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Title: Press Oil Final Release Survey

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Press Oil Final Release Survey Plan
Rev. 0, 03/25/2017

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Summary

A large hydraulic press contained in the TA-3 Press Building was used to shape depleted uranium (U-238) into components used for various nuclear programs. The press is no longer needed and is being dismantled. The press contained hydraulic oil in a hermetically sealed system. This oil was drained into 55 gallon drums during decommissioning of the press. Approximately 27 of these waste drums were filled with this oil, and recycling of the oil is the preferred disposition pathway. Information on the history of press and surface contamination surveys suggest a potential for having depleted uranium in the oil; thus, preliminary sampling was conducted to help determine its eligibility for recycle. The sampling plan for measurement of radionuclide content in the oil and the final results are outlined in this document.

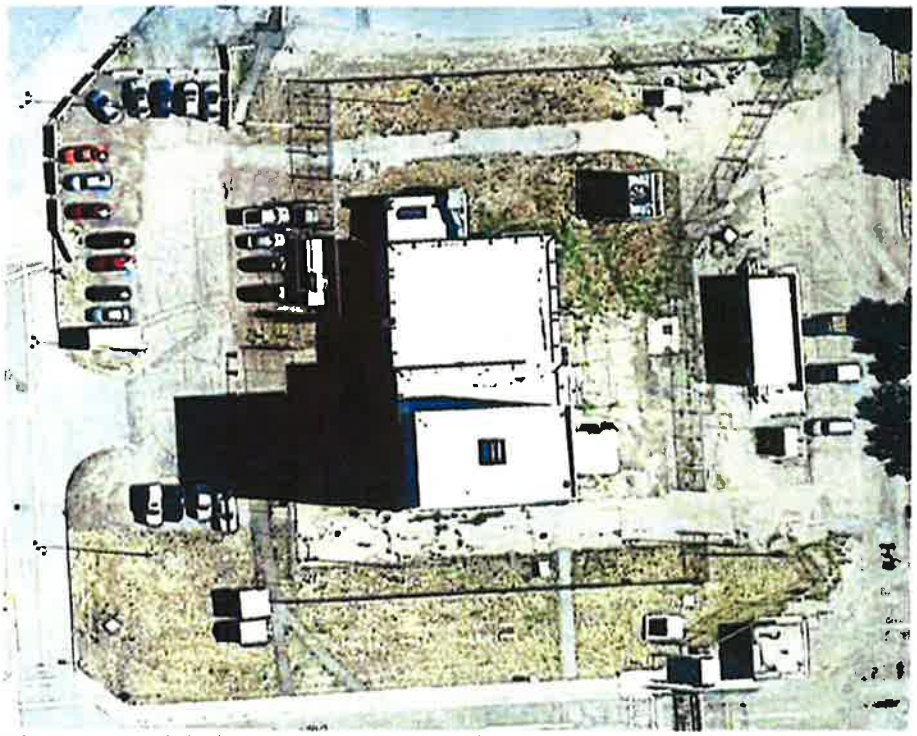


Figure 1. Aerial view of TA-3 Press Building. The press was contained in the high bay area.

1. Purpose and Scope of the Final Release Survey

1.1. There are forty-eight 55 gallon barrels filled with hydraulic oil that are candidates for release and recycle. This oil needs to be characterized prior to release. Principles of sampling as provided in MARSAME/MARSSIM approaches were used as guidance for sampling.

1.2. Per MARSSIM Section 2.4, there are six principal steps in the MARSSIM Radiation Survey and Site Investigation Process:

- Site Identification
- Historical Site Assessment (HSA)
- Scoping Survey
- Characterization Survey
- Remedial Action Support Survey
- Final Status Survey

1.3. The MARSSIM HSA information for the press is contained in Section 2 below. Though the hydraulic oil is in a self-contained system where contact with uranium from the outside is highly unlikely, surface contamination was measured in the lower working portion of the press. Therefore scoping/ characterization surveys of the oil were conducted to confirm uranium did not infiltrate the hydraulic oil.

1.4. Notes and Assumptions:

1.4.1. This plan was prepared in accordance with P412, *Environmental Radiation Protection*, and developed using P412 Data Quality Objectives.

1.4.2. Because there are no accepted release criteria for volumetrically contaminated materials, the nominal release criteria for the oil is indistinguishable from background. There is little data on naturally occurring radioactive content in refined oils and U-238 content in crude oil can range considerably (0.027 to 270 pCi/L for oil of density 0.8 g/mL per IAEA 2003).

