyst						
Date Analyzed						
Result						
Freeze / Thaw Testing						
Analyst						
Date Analyzed						
Result · · · · · · · · · · · · · · · · · · ·						
Paint Filter Activity					Date Completed	0/1 <i>5/2</i> 008
Analyst						
Date Analyzed					Reviewed Bv	
						FATURO

Compan Address Contact: Project:	 y: Lawrence Liver Security, LLC 7000 East Aver Mailstop L-620 Livermore, Cali Mr. Chad F. Da CES - Normal 	more Natic lue fornia 945 vis Deliverabl	51 e				R	leport]	Date: Octo	ober 15, 2008	
	Client Sample Sample ID: Matrix: Collect Date: Receive Date: Collector: Moisture:) ID:	212-W-2 215963010 SO 15-SEP-08 10:43 17-SEP-08 Client 4.07%	5		Pro Clie	ect: nt ID:	LLN	IL00306 IL002		
Parameter	Qualifier	Result	•	DL	RL	Units	DF	Ana	lystDate	Time Batch	Method
Mercury Analysis-C	VAA										
7471 Cold Vapor Hg i	n Solid "Dry Weight	Corrected"									
Mercury Metals Analysis-ICP		6.32	0.	.177	1.18	mg/kg	100	ETL	09/29/08	1235 796414	1
6010 TAL Metals Soil	Federal "Dry Weight	Corrected	11								
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	0.0)998	0.500	mg/kg	1				
Beryllium	U	-0.308	0.0)998	0.500	mg/kg	1				
Cadmium	J	0.304	0.0)998	0.500	mg/kg	1				
Chromium		33.2	0.0	1998	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	0.0	1998	1.30	mg/kg	1				
Silver		0.753	0.0	1998	0.500	mg/kg	1				
Thallium	U	-1.69	0.	.499	3.00	mg/kg	1				
Vanadium		29.2	0.0	1998	0.500	mg/kg	1				
Zinc		140	0.	.200	1.00	mg/kg	1				
Selenium	J	5.28	4	4.99	15.0	mg/kg	10	HSC	10/14/08	1758 796830	3.
The following Prep I	Methods were perfo	rmed									
Method	Description				Analyst	Date	Tim	e P	rep Batch		
SW846 3050B	846 3050BS P	REP			FGA	10/10/08	143() 7	96829		
SW846 7471A Prep	EPA 7471A M	lercury Prep	p Soil		TXB3	09/26/08	1600) 7	96413		
The following Analy	tical Methods were	performed									
Method	Description				A	analyst Comm	ents				
1	SW846 7471A										
2	SW846 3050B	6010B									
3	SW846 3050B	/6010B									

Compan	y: Lawrence	e Livermore Nat	ional							
Address	- 7000 East	LLC t Avenue								
Audress	. 7000 Las Mailston	1_620					ъ		1 14 0000	
	Livermor	e California 94	1551				K	eport Date: Octo	ober 14, 2008	
Contact:	Mr. Chad	F. Davis	551							
Project:	CES - No	ormal Delivera	ble							
	Client S Sample Matrix: Collect I Receive Collecto	ample ID: ID: Date: Date: r:	212-W-2 215964010 SO 15-SEP-08 10 17-SEP-08 Client	0:45		Proj Clie	iect: ent ID:	LLNL00306 LLNL002		
Parameter	Qual	ifier Resu	lt	DL	RL	Units	DF	AnalystDate	Time Batch	Method
Mercury Analysis-C	VAA									
STLC Hg in Solid "As	Received"									
Mercury	U.	-0.0541		0.030	0.200	mg/L	1	JXL1 10/07/08	1351 801780	1
Metals Analysis-ICP										
STLC ICP Metals for 3	Solids "As Rece	eived"								
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			
Molubdonum	17	1.42		0.025	0.100	mg/L	1			
Nickel	U	-0.00592		0.020	0.100	mg/L	1			
Selenium		0.079		0.010	0.030	mg/L	1			
Silver	т	0.410		0.050	0.150	mg/L	1			
Thallinm	J	-0.00274		0.010	0.000	mg/L	1			
Vanadium	0	0.00274		0.050	0.200	mg/L	1			
Zinc		8.62		0.020	0.100	mg/L	1			
The following Prep	Methods were	performed								
Method	Descript	tion			Analyst	Date	Time	Prep Batch		
California Code of Re	gulati Californ	ia Wet Method	STLC Leaching		CJP1	10/01/08	1000	800775		
SW846 3010A	ICP-TR	ACE TCLP by	SW846 3010A		CXS3	10/06/08	0810	801833		
SW846 7470A Prep	EPA 74	70A Mercury Pr	ep TCLP Liquid		TXB3	10/06/08	1140	801779		
The following Analy	tical Methods	were perform	'n							
Method	Descript	tion			ł	Analyst Comm	ents	·		
1	SW846	7470A								
2	SW8463	3010/6010B								

	Company :	Lawrence Liv	ermore Natio	onal								
	Address :	7000 East Av	enue									
		Mailstop L-62	20					R	eport Date: O	tober 13	2008	
	Contact:	Livermore, C Mr. Chad F. I	alifornia 945 Davis	551				Ĩ	eport Dute. O		2000	
	Project:	CES - Norm	al Deliverah	6								
		Client Samp Sample ID: Matrix: Collect Date Receive Dat Collector:	ole ID: e: te:	212-W-2 215966010 SO 15-SEP-08 10:4 17-SEP-08 Client	45		Proj Clie	ect: nt ID:	LLNL00306 LLNL002			
Parameter		Qualifier	Result	t ·	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Mercury An	alysis-CVA	4										
TCLP Hg in l	Solid "As Rec	ceived"										
Mercury		U -	0.000873	0	.0003	0.002	mg/L	1	JXL1 10/06/0	8 1310 8	01306	1
Metals Anal	ysis-ICP											
TCLP ICP M	letals for Soli	d "As Received	n									
Antimony		U	-0.0122		0.030	0.100	mg/L	1	KDL 10/07/0	8 1835 8	01337	2
Arsenic		U	0.0102	1	0.050	0.150	mg/L	1				
Barium			0.845		0.010	0.050	mg/L	1				
Beryllium		U -	0.000242	4	0.010	0.050	mg/L	1				
Chromium		U -	0.000/19		0.010	0.050	mg/L	1				
Cobalt		U	0.0120		0.020	0.050	mg/L	1				
Copper		U	0.00328		0.010	0.050	mg/L	1				
Lead		, II	0.0323		0.030	0.100	mg/L	1				
Molvbdenum	1	U U	0.00154		0.020	0.100	mg/L	1				
Nickel		ĩ	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 followi	ng Prep Met	hods were per	formed									
Method		Description				Analyst	Date	Time	Prep Bate	h		
SW846 1311		SW846 131	1 TCLP Leac	hing -FEDERAL		CXW3	10/01/08	1600	800777			
SW846 3010)A	ICP-TRACE	E TCLP by S	W846 3010A		CXS3	10/06/08	0810	801335			
SW846 7470	A Prep	EPA 7470A	Mercury Pre	p TCLP Liquid		TXB3	10/03/08	1155	801305			
The following	ng Analytica	l Methods wei	re performed	1								
Method		Description				A	Analyst Comm	ents				
1		SW846 7470)A									
2		SW846 3010	/6010B									

WDR Number		Analvtical		XT ۲		
		1 minut mon				ARE SECTION AND AND AND AND AND AND AND AND AND AN
N/A 2	212-N-1			17500	Analyst	
pH & NORMALITY		SC) RADIOI	OGICAL SCREENI	NG REPORT	Date Analyzed	
Analyst		AND THE REAL PROPERTY.	Tritium	Gross alpha, beta	Lement	Percentage
Date Analyzed	Aliquot (ml	- or g)	1g	1g		
pH Result	Analys	st	Claude Cardenas	Claude Cardenas		A MARKAN MANANA ANA ANA ANA ANA ANA ANA ANA AN
Normality Result (eq/L)	Date Anal	yzed	9/15/2008	9/15/2008		
HYDROMETER / SPECIFIC GRAVI	TY Energy Wi	wopu	0-18.6 keV	18.6-2000 keV		CANANA KUMULU MANDALA M
Analyst			0	0		
Date Analyzed			1000	3000		
Specific Gravity Result		Bull				***************************************
Hydrometer Result		Lasur	below IVIUC	Below MUC		
ELASH BOINT (METHOD 1010)			bicocal ica / vg			
			SAW GC			
	Date Analyze	od 🚽	Analyst			
		Chemical	Re	sult Detection Linit		
Nesult						
BOILING POINT						
Result					Total	
Unit					CO	MMENTS
LIQUIFICATION TESTING						
Vibration Testing						
Analyst a second second						
Date Analyzed		******				
Result						
Freeze / Thaw Testing						
Analyst						
Date Analyzed						
Result						
Paint Filter Activity					Date Completed	0/15/2008
Analyst						31 312000
Date Analyzed					Reviewed Bv	(YOY
Result						rak de

Company	: Lawrence Liver Security, LLC	nore Natio	nal								
Address :	7000 East Avem Mailstop L-620	ıe					R	eport]	Date: Octo	ober 15, 2008	
Contact:	Livermore, Calif Mr. Chad F. Dav	ornia 945 vis	51					1			
Project:	CES - Normal I	Deliverabl	e								
	Client Sample Sample ID: Matrix: Collect Date: Receive Date: Collector: Moisture:	ID:	212-N-1 215963011 SO 15-SEP-08 10:4 17-SEP-08 Client 2.68%	45		Pro Clie	iect: ent ID:	LLN LLN	IL00306 IL002		
Parameter	Qualifier	Result		DL	RL	Units	DF	Ana	lystDate	Time Batch	Method
Mercury Analysis-CV	AA						•				
7471 Cold Vapor Hg in	Solid "Dry Weight (Corrected"									
Mercury Metals Analysis-ICP	÷	137		1.59	10.6	mg/kg	1000	ETL	09/29/08	1341 796414	1
6010 TAL Metals Soil F	ederal "Dry Weight	Corrected	"								
Antimony	U	-0.299		0.307	1.50	mg/kg	1	HSC	10/12/08	1837 796830	2
Arsenic		5.18	1	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				
NICKEI		42.6		0.099	1.30	mg/kg	1				
Sliver	**	0.685		0.099	0.500	mg/kg	1				
Vonodium	U	-1.78		0.495	3.00	mg/kg	1				
Zinc		30.0		0.1099	0.500	mg/kg	1				
Selenium	U	4.81		4.95	14.8	mg/kg	10	HSC	10/14/08	1805 796830	3
The following Prep M	ethods were perfor	med									
Method	Description				Analyst	Date	Tim	e F	rep Batch		
SW846 3050B	846 3050BS PF	REP			FGA	10/10/08	1430) 7	96829		
SW846 7471A Prep	EPA 7471A M	ercury Prej	o Soil		TXB3	09/26/08	1600) 7	96413		
The following Analyti	cal Methods were p	erformed									
Method	Description				A	nalyst Comm	ents				
1	SW846 7471A										
2	SW846 3050B/	5010B									
3	SW846 3050B/	5010B									

Company	y: Lawrence	Livermore Nat	ional	. *						
Address	: 7000 East	LC Avenue								
Contact	Mailstop L Livermore, Mr. Chad B	620 , California 94 E Davis	551				R	eport Date: Oct	ober 14, 2008	
Project:	CEC New									
riojeci.	CES - Nor	mai Deliverat	ble							
	Client Sar Sample II Matrix: Collect D Receive I Collector:	mple ID: D: ate: Date:	212-N-1 215964011 SO 15-SEP-08 10 17-SEP-08 Client):45		Pro Clie	iect: ent ID:	LLNL00306 LLNL002		
Parameter	Qualifi	ier Resu	t	DL	RL	Units	DF	AnalystDate	Time Batch	Method
Mercury Analysis-CV	AA							-		
STLC Hg in Solid "As H	Received"									
Mercury	U	-0.0697		0.030	0.200	mg/L	1	IXI 1 10/07/08	1353 801780	1
Metals Analysis-ICP					0.200	mg/L	1	JALI 10/07/08	1333 801/80	1
STLC ICP Metals for S	olids "As Receiv	ved"								
Antimony	U	-0.00667		0.030	1.00	mg/I	1	KDI 10/12/00	1427 001024	2
Arsenic	Ŭ	-0.00839		0.050	0.150	mg/L	. 1	KDL 10/15/08	1427 801834	2
Barium		12.4		0.010	0.050	mg/L	1			
Beryllium	$^{\circ}$ 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			
Shver	U	0.00452		0.010	0.050	mg/L	1			
Vonodium	U	0.0139		0.050	0.200	mg/L	1			
		0.208		0.010	0.050	mg/L	1			
Zait		4.40		0.020	0.100	mg/L	1			
The following Prep M	lethods were p	erformed								
Method	Descriptio	'n			Analyst	Date	Time	Prep Batch		······································
California Code of Reg	ulati California	Wet Method S	TLC Leaching		CJP1	10/01/08	1000	800775		
SW846 3010A	ICP-TRAC	CE TCLP by S	W846 3010A		CXS3	10/06/08	0810	801833		
SW846 7470A Prep	EPA 7470	A Mercury Pre	p TCLP Liquid		TXB3	10/06/08	1140	801779		
The following Angles	and Made - 1-	A	-							
Method	Description	ere performe	1		A	naluct Comm				
1	CWOAC 74	70 4			A	manysi Comme	ents			
1 2	SW846 /4	/UA								
2	SW846 30	10/6010B								

Compa	iny :	Lawrence	Livern	ore Natio	nal								
		Security,											
Addres	ss :	7000 East	Avenu	e									
		Manstop J	L-620		~ .				R	eport I	Date: Oct	ober 13, 2008	3
Contac	rt:	Mr. Chad	F. Dav	ornia 945 is	51								
Project	t:	CES - No	rmal D	eliverabl	e								
		011 . 0											
		Sample 1	ample I	D:	212-N-1 215066011			P	roject:	LLN	L00306		
		Matrix.	ш.		SO			C	ment ID.	LLIN	L002		
		Collect I	Date:		15-SEP-08 10-	45							
		Receive	Date:		17-SEP-08								
		Collector	r:		Client								
Parameter		Quali	fier	Result		DL	RL	Units	DF	Ana	lystDate	Time Bate	h Method
Mercury Analysis-C	CVAA												
TCLP Hg in Solid "A	s Rece	eived"											
Mercury		U	-0.00	00646	0	.0003	0.002	mg/L	1	JXL1	10/06/08	1312 80130	5 1
Metals Analysis-ICI	Р							&	1	U1 (1) 1	10/00/00	1912 00150	0 1
TCLP ICP Metals for	r Solid	"As Recei	ved"										
Antimony		U	0.	00658		0.030	0.100	mg/L	1	KDI.	10/07/08	1843 80133	7 7
Arsenic		Ū	-0	.0216	(0.050	0.150	mg/L	1	nu L	10/07/00	1045 00155	1 2
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	l l	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	C	0.0218	(0.025	0.100	mg/L	1				
Molybdenum		U	-0.0	0523	(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				
Thellium		U		0.008	(0.010	0.050	mg/L	1				
Vonedium		U	-0.	.0128	(0.050	0.200	mg/L	1				
Zipe		0	-0.00	0245	(0.010	0.050	mg/L	1.				
Zuit				0.343	(J.020	0.100	mg/L	1				
The following Prep	Meth	ods were	perform	ned									
Method		Descripti	ion				Analyst	Date	Time	e P	rep Batch		
SW846 1311		SW846 1	311 TC	LP Leach	ing -FEDERAL		CXW3	10/01/08	1600) '8	00777		
SW846 3010A		ICP-TRA	ACE TO	LP by SV	/846 3010A		CXS3	10/06/08	0810	8	01335		
SW846 7470A Prep		EPA 747	0A Me	rcury Prep	TCLP Liquid		TXB3	10/03/08	1155	8	01305		
The following Anal	vtical	Methods	were na	erformed									
Method	<u>_</u>	Descripti	on					Analyst Con	ments				
1		SW846 7	470A					•					
2		SW846 3	010/601	10B									

WDR Number	Sample ID	Analytical	og Book ID	COC		XRF
N/A	212-N-2			17500	Analyst	
DH & NORMALITY			OGICAL SCREEN	ING REDORT	Date Analyzed	
Analyst			Tritium	Gross alpha, beta	Element	Percentage
Date Analyzed	Aliquot (n	nL or g)	19	19		
pH Result	Anal	yst	Claude Cardenas	Claude Cardenas		
Normality Result (eq/L)	Date An	alyzed	9/15/2008	9/15/2008		oonnoon aanaa aa aa aha kurusa qoo aa aha aha ahaa ahaa ahaa ahaa aha
HYDROMETER / SPECIEIC GE		Vindow	0-18.6 keV	18.6-2000 keV		
Analyst		>	0	0		
Date Analyzed			1000 2	3000		лоновические и пользование и пользование и пользование и пользование и пользование и пользование и пользование Лоновические и пользование и
Specific Gravity Result						
Hydrometer Result			Delow MUUU Dicocuries / ka	DELOW MUC		
FI ASH POINT (METHOD 10			Bucconnoold			
Analyst			SAW GC			
Date Analyzed	Date Analyz	zed	Analyst			
MDL		Chemical	~	esult Detection Linit		
Result		****				
Unit						
BOILING POINT						
Result					Total	
Unit					00	OMMENTS
LIQUIFICATION TESTING						
Vibration Testing					-	
Analyst						
Date Analyzed						
Result						
Freeze / Thaw Testing						
Analyst						
Date Analyzed						
Result						
Paint Filter Activity					Date Completed	011512000
Analyst						0002/01/16
Date Analyzed					Raviewad Rv	L D N N
Result						1 X KAN

(Company :	Lawrence Live	rmore Natio	nal							
	Address .	7000 Fast Ave	nue								
1	Address .	Mailston L -62))					T		15 0000	
(Contact:	Livermore, Ca Mr. Chad F. D.	ifornia 945	51				k	Report Date: Oc	tober 15, 2008	
	Droigoti	OFC No. 1									
	Project:	CES - Norma	Deliverabl	e							
		Client Sampl Sample ID: Matrix: Collect Date: Receive Date Collector: Moisture:	e ID: ::	212-N-2 215963012 SO 15-SEP-08 1 17-SEP-08 Client 2.06%	10:45		Pro Clie	iect: ent ID:	LLNL00306 LLNL002		
Parameter		Qualifier	Result		DL	RL	Units	DF	AnalystDate	Time Batch	Method
Mercury Ana	lysis-CVA	A									
7471 Cold Vap	oor Hg in Sc	olid "Dry Weight	Corrected"								
Mercury Metals Analys	sis-ICP		15.0		0.171	1.14	mg/kg	100	ETL 09/29/08	3 1239 796414	1
6010 TAL Met	als Soil Fed	leral "Dry Weigh	at Corrected	"							
Antimony		U	-0.0555		0.313	1.50	mg/kg	1	HSC 10/12/08	8 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	g Prep Met	hods were perfe	ormed						· · · ·		
Method		Description				Analyst	Date	Time	e Prep Batcl	1	
SW846 3050B		846 3050BS I	PREP			FGA	10/10/08	1430) 796829	······································	
SW846 7471A	Prep	EPA 7471A N	Aercury Prep	o Soil		TXB3	09/26/08	1600) 796413		;
The following	g Analytica	l Methods were	performed								
Method		Description				. 4	Analyst Comm	ents			
1		SW846 7471A	1								
2		SW846 3050E	6010B								
3		SW846 3050E	6010B								

(Company :	Lawrence Liv	ermore Natio	onal								
1	Address :	Security, LLC 7000 East Av Mailstop L-62	C enue 20					_	_			
(Contact:	Livermore, Ca Mr. Chad F. I	alifornia 945 Davis	51				R	leport Da	ite: Oct	ober 14, 2008	
1	Project:	CES - Norma	al Deliverab	le								
		Client Samp Sample ID: Matrix: Collect Date Receive Dat Collector:	vle ID: v: e:	212-N-2 215964012 SO 15-SEP-08 1 17-SEP-08 Client	0:45		Pro Clie	iect: ent ID:	LLNL LLNL	00306 002		
Parameter	·····	Qualifier	Result		DL	RL	Units	DF	Analy	stDate	Time Batch	Method
Mercury Anal	ysis-CVAA	L .										
STLC Hg in So	lid "As Rec	eived"										
Mercury		U	-0.0593		0.030	0.200	mg/L	1	JXL1 1	0/07/08	1355 801780	1
Metals Analys	is-ICP											-
STLC ICP Mete	als for Solia	ls "As Received	n									
Antimony		U	0.0156		0.030	1.00	mg/L	1	KDL 1	0/13/08	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				
Chromium		J	0.0252		0.010	0.050	mg/L	1				
Cobalt			0.148		0.020	0.050	mg/L	1				
Coppor			0.437		0.010	0.050	mg/L	1				
Lead			0.897		0.030	0.100	mg/L	1				
Molybdenum		τī	1.34		0.025	0.100	mg/L	1				
Nickel		U	0.00178		0.020	0.100	mg/L	1				
Selenium			0.340		0.010	0.050	mg/L	1				
Silver		ĨŢ	0.177		0.050	0.150	mg/L	1				
Thallium		U	0.00321		0.010	0.050	mg/L	1				
Vanadium		0	0.0127		0.000	0.200	mg/L	1				
Zinc			17.6		0.020	0.050	. mg/L	1				
The following	Prep Meth	inds were perf	ormed				0					
Method	arep men	Description	ormeu			Analyst	Date	Time	Pre	n Batch	· · · · · · · · · · · · · · · · · · ·	
California Code	of Regulat	i California W	et Method S	I C Leaching		CTP1	10/01/09	1000		775		
SW846 3010A		ICP TPACE	TCI D by SN	USAC 2010 A		CJII	10/01/08	1000	800	175		
SW846 7470A	Pren	EPA 7470A	Mercury Prer	TCLPL iquid		CAS3 TVP2	10/06/08	0810	801	833		
	- r -			, i chi hiquiu		1703	10/00/08	1140	801	//9		
The following	Analytical	Methods were	e performed									
Method		Description				Α	nalyst Commo	ents				
1		SW846 7470A	4									
2		SW846 3010/	6010B									

	Company :	Lawrence Security,	e Livern LLC	nore Natio	nal								
	Address :	7000 Eas	t Avenu	ie								·	
		Mailstop	L-620						R	eport D	ate: Oct	ober 13-2008	
	Contact:	Livermor Mr. Chad	e, Calif F. Dav	ornia 945. is	51					-port 20		10, 2000	
	Project:	CES - No	ormal I	Deliverabl	e								
								·····					
	-	Client S Sample Matrix: Collect I Receive Collecto	ample ID: Date: Date: r:	ID:	212-N-2 215966012 SO 15-SEP-08 10 17-SEP-08 Client):45		Pro Cli	viect: ent ID:	LLNI LLNI	.00306 .002		
Parameter	·	Quali	fier	Result		DL	RL	Units	DF	Analy	stDate	Time Batch	Method
Mercury An	alysis-CVA	A											
TCLP Hg in 3	Solid "As Rec	eived"											
Mercury		U	-0.0	00486		0.0003	0.002	mg/L	1	JXL1	10/06/08	1314 801306	1
Metals Analy	ysis-ICP												
TCLP ICP M	etals for Soli	d "As Recei	ived"										
Antimony		U	-0.0	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				
Berullium		T T	0.00	0.900		0.010	0.050	mg/L	1				
Cadmium			-0.0	JUU82 00479		0.010	0.050	mg/L	1				
Chromium		U U	0.	004/8		0.010	0.050	mg/L	1				
Cobalt		U U	-0.0	0613		0.020	0.050	mg/L	1				
Copper		- U	-0.00	0.012		0.010	0.050	mg/L	1				
Lead		U U	(0.012		0.025	0.100	mg/L	1				
Molybdenum		U	0	00179		0.020	0.100	mg/L	1				
Nickel		Ĵ	().0459		0.020	0.100	mg/L	1				
Selenium		Ū	-0	.0451		0.050	0.150	mg/L	1				
Silver		U	-0.0	0323		0.010	0.050	mg/L	1				
Thallium		U	-0.0	0316		0.050	0.200	mg/L	1				
Vanadium		U	0.0	00386		0.010	0.050	mg/L	1				
Zinc				0.911		0.020	0.100	mg/L	. 1				
The followin	ng Prep Met	hods were	perform	ned									
Method		Descripti	ion				Analyst	Date	Time	Pre	p Batch		
SW846 1311		SW846 1	311 TC	CLP Leach	ing -FEDERAL		CXW3	10/01/08	1600	80(0777		
SW846 3010	A	ICP-TRA	ACE TO	LP by SW	7846 3010A		CXS3	10/06/08	0810	80	1335		
SW846 7470	A Prep	EPA 747	0A Me	rcury Prep	TCLP Liquid		TXB3	10/03/08	1155	80	1305		
The followir	ng Analytical	Methods	were na	erformed									
Method		Descripti	on					Analyst Comm	ents				
1		SW8467	470A					-					
2		SW846 3	010/601	10P									
		5 11 0 10 5	010/00										

		Ŗ	HWM AI	NALYSIS REPC	IRT		
WDR Number	Sample ID		Analytica	ll Log Book ID	coc		XRF
N/A	212-N-3				17500	Analyst	
pH & NORM.	ALITY		SC) RADIC	DLOGICAL SCREEN	ING REPORT	Date Analyzed	
Analyst				Tritium	Gross alpha, beta		Percentage
Date Analyzed		Aliquot (ml	. or g)	1g	1g		
pH Result		Analys	st	Claude Cardenas	Claude Cardenas		
Normality Result (eq/L)		Date Anal	yzed	9/15/2008	9/15/2008		
HVDROMETER / SPE	CIFIC GRAVITY	Energy Wi	Mobn	0-18.6 keV	18.6-2000 keV		
Analyst		MAD		0	0		
Date Analyzed		NUC		1000	3000		
Specific Gravity Result		Actual Re	esult	0	0		
Hvdrometer Result		Reportable	Result	Below MDC	Below MDC		
		Unit		picocuries / kg	picocuries / kg		
FLASH POINT (ME	(THOD 1010)			SAW GC			CONTRACT ON THE OTHER STATES IN THE OTHER STATES OF THE OTHER STATES OF THE OTHER STATES OF THE OTHER STATES OF
Analyst		Date Analyze	p	Analyst			
Date Analyzed	-		Chemical	A States and a state of the sta	esult Detection Linit		
MDL							
unit was a contract of the second							
BOILING	OINT						
Result						Total	
						COI	<u> </u>
LIQUIFICATION	TESTING						
Vibration Te	sting						
Analyst							
Date Analyzed							
Result							
Freeze / Thaw	Testing						
Analyst							
Date Analyzed							
Result							
Paint Filter A	ctivity					Date Completed	9/15/2008
Analyst							
Date Analyzed						Reviewed Bv	(
Result							ANA -

Compa Address Contact Project:	ny : Lawrence Liver Security, LLC s : 7000 East Aver Mailstop L-620 Livermore, Cal t: Mr. Chad F. Da CES - Normal Client Sample Sample ID: Matrix:	rmore Nation nue ifornia 945: wis Deliverable e ID:	nal 51 212-N-3 215963013 SO		Pro Clia	R iect: ent ID:	LLN	Date: Octo IL00306 IL002	ober 15, 2008	
	Collect Date: Receive Date Collector: Moisture:	:	15-SEP-08 10:45 17-SEP-08 Client 2.27%							
Parameter	Qualifier	Result	D	L RL	Units	DF	Ana	lystDate	Time Batch	Method
Mercury Analysis-C	VAA									
7471 Cold Vapor Hg	in Solid "Dry Weight	Corrected"								
Mercury Metals Analysis-ICP	•	7.75	0.155	5 1.04	mg/kg	100	ETL	09/29/08	1245 796414	1
6010 TAL Metals Soil	l Federal "Dry Weigh	t Corrected'	1							
Antimony	U	-0.0663	0.306	5 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				
Chromum		34.0	0.0988	0.500	mg/kg	1				
Copait		9.95	0.198	0.500	mg/kg	1				
Copper		36.4	0.290	2.00	mg/kg	1				
Molybdenum	Y	20.8	0.247	1.50	mg/kg	1				
Nickel	j	40.8	0.190	1.00	mg/kg	1				
Silver		0.863	0.0988	0.500	mg/kg	1				
Thallium	ĨĬ	-1.8	0.0980	3.00	mg/kg	1				
Vanadium	0	29.4	0.0988	0.500	mg/kg					
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 perfo	ormed								
Method	Description			Analyst	Date	Tim	e F	rep Batch		
SW846 3050B	846 3050BS F	PREP		FGA	10/10/08	1430) 7	96829		
SW846 7471A Prep	EPA 7471A N	Aercury Prep	o Soil	TXB3	09/26/08	1600) 7	96413		
The following Anal	ytical Methods were	performed								
Method	Description				Analyst Comm	ents				
1	SW846 7471A	L								
2	SW846 3050B	/6010B								
3	SW846 3050B	/6010B								

