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Los Alamos
NATIONAL LABORATORY
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Environmental Protection and Compliance Division
Environmental Compliance Programs (EPC-CP)
PO Box 1663, K490
Los Alamos, New Mexico 87545
(505) 667-0666

Date: SEP 2 0 2016
Symbol: EPC-DO-16-269
LA-UR: 16-27148
Locates Action No.: U1601674

Ms. Michelle Hunter, Bureau Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building, N2250
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, New Mexico 87502

Ms. Shelly Lemon, Acting Bureau Chief
Surface Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building, N2050
1190 St. Francis Drive
P.O. Box 5469
Santa Fe, New Mexico 87502-5469

Dear Ms. Hunter and Ms. Lemon:

Subject: **Response to Assessment of Release ID#2016-425 Occurring at Technical Area 60, Sigma Mesa Laydown Yard on May 24, 2016**

In response to a request for information from the New Mexico Environment Department (NMED) Groundwater Quality Bureau dated July 22, 2016, Los Alamos National Security, LLC (LANS) is submitting information related to an unplanned release of purge water, development water, and calibration standards at the TA-60 Sigma Mesa Laydown Yard (also referred to as the Sigma Mesa Storage Yard).

On May 24, 2016, an unplanned release of approximately 3,300 gallons of a non-hazardous and non-radioactive mix of purge water, development water, and a small volume of calibration fluids (pH buffer, conductivity, oxidation reduction potential, and turbidity) occurred at Los Alamos National Laboratory (LANL), Technical Area 60: Sigma Mesa Laydown Yard. Verbal notifications were provided by LANS staff to NMED on May 25, 2016, within 24 hours of the release, pursuant to 20.6.2.1203 NMAC of the New Mexico Water Quality Control Commission Regulations. Written reports were submitted on May 31st and June 8th. The report submitted on June 8th contained an inventory of the water source locations and Safety Data Sheets of the calibration standards.

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Analytical data from sampling the recovered water on June 1st was submitted to NMED, along with a request for closure on June 29th. Staff from the NMED Department of Energy Oversight Bureau attended the sampling event on June 1st.

In the July 22, 2016 letter, NMED requested the following information:

1. Water quality sampling results from the June 1, 2016 sampling of the discharge waters.
2. A Standard Operating Procedure (SOP) for the transport and transfer of purge water and development water from well sampling locations to the holding tanks located at the TA-60 Sigma Mesa Laydown Yard.

Enclosure 1 contains analytical data, for the June 1, 2016 sampling event. To address the second request, an institutional Learning Team reviewed the events preceding the unplanned release and identified a combination of Human Performance attributes and engineering controls that should prevent future occurrences of unplanned releases at the Sigma Mesa Laydown Yard. The findings from the Learning Team demonstrated that engineering controls around the poly tanks would be more effective at preventing another release than implementing a procedure for transferring water.

The following summarizes the findings of the Learning Team to support unplanned release prevention at the TA-60 site:

1. Standardize the size and height of all purge water consolidation tanks.
   - A standard size and dimensions of an approximately 5,000 gallon poly tanks has been selected for the consolidation of waste purge water. Tanks are being purchased that are slightly over 7 feet tall. This will allow the construction of a shorter work platform and will allow project staff to continue to manage the purge water for off-site shipment in 4,000 gallon batches.
2. Purchase and install permanent access ramps, stairs, or work platforms that will be used to add purge water to the consolidation tanks.
   - After the installation of new tanks, steps and a work platform will be built to allow the addition of purge water at waist level. This will alleviate the lifting of containers to shoulder level or above.
3. Provide vehicle barricades to protect the consolidation tanks.
   - The area will be regraded and concrete barricades will be placed to allow personnel access to the tanks but exclude any vehicle traffic.
4. Review all work documents for activity related to purge water and revise to address any potential hazards.
   - The primary hazard associated with the work activity is lifting the containers. The work documents have been revised to include the work step of manual consolidation of purge water.
5. Provide spill kits for this area that are appropriate for the spill potential.
   - A spill kit is being assembled and will be in place prior to the work release to utilize these tanks. The spill kit will include items like a shovel, sealing compound for the bung threads, plugs sized for the threaded bung holes, sealing tape for a tear in a tank, and spill trays for waste container storage prior to transfer.