2. Historical Site Assessment and Press Oil Specific Information

2.1. From historical assessments: “The Press Building (TA-3-35) was built in 1954. It houses a 5,000-ton hydraulic press located in a high bay as well as other smaller presses, a casting room, and a machine shop (LANL 2001b:4). It was initially used by the Zia Company in the mid-1950s for fabricating cable assemblies in support of the nuclear weapons program. Research was later redirected during the late 1950s to support the Rover rocket program by developing, fabricating, and assembling uranium fuels for nuclear rocket research. A high-temperature furnace located in the casting area was used for working with uranium containing materials. After the Rover program ended in 1972, the Press Building

continued supporting various projects in materials science including work with uranium. This work ceased in 1987."[1]

2.2. The oil was hermetically sealed inside the press oil reservoir and, in theory, was never in contact with any radiological materials. For example, any leaks of the hydraulic oil would result in oil being pushed out of the reservoir rather than an intake of material, which decreases the possibility of finding depleted uranium (U-238) inside the oil. As an additional screen, the oil was measured for radioactivity using liquid scintillation counting (LSC), which showed no measureable radioactivity, and a gamma spectral analysis (Attachment 1) where one drum (#42 in Attachment 1) was found to contain U-238. The drum (#42) contained oil that leaked out during disassembly of the press and became contaminated during cleanup. This drum was segregated and disposed of as LLW. Thus, based on historical and process knowledge, combined with screening measurements, all other oil is considered radiologically non-impacted under DOE Order 458.1 *Radiation Protection of the Public and the Environment*. Despite the initial non-impacted classification, because the press was used to shape depleted uranium parts, and portions of the outer surfaces of the press were found to have significant surface radioactivity, LANL performed a set of confirmation measurements prior to the release of these oils using more sensitive techniques by an independent laboratory.

2.3. The general Minimum Detectable Activities (MDAs) for LSC are shown in Table 1:

Table 1. Typical MDAs for alpha and beta emissions in oil and water for LSC.

Aliquot (mL)	Countin	Beta<100keVMDA (pCi/L)	Beta>100 keV MDA(pCi/L)	Alpha MDA (pCi/L)	Comments
0.5	10	43,000	17,500	13,000	Max aliquot for oil
	60	17,400	7,100	52,000	Max aliquot for oil
3	10	7,000	2,900	2,200	Max aliquot for water
	60	3,000	1,200	900	Max aliquot for water

2.4 Because the MDAs for oil using LSC (Table 1) are higher than expected background levels for U-238 (< 270 pCi/L for oil of density 0.8 g/mL), this counting method does not meet measurement quality objectives for decisions of being indistinguishable from background.

[1] Historical information from Garcia K., et al. Pressing Matters: An evaluation of the Cold War Era building at the Sigma Complex. LA-UR-15-28961.

Thus, a 20 representative oil samples were sent off to an independent laboratory for radiochemical analysis.

3. Survey Units and Data Analysis

3.1. This sampling plan is designed to provide sufficient information for free release of the oil barrels for recycling. The results from the oil from each sampled barrel will first be evaluated individually against the instrument MDC. Second, any detectable values will be evaluated against the upper range of background for crude oil (200 pCi/L for oil of density 0.8 g/mL). Any oil barrels with concentrations below 200pCi/L will be considered to be within background and are candidates for recycle. Oil above this range will be considered outliers and not eligible for release.

4 Survey-Specific Instructions

4.1 Each barrel of oil was sampled while being filled. An aliquot of oil was taken at the beginning, middle and end of filling each barrel. For the purpose of this sampling, the entire group of barrels will be considered to be from a single source since the oil in each barrel came from the same reservoir within the press. A random set of oil from 20 barrels were sent off for radiochemical analysis for DU.

5 Results

5.1 Initial Screening Results- Oil samples were collected while filling the 55 gallon drums during the beginning, middle and end the filling. Radioactivity in the oil samples were then measured using Liquid Scintillation Counting (LSC) at LANL's Health Physics Analytical Laboratory (HPAL). Attachment 1 provides initial HPAL screening results for the oil samples, and no detectable radioactivity was noted. The minimum detectable activities (MDAs) for the alpha and beta emissions for the oil samples as a function of count time are shown in Table 1. While no detectable radioactivity was found in the oil samples, the MDAs in Table 1 are larger than the expected background values for oil, which would be in the 0.1 pCi/g range. Therefore, a subset of 20 of the samples from separate drums were sent to an analytical laboratory for radiochemical analysis. This would allow comparison to expected background values. Additionally, the isotopic analysis that is part of the radiochemical analysis for the uranium isotopes U-234, U235 and U-238 would allow comparisons to expected isotopic ratios.

