ESHID-602557

Environmental Protection & Compliance Division
Los Alamos National Laboratory
PO Box 1663, K491
Los Alamos, New Mexico 87545
(505) 667-2211

Environmental Management
Los Alamos Field Office
1900 Diamond Drive, M984
Los Alamos, New Mexico, 87544
(505) 665-5820/Fax (505) 665-5903

Date: AUG 1 4 2017
Symbol: EPC-DO: 17-306
LA-UR: 17-27165
Locates Action No.: *N/A*

Mr. John E. Kieling, Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505

Subject: **Transmittal of Analytical Results of Pre-treatment Sample for the Los Alamos National Laboratory Hazardous Waste Facility Permit**

Dear Mr. Kieling:

The purpose of this letter is to report analytical results as required by the Los Alamos National Laboratory (LANL) Hazardous Waste Facility Permit issued to the Department of Energy (DOE) and Los Alamos National Security, LLC (LANS), collectively the Permittees, in November 2010. Permit Section 7.6(2) and Section C.3.2.4 of Permit Attachment C (*Waste Analysis Plan*) require the collection of pre-treatment solid waste samples from six remediated nitrate salt-bearing waste containers and pre-treatment liquid waste samples from two unremediated nitrate salt-bearing waste containers. Analytical results from LANL on-site laboratory testing must be provided to the New Mexico Environment Department Hazardous Waste Bureau (NMED-HWB) within 60 days of the sample collection. The first pre-treatment composite sample (from container 68685) was collected on June 15, 2017.

Enclosure 1 includes a memorandum detailing the analytical results from the on-site analytical laboratory to the waste generating organization. Enclosure 2 includes a table with a column indicating expected ranges for each analyte based on the Permittee's surrogate waste testing. Most constituents and properties were comparable to the expected ranges for the waste stream. The expected ranges for the remediated nitrate salt-bearing waste stream were developed by the Permittees from the ranges of the surrogate materials utilized while developing the treatment method for nitrate salt waste. The oxalate concentration higher than the expected range, but would not change the treatment effectiveness.

If you have comments or questions regarding this submittal, please contact Arturo Duran (Environmental Management) at (505) 665-7772 or Mark P. Haagenstad (LANS) at (505) 665-2014.

Sincerely,

John C. Bretzke
Division Leader

Sincerely,

Arturo Q. Duran
Permitting and Compliance Manager

JCB/AQD/MPH:am

Enclosures: 1) Analytical Results for Sample Collected from Remediated Nitrate Salt-Bearing Waste Container 68685
2) Comparison Table of Expected Chemical Constituents/Properties

Copy: Laurie King, USEPA/Region 6, Dallas, TX (E-File)
Neelam Dhawan, NMED/HWB, Santa Fe, NM, (E-File)
Siona Briley, NMED/HWB, Santa Fe, NM, (E-File)
Robert Murphy, NMED/HWB, Santa Fe, NM, (E-File)
Pam Allen, NMED/HWB, Santa Fe, NM, (E-File)
Douglas E. Hintze, EM-LA, (E-File)
Kimberly Davis Lebak, NA-LA, (E-File)
David J. Nickless, EM-WM, (E-File)
Peter Maggiore, NA-LA, (E-File)
Jody M. Pugh, NA-LA, (E-File)
Adrienne Nash, NA-LA, (E-File)
Karen E. Armijo, NA-LA, (E-File)
Jordan Arnswald, NA-LA, (E-File)
Darlene S. Rodriguez, NA-LA, (E-File)
Craig S. Leasure, PADOPS, (E-File)
William R. Mairson, PADOPS, (E-File)
Michael T. Brandt, ADESH, (E-File)
Randall M. Erickson, ADEM, (E-File)
Cheryl D. Cabbil, ADNHHO, (E-File)
Raeanna Sharp-Geiger, ADESH, (E-File)
Enrique Torres, ADEM, (E-File)
David J. Funk, ADEM, (E-File)
Leslie K. Sonnenberg, EWMO-DO, (E-File)
Stephanie Q. Griego, EWMO-DO, (E-File)
Robert C. Stokes, DESHS-EWMS, (E-File)
Mark P. Haagenstad, EPC-CP, (E-File)
Ellena I. Martinez, EPC-CP, (E-File)
Victoria R. Baca, DESHS-EWMS (E-File)
lasomailbox@nnsa.doe.gov, (E-File)
locatesteam@lanl.gov, (E-File)
epc-correspondence@lanl.gov, (E-File)
adesh-records@lanl.gov, (E-File)
rcra-prr@lanl.gov, (E-File)

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NMED Hazardous Waste Bureau

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CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

8-10-17

John C. Bretzke
Division Leader
Environmental Protection and Compliance Programs
Los Alamos National Laboratory

Date Signed

8/14/17

Arturo Q. Duran
Permitting Manager
Environmental Management
Los Alamos Field Office
U.S. Department of Energy

Date Signed

ENCLOSURE 1

Analytical Results for Sample Collected from Remediated Nitrate Salt-Bearing Waste Container 68685

EPC-DO: 17-306

LA-UR-17-27165

Date: AUG 14 2017

Los Alamos
NATIONAL LABORATORY
EST. 1943

memorandum

Actinide Analytical Chemistry

To/MS: David Funk, ADEP, MS J910
Randy Erickson, ADEP, MS J910
From/MS: Rebecca Chamberlin, C-AAC, MS G740 RCC
Pat Martinez, C-AAC, MS G740 PM
Phone: 7-1841/5-1646