As an additional administrative control, all transfers of purge water, development water, and calibration standards to poly tanks from an elevated surface have been stopped until engineering controls have been installed at the TA-60 Sigma Mesa Laydown Yard. Enclosure 2 contains a plan view of the engineering controls that will be implemented at the TA-60 Sigma Mesa Laydown Yard prior to transfers of purge water, development water, and calibration standards to large volume poly tanks which are used for storage prior to disposal.

All corrective actions for Release Report #425 have been completed. LANS, LLC requests administrative closure of Release Report #425 pursuant to 20.6.2.1203 NMAC. Please contact Jacob Meadows of the Compliance Programs Group (EPC-CP) at (505) 606-0185 if additional information would be helpful.

Sincerely,

Anthony R. Grieggs
Group Leader
Environmental Compliance Programs (EPC-CP)
Los Alamos National Security LLC

ARG:MTS:JWM/lm

Enclosures:
1. TA-60 Sigma Mesa Laydown Yard Analytical Data from the June 1, 2016 Sampling Event
2. Plan View of TA-60 Sigma Mesa Laydown Yard Administrative Controls

Cy: Steve Huddleson, NMED/GWQB, Santa Fe, NM, (E-File)
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Sarah Holcomb, NMED/SWQB, Santa Fe, NM, (E-File)
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Los Alamos
NATIONAL LABORATORY

COPY

GROUND WATER

SEP 20 2016

BUREAU

Environmental Protection and Compliance Division
Environmental Compliance Programs (EPC-CP)
PO Box 1663, K490
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ENCLOSURE 1

TA-60 Sigma Mesa Laydown Yard Analytical Data from the June 1, 2016 Sampling Event

EPC-DO-16-269

LA-UR-16-27148

Locates Action No.: U1601674

Date: SEP 2 0 2016

Data Review Qualifier Definitions

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

ENCLOSURE 1
EPC-DO-16-269
LA-UR-16-27148

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P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference For HPLC, the difference is >70%.

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

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Volatile Analysis

ENCLOSURE 1
EPC-DO-16-269
LA-UR-16-27148

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	2016-1295	**Date Collected:**	06/01/2016 08:57	**Matrix:**	W
Lab Sample ID:	398580002	**Date Received:**	06/03/2016 08:55		
		Client:	ARSL004	**Project:**	ESHL00114
Client ID:	WST03-16-121868	**Method:**	SW-846:8260B	**SOP Ref:**	GL-OA-E-038
Batch ID:	1572538	**Inst:**	VOA1.I	**Dilution:**	1
Run Date:	06/07/2016 05:44	**Analyst:**	VXY1	**Purge Vol:**	5 mL
Prep Date:	06/07/2016 05:44				
Data File:	060616V1\1L143.D	**Column:**	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	2016-1295	**Date Collected:**	06/01/2016 08:57	**Matrix:**	W
Lab Sample ID:	398580002	**Date Received:**	06/03/2016 08:55		
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Client ID:	WST03-16-121868	**Method:**	SW-846:8260B	**SOP Ref:**	GL-OA-E-038
Batch ID:	1572538	**Inst:**	VOA1.I	**Dilution:**	1
Run Date:	06/07/2016 05:44	**Analyst:**	VXY1	**Purge Vol:**	5 mL
Prep Date:	06/07/2016 05:44				
Data File:	060616V1\1L143.D	**Column:**	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