Con	npany :	Lawrence Liv	ermore Nati	onal							
		Security, LLC	;								
Ado	iress :	7000 East Av	enue								
		Mailstop L-62	20					R	eport Date: Oct	ober 14, 2008	
Con	itact:	Livermore, Ca Mr. Chad F. I	alifornia 943 Davis	551							
Proj	ject:	CES - Norma	l Deliverab	le							
		Client Samp Sample ID: Matrix:	le ID:	212-N-3 215964013 SO			Pro Clie	iect: ent ID:	LLNL00306 LLNL002		
		Collect Date Receive Dat Collector:	e:	15-SEP-08 1 17-SEP-08 Client	0:45					· .	
Parameter		Qualifier	Result	t	DL	RL	Units	DF	AnalystDate	Time Batch	Method
Mercury Analysi	s-CVAA	<u> </u>				· · · · · · · · · · · · · · · · · · ·					
STLC Hg in Solid	"As Rec	eived"							-		i.
Mercury		U	-0.0563		0.030	0.200	mg/L	1	IXI.1 10/07/08	1357 801780	1
Metals Analysis-I	ICP	-				0.200		1	52111 10/07/00	1557 001700	1
STLC ICP Metals	for Solid	ds "As Received									
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		1500 001051	4
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 Pr	en Metl	hods were nerf	ormed								
Method	-p	Description	or meu			Analyst	Date	Time	Prep Batch		
California Code of	Regula	ti [,] California W	et Method S	TLC Leaching		CJP1	10/01/08	1000	800775		
SW846 3010A	-	ICP-TRACE	TCLP by SV	W846 3010A		CXS3	10/06/08	0010	801832		
SW846 7470A Pre	p	EPA 7470A	Mercury Pre	p TCLP Liquid		TXB3	10/06/08	1140	801779	· · · · ·	
The following A.	alvtical	Mathada war	norform								
Method	iary uca	Description	e periormed	l		A	nalyst Comm	ents			
1		SW846 7470	4								
2		SW846 3010/	6010B								

Company	: Lawrence Security,	e Liverr LLC	nore Natio	onal							
Address :	7000 Eas	t Avent	ie								
	Mailstop	L-620						Б	Concert Datas Oct	12 2000	
	Livermor	e, Calif	ornia 945	51				л	report Date: Oct	ober 13, 2008	
Contact:	Mr. Chad	F. Dav	vis								
Project:	CES - No	ormal I	Deliverabl	e							
	Client S	ample		212_N_3			Droi	ioot.			
	Sample	ID:	ID.	215966013			Clie	nt ID:	LLNL00306		
	Matrix:			SO							
	Collect]	Date:		15-SEP-08 10:4	5						
	Receive	Date:		17-SEP-08							
	Collecto	r:		Client	-						
Parameter	Quali	ifier	Result		DL	RL	Units	DF	AnalystDate	Time Batch	Method
Mercury Analysis-CVA	A										
TCLP Hg in Solid "As R	eceived"										
Mercury	U	-0.0	00565	0.0	0003	0.002	mg/L	1 -	IXL1 10/06/08	1316 801306	1
Metals Analysis-ICP							<u>6</u> .12	*	57 ET 10/00/08	1510 801500	1
TCLP ICP Metals for So	lid "As Rece	ived"									
Antimony	U	-0).0392	0	.030	0.100	mg/L	1	KDI 10/07/08	1857 801227	2
Arsenic	U	-0	0.0115	0	.050	0.150	mg/L	1	RDL 10/07/08	1057 001557	Z
Barium			0.949	0	.010	0.050	mg/L	1			
Beryllium	U	-0.0	00033	0.	.010	0.050	mg/L	ĩ			
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			
Lood	U	0.	.00204	0.	.030	0.100	mg/L	1			
Molubdonum	U	(0.0143	0.	.025	0.100	mg/L	1			
Nickel	U	0.	00353	0.	.020	0.100	mg/L	1			
Silver	J		J.0485	0.	.010	0.050	mg/L	1			
Thallium	U	-0.0	0245	0.	.010	0.050	mg/L	1			
Vanadium	U	-0	00545	0.	010	0.200	mg/L	1	•		
Zinc	U	0.0	1 33	0.	010	0.050	mg/L mg/L	1			
Selenium	J		0.415	0.	250	0.100	mg/L	1 5	VDI 10/00/09	1000 001227	2
The 6-11- 1 D		~	-	0.	200	0.750	mg/L	5	KDL 10/09/08	1900 801337	3
Ine following Prep Me	thods were	perfori	med						· · ·		
method	Descript	ion				Analyst	Date	Time	Prep Batch		
SW846 1311	SW846	311 TC	CLP Leach	ning -FEDERAL		CXŴ3	10/01/08	1600	800777		
SW846 3010A	ICP-TRA	ACE TO	CLP by SV	V846 3010A		CXS3	10/06/08	0810	801335		
SW846 7470A Prep	EPA 747	'0A Me	rcury Prep	TCLP Liquid		TXB3	10/03/08	1155	801305		
The following Analytic	al Methods	were p	erformed								
Method	Descripti	ion				A	nalyst Comme	ents			
1	SW846 7	470A		· · · · · · · · · · · · · · · · · · ·							
2	SW846 3	010/60	10B								
3	CW0AC 2	010/00									
J	SW 840 3	V10/60.	IUB								

		RHWM AN	VALYSIS RE	PORT			
WDR Number	Sample ID	Analytica	l Log Book ID		coc		XRF
N/A	212-N-4				17500	Analyst	
pH & NORMALI		(LSC) RADIO	LOGICAL SCF	EENING R	EPORT	Date Analyzed	
Analyst			Tritium	U U	ross alpha, beta		Percentage
Date Analyzed	Aliqu	ot (mL or g)	19		1g		
pH Result		Analyst	Claude Cardena	s C	laude Cardenas		
Normality Result (eq/L)	Dat	e Analyzed	9/15/2008		9/15/2008		
HARRANETER / SPECIEI	C CD AVITV	rgy Window	0-18.6 keV		18.6-2000 keV		
		DPM	0		0		
Pote Aneliand		MDC	1000		3000		
Date Artaryzed		wal Result	0		0		00000000000000000000000000000000000000
Undromater Recuit	Repo	rtable Result	Below MDC		Below MDC		
		Unit	picocuries / kg		picocuries / kg		
FLASH POINT (METHC	DD 1010)		SAW GC				
Analyst		nalvzed		c+			
Date Analyzed		nuiyeed Chemical		ot Pacifit	Dataction Linit		
MDL				Incoul			
Result							
Unit							
BOILING POIN							
Result		00000 -0014 8040 8000 8000 8000 8000 8000 8000 				Total	
						CON	INENTS
LIQUIFICATION TES	STING						
Vibration Testing							
Analyst							
Date Analyzed							
Result		an and a second a second a second a second a s					
Freeze / Thaw Test	ing	SAN AN A MANAGEMENT AND				hi h-se -	
Analyst							
Date Analyzed							
Result							
Paint Filter Activi	V.					Data Completed	0/15/2008
Analyst							8/ 10/2000
Date Analyzed						Reviewed By	(2° ()
Result							(pales)

Co	ompany :	Lawrence Live	rmore Natic	nal								-	
		Security, LLC											
Ac	idress :	7000 East Aver	nue										
		Mailstop L-620)	~ .				R	leport	Date: Octo	ober 15,	2008	
0		Livermore, Cal	itornia 945	51									
Ca	ontact:	Mr. Chad F. Da	IVIS										
Pr	oject:	CES - Normal	Deliverabl	e									
		Client Sampl		212 N 4			Pro	iect:	TIN	JI 00306			
		Sample ID:	сm.	215963014			Clie	ent ID:	LLI	VL00300			
		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	Ana	alystDate	Time	Batch	Method
Mercury Analy	sis-CVA	4											
7471 Cold Vapo	r Hg in So	olid "Dry Weight	Corrected"										
Mercury	-		0.802		0.0897	0.598	mg/kg	50	ETL	09/29/08	1405 7	96414	1
Metals Analysis	s-ICP						0.0						_
6010 TAL Metal	s Soil Fea	leral "Dry Weigh	t Corrected	"									
Antimony		Ū.	-0.549		0.314	1.50	mg/kg	1	HSC	10/12/08	1858 7	96830	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 79	96830	3
Inallium		U	0.0102		5.06	20.2	mg/kg	10				1 m	
The following	Prep Met	hods were perfo	ormed										
Method		Description				Analyst	Date	Tim	e l	Prep Batch			
SW846 3050B		846 3050BS F	PREP			FGA	10/10/08	1430) '	796829			
SW846 7471A F	Prep	EPA 7471A N	Aercury Prej	o Soil		TXB3	09/26/08	1600) ′	796413			
The following	Analytica	l Methods were	performed										
Method		Description	-		· · · ·		Analyst Comm	ents		-			
1		SW846 7471A	<u> </u>										
2		SW846 3050B	/6010B										
3		SW846 3050B	/6010B										

Matrix: SO Collect Date: 15-SEP-08 (7-SEP-08) Collect Date: 17-SEP-08 (Collector: Collector: Collector: Parameter Qualifier Result DL RL Units DF AnalystDate Time Batch Method Mercury Qualifier Result DL RL Units DF AnalystDate Time Batch Method Metrury U -0.0872 0.030 0.200 mg/L 1 JXL1 10/07/08 1359 801780 1 Matinx: U -0.0872 0.030 1.00 mg/L 1 JXL1 10/07/08 1359 801780 1 Metak Analysis-ICP	Company Address : Contact: Project:	: Lawrence Live Security, LLC 7000 East Ave Mailstop L-62 Livermore, Ca Mr. Chad F. D CES - Norma Client Samp Sample ID:	ermore Natio enue 0 alifornia 945 Davis 1 Deliverabl le ID:	212-N-4 215964014			Pro Clic	Rep iect:	port Date: Octo LLNL00306 LLNL002	ober 14, 2008	
Parameter Qualifier Result DL RL Units DF Analysite Time Batch Method Hercury Analysis-CVAJ STLC Hg in Solid "As Receiver" STLC Hg in Solid "As Receiver" No.0372 0.030 0.200 mg/L 1 JXL 1 10/07/08 359 80.1780 1 Metals Analysis-ICP STLC De Metals for Solids "As Receiver" No.030 1.00 mg/L 1 KDL 10/13/08 1516 80.1834 2 Arsenic U 0.0113 0.030 1.00 mg/L 1 KDL 10/13/08 1516 80.1834 2 Barinim 9.72 0.010 0.050 mg/L 1 L 1 L 1 L 1 L 2 Arsenic 0 0.000 mg/L 1 L 1 L 1 L 1 L 2 Arsenic 0.010 0.050 mg/L 1 L L L L L L		Collect Date Receive Date Collector:	: e:	15-SEP-08 10: 17-SEP-08 Client	45		•••				
Mercury Analysis-CVAA STLC Hg in Solid 'As Received" Mercury U -0.0872 0.030 0.200 mg/L I JXL1 10/07/08 1359 801780 1 Metals Analysis-ICP STLC ICP Metals for Solids ''As Received'' Antimony U 0.0113 0.030 1.00 mg/L 1 KDL 10/13/08 1516 801834 2 Arsenic U -0.0244 0.050 mg/L 1 L - </th <th>Parameter</th> <th>Qualifier</th> <th>Result</th> <th></th> <th>DL</th> <th>RL</th> <th>Units</th> <th>DF</th> <th>AnalystDate</th> <th>Time Batcl</th> <th>n Method</th>	Parameter	Qualifier	Result		DL	RL	Units	DF	AnalystDate	Time Batcl	n Method
STLC Hg in Solid "As Received" Mercury U -0.0872 0.030 0.200 mg/L 1 JXL1 10/07/08 1359 801780 1 STLC ICP Metals for Solids "As Received" STLC ICP Metals for Solids "As Received" Antimony U 0.0113 0.030 1.00 mg/L 1 KDL 10/13/08 1516 801834 2 Arsenic U 0.0244 0.050 mg/L 1 KDL 10/13/08 1516 801834 2 Barylin U 0.00271 0.010 0.050 mg/L 1 I <thi< th=""> I I</thi<>	Mercury Analysis-CVA	AA									
Metals Analysis-ICP U -0.0872 0.030 0.200 mg/L I JXL1 10/07/08 1359 801780 1 Metals Analysis-ICP U 0.0113 0.030 1.00 mg/L 1 KL1 10/07/08 1359 801780 1 Antimiony U 0.0113 0.030 1.00 mg/L 1 KDL 10/13/08 1516 801834 2 Arsenic U 0.00271 0.010 0.050 mg/L 1 I <thi< th=""> I <thi< th=""></thi<></thi<>	STLC Hg in Solid "As Re	eceived"									
Metals Analysis-ICP STL CLCP Metals for Solids "As Received" Antimony U 0.0113 0.030 I.KDL IOUI3/08 1516 801834 2 Arsenic U 0.010 0.050 mg/L 1 Barium 9.72 0.010 0.050 mg/L 1 Cadmium U 0.00773 0.010 0.050 mg/L 1 Colspan= 0.010 0.050 mg/L 1 Colspan= 0.222 0.0100 mg/L 1 Colspan= 0.210 mg/L 1 Molybdenum U 0.0020 0.100 mg/L 1 0.100 <th< td=""><td>Mercury</td><td>U</td><td>-0.0872</td><td></td><td>0.030</td><td>0.200</td><td>mg/L</td><td>1 J</td><td>XL1 10/07/08</td><td>1359 801780</td><td>1</td></th<>	Mercury	U	-0.0872		0.030	0.200	mg/L	1 J	XL1 10/07/08	1359 801780	1
STLC I CP Metals for Solids "As Received" Antimony U 0.0113 0.030 1.00 mg/L 1 KDL 10/13/08 1516 801834 2 Arsenic U 0.00271 0.010 0.050 mg/L 1 Barium 9.72 0.010 0.050 mg/L 1 Cadmium U 0.00271 0.010 0.050 mg/L 1 Cadmium U 0.00271 0.010 0.050 mg/L 1 Cobalt 0.422 0.010 0.050 mg/L 1 Cobalt 0.422 0.010 0.050 mg/L 1 Lead 0.211 0.025 0.100 mg/L 1 Lead 0.211 0.020 0.100 mg/L 1 Silver U 0.00657 0.010 0.050 mg/L 1 Silver U 0.00657 0.010 0.050 mg/L 1 Silver U 0.00657 0.010 0.050 mg/L 1 Ch	Metals Analysis-ICP						U				
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 0.00273 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 Selenium 0.225 0.050 0.150 mg/L 1 1 Silver U 0.00657 0.010 0.050 mg/L 1 Zinc 2.39 0.020 0.100 <t< td=""><td>STLC ICP Metals for So</td><td>lids "As Received</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	STLC ICP Metals for So	lids "As Received									
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 0.00935 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 1 Silver U 0.00657 0.010 0.050 mg/L 1 Silver U 0.00657 0.010 0.050 mg/L 1 Thallium U 0.014 0.050 mg/L 1 Zinc 2.39 0.020 0.100 mg/L 1 Zinc 2.39 0.020	Antimony	U	0.0113		0.030	1.00	mg/L	1 K	XDL 10/13/08	1516 801834	2
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 Lead 0.211 0.025 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 mg/L 1 Silver U 0.00657 0.010 0.050 mg/L 1 Vanadium 0.187 0.010 0.050 mg/L 1 Vanadium 0.187 0.010 0.050 mg/L 1 Zinc 2.39 0.020 0.100 mg/L 1 Zinc 2.39 0.020 0.100 80075 SW846 3010A ICP-TRACE TCLP by SW846 3010A CXS3 10/06/08 8010<	Arsenic	U	-0.0244		0.050	0.150	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 Silver U 0.00657 0.010 0.050 mg/L 1 Silver U 0.00657 0.010 0.050 mg/L 1 Zinc 2.39 0.020 0.100 mg/L 1 Zinc 2.39 0.020 0.100 mg/L 1 California Code of Regulatic California Wet Method STLC Leaching CIP1	Barium		9.72		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 Molyddenum U 0.00475 0.020 0.100 mg/L 1 Nickel 0.491 0.010 0.050 mg/L 1 Stennium 1 Stennium 0.225 0.050 mg/L 1 The Stennium 0.225 0.050 mg/L 1 The Stennium 0.187 0.010 0.050 mg/L 1 Vanadium 0.187 0.010 0.050 mg/L 1 I Zinc 2.39 0.20 0.100 mg/L 1 I Stenniu Stenniu Stenniu Stenniu Stenniu Stenniu Stenniu	Beryllium	U	0.00271		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 Vanadium 0.187 0.010 0.050 mg/L 1 Zinc 2.39 0.020 0.100 mg/L 1 California Code of Regulati-California Wet Method STLC Leaching CJP1 10/01/08 1000 800775 SW846 3010A ICP-TRACE TCLP by SW846 3010A CXS3 10/06/08 1140 801779 The following Analytical Methods were performed <t< td=""><td>Cadmium</td><td>U</td><td>0.00773</td><td></td><td>0.010</td><td>0.050</td><td>mg/L</td><td>1</td><td></td><td></td><td></td></t<>	Cadmium	U	0.00773		0.010	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 0.014 0.050 mg/L 1 1 Vanadium 0.187 0.010 0.050 mg/L 1 1 Zinc 2.39 0.020 0.100 mg/L 1 1 California Code of Regulati-California Wet Method STLC Leaching CJP1 10/01/08 1000 800775 SW846 3010A ICP-TRACE TCLP by SW846 3010A CXS3 10/06/08 810 801833 SW846 7470A	Chromium		0.0935		0.020	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 0.014 0.050 mg/L 1 Vanadium 0.187 0.010 0.050 mg/L 1 Zinc 2.39 0.020 0.100 mg/L 1 California Code of Regulati 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	Cobalt		0.422		0.010	0.050	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 Silver U 0.00657 0.010 0.050 mg/L 1 Thallium U 0.0114 0.050 mg/L 1 Vanadium 0.187 0.010 0.050 mg/L 1 Zinc 2.39 0.020 0.100 mg/L 1 California Code of Regulati 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 SW846 3010/6010B	Copper		1.47		0.030	0.100	mg/L	1			
Motyodenum U 0.00475 0.020 0.100 mg/L 1 Nickel 0.491 0.010 0.050 mg/L 1 Silver U 0.00657 0.010 0.050 mg/L 1 Thallium U 0.0114 0.050 mg/L 1 Vanadium 0.187 0.010 0.050 mg/L 1 Zinc 2.39 0.020 0.100 mg/L 1 Method Description Analyst Date Time Prep Batch California Code of Regulati- 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 Item Analyst Comments Item SW846 7470A 1 SW846 7470A 2 SW846 3010/6010B SW846 3010/6010B SW846 3010/6010B	Lead		0.211		0.025	0.100	mg/L	1			
McKel 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 mg/L 1 Vanadium 0.187 0.010 0.050 mg/L 1 Zinc 2.39 0.020 0.100 mg/L 1 Method Description Analyst Date Time Prep Batch California Code of Regulati 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 T Analyst Comments T 1 SW846 7470A SW846 7470A 2 SW846 3010/6010B 5	Molybdenum	U	0.00475		0.020	0.100	mg/L	1			
Steinant 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 0.020 mg/L 1 Vanadium 0.187 0.010 0.050 mg/L 1 Zinc 2.39 0.020 0.100 mg/L 1 Method Description Analyst Date Time Prep Batch California Code of Regulati-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 SW846 7470A 2 SW846 3010/6010B	Nickei Salanium		0.491		0.010	0.050	mg/L	1			
Shirt U 0.00037 0.010 0.030 high 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 Regulati 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 SW846 3010/6010B SW846 3010/6010B SW846 3010/6010B	Seleman	ŦŢ	0.225		0.050	0.150	mg/L	1			
Infantini O 0.0114 0.000 0.200 Ing/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 Regulati 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 SW846 3010/6010B SW846 3010/6010B	Thallium	U	0.00037		0.010	0.050	mg/L	1			
The following Prep Methods were performedOutput1MethodDescriptionAnalystDateTimePrep BatchCalifornia Code of Regulati-California Wet Method STLC LeachingCJP110/01/081000800775SW846 3010AICP-TRACE TCLP by SW846 3010ACXS310/06/080810801833SW846 7470A PrepEPA 7470A Mercury Prep TCLP LiquidTXB310/06/081140801779The following Analytical Methods were performedImage: CommentsImage: CommentsImage: Comments1SW846 7470ASW846 3010/6010BSW846 3010/6010BSW846 3010/6010BImage: Comments	Vanadium	U	0.0114		0.050	0.200	mg/L	1			
The following Prep Methods were performedMethodDescriptionAnalystDateTimePrep BatchCalifornia Code of RegulatiCalifornia Wet Method STLC LeachingCJP110/01/081000800775SW846 3010AICP-TRACE TCLP by SW846 3010ACXS310/06/080810801833SW846 7470A PrepEPA 7470A Mercury Prep TCLP LiquidTXB310/06/081140801779The following Analytical Methods were performedMethodDescriptionAnalyst Comments1SW846 7470ASW846 3010/6010BSW846 3010/6010B	Zinc		2.39		0.010	0.100	mg/L	1			
MethodDescriptionAnalystDateTimePrep BatchCalifornia Code of Regulati California Wet Method STLC LeachingCJP110/01/081000800775SW846 3010AICP-TRACE TCLP by SW846 3010ACXS310/06/080810801833SW846 7470A PrepEPA 7470A Mercury Prep TCLP LiquidTXB310/06/081140801779The following Analytical Methods were performed	The following Pren M	ethods were nerf	ormed								
California Code of RegulatiCalifornia Wet Method STLC LeachingCJP110/01/081000800775SW846 3010AICP-TRACE TCLP by SW846 3010ACXS310/06/080810801833SW846 7470A PrepEPA 7470A Mercury Prep TCLP LiquidTXB310/06/081140801779The following Analytical Methods were performedMethodDescriptionAnalyst Comments1SW846 7470ASW846 7470A2SW846 3010/6010BSW846 3010/6010B	Method	Description	ormeu			Analyst	Date	Time	Prep Batch		
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 SW846 7470A 2 SW846 3010/6010B SW846 3010/6010B	California Code of Regu	lati California W	et Method S	TLC Leaching		CJP1	10/01/08	1000	800775		·
SW846 7470A Prep EPA 7470A Mercury Prep TCLP Liquid TXB3 10/06/08 1140 801779 The following Analytical Methods were performed Analyst Comments Method Description Analyst Comments 1 SW846 7470A 2 SW846 3010/6010B	SW846 3010A	ICP-TRACE	TCLP by SV	V846 3010A		CXS3	10/06/08	0810	801833		
The following Analytical Methods were performedMethodDescriptionAnalyst Comments1SW846 7470A22SW846 3010/6010B	SW846 7470A Prep	EPA 7470A I	Mercury Prep	p TCLP Liquid		TXB3	10/06/08	1140	801779		
Method Description Analyst Comments 1 SW846 7470A 2 SW846 3010/6010B	The following Analytic	cal Methods were	e performed								
I SW846 7470A 2 SW846 3010/6010B	Method	Description	- 10110100			Ā	Analyst Comm	ents			
2 SW846 3010/6010B	1	SW846 7470	A								
	2	SW846 3010/	/6010B								

Company : Address : Contact: Project:	Lawrence Security, I 7000 East Mailstop I Livermore Mr. Chad I CES - Non Client Sa Sample I Matrix: Collect D Receive I Collector	Livermore Nati LC Avenue 2-620 2. California 945 F. Davis rmal Deliverab comple ID: D: Date: Date: :	212-N-4 215966014 SO 15-SEP-08 10:45 17-SEP-08 Client		Prc Cli	R biect: ent ID:	eport Date: Oct LLNL00306 LLNL002	ober 13, 2008	• • •
Parameter	Qualif	ier Resul	t I	DL RL	Units	DF	AnalystDate	Time Batch Met	thod
Mercury Analysis-CVA	A								
TCLP Hg in Solid "As Re	ceived"								
Mercury Metals Analysis-ICP	U	-0.000613	0.000	0.002	mg/L	1	JXL1 10/06/08	1322 801306 1	
TCLP ICP Metals for Sol	id "As Receiv	ved"							
Antimony	U	-0.0017	0.03	0 0.100	mg/I	1	KDI 10/07/08	1018 201227 . 2	
Arsenic	Ŭ	-0.0126	0.05	0 0.150	mg/L	1	KDL 10/07/08	1918 801557 2	
Barium		1.05	0.01	0 0.050	mg/L	1			
Beryllium	U	-0.000345	0.01	0 0.050	mg/L	1			
Cadmium	U	0.000869	0.01	0 0.050	mg/L	1			
Chromium	U	0.011	0.02	0 0.050	mg/L	1	· · ·		
Cobalt	U	-0.00107	0.01	0 0.050	mg/L	1			
Copper	U	-0.00084	0.03	0 0.100	mg/L	1			
Molubdonum	U	0.00977	0.02	5 0.100	mg/L	1			
Nickel	U	-0.00737	0.02	0 0.100	mg/L	. 1			
Selenium	J	0.0244	0.01	0 0.050	mg/L	1			
Silver	U	0.0112	0.05	0 0.150	mg/L	1			
Thallium	U	0.000425	0.01	0 0.050	mg/L	1	1. State 1.		•
Vanadium		0.0391	0.05	0 0.200	mg/L	1 -			
Zinc	0	0.141	0.02	0 0.030	mg/L mg/L	1			
The following Prep Met	thods were p	erformed							
Method	Descriptio	on		Analyst	Date	Time	Prep Batch		-
SW846 1311	SW846 12	311 TCLP Leac	hing -FEDERAL	CXW3	10/01/08	1600	200777		_
SW846 3010A	ICP-TRA	CE TCLP by SV	W846 30104	CXS3	10/06/08	0010	801225		
SW846 7470A Prep	EPA 7470	A Mercury Prej	p TCLP Liquid	TXB3	10/03/08	1155	801335		
The following Analytica	al Methods w	vere performed							
Method	Descriptio)n			Analyst Comm	ents			. .
1	SW846 74	70A		, ,					-
2	SW846 30)10/6010B							

WDR Numher			RT		
			200		XRF
N/A 212-N	1-5		17500	Analyst	
DH & NORMALITY	(LSC) RA	DIOLOGICAL SCREEN	ING REPORT	Date Analyzed	
Analysi		Tritium	Gross alpha, beta	Element	Percentage
Date Analyzed	Aliquot (mL or g)	1g	1g		
pH Result	Analyst	Claude Cardenas	Claude Cardenas		
Normality Result (eq/L)	Date Analyzed	9/15/2008	9/15/2008		
HYDROMETER / SPECIFIC GRAVITY	Energy Window	0-18.6 keV	18.6-2000 keV		
Analyst		0	0		
Date Analyzed		1000	3000		
Specific Gravity Result	Renortable Result				
Hydrometer Result	Unit	Dicocitries / ka	DEIUW IVIUC		
FLASH POINT (METHOD 1010)		Su composid			
Analysteeneed	Data Analused	SAW GC			
Date Analyzed					
MDL					
Result					
Unit					
BOILING POINT					
Result				Total	
Unit				<u>e</u>	MMFNTS
LIQUIFICATION TESTING					
Vibration Testing					
Analyst					
Date Analyzed					
Result					
Freeze / Thaw Testing					
Analyst					
Date Analyzed					
Result					
Paint Filter Activity				Date Completed	011 £ 10000
Analyst					000710118
Date Analyzed				Raviawad Bv	
					(Kylor a
)

Certificate of Analysis

Co	mpany :	Lawrence Lives	rmore Natic	onal									
Ad	dress ·	7000 East Aver	me										
110	uress .	Mailstop L-620)					г		D	1. 15 6	2000	
		Livermore, Cal	ifornia 945	51				г	(teport)	Date: Oct	ober 15, 2	2008	
Co	ntact:	Mr. Chad F. Da	ivis										
Pre	oject:	CES - Normal	Deliverabl	e									
		·······											
		Client Sample	e ID:	212-N-5			Pro	iect:	LLN	IL00306			
		Sample ID: Matrix:		215963015			Che	ent ID:	LLN	L002	,	,	
		Collect Date		15_SED_08	10.45								
		Receive Date:		17 SED 08	10.45								
		Collector:		Client									
		Moisture:		2.3%									
Parameter		Qualifier	Result	· · · · · · · · · · · · · · · · · · ·	DL	RL	Units	DF	Ana	lystDate	Time]	Batch	Method
Mercury Analys	is-CVA	1											
7471 Cold Vapor	Hg in Sc	olid "Dry Weight	Corrected"										
Mercury			0.185	V.	0.0161	0.107	mg/kg	10	ETL	09/29/08	1407 79	6414	1
Metals Analysis-	ICP						<i>•</i> •						
6010 TAL Metals	Soil Fed	eral "Dry Weigh	t Corrected	**									
Antimony		U	-0.337		0.306	1.50	mg/kg	.1	HSC	10/12/08	1905 79	6830	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 796	5830	3
Inainum		U	-1.52		4.93	19.7	mg/kg	10					
The following P	rep Met	hods were perfo	rmed										
Method		Description				Analyst	Date	Time	e P	rep Batch			
SW846 3050B		846 3050BS P	REP			FGA	10/10/08	1430) 7	96829			
SW846 7471A Pr	rep	EPA 7471A M	lercury Prep	o Soil		TXB3	09/26/08	1600) 7	96413			
The following A	nalytica	l Methods were	performed						•				
Method		Description	<u>p or for incu</u>			A	Analyst Comm	ents					
1		SW846 7471A					-						
2		SW846 3050B	/6010B										
3		SW846 3050B	/6010B										