Symbol: C-AAC-17-0059
Date: 08/07/2017

SUBJECT: Analytical Results for Drum 68685 Pre-Treatment Composite Sample

Sample Summary			
Drum #	**68685**		
Type of Sample	Pre-Treatment RNS		
Sample collection date	06/15/2017		
Analysis start date	06/22/2017		
Sample description	RNS material composite prepared from heterogeneous solid Top, Middle and Bottom drum samples (18 g each).		
pH (1 g solid / 25 mL water)	4.5		
Calculated pH of interstitial liquid	2.1		
Weight Loss Determination	**% weight loss**		
≤ 110 °C	9.9		
≤ 600 °C	61.6		
Radionuclides (NDA, SNAP)	**nCi/g**	**µg/g**	**(uncertainty)**
Am 241	6.27E+04	18.7	(4.5%)
Am 243	9.72E+00	0.05	(4.1%)
Np 237	9.97E-01	1.4	(4.2%)
Pu 238	8.17E+02	0.05	(62%)
Pu 239	1.66E+04	272	(4.4%)
Pu 240	4.54E+03	20.4	(29%)
Pu 241	2.39E+04	0.2	(12%)
U 235	2.72E-02	12.9	(24%)
Anions (Ion Chromatography)	**µg/g +/- 10% except where noted***		
Nitrate (NO_3^-)	235,000 (23.5 wt%)		
Nitrite (NO_2^-)	24		(140%)
Chloride (Cl^-)	420		
Fluoride (F^-)	< 800		
Sulfate (SO_4^{2-})	270		(36%)
Oxalate ($C_2O_4^{2-}$)	49,900 (5 wt%)		(67%)

RCRA Metals (ICP-MS/AES)	**µg/g +/- 20% except where noted***	
Silver (Ag)	< 1	
Arsenic (As)	1	
Barium (Ba)	0.5	
Cadmium (Cd)	0.02	
Chromium (Cr)	69	(27%)
Mercury (Hg)	0.04	
Lead (Pb)	210	(185%)
Selenium (Se)	< 0.4	
Cations (ICP-MS/AES)	**µg/g +/- 20% except where noted***	
Sodium (Na)	111,500 (11.2 wt%)	
Aluminum (Al)	55	(46%)
Calcium (Ca)	12	(63%)
Potassium (K)	2345	
Magnesium (Mg)	125	(133%)
Silicon (Si)	9	(93%)
Iron (Fe)	6	(87%)
Zinc (Zn)	0.4	
Beryllium (Be)	< 0.3	
Estimated Composition	**wt% (g/100 g sample)**	**(uncertainty)**
Anions	28.6	(3.8) wt%
Cations	11.4	(0.6)
Water	9.9	(2.2)
Calculated Organic Material (combustible)	31.1	(6.0)
Undissolved: *The undissolved portion of the sample was identified as PbO by XRF and SEM. This would have a composition of 12.1% Pb and 0.9% O.*	13.0	(0.8)
Oxidizers (as NO_2^- + NO_3^-)	23.5	(0.4)
Oxidizers (as $NaNO_2$ + $NaNO_3$)	32.2	(0.4)

*Measurement uncertainty is 10% for anions and 20% for cations/RCRA. Uncertainties in excess of these values may be a result of sample inhomogeneity.

Sample photos

68685-TOP

68686-MIDDLE

68685-BOTTOM

68685 Composite

Labware LIMS# 22509. Analytical procedures and work instructions used:

1) ANC 212, Ion Chromatography
2) ANC 102, Inductively Coupled Plasma—Mass Spectrometry Using the VG Elemental Plasma Quad
3) ANC 221, Operating the Jobin-Yvon (JY) Inductively Coupled Plasma – Atomic Emission Spectrometer
4) WI-5, Analytical Sample Receipt, Subsampling, and Distribution within Analytical Chemistry
5) WI-30, Chemical Analysis, Characterization and Research
6) WI-42, Radiochemical Research and Development at CMR
7) NF-ANC-124, Nuclear Materials-Weight Loss Determination
8) WI-56. Scanning Electron Microscopy
9) ANC1325, X-Ray Fluorescence Spectrometers in CMR

Cy: Ann Schake, C-AAC, MS G740
C-AAC File

ENCLOSURE 2

Comparison Table of Expected Chemical Constituents/Properties

EPC-DO: 17-306

LA-UR-17-27165

Date: AUG 14 2017

Expected Chemical Constituents/Properties of Pre-Treatment Nitrate Salt-Bearing Waste

Analyte	Analysis Results	Expected Range within Waste Stream	Unit
Nitrate	23.5%	20-70	%
Lead	210 µg/g (soluble) + 12.1% (insoluble)	0-40	%
Water	9.9 wt%	10-30	%
Sodium	11.2 wt%	0-25	%
Aluminum	55 µg/g	0-1	%
Calcium	12 µg/g	0-1	%
Iron	6 µg/g	0-1	%
Magnesium	125 µg/g	0-5	%
Potassium	2345 µg/g	0-1	%
Arsenic	1 µg/g	0-1	ppm
Barium	0.5 µg/g	0-10	ppm
Beryllium	<0.3 µg/g	0-1	ppm
Cadmium	0.02 µg/g	0-100	ppm
Chromium	69 µg/g	0-1000	ppm
Copper	Not measured	0-1000	ppm
Gallium	Not measured	0-1000	ppm
Mercury	0.04 µg/g	0-1	ppm
Nickel	Not measured	0-1000	ppm
Selenium	<0.4 µg/g	0-1	ppm
Silicon	9 µg/g	0-1000	ppm
Silver	<1 µg/g	0-1	ppm
Chloride	420 µg/g	0-1000	ppm
Fluoride	<800 µg/g	0-1000	ppm
Nitrite	24 µg/g	0-1000	ppm
Oxalate	5 wt%	0-1	%
Sulfate	270 µg/g	0-100	ppm
pH of moistened solid	4.5	0-7	pH
Organic Matter	31.1 wt%	5-90	%