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		Client:	ARSL004	**Project:**	ESHL00114
Client ID:	WST03-16-121868	**Method:**	SW-846:8260B	**SOP Ref:**	GL-OA-E-038
Batch ID:	1572538	**Inst:**	VOA1.I	**Dilution:**	1
Run Date:	06/07/2016 05:44	**Analyst:**	VXY1	**Purge Vol:**	5 mL
Prep Date:	06/07/2016 05:44				
Data File:	060616V1\1L143.D	**Column:**	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether	U	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	1.00	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	57.4	50.0	ug/L	115	(71%-134%)
Bromofluorobenzene	50.3	50.0	ug/L	101	(70%-131%)
Toluene-d8	49.9	50.0	ug/L	100	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	No Tentatively Identified Compounds Found			ug/L		

Semi-Volatile Analysis

ENCLOSURE 1
EPC-DO-16-269
LA-UR-16-27148

Semi-Volatile
Certificate of Analysis
Sample Summary

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Lab Sample ID:	398580002	**Date Received:**	06/03/2016 08:55		
		Client:	ARSL004	**Project:**	ESHL00114
Client ID:	WST03-16-121868	**Method:**	SW846 3510C/8270D	**SOP Ref:**	GL-OA-E-009
Batch ID:	1572590	**Inst:**	MSDA.I	**Dilution:**	1
Run Date:	06/07/2016 19:31	**Analyst:**	JMB3	**Inj. Vol:**	1 uL
Prep Date:	06/07/2016 10:05	**Aliquot:**	910 mL	**Final Volume:**	1 mL
Data File:	060716.s\sAf0712.D	**Column:**	DB-5ms		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	11.0	ug/L	3.30	11.0
120-82-1	1,2,4-Trichlorobenzene	U	11.0	ug/L	3.30	11.0
95-50-1	1,2-Dichlorobenzene	U	11.0	ug/L	3.30	11.0
122-66-7	Azobenzene	U	11.0	ug/L	3.30	11.0
	1,2-Diphenylhydrazine					
541-73-1	1,3-Dichlorobenzene	U	11.0	ug/L	3.30	11.0
106-46-7	1,4-Dichlorobenzene	U	11.0	ug/L	3.30	11.0
123-91-1	1,4-Dioxane	U	11.0	ug/L	3.30	11.0
90-12-0	1-Methylnaphthalene	U	1.10	ug/L	0.330	1.10
58-90-2	2,3,4,6-Tetrachlorophenol	U	11.0	ug/L	3.30	11.0
95-95-4	2,4,5-Trichlorophenol	U	11.0	ug/L	3.30	11.0
88-06-2	2,4,6-Trichlorophenol	U	11.0	ug/L	3.30	11.0
120-83-2	2,4-Dichlorophenol	U	11.0	ug/L	3.30	11.0
105-67-9	2,4-Dimethylphenol	U	11.0	ug/L	3.30	11.0
51-28-5	2,4-Dinitrophenol	U	22.0	ug/L	5.49	22.0
121-14-2	2,4-Dinitrotoluene	U	11.0	ug/L	3.30	11.0
606-20-2	2,6-Dinitrotoluene	U	11.0	ug/L	3.30	11.0
91-58-7	2-Chloronaphthalene	U	1.10	ug/L	0.451	1.10
95-57-8	2-Chlorophenol	U	11.0	ug/L	3.30	11.0
534-52-1	2-Methyl-4,6-dinitrophenol	U	11.0	ug/L	3.30	11.0
91-57-6	2-Methylnaphthalene	U	1.10	ug/L	0.330	1.10
88-75-5	2-Nitrophenol	U	11.0	ug/L	3.30	11.0
91-94-1	3,3'-Dichlorobenzidine	U	11.0	ug/L	3.30	11.0
101-55-3	4-Bromophenylphenylether	U	11.0	ug/L	3.30	11.0
59-50-7	Parachlorometa cresol	U	11.0	ug/L	3.30	11.0
	4-Chloro-3-methylphenol					
106-47-8	4-Chloroaniline	U	11.0	ug/L	3.63	11.0
7005-72-3	4-Chlorophenylphenylether	U	11.0	ug/L	3.30	11.0
100-02-7	4-Nitrophenol	U	11.0	ug/L	3.30	11.0
83-32-9	Acenaphthene	U	1.10	ug/L	0.330	1.10
208-96-8	Acenaphthylene	U	1.10	ug/L	0.330	1.10
62-53-3	Aniline	U	11.0	ug/L	4.62	11.0
120-12-7	Anthracene	U	1.10	ug/L	0.330	1.10
1912-24-9	Atrazine	U	11.0	ug/L	3.30	11.0
92-87-5	Benzidine	U	11.0	ug/L	4.29	11.0
56-55-3	Benzo(a)anthracene	U	1.10	ug/L	0.330	1.10
50-32-8	Benzo(a)pyrene	U	1.10	ug/L	0.330	1.10
205-99-2	Benzo(b)fluoranthene	U	1.10	ug/L	0.330	1.10
191-24-2	Benzo(ghi)perylene	U	1.10	ug/L	0.330	1.10