31

	Company :	Lawrence Liv	ermore Natio	onal							
		Security, LLC									
	Address :	7000 East Ave	enue								
		Mailstop L-62	:0					R	eport Date: Oct	ober 14, 2008	
	Contact:	Mr. Chad F. D	alifornia 945 Davis	51							
	Project:	CES - Norma	l Deliverab	le							
		Client Samp Sample ID: Matrix: Collect Date Receive Dat	le ID:	212-N-5 215964015 SO 15-SEP-08 10	0:45		Pro Clie	iect: int ID:	LLNL00306 LLNL002		
		Collector:	0.	1/-SEP-08 Client							-
Parameter		Qualifier	Result		DL	RL	Units	DF	AnalystDate	Time Batch	Method
Mercury An	alvsis-CVA	1							_		
STLC He in S	olid "As Rec	- eived"									
Mercury		II	-0.0801		0.030	0.200	ma/l	1	IXI 1 10/07/08	1401 801780	1
Metals Analy	sis-ICP	0	0.0001		0.050	0.200	Ing/L	1	JALI 10/0//08	1401 001700	1
STLC ICP Me	etals for Soli	ds "As Received									
Antimony		II	0.029		0.030	1.00	mg/I	1	KDI 10/13/08	1523 801834	2
Arsenic		Ŭ	-0.0206		0.050	0.150	mg/L	1	RDE 10/15/00	1525 001054	2
Barium		-	13.3		0.010	0.050	mg/L	î			
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			
Shver		U	0.00373		0.010	0.050	mg/L	1			
Vanadium		U	0.00398		0.050	0.200	mg/L	1			
Zinc			1.85		0.010	0.030	mg/L mg/L	1			
The followin	ng Prep Met	hods were perf	ormed								
Method		Description				Analyst	Date	Time	Prep Batch		
California Co	de of Regula	ti California W	et Method S	TLC Leaching		CJP1	10/01/08	1000	800775		
SW846 3010/	<u>م</u>	ICP-TRACE	TCLP by SV	W846 3010A		CXS3	10/06/08	0810	801833		
SW846 7470	A Prep	EPA 7470A	Mercury Pre	p TCLP Liquid		TXB3	10/06/08	1140	801779		
The followin	ng Analytica	l Methods wer	e performed	l							
Method		Description				A	Analyst Comm	ents			
1		SW846 7470	A								
2		SW846 3010/	6010B								

	Company :	Lawrence l	Livermore N	ational									
		Security, L	LC										
	Address :	7000 East .	Avenue										
		Mailstop L	-620					R	eport Dat	te: Oct	ober 13,	, 2008	
	-	Livermore,	California	94551									
	Contact:	Mr. Chad I	F. Davis										
	Project:	CES - Nor	mal Deliver	able									
(c) = 1888/Ab		Client Sa	mple ID [.]	212-N-5			Pro	niect.		0306			
· · · ·		Sample II	D:	215966015			Cl	ient ID:	LLNL	002			
		Matrix:		SO									
		Collect D	ate:	15-SEP-08 1	0:45								
		Receive I	Date:	17-SEP-08									
		Collector	:	Client									
Parameter		Qualifi	ier Res	ult	DL	, RL	Units	DF	Analys	tDate	Time	Batch	Method
Mercury Ana	alysis-CVA	1											
TCLP Hg in S	Solid "As Red	ceived"											
Mercury		U	-0.000801		0.0003	0.002	mg/L	1	JXL1 1	0/06/08	1324 8	01306	1
Metals Analy	sis-ICP						U						-
TCLP ICP Me	etals for Soli	d "As Receiv	red"										
Antimony		U	0.00232		0.030	0.100	mg/L	1	KDL 1	0/07/08	1926 8	01337	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 Solonium		J	0.0383		0.010	0.050	mg/L	1					
Silver		U	-0.0474		0.050	0.150	mg/L	1					
Thallium		U	-0.00437		0.010	0.050	mg/L	1					
Vanadium		U	-0.0180		0.050	0.200	mg/L	1					
Zinc		U	-0.00119 0.206		0.010	0.030	mg/L mg/L	1					
The followin	a Prop Mot	hode wore r	orformed				Ũ						
Method	ig i tep met	Descriptio)n			Analyst	Date	Time	e Pre	p Batch			
SW846 1311		SW846 13	311 TCLP Le	aching -FEDERA	L	CXW3	10/01/08	1600	800	777 ·			
SW846 3010A	4	ICP-TRA	CE TCLP by	SW846 3010A		CXS3	10/06/08	0810	801	335			
SW846 74704	A Prep	EPA 7470	A Mercury I	Prep TCLP Liquid		TXB3	10/03/08	1155	801	305			
The followin	o Analytica	l Methode v	vere nerform	hed									
Method	- mary aca	Descriptio)n			Ā	Analyst Comr	nents					
1		SW846 74	70A										
2		SW846 30)10/6010B										
		5											