Semi-Volatile
Certificate of Analysis
Sample Summary

SDG Number:	2016-1295	**Date Collected:**	06/01/2016 08:57	**Matrix:**	W
Lab Sample ID:	398580002	**Date Received:**	06/03/2016 08:55		
		Client:	ARSL004	**Project:**	ESHL00114
Client ID:	WST03-16-121868	**Method:**	SW846 3510C/8270D	**SOP Ref:**	GL-OA-E-009
Batch ID:	1572590	**Inst:**	MSDA.I	**Dilution:**	1
Run Date:	06/07/2016 19:31	**Analyst:**	JMB3	**Inj. Vol:**	1 uL
Prep Date:	06/07/2016 10:05	**Aliquot:**	910 mL	**Final Volume:**	1 mL
Data File:	060716.s\sA0712.D	**Column:**	DB-5ms		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	1.10	ug/L	0.330	1.10
65-85-0	Benzoic acid	U	22.0	ug/L	6.59	22.0
100-51-6	Benzyl alcohol	U	11.0	ug/L	3.30	11.0
85-68-7	Butylbenzylphthalate	U	11.0	ug/L	3.30	11.0
218-01-9	Chrysene	U	1.10	ug/L	0.330	1.10
84-74-2	Di-n-butylphthalate	U	11.0	ug/L	3.30	11.0
117-84-0	Di-n-octylphthalate	U	11.0	ug/L	3.30	11.0
53-70-3	Dibenzo(a,h)anthracene	U	1.10	ug/L	0.330	1.10
132-64-9	Dibenzofuran	U	11.0	ug/L	3.30	11.0
84-66-2	Diethylphthalate	U	11.0	ug/L	3.30	11.0
131-11-3	Dimethylphthalate	U	11.0	ug/L	3.30	11.0
88-85-7	Dinoseb	U	11.0	ug/L	3.30	11.0
122-39-4	Diphenylamine	U	11.0	ug/L	3.30	11.0
206-44-0	Fluoranthene	U	1.10	ug/L	0.330	1.10
86-73-7	Fluorene	U	1.10	ug/L	0.330	1.10
118-74-1	Hexachlorobenzene	U	11.0	ug/L	3.30	11.0
87-68-3	Hexachlorobutadiene	U	11.0	ug/L	3.30	11.0
77-47-4	Hexachlorocyclopentadiene	U	11.0	ug/L	3.30	11.0
67-72-1	Hexachloroethane	U	11.0	ug/L	3.30	11.0
193-39-5	Indeno(1,2,3-cd)pyrene	U	1.10	ug/L	0.330	1.10
78-59-1	Isophorone	U	11.0	ug/L	3.85	11.0
62-75-9	N-Methyl-N-nitrosomethylamine	U	11.0	ug/L	3.30	11.0
924-16-3	N-Nitrosodi-n-butylamine	U	11.0	ug/L	3.30	11.0
55-18-5	N-Nitrosodiethylamine	U	11.0	ug/L	3.30	11.0
621-64-7	N-Nitrosodi--n-propylamine *N-Nitrosodipropylamine*	U	11.0	ug/L	3.30	11.0
930-55-2	N-Nitrosopyrrolidine	U	11.0	ug/L	3.30	11.0
91-20-3	Naphthalene	U	1.10	ug/L	0.330	1.10
98-95-3	Nitrobenzene	U	11.0	ug/L	3.30	11.0
608-93-5	Pentachlorobenzene	U	11.0	ug/L	3.30	11.0
87-86-5	Pentachlorophenol	U	11.0	ug/L	3.30	11.0
85-01-8	Phenanthrene	U	1.10	ug/L	0.330	1.10
108-95-2	Phenol	U	11.0	ug/L	3.30	11.0
129-00-0	Pyrene	U	1.10	ug/L	0.330	1.10
110-86-1	Pyridine	U	11.0	ug/L	3.30	11.0
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	11.0	ug/L	3.30	11.0
111-91-1	bis(2-Chloroethoxy)methane	U	11.0	ug/L	3.30	11.0
111-44-4	bis(2-Chloroethyl) ether	U	11.0	ug/L	3.30	11.0
117-81-7	bis(2-Ethylhexyl)phthalate	U	11.0	ug/L	3.30	11.0