Quality Control Summary

					Q	C Su	mmary		Report 1	Date: October (15, 2008	
Contact:	Lawrence I 7000 East A Mailstop L Livermore, Mr. Chad I	Livermore N Avenue -620 California F. Davis	ational	Security	, LLC					Page 1	of 4	
Workorder:	215963											
Parmname			NOM	1	Sample	Qual	QC	Units RP	D% REC9	% Range	Anlst	Date Time
Metals Analysis- Batch	I CP 796830											
QC12016742	62 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%)		
QC12016742	51 MB						0.050					
Amania						U	0.053	mg/kg				10/12/08 16:35
Arsenic						U	0.212	mg/kg				
Darium						U	0.0943	mg/kg				
Genturi						U	0.00819	mg/kg				
Claumium						U	0.00183	mg/kg				
Cabalt						U	0.0963	mg/kg				
Coban						. U	0.00922	mg/kg				
Copper						U	0.0481	mg/kg				
Leau Maluh damum						U	-0.0471	mg/kg				
Molybdenum Nieleel						U	-0.0126	mg/kg				
Nickei						U	0.0728	mg/kg				
Scientum						U	-0.304	mg/kg				
Sliver						. U	0.0558	mg/kg				
Thallium						U	0.0952	mg/kg				
v anadium						U	-0.0567	mg/kg				
C12016742	\$3 215062001	мс				J	0.289	mg/kg				
Antimony	<i>JJ 21J9</i> 03001	1413	52.1	U	-0 220		383	mo/ko	74*	(75%-125%)		10/12/08 16:57
Arsenic		4	52.1	~	4 72		52.4	molko	91	(75% 125%)		10/12/00 10:57
Barium			52.1		172		213	mg/kg	76	$(75\%_{125}\%)$		
			~~~~		115		410	mg/ng	10	(10/120/0)		

### **QC Summary**

Workorder: 215963			<u> </u>			-			Dogo 1	.F 4	
Parmname	NON	4	Sample	Onal	00	Units	RPD%	PECO	Page 2	of 4	Dote Thurs
Metals Analysis-ICP			Sumple	Vuu	QC	Units	KID //	KEA 7	<u>Nange</u>	Anst	Date Time
Batch 796830											
Beryllium	52.1	U	-0 342		48.2	malka		02	(750-1050)		
Cadmium	52.1	J	0.384		46.9	mg/kg		92 80	(75% - 125%)	USC	10/10/00 1/ 57
Chromium	52.1	·	34.2		86.9	mg/kg		101	(75% 125%)	HSC	10/12/08 16:57
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	mø/kø		86	(75% - 125%)		
Molybdenum	52.1	J	0.656		45.5	mø/kø		86 ·	(75% 125%) (75% 125%)		
Nickel	52.1		42.3		87.7	mø/kø		87	(75% - 125%) (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%)		10/12/08 10.57
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						00			(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
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%)		
Cobait	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%)		
Solonium	50.6		42.3		87.6	mg/kg	0	90	(0%-20%)		
Silver	50.6	U	3.47		61.8	mg/kg	4	115	(0%-20%)		10/14/08 16:34
Thellium	50.6	••	0.813		48.4	mg/kg	3	94	(0%-20%)		10/12/08 17:03
Vanadium	50.6	U	-1.89		34.5	mg/kg	2	68*	(0%-20%)		
Zino	50.6		31.3		80.7	mg/kg	1	98	(0%-20%)		
OC1201674265 215963001 SDH T	50.6		128		176	mg/kg	2	95	(0%-20%)		
Antimony		U	-2.24	I	0.629	υσЛ	NI/A		(007, 1007)		10/10/09 17:10
Arsenic			46 1	T	13.2	ug/L	137		(0.07 - 10.00)		10/12/08 17:10
Barium			1690	5	375	ц <i>у Ц</i> ца/І	10.0 *		(0% - 10%)		
Beryllium		U	-3 34	IJ	-0.674	и <u>с</u> /L	N/A		(0%-10%)		
Cadmium		J	3 75	U	0.538	ug/L 110/I	N/A		(0% - 10%)		
Chromium		-	334	Ũ	72.1	ug/L ng/I	8.07		(0.0-10.00)		
Cobalt			103		23.2	ц <i>ур</i> на/Г	12.8 *		(0% 10%)		
Copper			3350		703	nø/L	4.72		(0%-10%)		
Lead			190		41.4	no/L	8.92		(0% 10%)		
Molybdenum		J	6.40	U	1.26	ч <i>ы</i> л.	N/A		(0%-10%)		
Nickel			413	-	92.3	us/I.	11.8 *		(0% 10%)		
						-8-			(0.0 10.0)		

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### **QC** Summary

workoruer.	215905										Page 3	of 4	
Parmname			NOM	[	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Metals Analysis-IC Batch 79	<b>P</b> 6830												
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-Me Batch 79	ercury 6414												
QC1201673385 Mercury QC1201673384	LCS MB		0.112				0.116	mg/kg		103	(66%-134%)	ETL	09/29/08 12:05
Mercury QC1201673386	215963001	MS				U	-0.00223	mg/kg					09/29/08 12:03
Mercury OC1201673387	215963001	MSD	0.106		32.2		23.8	mg/kg		N/A	(75%-125%)		09/29/08 12:09
Mercury OC1201673388	215963001	SDILT	0.119		32.2		21.8	mg/kg	9	N/A	(0%-20%)		09/29/08 12:11
Mercury					5.65		1.09	ug/L	3.36		(0%-10%)		09/29/08 12:13

### Notes:

Workordon

2150(2

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**

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### **QC Summary**

Worko	rder: 215963								Page 4	of 4		
Parmna	ime	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
UI	Gamma SpectroscopyUncertain	identification										
Х	Consult Case Narrative, Data Sun	nmary package	or Project	Manager co	oncerning t	nis qualifi	er					
Y	QC Samples were not spiked with	this compound	1									
^	RPD of sample and duplicate eval	uated using +/-	RL. Conce	ntrations a	re <5X the	RL. Qual	ifier Not Aj	pplicable for I	Radiochemi	istry.		
h	Preparation or preservation holding	g time was exc	eeded									

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 NON	CONFORMANCE REPORT	
<b>Mo.Day Yr.</b> 07-OCT-08	Division: Federal	Quality Criteria: Specifications	Type: Process
Instrument Type: ICP	Test / Method: SW846 3050B/6010B	Matrix Type: Solid	Client Code: LLNL
<b>Batch ID:</b> 796830	Sample Numbers: See Below		
Potentially affected work order(s)( Application Issues: Failed Recovery for MS/PS Failed RPD for MS/MSD, or PS/PSD	SDG): 215963	• • •	
Failed Recovery for MSD/PSD			
Nonconformance Description:		NRG Disposition:	
1. Failed Recovery for MS/PS: QC 1201674263MS		The matrix spike and matrix spike of and thallium due to possible matrix failed for copper because the samp was a brown soil. Data reported.	dup. both failed for antimony, copper interference. The MSD/MSD's RPD le was not homogeneous. The sample
2. Failed RPD for MS/MSD, or PS/F	PSD:		
QC 1201674264MSD			
3. Failed Recovery for MSD/PSD:			
QC 1201674264MSD			
Originator's Name:		Data Validator/Group Leader:	
Kurt Lesher 07-OCT-08		Kurt Lesher 15-OCT-0	8

Quality Review:

Director:

	Lawrence Livermore 7000 East Avenue	National	Securi	ity, LLC $Q$	C Si	ummary			Report D	ate: October Page 1	14, 2008 of 4	
Contact:	Mailstop L-620 Livermore, California Mr. Chad F. Davis	a										
Workorder:	215964											
Parmname		NOM	1	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Metals Analysis-I Batch	<b>CP</b> 801834											
QC120168528	9 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%)		
Danum		5.00				4.94	mg/L		99	(80%-120%)		
Codmium		5.00				4.77	mg/L		96	(80%-120%)		
Chromium		5.00				4.79	mg/L		96	(80%-120%)		
Cobalt		5.00				4.81	mg/L		96	(80%-120%)		
Copper		5.00				4.90	mg/L		98	(80% - 120%)		
Lead		5.00				4.90	mg/L		100	(80% - 120%)		
Molvbdenum		5.00				4.80	mg/L		97	(00% - 120%)		
Nickel		5.00				4.76	mg/I		95	(80% - 120%)		
Selenium		5.00				4 52	mg/L		90	(80% - 120%)		
Silver		5.00				4.84	mø/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%)		
QC120168528	8 MB						8			(0010 12010)		
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					$\mathbf{U}$	-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	1 215064001 249				U	0.00962	mg/L					
Antimony	1 213904001 MS	2 1 1	11	0.00262		1 74	-/T		00	(750 10501)		10/12/09 12 25
Arsenic		5.76	U U	0.00303		1./4	mg/L		02 01	(13%-123%)		10/15/08 12:55
Barium		10.5	0	-0.00489 0.04		4.80	mg/L		91 77	(13%-123%)		
		10.5		9.94		17.9	mg/L		76	(13%-125%)		

### **QC Summary**

Workorder: 215964									Page 2	of 4	
Parmname	NOM	1	Sample	Qual	QC	Units	RPD%	REC %	6 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 QC1201685292 215964001 SDILT	2.11		4.16		5.57	mg/L	7	67*	(0%-20%)		
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	1	Sample	Qual	QC	Units	RPD%	REC %	Range	Anlst	Date Time
Metals Analysis-ICl Batch 80	Р 1834												
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 QC1201683045	TB				416	•	85.8	ug/L	3.02		(0%-10%)		· -
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					н
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-Me Batch 80	<b>rcury</b> 1780												
QC1201685171	LCS												
Mercury			2.00				2.13	mg/L		106	(80%-120%)	JXL1	10/07/08 13:18
QC1201685170	MB												
Mercury OC1201682042	215064002	MC				U	-0.0607	mg/L				·· ·	10/07/08 13:16
Mercury	213964002	IVIS	0.020	I	-0.0362	П	0.00973	mg/I		<i>4</i> 9 *	(75%-125%)		10/07/08 13:28
QC1201683044	215964002	MSD	0.020	Ū	-0.0502	U	0.00715	шgг		47	(1570-12570)		10/07/08 15.28
Mercury QC1201685174	215964002	SDILT	0.020	υ	-0.0362	U	0.00423	mg/L	79 *	21*	(0%-20%)		10/07/08 13:30
Mercury QC1201683045	TB			U	-0.0362	U	-0.106	ug/L	N/A		(0%-10%)		10/07/08 13:32
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

### **GEL LABORATORIES LLC**

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### **QC Summary**

												Page 4	of 4		
Parmna	me			NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
А	The TI	C is a suspe	cted aldol-co	ondensation j	product										
В	For Ge	eneral Chemi	stry and Or	ganic analysi	s the targ	et analy	te was de	ected in the	associated	d blank.					
С	Analyt	e has been c	onfirmed by	GC/MS ana	lysis										
D	Result	s are reporte	d from a dilı	uted aliquot o	of the sam	nple									
E	Metals	%differend	e of sample	and SD is >	10%. Sa	mple co	ncentratic	n must mee	t flagging	criteria					
F	Estima	ted Value													
H	Analyt	ical holding	time was ex	ceeded											
J	Value	is estimated													
М	Matrix	Related Fai	lure												
N/A	RPD o	r %Recover	y limits do n	ot apply.											
ND	Analyt	e concentrat	ion is not de	tected above	the dete	ction lin	nit -								
NJ	Consu	lt Case Narra	tive, Data S	Summary pac	kage, or	Project I	Manager o	oncerning t	his qualifi	er		•			
R	Sample	e results are	rejected												
U	Analyt	e was analyz	ed for, but i	not detected a	above the	MDL,	MDA, or	LOD.							
Х	Consul	lt Case Narra	tive, Data S	Summary pac	kage, or	Project I	Manager (	oncerning t	his qualifie	er					
Y	QC Sa	mples were i	not spiked w	ith this com	oound										
٨	RPD o	f sample and	l duplicate e	valuated usir	ng +/-RL	Conce	ntrations	are <5X the	RL. Qual	ifier Not A	pplicable for	Radiochem	istry.		
h	Prepar	ation or pres	ervation hol	ding time wa	is exceed	ed									

^ 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 REPOF	RT
<b>Mo.Day Yr.</b> 07-OCT-08	<b>Division:</b> 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) Application Issues: Failed Recovery for MS/PS	(SDG):215964(215963-1)		
Failed RPD for MS/MSD, or PS/PS	)		
Failed Recovery for MSD/PSD		. traj_	
Specification and Requirements Nonconformance Description:		NRG Disposition:	
1. Failed Recovery for MS/PS: QC 1201683042MS		1. The MS recovered outside factor of 1000x.	e of its acceptance window due to the prep
2. Failed RPD for MS/MSD, or PS/	PSD:	2. The MSD recovered great N/A.	er than 20% of the MS however the RPD is
QC 1201683044MSD		3. The MSD recovered outsid factor of 1000x. Data reporte	de of its acceptance window due to the prep d as is.
3. Failed Recovery for MSD/PSD:			•
QC 1201683044MSD			
Originator's Name:		Data Validator/Group Leade	er:
Jason Loy 07-OCT-08		Eric Lawson 07-0	DCT-08

**Quality Review:** 

Director:

	COMPANY - WIDE N	IONCONFORMANCE REPO	RT
<b>Mo.Day Yr.</b> 13-OCT-08	<b>Division:</b> 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 Application Issues: Failed Recovery for MS/PS Failed Recovery for MSD/PSD	s)(SDG): 215964(215963-1)		
Specification and Requirements Nonconformance Description:		NRG Disposition:	
1. Failed Recovery for MS/PS:		1. and 2. The MS recovery	for silver and the MSD recoveries for thallium
QC 1201683041MS		and zinc were below the es recoveries were attributed to	tablished acceptance limits. Low MS/MSD o possible matrix interference. All of the
2. Failed Recovery for MSD/PSD:		associated data were repor	ted.
QC 1201683043MSD			
ς			
Originator's Name:		Data Validator/Group Lead	der:

Quality Review:

Director:

# **QC** Summary

Contact.	Lawrence Livermore N 7000 East Avenue Mailstop L-620 Livermore, California Mr. Chad E. Davie	Vational 1	Security, LI	rc <b>z</b>		J	•		Report D	ate: October Page 1	13, 2008 of 4		
Workorder:	215966												
Parmname		NOM		ample (	Jual	00	Unite	DDD.07	DECO	Domm	A 1 . 4	<b>D</b> /	(D)
Metals Analysis-I Batch	CP 801337	Rom	. 5		Zuai		Units	KI D 70	KEU %	Kange	Anist	Date	Time
QC120168412	7 LCS												
Antimony		5.00				4.81	mg/L		96	(80%-120%)	KDL	10/07/0	)8 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	mø/L		95	(80% 120%)			
Selenium		5.00				4 42	mø/L		88	(80% 120%)			
Silver		5.00				4 71	mg/L		94	(80% 120%)			
Thallium		5.00				4 72	mg/l		9/1	(80% 120%)			
Vanadium		5.00				4.87	mg/I		97	(80% - 120%)			
Zinc		5.00				4 59	mg/L		62	(80% - 120%)			
QC1201684120	5 MB					1.55	шţуĿ		12	(00/0-120/0)			
Antimony					U	-0.0136	mg/L					10/07/0	8 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	mø/L						
Silver					Ū	-0.000592	mg/L						
Thallium					Ū	0.012	mg/L						
Vanadium					Ū	-0.00187	mø/I						
Zinc					Ŭ	0.011	mo/I						
QC1201683046	215966001 MS				č	0.011	тgг						
Antimony		2.11	J 0	.0538		1.90	mg/L		88	(75%-125%)		10/07/08	3 17:02
Arsenic		5.26	U 0	.0161		4.78	mg/L		91	(75%-125%)			
Barium		10.5	1	0.733		10.1	mg/L		89	(75%-125%)			

# **QC Summary**

Workorder: 215966									Page 2 of 4				
Рагтпате	NOM	ſ	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	Ū	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 QC1201684130 215966001 SDILT	2.11		0.639		2.36	mg/L	2	82	(0%-20%)				
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%)				

				<u> </u>	<u> </u>		L					
Workorder:	215966									Page 3	of 4	
Parmname			NOM	Sample	Qual	QC	Units	RPD%	REC %	6 Range	Anlst	Date Time
Metals Analysis-IC	Р											
Batch 80	01337											
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-Me Batch 80	rcury 1306											
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	0.020	0.0(0		0.005	·			(TCM 10CM)		10106100 10 05
OC1201683049	215966001	MSD	0.020	0.269		0.265	mg/L		N/A	(/5%-125%)		10/06/08 12:05
Mercury	215700001	1100	0.020	0.269		0.240	mø/L	10	N/A	(0%-20%)		10/06/08 12-07
QC1201684069	215966001	SDILT		0.207		0.210		~~		(0,0 20,0)		10.00,00 12.07
Mercury QC1201683050	ТВ			2.69		0.526	ug/L	2.3		(0%-10%)		10/06/08 12:09
Mercury					U	-0.000924	mg/L					10/06/08 11:53

# **OC Summary**

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**

Workor	der:	215966					•						
Parmna	me		NOM	Sample	Qual	00	Unito	DDDØ	DECO	Page 4	l of 4		
A	The T	TIC is a suspected	aldol-condensation prod	uct	Quai		Onits	<u>KID%</u>	KEU %	Kange	Anist	Date	Time
В	For G	ieneral Chemistry	and Organic analysis the	target analy	te was de	tected in the	associated	l blank					
С	Analy	/te has been confi	med by GC/MS analysis	:			associator	. oranic.					
D	Resul	ts are reported fro	m a diluted aliquot of the	e sample									
E	Metal	s%difference of	sample and SD is >10%	. Sample co	ncentratic	n must meet	flagging	criteria					
F	Estim	ated Value					00 0						
Н	Analy	tical holding time	was exceeded										
J	Value	is estimated											
М	Matri	x Related Failure											
N/A	RPD o	or %Recovery lim	its do not apply.										
ND -	Analy	te concentration is	s not detected above the	detection lim	nit								
NJ	Consu	ılt Case Narrative,	. Data Summary package	, or Project I	Manager o	concerning th	nis qualifie	er					
R	Samp	le results are rejec	ted										
U	Analy	te was analyzed fo	or, but not detected abov	e the MDL, I	MDA, or	LOD.							
Х	Consu	ılt Case Narrative,	Data Summary package	, or Project N	Manager c	oncerning th	is qualifie	r					
Y	QC Sa	amples were not sj	piked with this compoun	đ				•					
^	RPD o	of sample and dup	licate evaluated using +/	-RL. Concer	ntrations a	are <5X the I	RL. Quali	fier Not Ap	plicable for R	adiochemi	stry.		
h	Prepa	ration or preservat	ion holding time was exe	ceeded									
N/A ind ^ The Re five time RL is us	icates ti elative es (5X) ed to ev	hat spike recovery Percent Difference the contract requi valuate the DUP re	r limits do not apply whe e (RPD) obtained from the ired detection limit (RL). esult.	n sample con ne sample du In cases wh	ncentratio plicate (l ere either	n exceeds sp DUP) is eval the sample c	ike conc. l uated agai or duplicat	by a factor nst the acce e value is le	of 4 or more. eptance criteri ess than 5X th	a when the e RL, a cor	sample is strol limit	greater t of +/- th	han e

* 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 NONC	ONFORMANCE REPORT	
<b>Mo.Day Yr.</b> 09-OCT-08	<b>Division:</b> 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(2165	42-2)	
Application Issues:			
Failed Recovery for MSD/PSD			
Specification and Requirements Nonconformance Description:		NRG Disposition:	
1. Failed Recovery for MSD/PSD:		1. The MSD recovery for copper was	s below the established acceptance
QC 1201683048MSD		the associated data were reported.	o possible matrix interference. All of
	1		
Originator's Name:		Data Validator/Group Loador	

Kurt Lesher

Quality Review:

esher 09-OCT-08

Data Validator/Group Leader:Helen Camelio10-OCT-08

Director:

# **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									
OC1201675583 215963001 DUP									
Alpha		111		8 51	nCi/a	27		(0% - 100%) DYR5	10/07/0921-55
	Uncert:	+/-1 81		+/-171	PCDE	. 21		(070 - 10070) DADJ	10/07/0821.55
	TPL	+/-3 35		+/-2.60					
Beta	110.	17.4		17.3	nCi/g	1		(0% - 20%)	
	Uncert:	+/-1.51		+/-1.51	P016	•		(070 2070)	
	TPU:	+/-2.88		+/-2.85					
QC1201675586 LCS		., 2.00							
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									
Аірпа	111	11.1		117	pCi/g	16	96	(0%-20%)	10/08/0811:33
	Uncert:	+/-1.81		+/-13.9					
Data	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	. 0				
	TPU:	+/-0.848		+/-0.855					
QC1201677665 LCS									

#### **GEL LABORATORIES LLC**

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

# **QC** Summary

Workordory 2150(2								
215965							Page 2 of 3	
Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range Anlst	Date Time
Rad Liquid Scintillation								
Batch /98304								
Tritium	12.0		12.6	pCi/g		105	(75%-125%)	
	Uncert:		+/-1.39					
	TPU:		+/-3.17					
QC1201677662 MB								
Intium		U	-0.394	pCi/g				09/30/0815:44
	Uncert:		+/-0.820				•	
OC1201677664 215062001 MS	TPU:		+/-0.820				<b>*</b>	
Tritium	12.2 11	-0 348	12.8	pCila		105	(750 10501)	00/20/0017 17
	Uncert:	+/-0.848	+/-1 40	peng		105	(75%-125%)	09/30/081/:1/
	TPU:	+/-0.848	+/-3.22				. ~	
The Qualifiers in this report are defined	t an fallanna							
The Quantiers in this report are defined	i as tonows:							
** Analyte is a surrogate compour	nd							
< Result is less than value reported	ed							
> Result is greater than value rep	orted							
A The TIC is a suspected aldol-co	ondensation product							
B For General Chemistry and Ors	anic analysis the ta	rget analyte was det	ected in the a	ssociated h	lank			
BD Results are either below the MI	DC or tracer recover	v is low	celea in the a	sooerated b	ank.			
C Analyte has been confirmed by	GC/MS analysis	, 10 10					•	
D Results are reported from a dilu	ted aliquot of the se	umple						
2 Acound are reported from a une	nea anquoi or the sa	unpic						

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**

WORKOTUCE: 21590	55						Page .	3 of 3		
Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
N/A indicates that spike	e recovery limits do not apply whe	en sample concentration e	exceeds spi	ike conc. l	by a factor of	of 4 or more.				
** Indicates analyte is a	a surrogate compound.									
^ The Relative Percent	Difference (RPD) obtained from	the sample duplicate (DU	JP) is evalu	uated agai	nst the acce	ptence criter	ia when the	e		

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.

Workordow

2150/2

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

arysi appropri n No appiy 50 Ś

For document control purposes, user <u>SHALL</u> ensure that all working copies are identical to current electronic version, http://cms.llnl.gov/ces/OA_Docs/DA_Docs/Hunl



## 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

 comptetion	1

9-17-08

**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

<u>Client ID</u>	CES ID	Requested Analyses
212-1	212-1	TTLC, STLC, TCLP metals, GAB, Tritium, Rad Dec.
212-2	212-2	TTLC, STLC, TCLP metals, GAB, Tritium, Rad Dec.
212-5	212-5	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:

5 Redemants

Hector Pedemonte

September 17, 2008 Date

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SOP-CES-P555 Addendum 3



V/C Version 1.0 3/22/00

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 ( $\sqrt{}$ ) 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	DB No/Matrix	
GEL Laboratories LLC, Charleston, South Carolina. WSAP (LLNL)	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)	Report Level	
GEL Labs LLC: TTLC, STLC, TCLP metals, GAB and Tritium. WSAP: Rad Decs ₽	Results and Summary QC	

Parameters	Acceptable	Comments	
1. Precision	V	See Additional Comments section below.	
2. Accuracy	V	See Additional Comments section below.	
3. Representativeness	V	The acquired sample is representative of the waste stream.	
4. Completeness	V	All requested analyses were reported.	
5. Comparability	$\checkmark$	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 results 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 Red	monto	Date September 17, 2008	

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



a mender of The GEL Group + C



P0 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, Edish M. Kest

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:

Laboratory	Sample
<b>Identification</b>	<b>Description</b>
<b>214909</b> 001	212-1
214909002	212-2
214909003	212-5
<b>214911</b> 001	212-1
214911002	212-2
214911003	212-5
<b>214912</b> 001	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. Keat

Edith Kent Project Manager

2040 Savage Road Charleston, SC 29407 P 843.556.8171 F 843.766.1178 www.gel.com

#### 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 214909002 was diluted 500x for mercury in order to bring over range concentrations within the linear to minimize suppression due to matrix interferences. 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. 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:

La Devis Date: 9-10-02 **Reviewer:** 

#### 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-BBBSD) 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-BBBSD) 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
<b>Prep Method :</b>	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: <u>Aplican's</u> Date: <u>9-10-08</u>

#### 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-BBBSD) 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-BBBSD) 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	GL-MA-E-013 REV# 17, GL-MA-E-008 REV# 13, GL-LB-E-
Procedures:	006 REV# 13 and GL-MA-E-010 REV# 18
Analytical Method:	SW846 3010/6010B and SW846 7470A
<b>Prep Method :</b>	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 Gella Miela

# Sample Transportation Determination

Section I					
Requester <u>Doug Villela</u>	Phone # <u>2-0927</u>				
Requisition # / Sample ID <u>212-1</u>					
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 <u>4= 250ml sqt jars @ 300gms ea</u> 500 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					
Section II (Sample Team Lead – complete and return to Requester if not DOT regulated) DOT Regulated?					
Determined by (Print) CHms 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 (Rrint) Doug Villela Date 8/28/08 ula ____ Signature _ Section II (Sample Team Lead – complete and return to Requester if not DOT regulated) DOT Regulated? Ves X No HAD DAVIS Date 8/28/08 Determined by (Print) 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 #

WGS 0140, Expiration Date: 07/31/11

# Sample Transportation Determination

Section I		
Requester	Doug Villela	Phone # <u>2-0927</u>
Requisition	# / Sample ID <u>212-5</u>	
Waste Type sign below a Hazardo Number of o	e: Non-hazardous wa and process sample. No f bus Radioactive N containers: 40 mL 125 mL 250 mL <u>4= 250m</u> 500 mL 1000 mL	aste or retention tank (not DOT) – Print and urther action required. lixed CA Combined
Print and signal Section II controls information	gn below and forward to S ompletion. Ensure WDR o is submitted along with th	Cample Team Lead for further review and r other preliminary characterization is form.
Determined Signature	by (Print) <u>Doug Villela</u>	Date <u>8/28/08</u>
Section II ( regulated) DOT Regula	Sample Team Lead – con ated? 🔲 Yes 💢 No	nplete and return to Requester if not DOT
Determined Signature _	by (Print) <u>CHAD</u>	DAVIS Date 8/28/08
If DOT regu	lated forward to RHWM D	isposal Office for completion of Section III.
Section III DOT Inform	ation	
Proper Ship	ping Name	
Packaging		
Rad Info	Attached	
COC #	17485	

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# Sample Hazard Assessment

**Client Sample ID** 

212-1

For Authorized Reviewer Use Only							
		Q	ualifyin	g Const	ituents		
Hazard Type	Yes	Co	mment		Hazard Type	Yes	Comment
Radiological					Solvents		
Alpha	4				Corrosive		
Beta		10035	itble		Acid		
Tritium	<b>H</b>	 	NORSH PROPAGATION - 1		Base		
Inhalation	Z	Hg	VAPOR		Reactive		
Beryllium (powder sample <0.10% Be; slurry, liquid, or solid sample >0.10% Be)					Oxidizer		
<b>Biologically Active Materials</b>					Ignitable		
Does the sample contain (Fed. or St.	ate-define	ed) Acutely	y or Extre	mely Haz	ardous Material?		
Does the sample contain high explose Does the sample contain <10 mg nor high explosives by mass?	sives? n-primary	initiating	or secon	dary expl	osives, or <25%		
None of the hazards listed ab	ove are p	present in	the sam	ple.			
🔀 Check here, if WDR is not a	available	(For RH	WM use	only).			
I certify, to the best of my know	ledge, ti	hat inforr	mation p	rovided	above is accurate	and comp	olete.
Authorized Reviewer (Print Nar	ne):		Authori	zed Rev	iewer (Signature):		Date:
(than DAN	11S		(	Hel	4000		8/28/08
			and the second of				
Qualifying Consti	e e e e e e e e e e e e e e e e e e e	For	Samp	ler Use	Only	Comm	
Qualifying Constit	tuents	For	Samp YES	ler Use NO	Only s/zol ^{oty}	Comm	nents
Qualifying Consti Was Hazard Assessment Control (H	tuents HAC) nece	For essary?	Samp YES ☑	Ier Use NO	Only s/zel ^{sk}	Comm	nents
Qualifying Constinue Was Hazard Assessment Control (H Per Sample Basis: Are rad levels de Exceeds 30	tuents HAC) nece etectable	For essary? by meter?	Samp YES	ler Use - NO E	Only s/zc/o%	Comn	nents
Qualifying Consti Was Hazard Assessment Control (H Per Sample Basis: Are rad levels d Exceeds 30 Exceeds 5 r @ 30 cm (1	tuents HAC) nece etectable 0,000 CF nR/hr ft)	For essary? by meter? PM	Samp YES 2	ler Use NO E	Only s/zclo⊄ □ Check if N/A	Comm	nents
Qualifying Consti Was Hazard Assessment Control (F Per Sample Basis: Are rad levels d Exceeds 30 Exceeds 5 r @ 30 cm (1 Exceeds 1 r	tuents HAC) nece etectable 9,000 CP mR/hr ft) microCu	For essary? by meter? 'M	Samp YES M	ler Use NO	Only s/zclos Check if N/A	Comn	nents
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CES	SHA Version 4.3	<u>с</u> _						Client Sample ID
	10/25/2005	Sa	mpi	ена	azar	d Assess	ment	412-2
			For Au	thorized	Review	er Use Only		
		<u></u>	C	Qualifyin	g Cons	tituents	* Korja 	
Hazar	d Type	Yes	Co	omment	n de far 19 - Albert - 19 - Albert -	Hazard Type	Yes	Comment
Radiological						Solvents		<u>continent</u>
Alpha		P				Corrosive		
Beta		Ψ	pos	sible		Acid		
Tritium		Æ	Tanca minimized and	\$75.900 pp. 000 pm. 000		Base		
Inhalation	<u> </u>	×	Hg	VATOR	nar shu nar shu nar shu	Reactive		
Deryllium (powder sample <  liquid, or solid sar	0.10% Be; slurry, nple >0.10% Be)		9			Oxidizer		
<b>Biologically Ac</b>	tive Materials					Ignitable		
Does the sample o	ontain (Fed. or St	ate-defin	ed) Acute	ly or Extre	mely Haz	ardous Material?		
Does the sample o Does the sample o high explosives by	ontain high explo ontain <10 mg noi y mass?	sives? 1-primary	y initiating	i or secon	dary expl	osives, or <25%		
None of the	hazards listed ab	ove are	present i	n the sam	ple.			
Check here	e, if WDR is not a	vailable	e (For RH	IWM use	only).			
I certify, to the I	best of my know	ledge, t	hat infor	mation p	orovided	above is accurate	and com	olete.
Authorized Rev	riewer (Print Nar	ne):	· · · · · · · · · · · · · · · · · · ·	Author	zed Rev	iewer (Signature):		Date:
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Quali	fuing Consti		Fo	r Samp	ler Use	Only I		
Was Hazard As	sessment Control (			TES M	NU	8/28/26	Comn	nents
Per Sample Basi	s: Are rad levels d	etectable	by mater?					
	Exceeds 30							
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Comments:	Comments:							
I certify, to the b	est of my know	edge, t	hat infor	mation p	rovided	above is accurate	and comp	plete,
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RHWM personne	I must notify CE	S PEL,	or design	or CES	Use C	Dnly exceed 1 microCuri	le for appr	oval to submit sample.
<ol> <li>Berms</li> <li>Retention Tanks</li> <li>PE Samples</li> </ol>	6. Preconstr 7. Environm 8. Trip or Fie	uction Soi ental Soils ental Blanks	ils (ini	n receiv tials):	Nea by	Date:	CE:	7485
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CES	SHA				and an		Client Sample ID
	Version 4.3 10/25/2005	Samp	le Ha	izar	d Assessr	nent	212-5
	For Authorized Reviewer Use Only						
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Radiological	dlype	Yes C	omment	성장상 1944년	Hazard Type	Yes	Comment
Alpha		R			Corrosive		
Beta	-	1 Dag	sible		Acid		
Tritium		A Poo			Base		
Inhalation		× 4	VAPOR		Reactive		
Beryllium (powder sample < liquid, or solid sar	0.10% Be; slurry, nple >0.10% Be)				Oxidizer		
<b>Biologically Ac</b>	tive Materials				Ignitable		
Does the sample c	ontain (Fed. or St.	ate-defined) Acute	ly or Extre	mely Haz	ardous Material?		
Does the sample c Does the sample c high explosives by	ontain high explo ontain <10 mg noi r mass?	sives? 1-primary initiatin	g or secon	dary expl	osives, or <25%		
None of the	hazards listed ab	ove are present	in the sam	ple.			
Check here	e, if WDR is not a	vailable (For RI	HWM use	only).			
I certify, to the t	pest of my know	ledge, that info	rmation p	rovided	above is accurate a	Ind comple	ete
Authorized Rev	iewer (Print Nar	ne):	Authori	zed Rev	iewer (Signature):		Date:
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		urius secondurations and					
Quali	fvina Consti		ves	er Use	Only	Comme	
Was Hazard Ass	sessment Control (H	AC) necessary?			8/28/0 5	Comme	
Per Sample Basis	s: Are rad levels de	etectable by meter	?	Ì	Check if N/A	<u></u>	
	Exceeds 30	.000 CPM					
	Exceeds 5 r @ 30 cm (1	nR/hr ft)					
	Exceeds 1 r	nicroCurie		Z			
Comments:	·····	······	· <u>↓</u>				
I certify, to the b	I certify, to the best of my knowledge, that information provided above is accurate and complete.						
Authorized Sam	pler (Print Nam	e):	Authoriz	ed Sam	pler (Signature):		Date:
DOUG V	1105-4		(in'	bith	1/1/1		8-20-00
/ 24-10(24-27)(24-11-1	e Se tos successivas			in Price in Price			
RHWM personne	I must notify CE	F S PEL, or désig	or CES	USE C	nly exceed 1 microCurie	for approv	al to submit sample
SHA is not required f 1. Berms	for: 5. Research 6. Preconstru	Samples SH uction Soils (in	A Receiv	ed by	Date:	CES	COC #:
<ol> <li>Retention Tanks</li> <li>PE Samples</li> </ol>	7. Environme 8. Trip or Fie	ental Soils   (III. Id Blanks	niais). A	0 d	8-78-18	17	495
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# Hazard Assessment and Control Form

This document summarizes key hazards and controls needed to perform work including, in some cases, specific respirators to be used. This document is not a work authorization.

File name: B212/1345.06HgSoil	Prep/Last rev. Date(s): 08.18.08	
Prepared by (list all): Philip Bumala	Discipline reviewed by (list all): Jennifer Kapp	Expiration Date: 08.18.09

### **Operation Description**

Building: 212	Room/Area: No Perimeter Area of Bldg. Footprint (Ref. Figure 1)			IWS/Authorizing document: 1345.06		
ES&H Team: 2	Program: RHWM			Operation Start Date: 08.19.08		
	Radioactive and Hazardous Waste Management Division					
RI (also list super	visor, if needed):	Employee No(s).		Phone/Page	No(s).	
Michael H. Auble (RI) / Joeseph Albert (Supr.) 005610 / 006982				925-422-8158	3/925-423-0149	
Operation: Mercu	ry (Hg) contaminted Soil Sample	Collections	Hours	/Day: 6-8	Days/Year: 10	

#### **Overall Operation Description:**

RHMW Technicians will collect surficial soil core samples as determined from a coring grid, the total sample number to be determined on site in the area of contamination. Soil vapor Hg levels will be continuously monitored using a real-time, hand-held Hg analyzer.

Personnel							
Personnel Involved — See IWS 🛛 See following list 🖂:							
Name(s) (Use Continuation Section if >20 people are involved)	LLNL Employee No.	Job Category Code					
Chad Davis	002608	RHMW TECHNICIAN					
Claude Cardenas	136125	RHMW TECHNICIAN					
Douglas Villela	004657	RHMW TECHNICIAN					
Comments:							

# Respiratory Protection

### Air Purifying Respirators:

Million donvines.	Phase/Activity/	Dhaqo/Activ/h/ Q	
	Description of works	Priase/Activity 2	Phase/Activity 3
	Soil romoval 8 transferre to	Description of work:	Description of work:
	Soli removal & transfere to	NA	NA
Filtor/Cartridge Tupe			
Others Combo D			
100/Margart			
	57		
Canister (specify type)			
Configuration			
1/2 Mask APR			
Other: Full face	$\boxtimes$		
(Mercury Canisters)			
HEPA/Activated			
Charcoal			
Frequency of respirator	After 8 hours of use or as		
exchange (if not after	per end of service indicator		
eight hours that can be	on Mersorb		
spread over up to five			
work days; also			
provide cartridge			
changeout schedule):			
OK to reuse filter? No D	ispose of filter as HW and cle	an masks before return? Yes	Note decontamination
instructions in the following	ng "Comments" section.		note desentamination
For filtering facepiece res	pirators only:		
Is this respirator being us	ed to prevent allergic reaction	s?No.	
Is this respirator being us	ed for personal comfort/prefe	rence? No	
Comments:			

#### Air Supplied Respirators

	Phase/Activity1	Phase/Activity 2	Phase/Activity 3
Operating Type			
Constant flow		<u>П</u>	17
Pressure demand			
Туре			
Abrasive blaster's hood		Π	
Other:			
Air source/location			
Comments: NA		L	

Issue Point Administrator	Badge No.	
Issue Point Location		

# Other PPE

### Personal Protective Equipment:

For engineering controls - see IWS 🛛 See the IWS and this section of the HAC 🗌 See this section 🗌							
	Phase/Activity1	Phase/Activity 2	Phase/Activity 3				
Eye protection	Full Face APR						
Garments	Disposable Tyvek						
Gloves	Work gloves over Nitrile						
Head protection	Hard Hat						
Hearing protection							
Safety shoes	Rubber Boots w/ toe						
	protection		- Longel				

Shoe covers	
Other PPE controls	
Comments:	

#### **Engineering Controls**

For engineering controls	s - see IWS 🔲 See the IWS a	nd this section of the HAC	See this section
	Phase/Activity1	Phase/Activity 2	Phase/Activity 3
Eyewash/Shower			
Glovebox			
Hood/fan number			
Interlocks			Π
Portable ventilation			
Other engin. controls			
Comments:		And the state of t	

# Administrative Controls

For administrative control	ols - see IWS 🔲 See the IWS	S and this section of the HAC	See this section
	Phase/Activity1	Phase/Activity 2	Phase/Activity 3
Training			
Requirements:			
Respirator-related			
HAZCOM-related	Mercury		$\square$
Posting/labeling			
HHC Poster			
Other signs/labels	Authorized Personnel		
	Only		
Other admin. controls			
Medical surveillance? R	espirator: 🔲 Hearing protec	tion: 🔲 Other: 🗍	
Comments:			

# Additional Control Requirements (Use Continuation Section if there are more than 10 comments)

# Hazard Evaluation

Pot	ential for: Confined space	e entry 🔲 Per	mit confined sp	bace entry	Oxygen deficie	ency 🗌 IDL	.H 🗌
Assi	ign a number to each agen	t. Assign a lower-	case letter after	each number if	more than one ro	oute of exposi	ure is possible
#	Agent(s) (Use Continuation Section if >10 agents are involved)	Exposure Level	Exposure Limit Type	Route(s) of Exposure	Evaluation Type	Current OEL	OEL Source
	Mercury (Hg)	ACGIH TLV 0.025 mg/m3 mg/m3	TWA	Inhalation	Literature	0.025 mg/m3	TLV
		mg/m3	TWA	Inhalation	Measured at L	1.0.11	OSHA PEL
		mg/m3	TWA	Inhalation	Measured at L		OSHA PEL
		mg/m3	TWA	Inhalation	Measured at L		OSHA PEL
		mg/m3	TWA	Inhalation	Measured at L		OSHA PEL
		ma/m3	TWA	Inhalation	Measured at L		OSHA PEL
		ma/m3	TWA	Inhalation	Measured at L		OSHA PEL
		mg/m3	TWA	Inhalation	Measured at L		OSHA PEL
		mg/m3	TWA	Inhalation	Measured at L		OSHA PEI
		mg/m3	TWA	Inhalation	Measured at L		OSHA PEL
		mg/m3	TWA	Inhalation	Measured at L		OSHA PEL
		ma/m3	TWA	Inhalation	Measured at L		OSHA PEL
		mg/m3	TWA	Inhalation	Measured at L		OSHA PEL
		mg/m3	TWA	Inhalation	Measured at L		OSHA PEL
		mg/m3	TWA	Inhalation	Measured at L		OSHA PEL
		mg/m2	TWA	Inhalation	Measured at L		OSHA PEL
		mg/m2	TWA	Inhalation	Measured at L		OSHA PEL
		mg/m3	TWA	Inhalation	Measured at L		OSHA PEL
		mg/m3	TWA	Inhalation	Measured at L		OSHA PEL
		mg/ma	TWA	Inhalation	Measured at L		OSHA PEL
		mg/m3	TWA	Inhalation	Measured at L		OSHA PEL
		mg/m3	TWA	Inhalation	Measured at L		OSHA PEL
		mg/m3					

# General Comments

# Emergency Procedures

Specify emergency measures, if applicable:

# Continuation Section

# **Sample Data Summary**

	R	HWM AN	<b>ALYSIS RE</b>	EPORT			
WDR Number Samp	ole ID	Analytical L	og Book ID		COC		XRF
N/A 212	2-1				17485	Analyst	
pH & NORMALITY		RADIOLOG	ICAL SCREE	NING REP	ORT	Date Analyzed	
Analyst			Tritium	9	ross alpha, beta		Percentage
Date Analyzed	Aliquot (r	nL)	1.0		1.0		
pH Result	Analys	ST STATES	Chad Davis		Chad Davis		00000000000000000000000000000000000000
Normality Result (eq/L)	Date Anal	yzed	8/28/2008		8/28/2008		
HYDROMETER / SPECIEIC GRAVITY	Energy Wi	wopu	0-18.6 keV		18.6-2000 keV		OR DOWN ON A SHARE BEFORE AND A DAMAGED A
	DPM		0		0		***********
Date Analvzed	WDC		1000		3000		
Shecific Gravity Result	Actual Re	esult	0		0		980 (1940) 99 (1940) 99 (1944) 90 (1940) 97 (1940) 98 (1940) 98 (1940) 99 (1940) 1940 1940 1940 1940 1940 1940
Hvdrometer Result	Reportable	Result	Below MDC		Below MDC		
uya anacan waan	nuit T		picocuries / kg		picocuries / kg		ORACODORACIONAL DE LA TRANSPORTANTI DE LA TRANSPORTANTI DE LA TRANSPORTANTI DE LA TRANSPORTANTI DE LA TRANSPORT
FLASH POINT (METHOD 1010)			SAW GC				YAMAN DIN DI DIR KARANJARA MANANANANANANANANANANANANANANANANANANA
Analyst	Date Analyze	<u>4</u>		ct in			
Date Analyzed		Chemical	<u>I Audiy</u>		Datastian Linit		
MDL				IVCOUL			лайна нь эм нэ
Result				000000000000000000000000000000000000000			
Unit							
BOILING POINT							
Result						Total	
Unit						ê	<b>MENTS</b>
LIQUIFICATION TESTING							
Vibration Testing				*********			
Analyst							
Date Analyzed							
Result							
Freeze / Thaw Testing							
Analyst							
Date Analyzed						- 10,000,000	
Result							
Paint Filter Activity						Poto Completed	
Analyst						nale collibried	0/20/2008
Date Analyzed							
Result							Stril FLY-30

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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.

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.

9-10-02 Caris

Réviewed by

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# **Certificate of Analysis**

Сог	mpany :	Lawrence Livern Security, LLC	nore Natio	nal									
Add	dress :	7000 East Avenu Mailstop L-620	e					R	enort l	Date: Sen:	temher	10 200	8
		Livermore, Calif	ornia 945	51				1	cepon i	Date. Sep		10, 2000	5
Сог	ntact:	Mr. Chad F. Dav	is										
Pro	ject:	CES - Normal I	)eliverabl	e									
		Client Sample Sample ID: Matrix: Collect Date: Receive Date: Collector: Moisture:	ID:	212-1 214909001 SO 19-AUG-08 30-AUG-08 Client 2.32%	11:30		Prc Cli	iect: ent ID:	LLN LLN	IL00306 IL002			
Parameter		Qualifier	Result		DL	RL	Units	DF	Ana	lystDate	Time	Batch	Method
Mercury Analys	is-CVAA	<b>A</b>											
7471 Cold Vapor	Hg in So	olid "Dry Weight C	Corrected"										
Mercury			2490		38.0	253	mg/kg	25000	JXL1	09/04/08	1541 7	'90539	1
Metals Analysis-	ICP												
6010 TAL Metals	Soil Fed	eral "Dry Weight	Corrected	· ·									
Arsenic			7.89		0.491	1.50	mg/kg	1	JWJ	09/09/08	0329 7	90812	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					
Inallium		j.	1.98		0.491	3.00	mg/kg	1					
		<b>T</b> T	37.7		0.0983	0.500	mg/kg	1	1100	00/00/00	0000 5	00010	2
Anumony		U	-14.2		15.2	49.1	mg/kg	50	HSC	09/09/08	0932 /	90812	3
German		U	-9.44		4.91	24.6	mg/kg	50					
Copper			1020		14.7	49.1	mg/kg	50					
Leau			1920		12.3	49.1	mg/kg	50					
Zinc			206 3850		4.91 9.83	24.6 49.1	mg/kg mg/kg	50 50					
The following P	ren Met	hads were norfar	med										
Method	Tep Met	Description	meg			Analyst	Date	Tim	e P	rep Batch			
SW846 3050B		846 3050BS PR	EP			CX\$3	09/08/08	0832	2 7	790808			
SW846 7471A Pr	rep	EPA 7471A Me	ercury Prep	o Soil		TXB3	09/04/08	0810	5 7	790538			
The following A	nalytica	l Methods were n	erformed										
Method		Description				A	Analyst Comn	ients					
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.

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.

9-10-08 Cavis

Reviewed by

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

Compa Addre: Contac Projec	any: Lawrence Liv Security, LLC SS: 7000 East Av Mailstop L-6: Livermore, C Ct: Mr. Chad F. I	vermore Natio C venue 20 alifornia 945 Davis al <b>Deliverabl</b>	onal 51				Re	port Date: Sep	tember 10. 2	:008
2.0,00	CES - NOrm									
	Client Samp Sample ID: Matrix: Collect Dat Receive Da Collector:	ple ID: e: te:	212-1 214911001 SO 19-AUG-08 1 30-AUG-08 Client	1:30		Proi Clie	ect: nt ID:	LLNL00306 LLNL002		
Parameter	Qualifier	Result		DL	RL	Units	DF	AnalystDate	Time Bat	tch Method
Mercury Analysis-(	CVAA									
STLC Hg in Solid "A	s Received"									
Mercury Metals Analysis-IC	P .	1.93	·	0.030	0.200	mg/L	1 ]	IXL1 09/08/08	1216 7914	94 1
STLC ICP Metals for	- Solids "As Received	d"								
Antimony	J	0.825		0.030	1.00	mg/L	1 ]	WJ 09/05/08	2350 7914	14 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	]			
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			
Leau		92.0		0.025	0.100	mg/L	1			
Nickel		0.379		0.020	0.100	mg/L	1			
Selenium	Ť	0.757		0.010	0.030	mg/L	1			
Silver	J	0.0032		0.000	0.150	mg/L	1			
Thallium	J II	0.0345		0.010	0.000	mg/L	1			
Vanadium	0	0.286		0.010	0.050	mg/L	1			
Zinc		58.7		0.020	0.100	mg/L	1 H	HSC 09/09/08	0850 7914	4 3
The following Prer	Methods were per	formed								
Method	Description				Analyst	Date	Time	Prep Batch		
California Code of R	egulati [,] California V	Vet Method S'	TLC Leaching		WXS1	09/02/08	1200	790317		<u> </u>
SW846 3010A	ICP-TRACE	E TCLP by SV	W846 3010A		AXG2	09/05/08	0805	791413		
SW846 7470A Prep	EPA 7470A	Mercury Pre	p TCLP Liquid		TXB3	09/05/08	1435	791492		
The following Anol	vical Mathode way	re nerformed								
Method	Description	e per tormed			A	Analyst Comm	ents			
1	SW846 7470	)A	·· ·· · · · · · · · · · · · · · · · ·			J	-			
2	SMAR 2010									
2	5 10 040 5010									
С	SW846 3010	76010B								

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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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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.

_____ avis 9-10-02

Reviewed by

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Compa Addres Contac Project	ny : Lawrence Security, L s : 7000 East Mailstop L Livermore t: Mr. Chad l : CES - Nor	Livermore Nation LC Avenue 620 , California 945 F. Davis rmal Deliverab	551 <b>le</b>			Rep	oort Date: Sept	ember 10, 2008	3
	Client Sa Sample I Matrix: Collect D Receive I Collector	mple ID: D: Date: Date: :	212-1 214912001 SO 19-AUG-08 11:30 30-AUG-08 Client		Proj Clie	ect: l nt ID: I	LLNL00306 LLNL002		
Parameter	Qualif	ier Resul	t DL	RL	Units	DF	AnalystDate	Time Batch	Method
Mercury Analysis-C	CVAA								
TCLP Hg in Solid "A	s Received"								
Mercury Metals Analysis-ICI		0.343	0.003	0.020	mg/L	10 J	XL1 09/05/08	1200 790913	1
TCLP ICP Metals for	Solid "As Receiv	ved"							
Antimony	U	0.0286	0.030	0.100	mg/L	1 H	ISC 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	ţ	0.045	0.020	0.050	mg/L	1			
Copper		0.0391	0.010	0.050	mg/L	1			
Lead		17.0	0.030	0.100	mg/L	1			
Molybdenum	ŢŢ	-0.000799	0.020	0.100	mg/L mg/l	1 1			
Nickel	0	0.145	0.010	0.050	mg/L	1			
Silver	U	-0.0036	0.010	0.050	mg/L	Î			
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 H	ISC 09/09/08	0948 790921	3
The following Prep Method	Methods were p	performed		Analyst	Date	Time	Pren Batch		
SW846 1311	STANDAC 1	211 TOLDI	hing EEDED AL			-1700	700219		
SW040 1511	5 W 640 1	OF TOLD 1	Ming -FEDERAL	OV02	09/02/08	1700	790318		
SW 840 SUIUA	ICP-IKA	ICE ICLP by S	W840 3010A	CX53	09/04/08	0650	/90919		
SW8467470A Prep	EPA 747(	UA Mercury Pre	p TCLP Liquid	TXB3	09/04/08	1205	790912		
The following Anal	ytical Methods v	were performed	1						
Method	Descriptio	on		1	Analyst Comm	ents			
1	SW846 74	470A							
2	SW846 30	010/6010B							
3	SW846 30	010/6010B							



CES COC# <u>17485</u> CES Sample # <u>212-1</u> Client Sample ID <u>Mercury Contaminated Soil</u>

Rad Dec #_____

RHWM-RD-08-022-RD

The sample was analyzed	for :		Subject was surveyed for:
<b>Bulk Gross Alpha</b>	🗌 Alpha TU	JPA	Surface Rad
Bulk Gross Beta	🔲 Gamma S	Spec	
🛛 🛛 Bulk Tritium	🗌 Removab	le Rad a	
<b>Removable Rad H-3</b>	Removab	le Rad β	
	≤ MDC	> MDC	Check if by Limited Rad Declaration (LRD)
Bulk Contamination			
Gross Alpha		$\boxtimes$	
Gross Beta Tritium		XX	
<i>Additional Analytical</i> Gamma Spec Alpha TUPA			
Surface Contamination Removable Rad H-3 Removable Rad α Removable Rad β Surface Rad α Surface Rad β			
Radioactivity 🛛 wa	as 🗌 was not	<b>can not s</b>	ay added to this sample.
Comments:			
Gross alpha, gross beta and tritic are above the Moratorium volum	um activities were detec netric screening limits fo	ted above their response or NORM in non-su	ective sample-specific MDCs and uspect soils and soil-analogs.
Finding by: <u>Lily</u> Philip Torretto,	(aud th x2-5515	Date:	September 16, 2008 .

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

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

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

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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.

Millian

Reviewed by

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

### **Certificate of Analysis**

	Company : Address : Contact: Project:	Lawrence Li Security, LL 7000 East A Mailstop L-6 Livermore, C Mr. Chad F. CES - Norm	ivermore N C venue 520 California ( Davis al Delivera	lational 94551 able				]	Report Date: Septembo	er 9, 2008
		Client Sam Sample ID Matrix: Collect Da Receive Da Collector: Moisture:	nple ID: : te: ate:		212-1 2149090 SO 19-AUG 30-AUG Client 2.32%	01 -08 -08		Proiect: Client ID:	LLNL00306 LLNL002	
Parameter		Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF Analyst Date	Time Batch Mtd.
Gravimetric	Solids									
"As Receive	ed"									
Rad Gas Flow	w Proportio	mal Counting	,							
GFPC, Gro.	ss A/B, solia	l "Dry Weight	Corrected	"			0.500	<i></i>		100 1550 200522 0
Alpha			11.3	+/-1.89	2.03	+/-3.30	0.500	pC1/g	DXB5 09/06	/08/1552/9053//2
Bela Rad Liquid S	cintillation	Analysis	19.0	+/-1.52	1.59	+/-3.14	1.50	peng		
ISC Tritius	m Dist Solie	rinary 313	1"							
Tritium	n Disi, sona	Asheceiveu	5 39	+/-1 75	2 4 5	+/-2 14	2.00	pCi/g	SXB4 09/08	/08 1523 790249 3
THUM			0.07		2		2100	P - ~ 5		
The followin	a Analytica	d Methods we	ere nerfor	med						
Method	Descr	iption	cie periori							
]	ASTN	4 D 2216 (Mo	dified)							
2	EPA 9	900.0 Modifie	d							
3	EPA 9	906.0 Modifie	d							
Notes:										
The Qualif	fiers in this	report are de	efined as t	follows :						
** Anal < Resu	lyte is a sur It is less th	тоgate comp an value repo	ound							

> 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**

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF Analyst Date	Time Batch Mtd.
	Client Sar Sample II	nple ID: ):		212-1 214909001			Project: Client ID:	LLNL00306 LLNL002	
Projec	ct: CES - Norm	nal Deliver:	able						
Conta	Livermore, htt: Mr. Chad F	California 9 . Davis	94551					х <u>г</u>	
Addie	Mailstop L-	620					F	Report Date: September	9. 2008
۵ ddre	Security, LI	LC Venue							
Comp	any: Lawrence L	ivermore N	Jational						

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.

	RHWI	<b>M ANALYSIS REP</b>	ORT		
WDR Number Sample I	D	nalytical Log Book ID	COC		XRF
N/A 212-2			17485	Analyst	
pH & NORMALITY	RAI	DIOLOGICAL SCREENI	NG REPORT	Date Analyzed	
Analyst		Tritium	Gross alpha, beta		Percentage
Date Analyzed	Aliquot (mL or g	1.0	1.0		
pH Result	Analyst	Chad Davis	Chad Davis		A SANG DO MALINA MALANDAR MANANANA MANANANA DO MANANA MANANA MANANA MANANA MANANA MANANA MANANA MANANA MANANA M
Normality Result (eq/L)	Date Analyzed	8/28/2008	8/28/2008		ALCOLUMN AND AND AND AND AND AND AND AND AND AN
	Energy Window	/ 0-18.6 keV	18.6-2000 keV		
	DPM	1.43	3.42		93/2007/2019 / MARTIN MAXAMOVANOVONO (CONTROLONDO / POPULO
	MDC	1000	3000		лотото на составлять на составлять на составлять на составляти на составляти на составляти на составляти на со
Pate Mialyzeu Shenifin Cravity Desult	Actual Result	640	1500		NALAN KANAN DA YANAN MUTUK
	Reportable Resu	IIf Below MDC	Below MDC		NO NY VERSIONAL AND
	Unit	picocuries / kg	picocuries / kg		NAMAN INAN INTERNET DESCRIPTION OF AND DESCRIPTION OF AND
FLASH POINT (METHOD 1010)		SAWGC			
Analyst	Data Analizad				ADDRESSED AND ADDRESSED A LONG A COMPANY AND ADDRESSED ADDRESSED ADDRESSED ADDRESSED ADDRESSED ADDRESSED ADDRESS
Date Analyzed					YALAN MUTUU MAANA MA
MDL		CHICA			A AN A DESTRUCTION OF A
Result					
Unit					**************************************
BOILING POINT					
Result				Total	
Unit					MMENTS
LIQUIFICATION TESTING					
Vibration Testing					
Analyst					
Date Analyzed					
Result		Alexandron and a second s			
Freeze / Thaw Testing					
Analyst.					
Date Analyzed					
Result					
Paint Filter Activity				Data Completed	8000/80/8
Analyst	*****				012012000
Date Analyzed				Reviewed Bv /	) AND 1
Kesult					

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

Co Ad Co Pro	mpany : dress : ntact: oject:	Lawrence Liver Security, LLC 7000 East Aver Mailstop L-620 Livermore. Cal Mr. Chad F. Da <b>CES - Normal</b> Client Sample Sample ID: Matrix: Collect Date: Receive Date Collector: Moisture	rmore Natic nue ifornia 945 ivis <b>Deliverabl</b> e ID: :	nal 51 e 212-2 214909002 SO 19-AUG-08 30-AUG-08 Client 5 7207	3 14:30 3	5	Proj Clie	R ect: nt ID:	eport Date: Sep LLNL00306 LLNL002	tember 10, 2008	8
Parameter		Qualifier	Result	5.1210	DL	RL	Units	DF	AnalystDate	Time Batch	Method
Mercury Analys	sis-CVA	1									
7471 Cold Vapor	Hg in Sc	olid "Dry Weight	Corrected"								
Mercury Metals Analysis	-ICP		23.8		0.707	4.71	mg/kg	500	JXL1 09/04/08	1530 790539	1
6010 TAL Metals	Soil Fed	eral "Dry Weigh	t Corrected	u.							
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			
Seleman			8.94		0.530	1.60	mg/kg	1			
Vanadium			0.598		0.106	0.530	mg/kg	1			
Rervilium		TI	146		0.100	2.55	mg/kg	1	USC 00/00/09	1002 700812	2
Thallium		1	-1.40		2.65	2.05	mg/kg	5	H3C 09/09/08	1002 790812	5
Zinc		0	281		1.06	5.30	mg/kg	5			
The following <b>F</b>	rep Met	hods were perfo	ormed								
Method		Description				Analyst	Date	Time	e Prep Batch		
SW846 3050B		846 3050BS P	REP			CXS3	09/08/08	0832	2 790808		
SW846 7471A P	rep	EPA 7471A N	lercury Prej	o Soil		TXB3	09/04/08	0810	) 790538		
The following A	nalytica	l Methods were	performed						······		·
Method		Description				I	Analyst Comm	ents			
1		SW846 7471A									
2		SW846 3050B	/6010B								
3		SW846 3050B	/6010B								

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Compan Address Contact: Project:	<ul> <li>y: Lawrence Liv Security, LLC</li> <li>7000 East Ave Mailstop L-62 Livermore, Ca Mr. Chad F. E</li> <li>CES - Norma</li> </ul>	ermore Natio enue 20 alifornia 945 Davis a <b>l Deliverabl</b>	nal 51 e				Rej	port Date: Sep	tember 10, 200	3
	Client Samp Sample ID: Matrix: Collect Date Receive Dat Collector:	ole ID: 2: e:	212-2 214911002 SO 19-AUG-08 14:30 30-AUG-08 Client	)		Proi Clier	ect: nt ID:	LLNL00306 LLNL002		
Parameter	Qualifier	Result		DL	RL	Units	DF	AnalystDate	Time Batch	Method
Mercury Analysis-CV	VAA									
STLC Hg in Solid "As	Received"									
Mercury Metals Analysis-ICP	J	0.112	0.0	30	0.200	mg/L	1 J	XL1 09/08/08	1218 791494	]
STLC ICP Metals for S	Solids "As Received	1''								
Antimony	U	0.0129	0.0	30	1.00	mg/L	1 ]	WJ 09/05/08	2358 791414	2
Arsenic	J	0.125	0.0	150	0.150	mg/L	1			
Barium		7.91	0.0	10	0.050	mg/L	1			
Beryllium	U	-0.00499	0.0	10	0.050	mg/L	1			
Cadmium		0.0623	0.0	10	0.050	mg/L	1			
Chromium		0.228	0.0	20	0.050	mg/L	1			
Cobalt		0.392	0.0	10	0.050	mg/L	1			
Copper		1.30	0.0	30	0.100	mg/L	1			
Lead		0.926	0.0	25	0.100	mg/L	1			
Molybdenum	J	0.0415	0.0	20	0.100	mg/L	1			
Nickel	<b>T</b> 1	0.551	0.0	10	0.050	mg/L	1			
Selenium	U	0.00755	0.0	50	0.150	mg/L	1			
Thellium	U	0.00115	0.0	10	0.030	mg/L	1			
Vapadium	U	0.0330	0.0	10	0.200	mg/L	1			
Zinc		21.7	0.0	20	0.100	mg/L	1 1 H	HSC 09/09/08	0857 791414	3
The following Prep I	Methods were per	formed								
Method	Description				Analyst	Date	Time	Prep Batch		
California Code of Re	gulati California W	Vet Method S	TLC Leaching		WXS1	09/02/08	1200	790317		
SW846 3010A	ICP-TRACE	E TCLP by SV	W846 3010A		AXG2	09/05/08	0805	791413		
SW846 7470A Prep	EPA 7470A	Mercury Pre	p TCLP Liquid		TXB3	09/05/08	1435	791492		
The following Analy	tical Methods wer	e performed								
Method	Description				A	Analyst Comm	ents			
1	SW846 7470	)A								
2	SW846 3010	/6010B								
3	SW846 3010	/6010B								

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Compa Addres Contac Project	ny : Lawrence I Security, L s : 7000 East / Mailstop L Livermore, t: Mr. Chad F CES - Nor	Livermore Natio LC Avenue -620 California 945 7. Davis <b>mal Deliverab</b>	51 e			Reț	port Date: Sep	tember 10, 200	8
	Client Sa Sample II Matrix: Collect D Receive I Collector:	mple ID: D: Pate: Date: :	212-2 214912002 SO 19-AUG-08 14:30 30-AUG-08 Client		Proi Clie	ect:	LLNL00306 LLNL002		
Parameter	Qualifi	ier Resul	t DL	RL	Units	DF	AnalystDate	Time Batch	Method
Mercury Analysis-C	VAA								
TCLP Hg in Solid "A	s Received"								
Mercury Metals Analysis-ICI	>	0.00322	0.0003	0.002	mg/L	1 J	XL1 09/05/08	1148 790913	1
TCLP ICP Metals for	Solid "As Receiv	ved"							
Antimony	U	0.00415	0.030	0.100	mg/L	I F	ISC 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	Ų	0.00228	0.020	0.100	mg/L	1			
N1CKel	J	0.0379	0.010	0.050	mg/L	1			
Thellium	U	-0.018	0.010	0.030	mg/L	1			
Vanadium	U	-0.108	0.030	0.200	mg/L	1			
Zinc	0	-0.0170	0.010	0.000	mg/L	1			
Selenium	J	0.0525	0.020	0.150	mg/L	1 F	ISC 09/09/08	0955 790921	3
The following Prep	Methods were p	performed							
Method	Descriptio	on		Analyst	Date	Time	Prep Batch	1	
SW846 1311	SW846 1	311 TCLP Leac	hing -FEDERAL	MTM1	09/02/08	1700	790318		
SW846 3010A	ICP-TRA	CE TCLP by S	W846 3010A	CXS3	09/04/08	0650	790919		
SW846 7470A Prep	EPA 7470	0A Mercury Pre	p TCLP Liquid	TXB3	09/04/08	1205	790912		
The following Anal	ytical Methods v	vere performed	1						
Method	Descriptio	on			Analyst Comm	ents			
1	SW846 74	470A							
2	SW846 30	010/6010B							
3	SW846 30	)10/6010B							



CES COC# 17485 CES Sample # 212-2 Client Sample ID Mercury Contaminated Soil

The sample was analyzed	for :	Su	bject was surveyed for:
🛛 🛛 Bulk Gross Alpha	🗌 Alpha TU	ЛРА 🗌	Surface Rad
🛛 Bulk Gross Beta	🗌 Gamma S	Spec	
🛛 🛛 Bulk Tritium	Removab	le Rad α	
Removable Rad H-3	Removab	le Rad β	
	≤ MDC	> MDC	Check if by Limited Rad Declaration (LRD)
Bulk Contamination			
Gross Alpha		$\boxtimes$	
Gross Beta Tritium			
Additional Analytical			
Gamma Spec Alpha TUPA			
Surface Contamination Removable Rad H-3 Removable Rad α Removable Rad β Surface Rad α Surface Rad β			
Radioactivity 🛛 wa	is 🗌 was not	🗌 can not say	added to this sample.
<b>Comments:</b> Gross alpha and gross beta activ above the Moratorium volumetri was not detected above the samp	ities were detected abov ic screening limits for N ple-specific MDC.	ve their respective samp ORM in non-suspect s	le-specific MDCs and are oils and soil-analogs. Tritium
Finding by: <u>Finding by:</u> Philip Torretto, 2	10.10 x2-5515	Date:	September 16, 2008 .

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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	Company : Address : Contact: Project:	Lawrence Li Security, LL 7000 East A Mailstop L-6 Livermore, C Mr. Chad F. CES - Norm	vermore N C venue 520 California 9 Davis al Delivera	ational 94551 able				]	Report Date: Sej	otember	9, 2008		
		Client Sam Sample ID Matrix: Collect Da Receive Da Collector: Moisture:	iple ID: : te: ate:		212-2 2149090 SO 19-AUG 30-AUG Client 5.72%	02 08 08		Project: Client ID:	LLNL00306 LLNL002				
Parameter		Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF Analys	t Date	Time I	Batch N	Atd.