Semi-Volatile
Certificate of Analysis
Sample Summary

SDG Number:	2016-1295	**Date Collected:**	06/01/2016 08:57	**Matrix:**	W
Lab Sample ID:	398580002	**Date Received:**	06/03/2016 08:55		
		Client:	ARSL004	**Project:**	ESHL00114
Client ID:	WST03-16-121868	**Method:**	SW846 3510C/8270D	**SOP Ref:**	GL-OA-E-009
Batch ID:	1572590	**Inst:**	MSDA.I	**Dilution:**	1
Run Date:	06/07/2016 19:31	**Analyst:**	JMB3	**Inj. Vol:**	1 uL
Prep Date:	06/07/2016 10:05	**Aliquot:**	910 mL	**Final Volume:**	1 mL
Data File:	060716.s\sAf0712.D	**Column:**	DB-5ms		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	11.0	ug/L	4.07	11.0
99-09-2	3-Nitroaniline *m-Nitroaniline*	U	11.0	ug/L	3.30	11.0
95-48-7	o-Cresol	U	11.0	ug/L	3.30	11.0
88-74-4	2-Nitroaniline *o-Nitroaniline*	U	11.0	ug/L	3.30	11.0
100-01-6	4-Nitroaniline *p-Nitroaniline*	U	11.0	ug/L	3.30	11.0

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	80.4	110	ug/L	73	(29%-124%)
2-Fluorobiphenyl	40.3	54.9	ug/L	73	(36%-105%)
2-Fluorophenol	50.2	110	ug/L	46	(15%-79%)
Nitrobenzene-d5	37.9	54.9	ug/L	69	(37%-110%)
Phenol-d5	35.7	110	ug/L	32	(15%-78%)
p-Terphenyl-d14	44.1	54.9	ug/L	80	(36%-132%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000050-84-0	Benzoic acid, 2,4-dichloro-	9.657	16.8	ug/L	99	NJ

Perchlorates by LCMSMS Analysis

ENCLOSURE 1
EPC-DO-16-269
LA-UR-16-27148

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1572503

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.
WST03-16-121868

Date Received: 03-JUN-16

GEL Job No (SDG): 2016-1295

GEL Sample ID: 398580002

Date Filtered: 07-JUN-16

Injection Volume (uL): 20

%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.5	2	3.84	ug/L		10	07-JUN-16 14:24	per0607024a
	Perchlorate Isotope Ratio			3.15			10	07-JUN-16 14:24	per0607024a
14797-73-0	Perchlorate-101	.5	2	4.04	ug/L		10	07-JUN-16 14:24	per0607024a
	Perchlorate-O(18)			4.76	ug/L		10	07-JUN-16 14:24	per0607024a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