Gravimetrie "As Recei Rad Gas Fle GFPC, Gr Alpha Beta Rad Liquid LSC, Tritiu Tritium The followi Method 1 2	c Solids ived" ow Proportio coss A/B, solia Scintillation um Dist, Solia ing Analytica Descr ASTM EPA S	mal Counting I "Dry Weight Analysis I "As Received U I Methods we iption 4 D 2216 (Mo 900.0 Modifier	Corrected 7.13 14.3 " -0.386 ere perform dified) d	" +/-1.85 +/-1.62 +/-0.962 med	2.49 2.13 1.79	+/-2.53 +/-2.58 +/-0.962	0.500 1.50 2.00	pCi/g pCi/g pCi/g	DXB5 SXB4	09/06/0	08 1552 7	790537 790249	2
3 Notes: The Qual ** An < Res > Res A The B For BD Re	EPA S lifiers in this alyte is a sur- oult is less th oult is greater e TIC is a su General Ch esults are eit	report are de rogate comp an value report than value r spected aldo emistry and her below the	d efined as f ound orted reported 1-condens Organic a e MDC or	follows : ation product nalysis the tar	get analyt ry is low	e was detec	ted in the a	associated bla	nk.				

- 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**

Parameter		Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF Analyst Date	Time Batch Mtd.				
		Client Sample ID: Sample ID:		212-2 214909002	2		Project: Client ID:	LLNL00306 LLNL002						
I	Project:	CES - Norma	al Deliver:	ible										
(	Contact:	Livermore, C Mr. Chad F.	e. California 94551 F. Davis						Report Date: September 9, 2008					
1	Address :	Security, LL 7000 East Av	C venue					-						
(	Company :	Lawrence Li	vermore N	lational										

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.

WDR Number	THIN A Analytic	INAL 7313 REPUR			Long Long Long Long Long Long Long Long
					ARF V V V
N/A 2	12-5			Analyst	
pH & NORMALITY	RADIOLO	DGICAL SCREENING	REPORT	Date Analyzed	
Analyst		Tritium	Gross alpha, beta		Percentage
Date Analyzed	Aliquot (mL or g)	1.0	1.0		
pH Result	Analyst	Chad Davis	Chad Davis		
Normality Result (eq/L)	Date Analyzed	8/28/2008	8/28/2008		00 YM 00 H 10
HYDROMETER / SPECIEIC GRAVITY	C Energy Window	0-18.6 keV	18.6-2000 keV		AND AN AND AND AND AND AND AND AND AND A
	DPM	1.33	3.33		******
Date Analyzed		1000	3000		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Shecific Gravity Result	Actual Result	600	1500		
Hvdrometer Result	Reportable Result	Below MDC	Below MDC		
	Unit	picocuries / kg	picocuries / kg		
FLASH POINT (METHOD 1010)		SAWGC			A CALLER AND A CALLE
Analyst	Date Analvzed	Analyset			
Date Analyzed	Chemics		It Dotoction Linit		
Result					
Unit					
BOILING POINT					
Result				Total	
Unit				100	<b>WIMENTS</b>
LIQUIFICATION TESTING					
Vibration Testing					
Analyst					
Date Analyzed					
Result					
Freeze / Thaw Testing					
Analyst					
Date Analyzed					
Result					
Paint Filter Activity				Data Completed	
Analyst					012012100
Date Analyzed				Paviawad Bv	
Result					YAT IVS

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# **Certificate of Analysis**

Cor	npany :	Lawrence Liver	more Natio	nal						
٨da	trocc -	7000 East Aven	110							
Aut	ness :	Mailston I -620	uc				~	5	1 10 00	
		Livermore, Cali	fornia 945	51			Rep	ort Date: Sep	tember 10, 20	08
Cor	ntact:	Mr. Chad F. Da	vis							
Proj	ject:	CES - Normal	Deliverabl	ε						
		Client Sample	· ID·	212-5		Proj	iect- I	I NI 00306	······	
		Sample ID:		214909003		Clie	nt ID: I	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	AnalystDate	Time Batc	h Method
Mercury Analysi	is-CVAA									
7471 Cold Vapor	Hg in So	lid "Dry Weight	Corrected"							
Mercury			9.26	0.787	5.24	mg/kg	500 J.	XL1 09/04/08	1532 790539	) 1
Metals Analysis-	ICP									
6010 TAL Metals	Soil Fed	eral "Dry Weight	Corrected	"						
Antimony		U	-0.467	0.324	1.50	mg/kg	1 J	WJ 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	]			
Copper			60.6	0.313	2.00	mg/kg	1			
Lead			9.08	0.261	1.50	mg/kg	]			
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			
Thelling		J	0.284	0.104	0.522	mg/kg	1			
Vanadium		0	-1.64	0.522	3.00	mg/kg	1			
Zino			21.9	0.104	0.522	mg/kg	1			
Beryllium		TT	19.0	0.209	1.04	mg/kg		80 00000	1000 700010	
Cadmium		U	-0.919	0.522	2.61	mg/kg mg/kg	эн 5	SC 09/09/08	1009 /90812	3
The following P	ren Metl	nde were perfo	rmed							
Method	rep men	Description	mu		Analyst	Date	Time	Pren Batch		
		046 2050DC D	DED					Trep battin		
SW846 3030B		846 3050BS P	KEP -	a	CXS3	09/08/08	0832	790808		
5W846 /4/1A Pro	ep	EPA 7471A M	ercury Prep	o Soil	TXB3	09/04/08	0810	790538		
The following A	nalytical	Methods were	performed							
Method		Description			د	Analyst Comm	ents			
1		SW846 7471A								
2		SW846 3050B/	6010B							

3 SW846 3050B/6010B

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Compan Address Contact:	<ul> <li>y: Lawrence Livermore N Security, LLC</li> <li>7000 East Avenue Mailstop L-620 Livermore, California Mr. Chad F. Davis</li> </ul>	Vational 94551		Report Date: September 10, 2008						
Project:	CES - Normal Delive	rable								
	Client Sample ID: Sample ID: Matrix: Collect Date: Receive Date: Collector:	212-5 214911003 SO 28-AUG-08 11:25 30-AUG-08 Client		Proi Clie:	ect: L nt ID: L	LNL00306 LNL002				
Parameter	Qualifier Re	esult D	L RL	Units	DF	AnalystDate	Time Batch	Method		
Mercury Analysis-C	VAA									
STLC Hg in Solid "As	Received"									
Mercury Metals Analysis-ICP	J 0.090	7 0.030	0.200	mg/L	1 J2	KL1 09/08/08	1220 791494	1		
STLC ICP Metals for S	Solids "As Received"									
Antimony	U 0.0012	4 0.030	1.00	mg/L	1 JV	VJ 09/06/08	0005 791414	2		
Arsenic	J 0.090	8 0.050	0.150	mg/L	1					
Barium	7.6	2 0.010	0.050	mg/L	1					
Beryllium	U -0.00365	0.010	0.050	mg/L	1					
Cadmium	U 0.0066	3 0.010	0.050	mg/L	1					
Chromium	0.11	0 0.020	0.050	mg/L	1					
Cobalt	0.28	6 0.010	0.050	mg/L	1					
Copper	2.2	7 0.030	0.100	mg/L	1					
Lead	0.19	2 0.025	0.100	mg/L	1					
Niolybdenum	J 0.027	I 0.020	0.100	mg/L	1					
Solonium	U.30	0.010	0.050	mg/L	1					
Silver	U 0.043.	0.030	0.150	mg/L mg/l	1					
Thallium	U -0.000032	0.010	0.030	mg/L	1					
Vanadium	0.18	1 0.010	0.200	mg/L	1					
Zinc	1.4	5 0.020	0.100	mg/L	ı H	SC 09/09/08	0904 791414	3		
The following Prep	Methods were performed									
Method	Description		Analyst	Date	Time	Prep Batch				
California Code of Re	gulati California Wet Metho	od STLC Leaching	WXS1	09/02/08	1200	790317				
SW846 3010A	ICP-TRACE TCLP h	v 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 Area be										
I ne Iollowing Analy Mothod	ucal Methods were perfor	mea		Analust Com-	mte					
TAICHION	Description	······································		Analyst Commo	ents		·····			
1	SW846 7470A									
2	SW846 3010/6010B									
3	SW846 3010/6010B									

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Com Addr Cont Proje	pany : ress : act: ect:	Lawrence I Security, L 7000 East A Mailstop L Livermore, Mr. Chad F CES - Nor	Livern LC Avenue -620 Califo F. Davi mal D	nore Natio e ornia 945 is <b>veliverabl</b>	nal 51 e			Report Date: September 10. 2008								
		Client Sam Sample II Matrix: Collect D Receive I Collector:	mple ] D: ate: Date:	ID:	212-5 214912003 SO 28-AUG-08 11 30-AUG-08 Client	:25		Proi Clie	ect: nt ID:	LLN LLN	L00306 L002					
Parameter		Qualifi	ier	Result		DL	RL	Units	DF	Ana	lystDate	Time	Batch	Method		
Mercury Analysis	-CVAA															
TCLP Hg in Solid	"As Rece	rived"														
Mercury Metals Analysis-I	СР		(	0.0541	0	.0003	0.002	mg/L	1	JXL1	09/05/08	1150 7	90913	1		
TCLP ICP Metals j	for Solid	"As Receiv	red"													
Antimony		U	0.	00542		0.030	0.100	mg/L	1	HSC	09/05/08	2143	90921	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	0.0	00277		0.010	0.050	mg/L	1							
Chromium		U	(	0.0153		0.020	0.050	mg/L	1							
Cobalt		U	-0	0.0171		0.010	0.050	mg/L.	I							
Copper		U	(	).0242		0.030	0.100	mg/L	1							
Molubdonum		J	0.0	J.0364		0.025	0.100	mg/L	1							
Nickel		U T	-0.0	0412		0.020	0.100	mg/L	i 1							
Silver		J	_0	0177		0.010	0.050	mg/L	1							
Thallium		11	-0	00208		0.010	0.000	mg/L	1		<i>e</i> -					
Vanadium		U	0.0	00200		0.010	0.050	mg/L	I		,					
Zinc		J	0.0	0.099		0.020	0.100	mg/L	1							
Selenium		U	(	).0408		0.050	0.150	mg/L	I	HSC	09/09/08	1002 7	90921	3		
The following Pr	ep Meth	ods were p	perform	med												
Method		Descriptio	on				Analyst	Date	Time	e P	rep Batch					
SW846 1311		SW846 1	311 TC	CLP Leacl	ing -FEDERAL		MTM1	09/02/08	1700	7	90318					
SW846 3010A		ICP-TRA	CE TO	CLP by SV	V846 3010A		CXS3	09/04/08	0650	7	90919					
SW846 7470A Pre	р	EPA 747(	)A Me	rcury Prej	o TCLP Liquid		TXB3	09/04/08	1205	7	90912					
The following An	alytical	Methods v	vere p	erformed			<u></u>	1 1 1 1 1 1								
Method		Descriptio	n				A	Analyst Comm	ents							
1 .		SW846 74	70A													
2		SW846 30	)10/60	10B												
3		SW846 30	)10/60	10B												

CES COC# 17485 CES Sample # 212-5 Client Sample ID Mercury Contaminated Soil

The sample was analyzed	for :	Su	bject was surveyed for:
🛛 Bulk Gross Alpha	🗌 Alpha TU	ЛРА 🗌	Surface Rad
🛛 Bulk Gross Beta	🔲 Gamma S	Spec	
🛛 Bulk Tritium	Removab	le Rad α	
<b>Removable Rad H-3</b>	Removab	le Rad β	
	≤ MDC	> MDC	Check if by Limited Rad Declaration (LRD)
Bulk Contamination			
Gross Alpha		$\square$	
Gross Beta Tritium			
Additional Analytical			_
Gamma Spec Alpha TUPA			
Surface Contamination Removable Rad H-3 Removable Rad α Removable Rad β Surface Rad α Surface Rad β			
Radioactivity 🛛 wa	is 🗌 was not	🗌 can not say	added to this sample.
<b>Comments:</b> Gross alpha and gross beta activ above the Moratorium volumetr was not detected above the samp	ities were detected abov ic screening limits for N ble-specific MDC.	ve their respective samp ORM in non-suspect s	ele-specific MDCs and are oils and soil-analogs. Tritium
Finding by: Hilip	(e	Date:	<u>September 16, 2008</u> .

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 : Address : Contact:	Lawrence Li Security, LL 7000 East A Mailstop L-6 Livermore. ( Mr. Chad F.	ivermore N C venue 520 California S Davis	ational 94551				J	Report Date: September 9, 2008	
	Project:	CES - Norm Client Sam Sample ID Matrix: Collect Da Receive Da Collector: Moisture:	al Delivera nple ID: ': te: ate:		212-5 2149090 SO 28-AUG 30-AUG Client 4,65%	03 -08 -08		Project: Client ID:	LLNL00306 LLNL002	
Parameter		Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF Analyst Date Time Batch Mtd.	-
Gravimetric "As Receiv Rad Gas Flo GFPC. Gra Alpha Beta Rad Liquid S LSC, Tritiun Tritium	Solids ed" w Proportio oss A/B, solid Scintillation m Dist, Solid	nal Counting "Dry Weight Analysis "As Receivea U	Corrected 8.76 17.2 !" -0.376	" +/-1.53 +/-1.44 +/-0.936	1.41 1.51 1.74	+/-2.53 +/-2.59 +/-0.936	0.500 1.50 2.00	pCi/g pCi/g pCi/g	DXB5 09/06/08 1552 790537 2 SXB4 09/05/08 1138 790249 3	
The followir Method	ng Analytica Descr	l Methods we iption	ere perfori	ned						
1 2 3	ASTN EPA 9 EPA 9	1 D 2216 (Mo 200.0 Modifie 206.0 Modifie	odified) d d							
Notes: The Quali ** Ana < Resu	fiers in this lyte is a sur llt is less th	report are de rogate comp an value repo	efined as f bound orted	follows :						

> 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**

Parameter		Qualifier Result Uncertainty	DL TPU	RL Units	DF Analyst Date	Time Batch Mtd.
		Client Sample ID: Sample ID:	212-5 214909003	Project: Client ID:	LLNL00306 LLNL002	
	Project:	CES - Normal Deliverable				
	Contact:	Livermore. California 94551 Mr. Chad F. Davis				
	Address .	Mailstop L-620			Report Date: September	9, 2008
	Address	Security, LLC				
	Company :	Lawrence Livermore National				

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.

# Quality Control Summary

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

## QC Summary

Report Date: S	Septen	ıber	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: 214909

Parmname	NOM	Sample Qual	QC	Units RPD%	REC %	Range	Anlst	Date Time
Metals Analysis-ICP						X		
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 M Antimony	AS 511 17	14.2	27.0	mallia	71×	(750) 10501	1100	00/00/08 00:20
Arsenic	511	-14.Z J	51.9	mg/kg	/4 ~ 05	(13%-125%)	HSC	09/09/08 09:39
Rarium	51.1	1.07	21.2	mg/kg	65 55 *	(13%-123%)	Ĵ₩Ĵ	09/09/08 03:30
1741 (UIII	J1.1	120	218	mg/kg	22 *	(73%-123%)		

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## **QC** Summary

Workorder: 214909								Page 2 of 4					
Parmname	NOM		Sample Qual		QC	Units	Units RPD%		Range	Anlst	Date Time		
Metals Analysis-ICP Batch 790812											····		
Beryllium	51.1	U	-9.44		39.2	m@/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	υ	-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		
Thallum	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 OC1201660212 214000001 SDU T	50.9		3850		1780	mg/kg	12	N/A	(0%-20%)	HSC	09/09/08 09:47		
Antimony		IJ	-2.0	H	0.574	паЛ	N/A		(0%,10%)		00/00/08 00.55		
Arsenic		Ų	80.3	C	18.0	ug/L	17.3		(0% + 10%)	1371	09/09/08 09:55		
Barium			1030		408	ug/L	57		(0% 10%)	J ** J	09/09/08 03:51		
Bervllium		IJ	-1.92	IT	-18	ug/L	N/A		(0% - 10%)	HSC	00/00/08 00-55		
Cadmium		0	530	C	113	ug/L	4.43		(0% - 10%) (0% - 10%)	1300	09/09/08 09:55		
Chromium			10400		2190	ng/I	5.69		(0%-10%)	J ** 3	09109106 03.51		
Cobalt			10100		42.0	ug/L ng/I	6.36		(0% 10%)				
Copper			1230		250	ид/Ц 110/Л	1.87		(0% - 10%)	HSC	00/00/08 00.55		
Lead			390		77 5	110/I	709		(0% - 10%) (0% - 10%)	1100	07109100 09.33		
Molvbdenum			335		70.0	ug/L	4 5		(0%-10%) (0%-10%)	1371	00/00/08 03-51		
Nickel			2050		,0.0 ∆27	и <u>е</u> /1. ра/1	6.67		(0.0-10.00)	J¥¥J	02102100 03.31		
			-0.00		TJ /	4 குட	V.V/		(0/0-10/0)				

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### QC Summary

					Alexand and a second se								
Workorder:	214909										Page 3	of 4	
Parmname			NOM		Sample	Qual	QC	Units	RPD%	REC 9	% 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	20.2	U	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- Batch	<b>Mercury</b> 790539												
QC12016594	98 LCS												
Mercury			0.0984				0.104	mg/kg		106	(80%-120%)	JXL1	09/04/08 13:47
QC12016594 Mercury	97 MB					U	-0.00145	mg/kg					09/04/08 13:45
QC12016594	99 214909001	MS											
Mercury			0.102		2490		2800	mg/kg		N/A	(75%-125%)		09/04/08 15:43
Mercury	00 214909001	MSD	0.102		2490		2540	mg/kg	10	N/A	(0%-20%)		09/04/08 15:45
QC12016595 Mercury	01 214909001	SDILT			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

А The TIC is a suspected aldol-condensation product

В 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

С Analyte has been confirmed by GC/MS analysis

D Results are reported from a diluted aliquot of the sample

Е Metals -- % difference of sample and SD is >10%. Sample concentration must meet flagging criteria

F Estimated Value

Η Analytical holding time was exceeded

J Value is estimated

М M if above MDC and less than LLD

Matrix Related Failure М

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

	1401. 214/0/								Page 4	of 4		
Parmn	ame	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
UI	Gamma SpectroscopyUnc	ertain identification										
Х	Consult Case Narrative, Da	ta Summary packag	e, or Project I	Manager o	oncerning t	his qualifi	er					
Y	QC Samples were not spike	ed with this compour	nd									
^	RPD of sample and duplica	te evaluated using +	/-RL. Conce	ntrations a	are <5X the	RL. Qual	ifier Not Ap	plicable for l	Radiochemi	istry.		
h	Preparation or preservation	holding time was ex	ceeded									
NI/A in	diantan that aniles measured by	· · · · · · · · · · · · · · · · · · ·			1	- 1	1 C .	C 4				

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.

Workordory

314000

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 NO	ONCONFORMANCE REPORT	
Mo Dav Yr	Division		Tuze
09-SEP-08	Federal	Specifications	Process
Instrument Type: ICP	<b>Test / Method:</b> 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/PSE	)		
Specification and Requirements Nonconformance Description:		NRG Disposition:	
1. Failed Recovery for MS/PS:		1. The matrix spike recovery fa	iled for antimony,barium and silver while
QC 1201660210MS		matrix spike duplicate failed for and silver due to possible matr	r barium ,antimony,nickel,thallium,beryllium ix interference.
2. Failed RPD for MS/MSD, or PS/	PSD:	2. The RPD failed on matrix sp nickel,copper,lead and silver d	ue to sample not homogeneous. Sample
QC 1201660211MSD		reported.	in plant matter. Data are qualified and
3. Failed Recovery for MSD/PSD:			
QC 1201660211MSD			
Originator's Name:		Data Validator/Group Leader	
Helen Camello 09-SEP-08		Bryan Davis 10-SE	EP-08
Quality Review:			

Director:

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

## QC Summary

Report Da	ite: Septen	ıber	10,	2008
	Page	1  of	4	

	7000 East Avenue
	Mailstop L-620
	Livermore, California
Contact:	Mr. Chad F. Davis

Lawrence Livermore National Security, LLC

#### Workorder: 214911

Parmname		NOI	M	Sample	Qual	QC	Units	RPD%	REC %	Range	Anlst	Date	Time
Metals Analysis-IC	Р												
Batch 79	1414												
QC1201661526	LCS												
Antimony		2.00				1.92	mg/L		96	(80%-120%)	JWJ	09/05/0	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 OC1201661525	MB	2.00				2,04	mg/L		102	(80%-120%)	HSC	09/09/0	)8 08:15
Antimony					U	0.0138	mg/L				JWJ	09/05/0	)8 22:58
Arsenic					U	-0.0039	mg/L					0,7,00,00	
Barium					Ū	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	09/09/0	8 08:01
QC1201659017	214600001	MS			-							55. 5776	
Antimony		2.11	U	-0.0227		1.86	mg/L		88	(75%-125%)	JWJ	09/05/0	18 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	I	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	1	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						e			. ,				
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	ł	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: 2	214911										Page 3	of 4	
Parmname			NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Metals Analysis-ICI Batch 79	> i414												
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 QC1201659021	TB				102		22.0	ug/L	7.41		(0%-10%)	HSC	09/09/08 08:43
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-Me Batch 79	<b>rcury</b> 1494												
QC1201661774	LCS												
Mercury			2.00				2.07	mg/L		103	(80%-120%)	JXL1	09/08/08 12:02
QC1201661773	MB						0.000.1						00/08/08 12:00
Mercury	214600001	MC				U	-0.0224	mg/L					09/08/08 12:00
Mercury	214000001	MS	0.020	U	-0.0389	I	-0.039	mø/L		0*	(75%-125%)		09/08/08 12:10
OC1201659020	214600001	MSD	0.020	U	0.0507	0	0.057			•	(		
Mercury			0.020	U	-0.0389	U	-0.0218	mg/L	57 *	0*	(0%-20%)		09/08/08 12:12
QC1201661777	214600001	SDILT											
Mercury QC1201659021	TB			U	-0.0389	U	-0.0397	ug/L	N/A		(0%-10%)		09/08/08 12:14
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								t of 4					
Parmnar	me		NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
А	The TIC	is a suspected al	dol-condensation prod	luct									
В	For Gene	eral Chemistry ar	d Organic analysis th	e target analy	rte was de	tected in the	e associate	d blank.					
С	Analyte	has been confirm	ed by GC/MS analysi	s									
D	Results a	re reported from	a diluted aliquot of th	e sample									
Е	Metals	%difference of sa	mple and SD is >10%	. Sample co	ncentratic	n must mee	t flagging	criteria					
F	Estimate	d Value											
Н	Analytic	al holding time w	vas exceeded										
J	Value is	estimated											
М	Matrix R	elated Failure											
N/A	RPD or 9	%Recovery limits	s do not apply.										
ND	Analyte	concentration is 1	not detected above the	detection lin	nit								
NJ	Consult (	Case Narrative, I	Data Summary packag	e, or Project	Manager o	concerning	this qualifi	er					
R	Sample r	esults are rejecte	d										
U	Analyte •	was analyzed for	, but not detected abov	ve the MDL,	MDA, or	LOD.							
Х	Consult (	Case Narrative, I	ata Summary packag	e, or Project	Manager o	concerning	this qualifi	er					
Y	QC Samp	ples were not spi	ked with this compour	nd									
٨	RPD of s	ample and duplic	cate evaluated using +	/-RL. Conce	ntrations	are <5X the	RL. Qual	ifier Not Aj	oplicable for I	Radiochem	istry.		
h	Preparati	on or preservatic	n holding time was ex	ceeded									
N/A indi ^ The Re five time RL is use	icates that elative Per es (5X) th red to eval	spike recovery 1 rcent Difference e contract require uate the DUP res	imits do not apply wh (RPD) obtained from ed detection limit (RL) ult.	en sample co the sample di ). In cases wh	ncentratic uplicate ( nere either	n exceeds s DUP) is eva the sample	pike conc. ilüated aga or duplica	by a factor iinst the acc ite value is l	of 4 or more. eptance criter ess than 5X t	ria when the he RL, a cc	e sample i ntrol limi	s greater t of +/- tl	than 1e

* 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 REPOR	Т
<b>Mo.Day Yr.</b> 08-SEP-08	<b>Division:</b> Federal	Quality Criteria: Specifications	<b>Type:</b> 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)( Application Issues: Failed Recovery for MS/PS Failed RPD for MS/MSD, or PS/PSD Failed Recovery for MSD/PSD	SDG): 214600(214597-1),2149	11(214909-1)	
Specification and Requirements Nonconformance Description:		NRG Disposition:	
<ol> <li>Failed Recovery for MS/PS: QC 1201659018MS</li> <li>Failed RPD for MS/MSD, or PS/F QC 1201659020MSD</li> <li>Failed Recovery for MSD/PSD: QC 1201659020MSD</li> </ol>	PSD:	1. The MS and MSD recover the prep factor of 1000x. Dat	ed outside of their acceptance windows due to a reported as is.
	·		
Uriginator's Name: Jason Lov 08-SEP-08		Data Validator/Group Leade	er: SEP-08

Quality Review:

Director:

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## **QC Summary**

Report Date: September	r 10, 2008
Page 1 o	f 4

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

Workorder: 214912

Contact:

Parmname	· · · ·		NOM	[	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Metals Analysis-IC	P										Q			
Batch 79	00921													
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%)		09/09/0	08 09:42
Silver			0.500				0.490	mg/L		98	(80%-120%)		09/05/0	08 20:54
Thallium			2.00				2.01	mg/L		101	(80%-120%)			
Vanadium			2.00				2.11	mg/L		105	(80%-120%)			
Zinc QC1201660439	MB		2.00				2.06	mg/L		103	(80%-120%)			
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/(	8 09:28
Silver						U	-0.00627	mg/L					09/05/0	8 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%)		09/05/0	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			<u></u>						Daga 1	of A	
Dormona	NON	f	Sample	Qual	00	Unite	RPD%	RECO	Range 2	Anlst	Date Time
f ai fundance Motole A polycie ICD	14014	L	Sample	Quai	<u></u>	Omo		<u>NDC A</u>	Kange	Anist	Date Thit
Batch 790921											
Bervllium	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	I	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 SDIL1		ī	<u>۹</u> ۵ ۸	TT	0 944	110/1	NI/A		(0% 10%)		00/05/08 21.22
Anthiony		11	0.04	U	-0.644	ug/L	N/A		(076-1076) (076-1076)		09/05/08 21:22
Barium		I	2.05	11	0.830	ug/L	N/A		(0% 10%)		
Beryllium		I	0.203	11	0.652	ug/L	N/A		(0%-10%)		
Codmium		1	-0.295	U	-0.201	ug/L	NVA		(07-1076)		
Chromium		I I	-0.440	0	0.035	ug/L	N/A		(0%-10%)		
Cobalt		J	1.10	U U	1.02	ug/L	N/A		(0%-10%)		
Conner		11	-1.10 2.92	U	1.05	n the market of	N/A		(0%-10%) (0%-10%)		
Lead		П.	2.02	U T	2.05	ид/с	N/A		(0% 10%)		
Molyhdenum		U I	1.74	I I I	_0.404	ug/L	N/A		(070-1070) (076-1076)		
Nickel		J	2.40	U	-0.404	ug/L	N/A		(076-1076) (076-1076)		
INICAUL		J	2.39	U	-0.00	ug/L	IN/A		(076-1076)		

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### **QC** Summary

							and the second						
Workorder:	214912										Page 3	of 4	
Parmname			NOM	[	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Metals Analysis-IC Batch 7	C <b>P</b> 90921												
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 QC120165903	1 TB				43.5	J	9.23	ug/L	6.19		(0%-10%)		
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					
<b>Metals Analysis-M</b> Batch 7	lercury 90913												
QC1201660422 Mercury	2 LCS		0.020				0.0215	mg/L		108	(80%-120%)	JXLI	09/05/08 11:19
QC1201660423	I MB												
Mercury QC1201659028	3 214602001	MS				U	-0.000894	mg/L					09/05/08 11:17
Mercury			0.020	U	-0.000992		0.0145	mg/L		73*	(75%-125%)		09/05/08 11:23
QC1201659030 Mercury	) 214602001	MSD	0.020	U	-0.000992		0.015	mg/L	3	75	(0%-20%)		09/05/08 11:29
OC1201659031	TB	SUILI		U	-0.0992	U	-0.106	ug/L	N/A		(0%-10%)		09/05/08 11:31
Mercury	_ 647					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

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### **QC** Summary

Parmna	mo	NOM	Sample	Qual	00	Unite	DDDG	DECO	Dones		Det	TP:
A	The TIC is a suspected aldol	-condensation prod	het	Quai	<u> </u>	Units	KID7	KEC 76	Kange	Amst	Date	1 1114
В	For General Chemistry and (	Organic analysis th	e target analy	te was det	ected in the	associated	i blank					
С	Analyte has been confirmed	by GC/MS analysi	s			associated	a orann.					
D	Results are reported from a c	liluted aliquot of th	e sample									
Е	Metals%difference of sam	ole and SD is >10%	. Sample coi	ncentration	n must mee	t flagging (	criteria					
F	Estimated Value		*									
Н	Analytical holding time was	exceeded										
J	Value is estimated											
М	Matrix Related Failure											
N/A	RPD or %Recovery limits do	o not apply.										
ND	Analyte concentration is not	detected above the	detection lim	it								
NJ	Consult Case Narrative, Data	a Summary packag	e, or Project N	Manager co	oncerning t	his qualifie	er					
R	Sample results are rejected											
U	Analyte was analyzed for. bu	it not detected abov	e the MDL. I	MDA, or L	.OD.							
Х	Consult Case Narrative. Data	a Summary package	e, or Project N	Manager co	oncerning t	his qualifie	er					
Y	QC Samples were not spiked	with this compour	nd									
^	RPD of sample and duplicate	e evaluated using +.	-RL. Concer	ntrations a	re <5X the	RL. Quali	fier Not Ap	plicable for H	Radiochemi	istry.		
h	Preparation or preservation h	olding time was ex	ceeded									

^ 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.

**TX7 8 1** 

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.

GEL Laboratories LLC Form GEL-NCR Rev. 06/05

<b>Mo.Day Yr</b> . 05-SEP-08	<b>Division:</b> Federal	Quality Criteria: Specifications	<b>Type:</b> 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) Application Issues: Failed Recovery for MS/PS Failed Recovery for MSD/PSD Specification and Requirements Nonconformance Description:	(SDG): 214602(214597-2),2149	12(214909-2) NRG Disposition:	
1. Failed Recovery for MS/PS:		1. The MS recovered outsid the MS failure. Possible san	e of its acceptance window. The MSD confirms pple matrix interference. Data reported as is.
QC 1201659028MS			
2. Failed Recovery for MSD/PSD:			
Originator's Name:		Data Validator/Group Lead	er:
Jason Lov 05-SEP-08		Eric Lawson 05	-SEP-08

Quality Review:

Director:

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### **QC** Summary

Report Date: September 9, 2008 Page 1 of 3

Chent : Contact:	Lawrence Livermore Na Security, LLC 7000 East Avenue Mailstop L-620 Livermore, California Mr. Chad F. Davis	ational						Page 1 of 3	
Workorder:	214909								
Parmname	······	NOM	Sample Qual	QC	Units	RPD%	REC%	Range Anlst	Date Time
<b>Rad Gas Flow</b> Batch	790537								
QC12016594	493 214909001 DUP								
Alpha		* *	11.3	9.22	pCi/g	21*		(0% - 20%) DXB5	09/06/0815:53
		Uncert:	+/-1.89	+/-1.56					
Reto		TPU:	+/-3.30	+/-2.62	nCila	3		(0% 20%)	
Deta		Uncert-	+/-1.52	±/-1.49	peng	J		(0.70 - 20.70)	
		TPU-	+/-3.14	+/-2.94					
OC12016594	196 LCS	11 0.	17 5.14	11 2.93					
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					
QC12016594	92 MB		TI	0 ( 0 0	0:1				00/06/0016 66
Alpha		1.1	U	0.690	pCvg				09/06/0815:52
		Uncert:		+/-0.4 /8					
Pote		IPU:	11	+/-0.507	nCila				
Deta		Upcort	0	1/0.584	pena				
		TDII.		+/-0.584					
OC12016594	94 214909001 MS	110.		77-0.334					
Alpha	57 21000001 140	108	11.3	121	pCi/g		102	(75%-125%)	09/07/0807:59
x		Uncert:	+/-1.89	+/-14.1	10			(	
		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					
QC12016594	95 214909001 MSD								
Alpha		107	11.3	119	pCi/g	2	100	(0%-20%)	09/07/0807:59
		Uncert:	+/-1.89	+/-13.9					
D .		TPU:	+/-3.30	+/-31.4	0.1	1.0	0.0		
Beta		376	19.6	366	pC1/g	15	92	(0%-20%)	
		Uncert:	+/-1.52	+/-14.9					
Pod Timid Set	Hilation	IPU:	+/-3.14	+/-52.9					
Batch	790249								
QC12016588	41 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: TPU:		+/-2.07 +/-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.</p>
- h Preparation or preservation holding time was exceeded

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### **QC** Summary

Workorder:	214909							Page 3	3 of 3		
Parmname		NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
N/A indicates the	hat spike recovery lim	its do not apply whe	en sample concentration	exceeds spi	ike conc. t	y a factor c	f 4 or more.				
** Indicates and	alvte is a surrogate co:	mpound.									

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptence 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.

		2 🔲 Level 3						uctions:		_	Composition	nated soil	nated soil	nated soil							age a Time	500 Joch	•		AP Certifications #1554	
ES COC # 17499	K Normal CLP	🗖 Level 1 🕱 Level 1 SAMPLE TO CLIENT	a from off-site labs only)	: 🗖 No Discrepancies				Additional Instr	212-1 = 0" to 6" 212-2 = 6" to 12"	212-5 = 24" to 30"	Sample (	Mercury contamir	Mercury contamir	Mercury contamir								6			EL	rker
ບ ≡ 	Data Package Required:	Reporting level:	Client ID SAT	FOR CES USE ONLY Condition Upon Receipt			alyses														Automatical Automatica Automatical Automatical Automatica Automatical Automatical	8				d ES&H Policies, General Wor
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Custody			LECT	lite		Tests / J	<b>Circle Preservation</b>														e e	D Received by:	Received by:	Received by:	d additional instructions.	scribed by Section 4.3.1 of ]
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<b>COC</b> rsion 6.0 /12/2006			2-6345			 			Time	Idmac		1130	1430	1125				 			0	)	-		2-2060	iffies that the S
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( The second sec	Send Results to:	LISA CRAWFORD	L- 626	Copy:					Client Sample	Identification		212-1 1	212-2 2	212-5 3	4	5	<del>و</del>	2	8	6		Sampled and Kelinquished	Relinquished by:	Relinquished by:	CES phone # (925) 422-66	

*

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### **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#: <u>17499</u>

<u>Client ID</u>	CES ID	<b>Requested Analyses</b>
212-1	212-1	GAMMA spec, TUPA
212-2	212-2	GAMMA spec, TUPA
212-5	212-5	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:

Pedemonto

Hector Pedemonte

October 21, 2008 Date

Page 1 of 1

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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 ( $\sqrt{}$ ) 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	DB No/Matrix
GEL Laboratories LLC, Charleston, South Carolina.	COC # 17499 (three samples: 212-1 (0"-6"), 212-2 (6"-12"), 212-5 (24"-30"): all three samples are Mercury contaminated soil).
Method No(s)	Report Level
GEL Labs LLC: GAMMA spec, TUPA	Results and Summary QC

Parameters	Acceptable	Comments				
1. Precision	1	See Comments below.				
2. Accuracy	V	See Comments below.				
3. Representativeness	V	The acquired samples are representative of the waste stream.				
4. Completeness	V	All the requested analyses were reported.				
5. Comparability	V	The acquired samples are comparable to the waste matrix.				
Additional Comments:	<u>د ــــــــــــــــــــــــــــــــــــ</u>					
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.						
Signature		Date				

lure		
	MULA	Kolowanta
	10001	<u>Varmana</u>

October 21, 2008

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a member of The GEL Group NO



P0 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 M. Keat

Edith Kent Project Manager

Purchase Order: LDH0584 Chain of Custody: LDH0584 Enclosures

#### **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	Sample
<b>Identification</b>	<b>Description</b>
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

www.gal.com

#### 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</p>
- 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	<b>Client Sample</b>
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier	Americium-243	1201685705	MB for batch 801994
х	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 212-2215722003 212-5 1201685717 Method Blank (MB) 1201685718 215722001(212-1) Sample Duplicate (DUP) 215722001(212-1) Matrix Spike (MS) 1201685719 Laboratory Control Sample (LCS) 1201685720

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:	Gammaspec, 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**

Qualifier	Reason	Analyte	Sample	<b>Client Sample</b>
UI	Data rejected due to low abundance.	Bismuth-212	215722001	212-1
			1201676587	212-1(215722001DUP)
		Lead-212	1201676587	212-1(215722001DUP)
		Lead-214	1201676587	212-1(215722001DUP)
		Niobium-95	215722002	212-2
		Thorium-234	215722002	212-2
		Uranium-238	215722002	212-2

#### **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:

10/17/08

Reviewer/Date:_
# **Sample Data Summary**

CES	

CES COC# <u>17499</u> CE Soil	S Sample # <u>212-1</u>	_ Client Sample ID	Mercury Contaminated								
Rad Dec #RH	IWM-RD-08-0034-	<u>R</u>									
The sample was analyzed	for :	Sub	ject was surveyed for:								
Bulk Gross Alpha       Alpha TUPA       Surface Rad         Bulk Gross Beta       Gamma Spec       Bulk Tritium       Removable Rad α         Removable Rad H-3       Removable Rad β       Check if by Limited Rad											
	≤ MDC	> MDC	Check if by Limited Rad Declaration (LRD)								
<i>Bulk Contamination</i> Gross Alpha Gross Beta Tritium											
<i>Additional Analytical</i> Gamma Spec Alpha TUPA											
Alpha TUPA     Δ       Surface Contamination        Removable Rad H-3        Removable Rad α        Removable Rad β        Surface Rad α        Surface Rad β											
Radioactivity 🛛 wa	as 🗌 was not	an not say	added to this sample.								
<b>Comments:</b> 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: <u>Hilip</u>	<u>(a.th</u> ) x2-5515	Date:	October 23, 2008 .								

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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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

# **Certificate of Analysis**

Compa Addrea Contac	any : Lawrence Security, J ss : 7000 East Mailstop J Livermore ct: Mr. Chad	Livermore 1 LLC Avenue L-620 e, California F. Davis	National 94551				]	Report Date: Oc	tober 17,	, 2008	
Projec	t: CES - Not	rmal Deliver	able								
·	Client Sa Sample J Matrix: Collect I Receive J Collector	ample ID: D: Date: Date: ::		212-1 2157220 SO 19-AUC 30-AUC Client	001 3-08 3-08		Project: Client ID:	LLNL00306 LLNL002	<u> </u>		
Parameter	Qualifier	· Result	Uncertainty	DL	TPU	RL	Units	DF Analys	t Date	Time Batch	Mtd.
Rad Alpha Spec An	alysis		<b>.</b>								
Alphaspec Am243.	solid "Drv Weig	ht Corrected	/"								
Americium-241 Americium-243	U U	-0.0187 0.0142	+/-0.0282 +/-0.0369	0.0916 0.090	+/-0.0282 +/-0.0369	0.100 0.100	pCi/g pCi/g	AXD3	10/15/0	8 2314 80199	41
Alphaspec Pu, soli	d "Dry Weight C	orrected"									
Plutonium-238	U	0.000856	+/-0.0329	0.0864	+/-0.0329	0.100	pCi/g	AXD3	10/12/0	8 1041 80199	53
Plutonium-239/24	0 U	0.0483	+/-0.0474	0.0592	+/-0.0477	0.100	pCi/g				
lphaspec Th, soli	d "Dry Weight Co	orrected"									
Thorium-228		0.740	+/-0.265	0.0742	+/-0.303	0.200	pCi/g	AXD3	10/12/0	8 1042 80199	64
Thorium-230		0.678	+/-0.248	0.112	+/-0.282	0.200	pCi/g				
11011011-252		0.649	+/~0.243	0.112	+/-0.275	0.200	pCi/g				
Alphaspec U, solid	"Dry Weight Co	rrected"	( )								
Uranium-233/234		0.672	+/-0.223	0.105	+/-0.241	0.200	pCi/g	AXD3	10/12/08	8 1041 80199	7 5
Uranium-238	U	0.0040	+/-0.0802	0.112	+/-0.080/	0.200	pCi/g				
Rad Gamma Spec A	nalvsis	0.002	+7-0.2.52	0.105	+1-0.278	0.200	pcug				
Gammasnec Gam	ma Solid (Long )	ict) "Dry W	aight Corrected	4							
Actinium-228	iu, sona (Long I	0.607	±1.0 0873	0.124	1/ 0.0873		nCi/a	MILLI	10/00/09	0 0610 70777	0 6
Americium-241	Ţ	-0.0119	+/-0.0873	0.124	+/-0.0614		pCI/g	IVIJ 🗖 I	10/09/08	5 0049 79777	90
Antimony-124	Ŭ	0.0435	+/-0.0392	0.141	+/-0.0392		pCi/g				
Antimony-125	Ū	-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				
Bismun-214		0.506	+/-0.0499	0.0725	+/-0.0499		pCi/g				
Cerium-141	0	-0.00709	+/-0.0111	0.0587	+/-0.0111		pCl/g				
Cerium-144	U U	0.00149	+/-0.0421 +/-0.072	0.135	$\pm /_{-0.0421}$		pCl/g				
Cesium-134	U	0.0379	+/-0.0147	0.0528	+/-0.0147		pCi/g				
Cesium-136	Ŭ	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				
Couait-00	U	0.016	+/-0.0119	0.0426	+/-0.0119		pC1/g				

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Company : Address : Contact:	Lawrence l Security, L 7000 East J Mailstop L Livermore, Mr. Chad H	Livermore N LC Avenue -620 . California F. Davis	Vational 94551		·	Report Date: October 17, 2008					
Project:	CES - Norr	mal Deliver	able								
	Client Sa Sample II	mple ID: D:		212-1 2157220	01		Project: Client ID:	LLNL00306 LLNL002			
Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF Analyst Date	Time Batch Mtd.		
Rad Gamma Spec Analy	vsis										
Gammaspec, Gamma, S	Solid (Long L	ist) "Dry W	eight Corrected'	7							
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				
√eodymium-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		·	

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### **Certificate of Analysis**

	Company :	Lawrence Li	ivermore N	lational							
	Address	Security, LL	U Vervie								
	Address.	Mailston L-	620								7. 2000
		Livermore (	California (	94551						Report Date: October 1	7, 2008
	Contact:	Mr. Chad F.	Davis	74551							
	Project:	CES - Norm	al Deliver	able							
		Client Sarr Sample ID	nple ID: :		212-1 21572	200	)1		Project: Client ID:	LLNL00306 LLNL002	
Parameter		Qualifier	Result	Uncertainty	, D	)L	· TPU	RL	Units	DF Analyst Date	Time Batch Mtd.
5	DOEI	EML HASL-3	300, U-02-J	RC Modified			,				·
6	EML I	HASL 300, 4.	5.2.3								
Surrogate/	Tracer recove	ery Test					Recovery%	А	cceptable Limi	its	
Americium-	243 Tracer	Alph	aspec Am2	243, solid "Dry	Wei		90		(15%-125%)		
Curium-244	Tracer	Alph	aspec Am2	243, solid "Dry	Wei		93		(15%-125%)		
Americium-	243 Tracer	Alph	aspec Am2	43, solid "Dry	Wei		90		(15%-125%)		
Plutonium-2	42 Tracer	Alph	aspec Pu, s	olid "Dry Weig	ht C		91		(15%-125%)		
Thorium-229	9 Tracer	Alph	aspec Th, s	solid "Dry Weig	tht C		81		(15%-125%)		
Uranium-23	2 Tracer	Alph	aspec U, so	olid "Dry Weigl	nt C		105		(15%-125%)		
Ates:											
The Qual	ifiers in this	report are de	efined as f	follows :							
** An:	alvte is a sur	rogate comp	ound								

- Result is less than value reported <
- Result is greater than value reported >
- The TIC is a suspected aldol-condensation product А
- For General Chemistry and Organic analysis the target analyte was detected in the associated blank. В
- BD Results are either below the MDC or tracer recovery is low
- Analyte has been confirmed by GC/MS analysis С
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- Η Analytical holding time was exceeded
- T 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
- Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier Х
- 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. Λ
- Preparation or preservation holding time was exceeded h
- The above sample is reported on a dry weight basis.

CES	RD Version 1.2 9/14/98 REVIEW of RADIOCHEMICAL DATA									
CES COC# Rad Dec #	<u>17499</u> Sar RF	nple # <u>212-2</u> Cli <del>IWM-RD-08-0035-</del>	ient Sample ID <u>.</u> R	Mer	cury Contaminated Soil					
The sample	was analyzed	for :		Subje	ect was surveyed for:					
Bulk C Bulk C Bulk C Remov	Gross Alpha Gross Beta Tritium Vable Rad H-3	<ul> <li>☑ Alpha TU</li> <li>☑ Gamma S</li> <li>☑ Removab</li> <li>☑ Removab</li> </ul>	JPA Spec le Rad α le Rad β	Surface Rad						
		≤ MDC	> MDC		Check if by Limited Rad Declaration (LRD)					
Bulk Contamination     Image: Contamination       Gross Alpha     Image: Contamination       Gross Beta     Image: Contamination       Tritium     Image: Contamination										
<i>Additional A</i> Gamma Alpha T	A <i>nalytical</i> a Spec TUPA		XX							
Surface Contamination										
Radioactivi	ity 🛛 wa	ns 🗌 was not	🗌 can not	say	added to this sample.					
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	x2-5515	Date:	0	october 23, 2008					

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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Company	: Lawrence I Security, LI 7000 East A	Livermore N LC	Vational										
Address.	Mailstop L	-620	0.1221			-	· ]	Report Da	te: Oct	ober 17	, 2008		
Contact:	Livermore, Mr. Chad F	California . Davis	94551										
Project:	CES - Norr	nal Deliver	able										
	Client Sar Sample II Matrix: Collect Da Receive D Collector:	nple ID: ): ate: Pate:		212-2 2157220 SO 19-AUG 30-AUG Client	002 5-08 5-08		Project: Client ID:	LLNL( LLNL(	0306 02				
Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch M	Mtd.
Rad Alpha Spec Analys	sis												
Alphaspec Am243, soli	id "Dry Weight	t Corrected											
Americium-241	Ŭ	0.0304	+/-0.0468	0.0822	+/-0.047	0.100	pCi/g		AXD3	10/17/0	8 0807	801994	1
Americium-243	Х	0.105	+/-0.0646	0.0775	+/-0.0653	0.100	pCi/g						•
Alphaspec Pu, solid "L	Dry Weight Co	rrected"											
Plutonium-238	· U	0.00558	+/-0.0299	0.0737	+/-0.0299	0.100	pCi/g		AXD3	10/12/0	8 1041	801995	5
Plutonium-239/240		0.0871	+/-0.0587	0.0477	+/-0.0594	0.100	pCi/g						-
Alphaspec Th, solid "L	Ory Weight Cor	rected"											
horium-228		1.03	+/-0.330	0.165	+/-0.394	0.200	pCi/g		AXD3	10/12/0	8 1042	801996	6
1horium-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						
Alphaspec U, solid "Di	ry Weight Corr	rected"											
Uranium-233/234		0.469	+/-0.204	0.151	+/-0.214	0.200	pCi/g		AXD3	10/12/0	8 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 Anal	ysis												
Gammaspec, Gamma,	Solid (Long Li	st) "Dry We	eight Corrected	n									
Actinium-228		0.652	+/-0.137	0.221	+/-0.137		pCi/g		MJH1	10/09/0	8 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 Rarium 122	U	-0.0103	+/-0.0458	0.150	+/-0.0458		pCi/g						
Barium-140	U	0.00050	+/-0.0233	. 0.0098 2.79	+/-0.0235		pCi/g						
Bervllinm-7	U	-0.0614	+/-0.905	0.003	+/-0.275		pCl/g						
Bismuth-212	Ŭ	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						
Cobalt 56	U	-0.0491	+/-0.435	1.47	+/-0.435		pCi/g						
Cobalt-50 Cobalt-57	U	0.0155	+/-0.02//	0.0902	+/-0.02//		pCi/g		_				
Cobalt-58	U 11	0.00144	+/-0.0105	0.0334	±/-0.0103		pCl/g		-				
Cobalt-60	U U	0.00514	+/-0.0256	0.0846	+/-0.0256		pCrg pCi/g						
Europium-152	Ŭ	0.0332	+/-0.0767	0.157	+/-0.0767		nCi/g						

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# **Certificate of Analysis**

Company : Address : Contact: Project:	: Lawrence Livermore National Security, LLC 7000 East Avenue Mailstop L-620 Livermore, California 94551 Mr. Chad F. Davis CES - Normal Deliverable									
	Client Sa Sample II	mple ID: D:		212-2 2157220	002		Project: Client ID:	LLNL00306 LLNL002		
Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF Analyst Date	Time Batch Mtd.	
Rad Gamma Spec Analy	/sis					· · · · · · · · · · · · · · · · · · ·				
Gammaspec, Gamma, S	Solid (Long L	ist) "Dry W	eight Corrected	n						
Europium-154	Ŭ	-0.0631	+/-0.067	0.202	+/-0.067		DCi/g			
Europium-155	Ū	0.102	+/-0.0401	0.142	+/-0.0401		pCi/g			
Iridium-192	Ū	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			
eptunium-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	Ū	-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

MethodDescription1DOE EML HASL-300, Am-05-RC Modified2DOE EML HASL-300, Am-05-RC Modified3DOE EML HASL-300, Am-05-RC Modified4DOE EML HASL-300, Am-05-RC Modified5DOE EML HASL-300, Pu-11-RC Modified

# **Certificate of Analysis**

Company : Address : Contact: Project:	Lawrence I Security, L 7000 East A Mailstop L- Livermore, Mr. Chad F CES - Norr Client Sat Sample II	Livermore P LC Avenue -620 California 7. Davis nal Deliver mple ID: D:	94551 able 21 21	2-2 572200	02		Re Proiect: Client ID:	port Date: October 1 LLNL00306 LLNL002	7, 2008
Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF Analyst Date	Time Batch Mtd.
6 DOE	EML HASL-	300, Th-01	-RC Modified						. · · ·
7 DOE I	EML HASL-	-300, U-02-	RC Modified						
8 EML	HASL 300, 4	4.5.2.3							
Surrogate/Tracer recov	ery Test	t			Recovery%	Acc	eptable Limits	· · · · · · · · · · · · · · · · · · ·	
Americium-243 Tracer	Alp	haspec Am	243, solid "Dry Wei		85	(	(15%-125%)		
Curium-244 Tracer	Alp	haspec Am	243, solid "Dry Wei		77	(	(15%-125%)		
Americium-243 Tracer	Alp	haspec Am	243, solid "Dry Wei		86	(	(15%-125%)		
Thorium 220 Trocor	Alp	haspec Pu, :	solid "Dry Weight C		95 74	(	(15% - 125%)		
nium-232 Tracer	Alp	haspee II s	olid "Dry Weight C		74 89	,	(15% - 125%)		
<ul> <li>** Analyte is a sur</li> <li>Result is less that</li> <li>Result is greater</li> <li>A The TIC is a sur</li> <li>B For General Che</li> <li>BD Results are eith</li> <li>C Analyte has bee</li> <li>D Results are report</li> <li>F Estimated Value</li> <li>H Analytical holdit</li> <li>J Value is estimated</li> <li>M M if above MD</li> <li>M Matrix Related</li> <li>N/A RPD or %Record</li> <li>ND Analyte concert</li> <li>NJ Consult Case N</li> <li>R Sample results and</li> <li>UI Gamma Spectrot</li> <li>X Consult Case N</li> <li>Y QC Samples were</li> </ul>	rogate com n value rep than value pected aldo mistry and the below the n confirmed rted from a ng time wa d C and less Failure overy limits atration is n arrative, Da re rejected lyzed for, t scopyUnd arrative, Da	pound ported reported ol-condens Organic a ne MDC of d by GC/M diluted al s exceeded than LLD s do not ap not detected ata Summa but not det certain ide ata Summa	sation product malysis the target r tracer recovery is iquot of the sampl d d by d above the detect ary package, or Pro- ected above the M ntification ry package, or Pro-	analyte s low le ion lim oject M IDL, M oject M	it inager conce iDA, or LOD. anager concer	in the as rning this	sociated blank qualifier qualifier		

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# **Certificate of Analysis**

Parameter		Qualifier Result	Uncertainty	DL	TPU	RL	Units	DF Analyst Date	Time Batch Mtd.
		Client Sample ID: Sample ID:		212-2 21572200	2		Project: Client ID:	LLNL00306 LLNL002	
	Project:	CES - Normal Delivera	ble						
	Contact:	Livermore, California 9 Mr. Chad F. Davis	94551						
		Mailstop L-620					F	Report Date: October 17	, 2008
	Address :	Security, LLC 7000 East Avenue							
	Company :	Lawrence Livermore N	ational						

....

The above sample is reported on a dry weight basis.

CES COC#	17499	CES Sample #_	212-5	Client Sample ID_	Mercury	Contaminated
Soil	-					

 Rad Dec #______
 RHWM-RD-08-0036-R______

The	sample was analyzed fo	Subject was surveyed for:					
	Bulk Gross Alpha	$\boxtimes$	Alpha TUPA		Surface Rad		
	Bulk Gross Beta	$\boxtimes$	Gamma Spec				
	Bulk Tritium		Removable Rad $\alpha$				
	<b>Removable Rad H-3</b>		Removable Rad β				

	≤ MDC	> MDC	Check if by Limited Rad Declaration (LRD)							
<i>Bulk Contamination</i> Gross Alpha Gross Beta Tritium										
<i>Additional Analytical</i> Gamma Spec Alpha TUPA		XX								
Surface Contamination Removable Rad H-3 Removable Rad α Removable Rad β Surface Rad α Surface Rad β										
Radioactivity 🛛 wa	ıs 🗌 was not	an 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: Hilip Torretto,	(anth) x2-5515	Date:	October 23, 2008 .							

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.

# **Certificate of Analysis**

Company : Address :	Lawrence L Security, LI 7000 East A	Livermore N LC Avenue	National								
	Mailstop L-	-620	04551					Report Date: Oc	tober 1	7, 2008	
Contact:	Mr. Chad F	Davis	94551								
Project:	CES - Norn	nal Deliver	able								
	Client San Sample II Matrix: Collect Da Receive D Collector:	nple ID: ): ate: Pate:		212-5 2157220 SO 28-AUC 30-AUC Client	)03 3-08 3-08		Proiect: Client ID:	LLNL00306 LLNL002			
Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF Analys	t Date	Time Batc	h Mtd.
Rad Alpha Spec Analys	is							······			
Alphaspec Am243, soli	d "Dry Weight	t Corrected	"								
Americium-241	U	0.022	+/-0.0406	0.0781	+/-0.0407	0.100	pCi/g	AXD3	10/15/	08 2314 8019	194 1
Americium-243	U	0.0699	+/-0.0612	0.0857	+/-0.0617	0.100	pCi/g				
Alphaspec Pu, solid "L	ry Weight Cor	rrected"									
Plutonium-238	U	-0.0196	+/-0.0242	0.0826	+/-0.0243	0.100	pCi/g	AXD3	10/12/	08 1041 8019	195 3
Plutonium-239/240	U	-0.00736	+/-0.0217	0.0624	+/-0.0217	0.100	pCi/g				
^1phaspec Th, solid "D	ry Weight Cor	rected"									
horium-228		0.773	+/-0.301	0.203	+/-0.347	0.200	pCi/g	AXD3	10/12/	08 1042 8019	96 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				
Alphaspec U, solid "Dr	y Weight Corr	rected"	• · · ·								
Uranium-233/234		0.637	+/-0.211	0.0546	+/-0.229	0.200	pCi/g	AXD3	10/12/	08 1041 8019	97 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 Anal	ysis										
Gammaspec, Gamma,	Solid (Long Li	st) "Dry We	eight Corrected'	,							
Actinium-228		0.828	+/-0.103	0.137	+/-0.103		pCi/g	MJH1	10/09/0	08 0851 7977	79 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				
Berymum-/	U	-0.103	+/-0.140	0.464	+/-0.140		pCi/g				
Bismuth 214		0.549	+/-0.152	0.509	+/-0.132		pCi/g				
Cerium-139	IT	-0.0127	+/-0.0330	0.0720	$\pm 1.00104$		pCrg				
Cerium-141	U	-0.00422	+/-0.0371	0.123	+/-0.0371		pCi/g				
Cerium-144	Ŭ	0.0253	+/-0.0727	0.246	+/-0.0727		pCi/g				
Cesium-134	Ŭ	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				
CODAIT-OU	U	0.0134	+/-0.0123	0.0434	+/-0.0123		pCi/g				
Europiun-152	U	0.0186	+/-0.0334	0.0997	+/-0.0334		pC1/g				

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### **Certificate of Analysis**

Company : Address : Contact:	Lawrence I Security, L 7000 East A Mailstop L Livermore, Mr. Chad F	Livermore N LC Avenue -620 California 5. Davis	National 94551		Report Date: October 17, 2008					
Project:	CES - Norr	nal Deliver	able							
	Client Sa Sample II	mple ID: ):		212-5 2157220	003		Project: Client ID:	LLNL00306 LLNL002		
Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF Analyst Date	Time Batch Mtd.	
Rad Gamma Spec Anal	ysis									
Gammaspec, Gamma, S	Solid (Long L	ist) "Dry W	eight Corrected'	"						
Europium-154	ับ	-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			
eodymium-147	U	-0.909	+/-0.869	2.80	+/-0.869		pCi/g			
eptunium-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			
Ruthemum-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			
Inorium-234	U	0.0629	+/-0.554	1.96	+/-0.554		pCi/g			
110-113 Davation 225	U	0.012	+/-0.0176	0.059	+/-0.0176		pCi/g			
Uranium-235	U	0.0197	+/-0.0/44	0.245	+/-0.0744		pCi/g			
Uranium-238	U	0.0629	+/-0.554	1.96	+/-0.554		pCi/g			
rttrium-88	U	-0.00125	+/-0.012	0.0393	+/-0.012		pCi/g	·		
∠INC-00 Zincening 05	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

MethodDescription1DOE EML HASL-300, Am-05-RC Modified2DOE EML HASL-300, Am-05-RC Modified3DOE EML HASL-300, Pu-11-RC Modified4DOE EML HASL-300, Th-01-RC Modified5DOE EML HASL-300, U-02-RC Modified

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### **Certificate of Analysis**

	Company : Address : Contact:	Lawrence Security, L 7000 East Mailstop L Livermore Mr. Chad	Livermore l LC Avenue 620 , California F. Davis	Vational 94551			Report Date: October 17, 2008						
	Project:	CES - Nor	mal Deliver	able									
		Client Sa Sample I	mple ID: D:		212-5 2157220	003		Project: Client ID:					
Parameter		Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF Analyst Date	Time Batch Mtd.			
6	EML	HASL 300,	4.5.2.3										
Surrogate/I	Tracer recovery		it			Recovery%	Ac	ceptable Limi	ts				
Americium-2	43 Tracer Alphaspec Am243, solid "Dry				Wei	78 (15%-125%		(15%-125%)					
Curium-244 Tracer Alphaspec Am243 solid "Dry Wei						83		(15%-125%)					

Americium-243 Tracer	Alphaspec Am243, solid "Dry Wei	79	(15%-125%)
Plutonium-242 Tracer	Alphaspec Pu, solid "Dry Weight C	92	(15%-125%)
Thorium-229 Tracer	Alphaspec Th, solid "Dry Weight C	62	(15%-125%)
Uranium-232 Tracer	Alphaspec U, solid "Dry Weight C	93	(15%-125%)

stes:

Curi

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 >
- The TIC is a suspected aldol-condensation product Α

For General Chemistry and Organic analysis the target analyte was detected in the associated blank. B

- BD Results are either below the MDC or tracer recovery is low
- С Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- Estimated Value F
- Analytical holding time was exceeded Η
- Value is estimated J
- M if above MDC and less than LLD Μ
- Matrix Related Failure Μ
- 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
- Х Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y QC Samples were not spiked with this compound
- ٨ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
- Preparation or preservation holding time was exceeded h
- The above sample is reported on a dry weight basis.

# Quality Control Summary

			QC	Su	mmary		т	) an ant T	latas Ostabar 17 2008	
Client : Contact:	Lawrence Livermore Na Security, LLC 7000 East Avenue Mailstop L-620 Livermore, California Mr. Chad F. Davis	ational					F	Ceport L	Page 1 of 14	
Workorder	215722									
									· · · · · · · · · · · · · · · · · · ·	
Parmname	d	NOM	Sample (	2ual	QC	Units	RPD%	REC%	Range Anlst	Date Time
Batch 8	01994									
QC120168570 Americium-241	6 215722001 DUP	U Uncert:	-0.0187 +/-0.0282	U	0.0211 +/-0.0439	pCi/g	3320		N/A AXD3	10/15/0823:14
		TPU:	+/-0.0282		+/-0.044	0.1			(00) 10000	10 °
Americium-243		U Uncert: TPU:	+/-0.0369 +/-0.0369	х	0.346 +/-0.0976 +/-0.101	pCi/g	184*		(0% - 100%)	-
QC120168570 Americium-241	8 LCS	5.27			4.66	pCi/g		88	(75%-125%)	10/15/0823:14
		Uncert: TPU:			+/-0.473 +/-0.752					
Americium-243		Uncert: TPU:			7.55 +/-0.599 +/-1.12	pCi/g			(75%-125%)	
QC120168570 Americium-241	5 MB	Uncert:		U	0.0138 +/-0.0269	pCi/g				10/17/0808:07
Americium-243		TPU: Uncert:		х	+/-0.027 0.151 +/-0.0778	pCi/g				
00120168570	7 215722001 MS	TPU:			+/-0.0791					
Americium-241	/ 213722001 110	5.31 U Uncert:	-0.0187 +/-0.0282 +/-0.0282		5.77 +/-0.543 +/-0.912	pCi/g		109	(75%-125%)	10/15/0823:14
Americium-243		U Uncert: TPU:	0.0142 +/-0.0369 +/-0.0369		7.61 +/-0.622 +/-1.15	pCi/g			(75%-125%)	
Batch 8	01995	11 0.	11 010007		.,					
QC120168571 Plutonium-238	0 215722001 DUP	U Uncert:	0.000856 +/-0.0329	U	0.00	pCi/g	0		N/A AXD3	10/12/0810:41
Plutonium-239/2	40	TPU: U Uncert:	+/-0.0329 0.0483 +/-0.0474		+/-0.0215 0.0907 +/-0.065	pCi/g	61		(0% - 100%)	
QC1201685712 Plutonium-238	2 LCS	Uncert:	+/-U.U4//	U	0.0161	pCi/g			(75%-125%)	10/12/0810:41
Plutonium-239/2	40	TPU: 5.48 Uncert:			+/-0.0258 4.61 +/-0.403	pCi/g		84	(75%-125%)	

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Workorder: 215722						Page 2 of 14					
Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range Anlst	Date Time			
Rad Alpha Spec	-										
Batch 801995											
	TPU:		+/-0.630								
QC1201685709 MB											
Plutonium-238		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		0.000856 11	0.0402	-Cila			(750, 1050)	10/12/0010.41			
r lutomum-256	U Uncert:	1/0.0320	+/ 0.0402	peng			(7570-12570)	10/12/0810.41			
	TDII.	+/-0.0329	+/-0.0454								
Plutonium-239/240	553 IT	0.0483	+7-0.04 <i>3</i> 0 5.67	nCi/a		102	(75%-125%)				
	Uncert:	+/-0 0474	+/-0 499	pens		102	(1570-12570)				
	TPII-	+/-0 0477	+/-0.800								
Batch 801996	11 0.	11 0.0417	17 0.000								
OC1201685714 215722001 DUP											
Thorium-228		0.740	0.615	pCi/g	19		(0% - 100%) AXD	3 10/12/0810:42			
	Uncert:	+/-0.265	+/-0.242								
	TPU:	+/-0.303	+/-0.271								
iorium-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								
<b>m</b> : 000	TPU:		+/-1.73	0.1			(BCG 10CG)				
Thorium-230			3.41	pC1/g			(75%-125%)				
	Uncert:		+/-0.493								
Thereium 222	TPU:		+/-0.820	- Ci/-		100	(750) 1050)				
1H011um-232	U.91		1.52	pera		100	(73%-125%)				
	Uncen:		+/-0.721								
OC1201685713 MB	IPU:		+/-1.36								
Thorium-228		U	0.0413	nCi/g				10/12/0810.42			
	Uncert:	Ũ	+/-0.0981	P0-28				10/12/0010112			
	TPII		+/-0.0985								
Thorium-230		U	0.0862	pCi/g							
	Uncert:	_	+/-0.0997	r - 0							
	TPU:		+/-0.102								
Thorium-232		U	0.0537	pCi/g							
	Uncert:		+/-0.0752								
	TPU:		+/-0.0762								
QC1201685715 215722001 MS											
Thorium-228		0.740	9.91	pCi/g			(75%-125%)	10/12/0810:42			
	Uncert:	+/-0.265	+/-1.07								

Workorder: 215722						Page 3 of 14				
Parmname	NOM	Sample (	Jual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Alpha Spec										
Batch 801996										
	TPU	+/-0 303		+/-2.40						
Thorium-230		0.678		3.73	pCi/g			(75%-125%)	)	
	Uncert:	+/-0.248		+/-0.635	1 0					
	TPU:	+/-0.282		+/-1.03						
Thorium-232	7.60	0.649		8.86	pCi/g		108	(75%-125%)	r	
	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						
	TPU:	+/-0.241		+/-0.267						
Uranium-235/236	U	0.0646	U	0.00	pCi/g	0		N/A	1	
	Uncert:	+/-0.0802		+/-0.0737						
	TPU:	+/-0.0807		+/-0.0739						
Uranium-238		0.862		0.608	pCi/g	35*		(0% - 20%)		
	Uncert:	+/-0.252		+/-0.267						
0.01001/057700	TPU:	+/-0.278		+/-0.282						
QC1201685720 LCS				0.10	nCi/a			(75%-125%)		10/12/0810-41
Mamum-255/254	Uncert			±/_0 978	peng			(15/0-125/0)		10/12/0010.41