Metals Analysis

ENCLOSURE 1
EPC-DO-16-269
LA-UR-16-27148

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2016-1295 **CONTRACT:** ESHL00114 **METHOD TYPE:** EPA

SAMPLE ID: 398580001 **BASIS:** As Received **DATE COLLECTED** 01-JUN-16

CLIENT ID: WST03-16-121867 **LEVEL:** Low **DATE RECEIVED** 06-JUN-16

MATRIX: W **%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/08/16 11:05	060816W1-5	1572634

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2016-1295 **CONTRACT:** ESHL00114 **METHOD TYPE:** SW846

SAMPLE ID: 398580001 **BASIS:** As Received **DATE COLLECTED** 01-JUN-16

CLIENT ID: WST03-16-121867 **LEVEL:** Low **DATE RECEIVED** 06-JUN-16

MATRIX: W **%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	200	ug/L	U	68	200	200	1	P	LS	06/08/16 09:18	060816-1	1572019
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/08/16 16:20	160608-3	1572021
7440-38-2	Arsenic	5	ug/L	U	1.7	5	5	1	MS	BAJ	06/08/16 14:53	160608-2	1572021
7440-39-3	Barium	54.7	ug/L		1	5	5	1	P	LS	06/08/16 09:18	060816-1	1572019
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	LS	06/08/16 09:18	060816-1	1572019
7440-42-8	Boron	16	ug/L	J	15	50	50	1	P	LS	06/08/16 09:18	060816-1	1572019
7440-43-9	Cadmium	1	ug/L	U	0.11	1	1	1	MS	BAJ	06/08/16 14:53	160608-2	1572021
7440-70-2	Calcium	25200	ug/L		50	200	200	1	P	LS	06/08/16 09:18	060816-1	1572019
7440-47-3	Chromium	195	ug/L	N	2	10	10	1	MS	BAJ	06/08/16 14:53	160608-2	1572021
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	LS	06/08/16 09:18	060816-1	1572019
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	LS	06/08/16 09:18	060816-1	1572019
7439-89-6	Iron	859	ug/L		30	100	100	1	P	LS	06/08/16 09:18	060816-1	1572019
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/08/16 14:53	160608-2	1572021
7439-95-4	Magnesium	6540	ug/L		110	300	300	1	P	LS	06/08/16 09:18	060816-1	1572019
7439-96-5	Manganese	210	ug/L		2	10	10	1	P	LS	06/08/16 09:18	060816-1	1572019
7439-98-7	Molybdenum	1.36	ug/L		0.165	0.5	0.5	1	MS	BAJ	06/08/16 18:02	160608-4	1572021
7440-02-0	Nickel	7.09	ug/L		0.5	2	2	1	MS	BAJ	06/08/16 18:02	160608-4	1572021
7440-09-7	Potassium	21400	ug/L		50	150	150	1	P	LS	06/08/16 09:18	060816-1	1572019
7782-49-2	Selenium	5	ug/L	U	1.5	5	5	1	MS	BAJ	06/08/16 14:53	160608-2	1572021
7440-22-4	Silver	1	ug/L	U	0.2	1	1	1	MS	BAJ	06/08/16 14:53	160608-2	1572021
7440-23-5	Sodium	20900	ug/L		100	300	300	1	P	LS	06/08/16 09:18	060816-1	1572019
7440-24-6	Strontium	109	ug/L		1	5	5	1	P	LS	06/08/16 09:18	060816-1	1572019
7440-28-0	Thallium	2	ug/L	U	0.45	2	2	1	MS	BAJ	06/08/16 18:02	160608-4	1572021
7440-31-5	Tin	14	ug/L		2.5	10	10	1	P	LS	06/08/16 09:18	060816-1	1572019
7440-61-1	Uranium	0.497	ug/L		0.067	0.2	0.2	1	MS	BAJ	06/08/16 18:02	160608-4	1572021
7440-62-2	Vanadium	4.31	ug/L	J	1	5	5	1	P	LS	06/08/16 09:18	060816-1	1572019
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	LS	06/08/16 09:18	060816-1	1572019