	TDII.			+/-1 71						
Uranium-235/236	11 0.			0.260	pCi/g			(75%-125%)		
51411411 200/200	Uncert:			+/-0.186	r6			(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
	TPU:			+/-0.191						
Uranium-238	8.90			9.61	pCi/g		108	(75%-125%)	1	
	Uncert:			+/-1.00						
	TPU:			+/-1.78						
QC1201685717 MB										
Uranium-233/234				0.132	pCi/g					10/12/0810:41
	Uncert:			+/-0.0914						
	TPU:			+/-0.0932						
Uranium-235/236			U	0.0408	pCi/g					
	Uncert:			+/-0.0565						
11 . 000	TPU:		* *	+/-0.0568	0.1					
Uranium-238	T.T		U	0.0125	pCi/g					
	Uncert:			+/-0.0332						
OC1201685719 215722001 MS	IPU:			+/-0.0333						-
Uranium-233/234		0.672		11.5	pCi/g			(75%-125%)	1	10/12/0810:41
	Uncert:	+/-0.223		+/-1.21	r - o			(,		
	TPU:	+/-0.241		+/-2.18						
Uranium-235/236		0.0646		0.438	pCi/g			(75%-125%)	1	
	Uncert:	+/-0.0802		+/-0.265						
	TPU:	+/-0.0807		+/-0.274						
Uranium-238	9.80	0.862		12.3	pCi/g		117	(75%-125%)	,	
	Uncert:	+/-0.252		+/-1.25						
	TPU:	+/-0.278		+/-2.32						

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Workorder: 215722						Page 4 of 14					
Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range Anlst	Date Time		
Rad Gamma Spec											
Batch 797779											
OC1201676587 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							
Di lati	TPU:	+/-0.187		+/-0.186	<i>a</i>			(0.01			
Bismuth-214		0.506		0.569	pCı/g	12		(0% - 20%)			
	Uncert:	+/-0.0499		+/-0.0628							
Q : 130	TPU:	+/-0.0499		+/-0.0628	0.1	220		27/1			
Cerium-139	U	-0.00709	U	0.0276	pC1/g	338		N/A			
	Uncert:	+/-0.0111		+/-0.0125							
Continue 141	TPU:	+/-0.0111	TT	+/-0.0125	-0:4-	104		<b>NT/A</b>			
Cenum-141	U	-0.0342	U	-0.0171	pc1/g	104		IN/A			
	Uncert:	+/-0.0421		+/-0.048							
Cerium 144	IPU:	+/-0.0421	T	+/-0.048	*Cila	228		N1/ A			
Certuin-144	U	0.00149	0	-0.01/1	peng	230		IN/A			
	TDU.	+/-0.072		+/-0.0716							
Cesium-134	IPU:	+/-0.072	U		nCila	66		NI/A			
Costain 154	U Uncert:	+4.0 0147	0	+/-0.0175	pene	00					
	TDU	+/-0.0147		$\pm 1-0.0175$							
Cesium-136	IFU.	0 156	П	-0.189	nCi/g	2090		N/A			
	U Uncert:	+/-0 227	U	+/-0.263	pers	2070		1.071			
	TPI	+/-0.227		+/-0.263							
Cesium-137	11 0.	0.588		0.613	nCi/ø	4		(0% - 20%)			
	Uncert:	+/-0.0356		+/-0.038	r~55	,		(370 - 370)			
	TPII	+/-0.0356		+/-0.038							
Chromium-51	11 O. 11	0.411	U	0.206	pCi/g	67		N/A			
	Uncert:	+/-0.289	-	+/-0.361	r8			- ***			
	TPU:	+/-0.289		+/-0.361							

Workorder: 215722						Page 5 of 14					
Parmname	NOM	A Sample Qual QC			Units	RPD%	REC%	Date Time			
Rad Gamma Spec											
Batch 797779											
Cobalt-56	11	-0.0102	U	0.00178	nCi/g	284		N/A			
	Uncert:	+/-0.0167	Ŭ	+/-0.0197	P = 28	201					
	TPI	+/-0.0167		+/-0.0197							
Cobalt-57	110. 11	0.0019	U	-0.00619	pCi/g	377		N/A			
	Uncert:	+/-0.00885		+/-0.00907	г <del>о</del>						
	TPI	+/-0.00885		+/-0.00907							
Cobalt-58	II	-0.0425	U	-0.0444	pCi/g	4		N/A			
	Uncert:	+/-0.0155		+/-0.0202	1 0						
	TPU	+/-0.0155		+/-0.0202							
Cobalt-60	11	0.016	U	0.00951	pCi/g	51		~~~ <b>N/A</b> ~			
	Uncert:	+/-0.0119		+/-0.0162	1 0						
•	TPU	+/-0.0119		+/-0.0162							
Europium-152	11 U.	-0.0212	U	-0.00397	pCi/g	137		N/A			
1	Uncert:	+/-0.0346		+/-0.0498	1 0						
	TPU:	+/-0.0346		+/-0.0498							
Europium-154	1	-0.119	U	-0.00959	pCi/g	170		N/A			
1	Uncert:	+/-0.0369		+/-0.0374	1 0						
	TPU:	+/-0.0369		+/-0.0374							
Europium-155	11	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	Ŭ	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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Workorder: 215722							Page 6 of 14				
Parmname	NOM	Sample (	Qual	QC	Units	RPD%	REC% Range A		Anlst	Date Time	
Rad Gamma Spec											
Batch 797779											
Niobium-94	I	0.00913	U	-0.0138	pCi/g	975		N/A			
	Uncert:	+/-0.0101		+/-0.013	F8						
	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	$\mathbb{C}^{\mathbb{C}^{n}}$ , where $\mathbb{C}^{n}$	-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							
<b>a w a</b>	TPU:	+/-0.0148		+/-0.0156	<i></i>						
Sodium-22	U	-0.0411	U	-0.00271	pCı/g	175		N/A			
	Uncert:	+/-0.0133		+/-0.0137							
<b>EI 11:</b> 000	TPU:	+/-0.0133		+/-0.0137	0.1	(		(00 1000)			
Thailium-208	TT	0.211		0.225	pCvg	0		(0% - 100%)			
	Uncert:	+/-0.0279		+/-0.031							
Thereisen 220	TPU:	+/-0.02/9		+/-0.031		10		(000 2000)			
Inonum-230	T	0.506		0.509	pC1/g	12		(0% - 20%)			
•	Uncert:	+/-0.0499		+/-0.0628							
Thorium 234	IPU:	+/-0.0499	T.T	+/-0.0028	-Cila	107		NI/A			
monum-234	U	0.248	0	1.12	peng	127		IN/A			
	TDU.	+/-0.519		+/-0.569							
Tin-113	IPU:	0.0339	ĨĨ	+/-0.309 0.0007	nCila	111		NI/A			
111-115	U	$\pm /_{-0.0172}$	0	+/-0.0222	perg	111		11/1			
	TDI I.	+/ 0.0172		+1-0.0222							
Uranium-235	11 U. 11	0.053	П	-0.0222	nCi/g	507		N/A			
orumum 235	U Uncert:	+/-0.0696	0	+/-0.0772	pens	507		1 1 1 1			
	TPIL	+/-0.0696		+/-0.0772							
Uranium-238	11 U.	0.248	П	1 12	nCi/g	127		N/A			
	Uncert:	+/-0 519	Ŷ	+/-0.569	r~"5						
	TPL	+/-0 519		+/-0 569		÷					
Yttrium-88	11 U.	0.0104	U	0.00929	pCi/g	11		N/A			
	Uncert:	+/-0.0124	-	+/-0.0142	r 0						
	TPU:	+/-0.0124		+/-0.0142							

	· ·	QC	<u>Su</u>	mmary					
Workorder: 215722								Page 7 of 14	
Parmname	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			2010		
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					
Rarium-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	1				
	TPU			+1-0.277					
Bismuth-214				0.526	nCi/g				
	Uncert:			+/-0.100	r8				
	TPU			+/-0.100					
Cerium-139				0.191	nCi/g				
	Uncert:			+/-0.039	Perb				
	TPU			+/-0.039					
Cerium-141	11 0.		IJ	-0.00109	nCi/a				
	Uncert.		0	+/-0.052	peng				
	TDI I-			+/-0.052					
Cerium-144	iru.		<b>T</b> T	-0.052	pCi/g				
<b>a</b> , ,	Uncert		0	+/_0 170	PC1/g				
	TDI I.			+/-0.172					
Cesium-134	IPU:		11	-0.00114	nCi/c				
Contail 10-1	Uncort.		U	-0.00114	pena				
	UNCER.			+1-0.0431					
Cesium-136	IPU:		I I	+/-0.0437	nCi/a				
Contain 100	Uncort		0	-0.11	peng				
	oncert.			+1-0.178					

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Date Time

### **QC** Summary Workorder: 215722 Page 8 of 14 Parmname NOM Sample Qual QC Units RPD% REC% Range Anlst Rad Gamma Spec 797779 TPU: +/-0.178 Cesium-137 5.99 6.14 pCi/g 102 (75%-125%) Uncert: +/-0.288 TPU: +/-0.288 Chromium-51 U 0.385 pCi/g +/-0.408 Uncert: TPU: +/-0.408 Cobalt-56 U -0.0349 pCi/g Uncert: · +/-0.0442 TPU: +/-0.0442 Cobalt-57 0.797 pCi/g Uncert: +/-0.0517 TPU: +/-0.0517 Cobalt-58 U 0.0394 pCi/g +/-0.042 Uncert: +/-0.042 TPU: Cobalt-60 7.69 pCi/g 94 (75%-125%) 7.23 Uncert: +/-0.277 +/-0.277 TPU: "uropium-152 U -0.0278 pCi/g Uncert: +/-0.0925 +/-0.0925 TPU: Europium-154 U 0.0483 pCi/g Uncert: +/-0.0663 TPU: +/-0.0663 Europium-155 U 0.00778 pCi/g Uncert: +/-0.0781 TPU: +/-0.0781 Iridium-192 U 0.0416 pCi/g Uncert: +/-0.033 TPU: +/-0.033 Iron-59 U 0.018 pCi/g Uncert: +/-0.111 TPU: +/-0.111 Lead-210 U 0.583 pCi/g Uncert: +/-2.30 TPU: +/-2.30 Lead-212 0.858 pCi/g Uncert: +/-0.0878 +/-0.0878 TPU: Lead-214 0.674 pCi/g +/-0.0977 Uncert: +/-0.0977 TPU: Manganese-54 U 0.0247 pCi/g Uncert: +/-0.0364 +/-0.0364 TPU:

-0.0273

+/-0.0394

pCi/g

U

Mercury-203

Batch

Uncert:

Workorder: 215722						Page 9	) of 14	
Parmname NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec	·							
Batch 797779								
TPU:		+/-0.0394						
Neodymium-147	U	1.22	pCi/g					
Uncert:		+/-0.837						
TPU:		+/-0.837		-				
Neptunium-239	U	-0.0347	pCi/g					
Uncert:		+/-0.168						
TPU:		+/-0.168						
Niobium-94	U	-0.0229	pCi/g					
Uncert:		+/-0.0282						
TPU:		+/-0.0282	×	•				
Niobium-95	U	-0.0178	pCi/g					
. Uncert:		+/-0.049						
TPU:		+/-0.049	0.1					
Potassium-40		1.44	pCi/g					
Uncert:		+/-0.273						
1PU:	II	+/-0.273	-Cila					
Promeunum-144	U	-0.00494	peng					
		+/-0.0280						
*Tromethium-146	IJ	-0.0280	nCi/a					
Uncert:	0	+/-0.0466	pere					
TPI		+/-0.0466						
Radium-228		1.52	pCi/g					
Uncert:		+/-0.300	r - 0					
TPU:		+/-0.300						
Ruthenium-106	U	0.728	pCi/g					
Uncert:		+/-0.294						
TPU:		+/-0.294						
Silver-110m	U	0.000475	pCi/g					
Uncert:		+/-0.0404						
TPU:		+/-0.0404						
Sodium-22	U	0.0174	pCi/g					
Uncert:		+/-0.0238						
TPU:		+/-0.0238						
Thallium-208		0.381	pC1/g					
Uncert:		+/-0.0659						
TPU:		+/-0.0659	0.1					
Inorium-230		0.520	pC1/g					
Uncert		+/-0.100						
Thorium 234	. II	+/-0.100	nCi/a					
Inorum-234	0	-0.323	peng					
		+/-1.04						
Tin-113		0 330	nCi/o					
Uncert:		+/-0.0625	P 0 2 6					
TPI.		+/-0.0625						
Uranium-235	U	-0.0627	pCi/g					
Uncert:		+/-0.146						

		QC St	immary						
Workorder: 215722		<u> </u>					Page 1	0 of 14	
Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec									
Batch 797779									
	TPU		+/-0 146						
Uranium-238		U	-0.325	pCi/g					
	Uncert:		+/-1.04	1 0					
	TPU:		+/-1.04						
Yttrium-88			0.235	pCi/g					
	Uncert:		+/-0.0465						
	TPU:		+/-0.0465						
Zinc-65		U	-0.198	pCi/g					
	Uncert:		+/-0.0962						
21 · · · · ·	TPU:		+/-0.0962						
Zirconium-95		U	0.0933	pCi/g					
	Uncert:		+/-0.0691						
	TPU:		+/-0.0691						
QC1201676586 MB									
Actinium-228		U	-0.0217	pCi/g					10/09/0808:51
	Uncert:		+/-0.0477						
	TPU:		+/-0.0477						
Americium-241		U	-0.00583	pCi/g					
	Uncert:		+/-0.0105						
	TPU:		+/-0.0105						
ntimony-124		U	-0.0205	pCi/g					
2	Uncert:		+/-0.0359	r - 0					
	TPU:		+/-0.0359						
Antimony-125		U	-2.30E-05	pCi/g					
2	Uncert:		+/-0.0274	r 0					
	TPU		+/-0.0274						
Barium-133		U	-0.0449	pCi/g					
	Uncert:		+/-0.0147	r 6					
	TPU		+/-0.0147						
Barium-140	11 0.	U	0.0436	pCi/g					
	Uncert:	-	+/-0.141	r6					
	TPU		+/-0.141						
Beryllium-7	11 0.	U	0.0312	pCi/g					
······································	Uncert:	Ū.	+/-0.107	1018					
	TPU		+/-0.107						
Bismuth-212	11 0.	U	-0.0503	nCi/g					
	Uncert:		+/-0.098	P-18					
	TPU		+/-0.098						
Bismuth-214	11 0.	U	-0.0316	nCi/g					
	Uncert:	, , , , , , , , , , , , , , , , , , ,	+/-0.0322	Pers					
	TPIJ		+/-0.0322						
Cerium-139		. U	-0.00035	nCi/g					
	Uncert:	-	+/-0.00717	P - 2 B					
	TPU		+/-0.00717						
Cerium-141		U	-0.0107	pCi/g					
	Uncert:	U	+/-0.017	r~*5					
	TPU		+/-0.017						
Cerium-144		U	-0.000337	pCi/g					

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7

Workorder: 215722						Page 11 of 14			
Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec									
Batch 797779									
	Uncert:		+/-0.0461						
	TPU:		+/-0.0461						
Cesium-134		U	0.0011	pCi/g					
	Uncert:		+/-0.0138	1 0					
	TPU:		+/-0.0138						
Cesium-136		U	-0.0671	pCi/g					
	Uncert:		+/-0.0539						
	TPU:		+/-0.0539						
Cesium-137		U	0.004	pCi/g					
	Uncert:		+/-0.0136						
	TPU:		+/-0.0136						
Chromium-51		U	0.021	pCi/g					
	Uncert:		+/-0.150						
	TPU:		+/-0.150						
Cobalt-56		υ	-0.0205	pCi/g					
	Uncert:		+/-0.0177						
	TPU:		+/-0.0177						
Cobalt-57		U	0.000692	pCi/g					
	Uncert:		+/-0.00469						
	TPU:		+/-0.00469						
Cobalt-58		U	0.00206	pCi/g					
	Uncert:		+/-0.0145						
	TPU:		+/-0.0145						
Cobalt-60		U	-0.0255	pCi/g					
	Uncert:		+/-0.0171						
	TPU:		+/-0.0171						
Europium-152		U	0.0224	pCi/g					
	Uncert:		+/-0.030						
	TPU:		+/-0.030						
Europium-154		U	0.0174	pCi/g					
*	Uncert:		+/-0.0272	1 0					
	TPU:		+/-0.0272						
Europium-155		Û	0.0107	pCi/g					
-	Uncert:		+/-0.0184						
	TPU:		+/-0.0184						
Iridium-192		U	-0.00177	pCi/g					
	Uncert:		+/-0.0126						
	TPU:		+/-0.0126						
Iron-59		U	0.052	pCi/g					
	Uncert:		+/-0.0341						
	TPU:		+/-0.0341						
Lead-210		U	0.159	pCi/g					
	Uncert:		+/-0.106	. 0					
	TPU:		+/-0.106						
Lead-212		U	-0.0299	pCi/g					
	Uncert:		+/-0.0172	_ 0					
	TPU:		+/-0.0172						
Lead-214		U	0.0274	pCi/g					

Paramane         NOM         Sample Qual         QC         Units         RPD%         REC%         Range         Anist         Date Time           Rad Gamma Spec back         99779	Workorder: 215722							Page 12 of 14			
Ref can spec Back 7979Honer:+/-0.0257 -TPU:-4/-0.0257 -Maganese-54TPU:-4/-0.0257 	Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Bath79779ITU:+/-0.0257 +/-0.0018Marganese-54TU:+/-0.0257 +/-0.018Itueret:+/-0.018 VMercury-203Itueret:+/-0.013 VModymium-147Uaceret:+/-0.013 VModymium-239U-0.0563 VMothingItueret:+/-0.021 VMothingV-0.0564 VMothingV-0.0564 VMothingV-0.0564 VMothingV-0.0564 VMothingV-0.0564 VMothingV-0.0564 VMothingV-0.0564 VMothingV-0.0564 VMothingV-0.0564 VMothingV-0.0564 VMothingV-0.0564 VMothingV-0.0564 VMothingV-0.0564 VMothingV-0.0564 VMothingV-0.0564 VMothingV-0.0574 VMothingV-0.0574 VMothingV-0.0574 VMothingV-0.0574 VMothingV-0.0574 VMothingV-0.0574 VMothingV-0.0574 VMothingV-0.0574 VMothingV-0.0574 VMothingV-0.0574 VMothingV-0.0574 VMothingV-0.0574 VMothing	Rad Gamma Spec										
$\begin{split} & \begin{array}{ccccccccccccccccccccccccccccccccccc$	Batch 797779										
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Uncert:		+/-0.0257							
Marganese-54U0.00383 40015CVg 400135TPU:+40.0135Precury-203Uncert:+40.013 40013Uncert:+40.013 40031TPU:-40.0321 40.0321Neghaniam-239U0.0553 40.0341TPU:+40.0341 40.0341TPU:+40.0341 40.0341TPU:+40.0341 40.0341TPU:+40.0341 40.0341TPU:+40.0122 40.0341TPU:+40.0134 40.0455TPU:+40.0184 40.0122Nicbiam-94U0.0455 40.012Uncert:+40.0184 40.0142TPU:+40.0184 40.0142TPU:+40.0184 40.0142TPU:+40.0184 40.0142TPU:+40.0184 40.0142Ponethium-146UUncert:+40.0134 40.0134TPU:+40.0134 40.0134Ponethium-146UUncert:+40.0134 40.0134TPU:+40.0137 40.0135Radium-228Uncert:TPU:+40.0137 40.0135TPU:+40.0177 40.0135TPU:+40.0177 40.0136TPU:+40.0177 40.0136TPU:+40.0174 40.0136TPU:+40.0174 40.0174TPU:+40.0174 40.0174TPU:+40.0174 40.0174TPU:+40.0174 40.0174TPU:+40.0174 40.0174TPU:+40.0174 40.0174TPU:+40.0174 40.0174TPU:+40.0174 40.0174		TPU:		+/-0.0257							
	Manganese-54		U	-0.00383	pCi/g						
TPU:+/-0.013 +/-0.03Mercury-203Uncert:+/-0.013 +/-0.03TPU:+/-0.03 +/-0.21Medymium-147Uncert:+/-0.21 +/-0.21Methanization (Construction (C		Uncert:		+/-0.0115							
<table-container>Meerury-203U0.0113pC/gTPU:+/-0.013Neodymium-147TPU:+/-0.014Meerury-209TPU:+/-0.221TPU:+/-0.231TPU:+/-0.053PC/gUncert:+/-0.0531PC/gMobium-94U-0.00864pC/gTPU:+/-0.0124-Mobium-94U-0.00864pC/gMobium-95+/-0.0124Uncert:+/-0.0124-Mobium-96U0.0012pC/gMobium-97U0.0012pC/gMobium-98V0.0112pC/gMobium-91U0.0121pC/gMobium-92TPU:+/-0.0184-Mobium-94U0.0112pC/gMobium-95Uncert:+/-0.0184-Mobium-96U0.0121pC/gMobium-146U0.0121pC/gMonethium-146U0.0121pC/gMobium-146U0.0121pC/gMobium-146U0.0121pC/gMobium-146U0.0121pC/gMobium-146U0.0121pC/gMobium-146U0.0121pC/gMobium-146U0.0121pC/gMobium-146U0.0121pC/gMobium-146U0.0121pC/gMobium-146U0.0031pC/gMobium-146U0.0032pC/gMobium-146U0.0032<!--</td--><td></td><td>TPU:</td><td></td><td>+/-0.0115</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></table-container>		TPU:		+/-0.0115							
Uncert:+ /-0.013TPU:+ /-0.32Uncert:+ /-0.321Nepanium-2390100.0553Cuncert:+ /-0.0341TPU:+ /-0.034110.000064pCi/gMobian-94U00.00006410.000064pCi/g10.000064pCi/g10.000064pCi/g10.000064pCi/g10.000064pCi/g10.000064pCi/g10.000064pCi/g10.000064pCi/g10.000064pCi/g10.000064pCi/g10.000064pCi/g10.00007pCi/g10.00007pCi/g10.00007pCi/g10.00007pCi/g10.00007pCi/g10.00007pCi/g10.00007pCi/g10.00007pCi/g10.00007pCi/g10.00007pCi/g10.00007pCi/g10.00007pCi/g10.00007pCi/g10.00007pCi/g10.00007pCi/g10.00007pCi/g10.00007pCi/g10.00007pCi/g10.00007pCi/g10.00007pCi/g10.00007pCi/g10.00007pCi/g10.00007pCi/g10.00007pCi/g10.00007pCi/g10.00007pCi/g10.00007pCi/g10.00007pCi/g10.00007pCi/g10.00007p	Mercury-203		U	0.0113	pCi/g						
TPU:+4-0.031Nedymium-239TPU:+4-0.321Umcert:+4-0.0351pCVgTU:+4-0.0364pCVgTU:-4-0.0364pCVgTU:-4-0.0122-Mobium-94U-0.00864pCVgTU:+4-0.0122-Mobium-95Umcert:+4-0.0122Umcert:+4-0.0184-TU:-4-0.0184-Mobium-96U-Umcert:+4-0.0184-TU:-4-0.168-TU:-4-0.168-Umcert:-4-0.168-TU:-4-0.168-TU:-4-0.168-Pomethium-146U-Umcert:+4-0.0134-TU:-4-0.168-TU:-4-0.0134-TU:-4-0.0134-TU:-4-0.0135-TU:-4-0.0137-TU:-4-0.0137-TU:-4-0.0137-TU:-4-0.0137-TU:-4-0.0137-TU:-4-0.0137-TU:-4-0.0137-TU:-4-0.0137-TU:-4-0.0137-TU:-4-0.0137-TU:-4-0.0147-TU:-4-0.0147-TU:-4-0.0147-TU:-4-0.0147-TU:-4-0.0147-TU:-4-0.0147-TU:-4-		Uncert:		+/-0.013							
Nedymium-147 U -0.146 pCl/g TPU: -0.321 TPU: +/-0.321 Uncert: +/-0.0341 TPU: -4/-0.0341 TPU: -4/-0.0341 Uncert: -4/-0.034 TPU: -4/-0.035 Uncert: -4/-0.035 Uncert: -4/-0.012 TU: -4/-0.018 TU: -4/-0.020 TU: -4/-0.020 TU		TPU:		+/-0.013							
$\begin{tabular}{ c c c c } & $+0.32] & $+0.32] & $+0.32] & $+0.32] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.33] & $+0.3$	Neodymium-147		U	-0.146	pCi/g						
$\begin{tabular}{ c c c } & +4.0.31 & +7.0.31 & +7.0.34 & +7.0.34 & +7.0.34 & +7.0.34 & +7.0.34 & +7.0.34 & +7.0.34 & +7.0.34 & +7.0.34 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36 & +7.0.36$		Uncert:		+/-0.321							
$\begin{split} \text{Neptinatium-239} & U & -0.0533 & \text{pCl/g} \\ & & & +/-0.0341 & & & & & & & & & & & & & & & & & & &$		TPU:		+/-0.321							
$\begin{tabular}{ c                                   $	Neptunium-239		U	-0.0553	pCi/g						
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Uncert:		+/-0.0341							
Nicklam-94       U       -0.00864       pC/g         TPU:       +/-0.0122         TPU:       +/-0.0184         U       0.0455       pC/g         Uccert:       +/-0.0184         votassium-40       U       -0.0912         Uncert:       +/-0.0184         Promethium-144       U       -0.012         Uncert:       +/-0.0184         Promethium-146       U       0.0112         Uncert:       +/-0.0134         Promethium-146       U       -0.0219         Uncert:       +/-0.0135         TPU:       +/-0.0135         Radium-228       TPU:       +/-0.0135         TPU:       +/-0.0135         Radium-228       Uncert:       +/-0.0136         TPU:       +/-0.0137       PC/g         Silver-110m       Uncert:       +/-0.0124         TPU:       +/-0.0124       TPU:         Sodium-22       TPU:       +/-0.0124         TPU:       +/-0.0124       TPU:         TPU:       +/-0.00376       PC/g         TPU:       +/-0.00376       PC/g         TPU:       +/-0.0037       PC/g         TPU:		TPU:		+/-0.0341							
$\begin{tabular}{ c c c } & U & U & +/-0.0122 & & & & & & & & & & & & & & & & & & $	Niobium-94		U	-0.00864	pCi/g						
TPU: $+/-0.0122$ Niobium-95         Uncert: $+/-0.0184$ 'otassium-40         U         -0.0912         pCi/g           'otassium-40         U         -0.0124         pCi/g           TPU: $+/-0.168$		Uncert:		+/-0.0122							
Niobium-95       U       0.0455       pC/g         Uncert:       +/-0.0184         ''otassium-40       U       -0.0912       pC/g         Uncert:       +/-0.168       -         TPU:       +/-0.0134       -         Promethium-144       U       0.0112       pC/g         Oncert:       +/-0.0134       -       -         Promethium-166       U       -0.0219       pCi/g         Micert:       +/-0.0135       -       -         TPU:       +/-0.0135       -       -         Radium-228       Uncert:       +/-0.0135       -         TPU:       +/-0.0135       -       -         Ruthenium-106       Uncert:       +/-0.0137       -         TPU:       +/-0.0137       -       -         Silver-110m       Uncert:       +/-0.0128       -         TPU:       +/-0.0124       -       -         Sodium-22       Uncert:       +/-0.0124       -         TPU:       +/-0.0124       -       -         TPU:       +/-0.0124       -       -         TPU:       +/-0.00976       -       -         Thorium-2		TPU:		+/-0.0122							
$\begin{tabular}{ c c c c } & & & & & & & & & & & & & & & & & & &$	Niobium-95		U	0.0455	pCi/g						
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Uncert:		+/-0.0184							
$\begin{tabular}{ c c } & & & & & & & & & & & & & & & & & & &$		TPU:		+/-0.0184							
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	otassium-40		U	-0.0912	pCi/g						
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		Uncert:		+/-0.168							
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Promothium 144	TPU:	T	+/-0.168	0.1						
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Prometnium-144	¥ 7	U	0.0112	pCi/g						
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Uncert:		+/-0.0134							
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Promothium 146	TPU:	TT	+/-0.0134	-0:/-						
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	riomeunum-140	I la sente	0	-0.0219	pC1/g						
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Uncert:		+/-0.0135							
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Radium-228	IPU:	T	+/-0.0155	-Cila						
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Naulum-220	Uncert	0	-0.0217	peng						
Ruthenium-106       U       0.185       pCi/g         IPU:       +/-0.128         TPU:       +/-0.128         Silver-110m       U       1.31E-05       pCi/g         Uncert:       +/-0.0124         Uncert:       +/-0.00976         Uncert:       +/-0.00976         Uncert:       +/-0.00976         TPU:       +/-0.00976         TPU:       +/-0.014         Uncert:       +/-0.014         TPU:       +/-0.014         Uncert:       +/-0.014         Uncert:       +/-0.014         Uncert:       +/-0.014         Thorium-230       U       -0.0316         TPU:       +/-0.0322         Thorium-234       U       0.118		TDU.		+/-0.0477							
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Ruthenium-106	IFU:	11		nCi/a						
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		Uncert.	U	+/-0 128	peng						
Silver-110mU1.31E-05pCi/gUncert:+/-0.0124TPU:+/-0.0124Sodium-22U0.00627pCi/gUncert:+/-0.00976TPU:+/-0.00976Uncert:+/-0.00976Uncert:+/-0.014Uncert:+/-0.014TPU:+/-0.014Uncert:+/-0.014TPU:+/-0.014Thorium-230UTPU:+/-0.0316TPU:+/-0.0322TPU:+/-0.0322Thorium-234U00.118pCi/g		TDI 1-		+/-0.128							
Uncert:       +/-0.0124         TPU:       +/-0.0124         Sodium-22       U       0.00627       pCi/g         Uncert:       +/-0.00976         TPU:       +/-0.00976         Uncert:       +/-0.014         Uncert:       +/-0.014         TPU:       +/-0.014         Uncert:       +/-0.014         Thorium-230       U       -0.0316         Uncert:       +/-0.0322         TPU:       +/-0.0322         Thorium-234       U       0.118	Silver-110m	110.	IJ	1 31E-05	nCi/a						
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		Uncert	0	+/-0.0124	peng						
Sodium-22       U $0.00627$ pCi/g         Uncert:       +/-0.00976         TPU:       +/-0.00976         Uncert:       +/-0.00976         Uncert:       +/-0.014         TPU:       +/-0.014         TPU:       +/-0.014         Uncert:       +/-0.0316         Uncert:       +/-0.0322         TPU:       +/-0.0322         Thorium-234       U       0.118         pCi/g       U		TPU		+/-0.0124							
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Sodium-22		U	0.00627	pCi/g						
$\begin{array}{cccc} TPU: & +/-0.00976 & & \\ & U & 0.0053 & pCi/g \\ & Uncert: & +/-0.014 & & \\ TPU: & +/-0.014 & & \\ TPU: & +/-0.0316 & pCi/g \\ & Uncert: & +/-0.0322 & & \\ TPU: & +/-0.0322 & & \\ TPU: & +/-0.0322 & & \\ Thorium-234 & U & 0.118 & pCi/g \end{array}$		Uncert:		+/-0.00976	10						
U $0.0053$ pCi/g         Uncert:       +/-0.014         TPU:       +/-0.014         Thorium-230       U       -0.0316       pCi/g         Uncert:       +/-0.0322       -         TPU:       +/-0.0322       -         Thorium-234       U       0.118       pCi/g		TPU:		+/-0.00976							
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Thallium-208		U	0.0053	pCi/g						
$\begin{array}{ccccc} TPU: & +/-0.014 & & \\ Thorium-230 & U & -0.0316 & pCi/g & \\ & Uncert: & +/-0.0322 & & \\ TPU: & +/-0.0322 & & \\ Thorium-234 & U & 0.118 & pCi/g & & \\ \end{array}$		Uncert:		+/-0.014	. 0						
Thorium-230     U     -0.0316     pCi/g       Uncert:     +/-0.0322       TPU:     +/-0.0322       U     0.118     pCi/g		TPU:		+/-0.014							
Uncert:         +/-0.0322           TPU:         +/-0.0322           U         0.118         pCi/g	Thorium-230		U	-0.0316	pCi/g						
Thorium-234 TPU: +/-0.0322 U 0.118 pCi/g		Uncert:		+/-0.0322	2 0						
Thorium-234 U 0.118 pCi/g		TPU:		+/-0.0322							
	Thorium-234		U	0.118	pCi/g						

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		QC Su	mmary							
Workorder: 215722							Page 1	13 of 14		
Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Tim	ie
Rad Gamma SpecBatch797779										
	Uncert:		+/-0.114							
	TPU:		+/-0.114							
Tin-113		U	-0.038	pCi/g						
	Uncert:		+/-0.0135							
	TPU:		+/-0.0135							
Uranium-235		U	-0.0391	pCi/g						
	Uncert:		+/-0.0471							
	TPU:		+/-0.0471							
Uranium-238		U	0.118	pCi/g						
	Uncert:	2	+/-0.114							
	TPU:		+/-0.114							
Yttrium-88		U	0.00621	pCi/g						
	Uncert:		+/-0.0197							
	TPU:		+/-0.0197							
Zinc-65	,	U	-0.0103	pCi/g						
	Uncert:		+/-0.0321							
	TPU:		+/-0.0321							
Zirconium-95		U	0.0192	pCi/g						
	Uncert:		+/-0.0253							
	TPU:		+/-0.0253							

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

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### **QC** Summary

										Page 14	of 14		
Parmna	me		NOM	Sample Q	ual (	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Y	QC Samp	oles were not spiked w	ith this compound										

۸ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.

Preparation or preservation holding time was exceeded h

Workorder:

215722

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 acceptence 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 NON	ICONFORMANCE REPOR	т
<b>Mo.Day Yr.</b> 10-OCT-08	<b>Division:</b> Radiochemistry	Quality Criteria: Specifications	<b>Type:</b> 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 Application Issues: Failed RPD for DUP	s)(SDG): 215722		
Specification and Requirements Nonconformance Description:		NRG Disposition:	· · ·
1. The relative percent difference does not meet the acceptance lin	for Pb-212 for sample 1201676587 hits.	1. Reporting results.	-
Originator's Name: Heather McCarty 10-OCT-08	3	Data Validator/Group Leade	PCT-08

-

**Quality Review:** 

Director:

	COMPANY - WIDE NONC	ONFORMANCE REPOR	RT
<b>Mo.Day Yr.</b> 17-OCT-08	<b>Division:</b> Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, Am-05-RC	Matrix Type: Solid	Client Code: LLNL
Batch ID: 801994	Sample Numbers: See Below		
Potentially affected work order(s	s)(SDG): 215722		
Application Issues:			
Method Blank contamination			
Failed RPD for DUP			
Specification and Requirements Nonconformance Description:		NRG Disposition:	······
1. The QC and the DUP, 2157220 RPD or RER requirements for An tracer ROI. Results qualified acc	201 and 1201685706, failed to meet n 243 due to tailing from the Cm 243/244 ordingly.	1. Reporting results	
2. The Method Blank, 120168570 having activity less than RDL for 2 243/244 tracer ROI. Results qual	5, failed to meet the requirement of Am 243 due to tailing from the Cm lified accordingly.	2. Reporting results	
Originator's Name:		Data Validator/Group Lead	ler:
Joseph Moulden 17-OCT-0	8	Leslev Anderson 17-	-OCT-08

Quality Review:

Director:

# Attachment D

# **Clean Fill Certification**

Jan 12 09 02:07p

Jan-12-09 13:19

Corinne Flanigan From-TEICHERT QA

+19163066455

925-449-1691

T-320 P.02/03 F-462

FOR BZIZ

8609 Jackson Road, Bldg #101 Secramento, CA 9:5926-9713 P.O. Box 15002 Sacrametrio, CA 95851-1002 (916) 356-6974 - FAX (916) 386-8455

p.2



January 12, 2009

RC Readymix 1227 Greenville Road Livermore, CA 94550

Attention: Mr. Rob Costa

Re: Lawerence 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

.

-

		TEI	CHERT AC Material E	GREGATES	
			Plant:	Vernalis	
			Product:	3/4" AB Class 2	
<u></u>		Percent			
eve Si	28	Passing		Specific Gravity	2 769
mm	3"			Apparent Cuaise	2,745
<u>m</u> .m	2 1/2"			Apparent rine	2.1
mm	2*			ADSOIDTION	······································
.5mm	1 1/2"			Win Resistivity ohm-em	3700
in m	1"	100			8.00
กก	3/4"	95		Chloride Cl DDM	15.7
2.5mm	1/2"	75		Sulphale SO. ppm	23.1
.5mm	3/8"	63			
.76mm	#4	44		Amehen Particle Count	
.36mm	#8	32		1 100	96.0
.18mm	#16	23		2 face	80.0
00µm	#30	16		2 face	63.0
100µm	#50	12	<u>↓</u>	3 1803	
150µm	#100	8		A Battler (abrasion los	<b>)</b>
75µm	#200	5.8	J	Lass @ 100 revs	3.7
			27	Loss @ 500 revs	21.2
Sand	Equivale	11	1 21		
			13	Max Wet Density CTM 21	6
Durat	vility Inde	×	70	Caltrans PCF	146.7
Coa	rse		10	Optimum Moisture %	6.5
Fine	<u>}</u>		43		
<b></b>			NP	Max Dry Densly ASTM D	01557
Plast	icity Inde	*		ASTM PCF	140.5
Liq	uid Limit		Nn	Optimum Moisture %	5.5
Pla	stic Limit	and the second			
			82	Unit Weight	
R Va	โปล			Dry Loose (PCF)	100.5
			.e. a	Dry Rodded (PCF)	114.3



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