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2016-1295 **CONTRACT:** ESHL00114 **METHOD TYPE:**

SAMPLE ID: 398580001 **BASIS:** As Received **DATE COLLECTED** 01-JUN-16

CLIENT ID: WST03-16-121867 **LEVEL:** Low **DATE RECEIVED** 06-JUN-16

MATRIX: W **%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	89.8	mg/L		0.453	1.24	1.24	1		TXT1	06/08/16 15:11		1573246

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1572019	1572018	SW846 3005A	50	mL	50	mL	06/07/16	JP1
1572021	1572020	SW846 3005A	50	mL	50	mL	06/07/16	JP1
1572634	1572630	EPA 245.1/245.2 Prep	20	mL	20	mL	06/07/16	AXS5

***Analytical Methods:**

P	**SW846 3005A/6010C**
MS	**SW846 3005A/6020A**
AV	**EPA 245.1/245.2**

General Chem Analysis

ENCLOSURE 1
EPC-DO-16-269
LA-UR-16-27148

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

Certificate of Analysis

Report Date: June 9, 2016

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL- WQH Water Samples

Client SDG: 2016-1295

Client Sample ID: WST03-16-121868
Sample ID: 398580002
Matrix: W
Collect Date: 01-JUN-16 08:57
Receive Date: 06-JUN-16
Collector: Client

Project: ESHL00114
Client ID: ARSL004

arameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
ow Injection Analysis											
'SP-CN(T) "As Received"											
/anide, Total		2510	83.5	250	ug/L	50	AXH3	06/07/16	0814	1572336	1
n Chromatography											
PA 300.0 o-Phosphate (PO4) "As Received"											
omide		0.503	0.067	0.200	mg/L	1	MXL2	06/07/16	0433	1572496	2
uoride		0.237	0.033	0.100	mg/L	1					
ıloride		22.8	0.335	1.00	mg/L	5	MXL2	06/07/16	1257	1572496	3
Phosphate as P	H	3.25	0.335	1.00	mg/L	5					
ılfate		24.4	0.665	2.00	mg/L	5					
utrient Analysis											
O3NO2 "As Received"											
trogen, Nitrate/Nitrite		1.88	0.085	0.250	mg/L	5	AXH3	06/07/16	0543	1572608	4

he following Prep Methods were performed:

lethod	Description	Analyst	Date	Time	Prep Batch
A 335.4	EPA 335.4 Total Cyanide	AXH3	06/07/16	0725	1572335

he following Analytical Methods were performed:

lethod	Description	Analyst Comments
	EPA 335.4 1993	
	EPA:300.0	
	EPA:300.0	
	EPA:353.2	

otes:

Radiological Analysis

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

Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545
Report Date: June 10, 2016
Contact: Mr. Keith Greene
Project: LANL- WQH Water Samples

Client Sample ID: WST03-16-121868
Sample ID: 398580002
Matrix: W
Collect Date: 01-JUN-16
Receive Date: 06-JUN-16
Collector: Client
Project: ESHL00114
Client ID: ARSL004

arameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	M
ad Liquid Scintillation Analysis														
H3 "As Received"														
ritium	U	33.2	+/-59.8	201	97.5	+/-59.9	200	pCi/L		GXR1	06/09/16	1226	1573024	

he following Analytical Methods were performed

lethod	Description
	EPA:906.0

urrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

otes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

ENCLOSURE 2

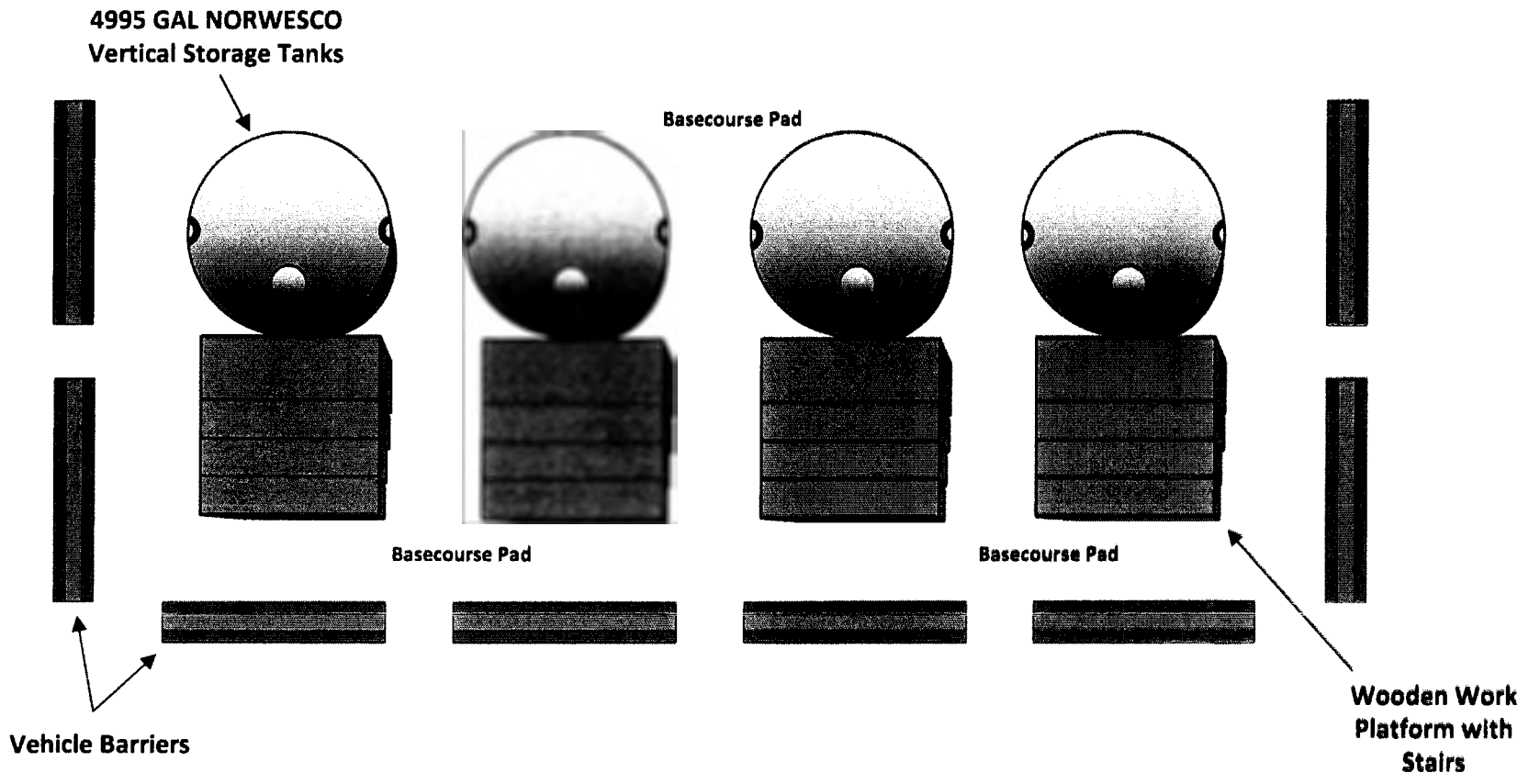
Plan View of TA-60 Sigma Mesa Laydown Yard
Administrative Controls

EPC-DO-16-269

LA-UR-16-27148

Locates Action No.: U1601674

Date: SEP 2 0 2016



Sigma Mesa Storage Yard

ENVIRONMENTAL PROGRAMS

SIGMA STORAGE YARD
Storage Tank Configuration

TA- 60 BLDG NA

Los Alamos

NA | SK-60-TANKS-001 | NA | 0