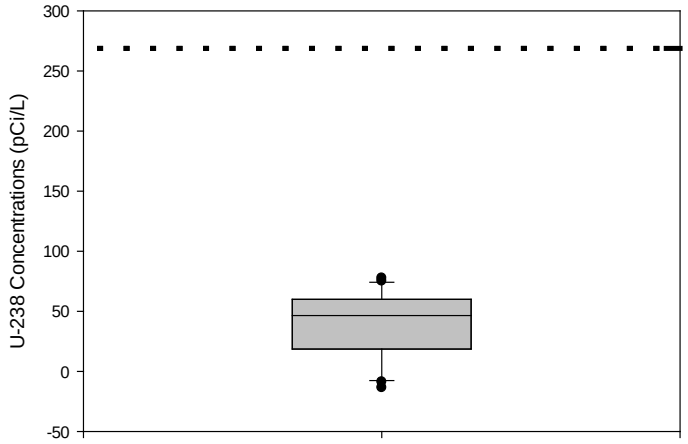
5.2 Concentrations from Radiochemical Analysis- The full results from the analytical laboratory are provided in Attachment 1 and the summary statistics are provided in Table 2. Although concentrations for all uranium isotopes are provided in Table 1, the isotope of concern was U-238. We could not find studies with measurements of U-238 content in hydraulic oil, however the uranium content in the press oil was within the range of background value for crude oil (IAEA 2003). Specifically, the maximum U-238

concentration measured in the hydraulic oil was 78 pCi/L with a mean of 40 pCi/L, which is within the background range for crude oil (<270 pCi/L). Figure 1 shows the distribution of the measurements of the hydraulic oil.

Table 2 Uranium isotopic results for oil samples. For comparison, the range of naturally occurring U-238 in crude oil ranges up to 270 pCi/L.

Radionuclide	Statistic	Concentration (pCi/L)
U-238	mean	39.16
(pCi/L)	Maximum	77.60
	Standard deviation	26.95
U-235	Mean	-1.52
(pCi/L)	Maximum	20.00
	Standard deviation	9.80
U-234	Mean	90.32
(pCi/L)	Maximum	262.40
	Standard Deviation	73.84

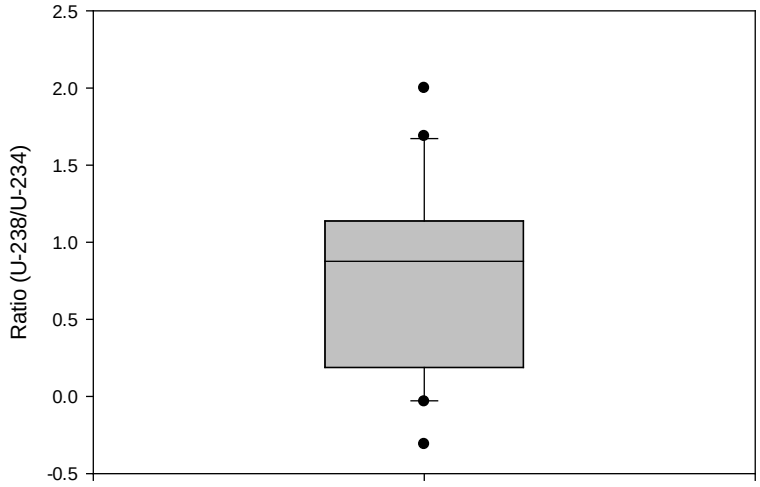
Figure 1. Distribution of U-238 concentrations in the hydraulic oil from the press. All values were below the 270 pCi/L upper-bound concentration found in crude oil.



Because of the possibility of hydraulic oil having a lower background concentration of uranium relative to crude oil, the ratio of the U-238/U-234 isotopes was analyzed. If the uranium content

were at natural levels, the ratio would be expected to be 1. Figure 2 provides the distribution of the ratios for the hydraulic oil, and the distribution is centered about 1. Ratios with substantially elevated U-238 would be much greater than 1 and would be an indicator of contamination in the hydraulic oil, but this is not suggested in this data set.

Figure 2. Distribution of isotopic ratios of U-238/U-234.



6 Conclusion

The sample results, combined with process knowledge, show that uranium content in the oil is indistinguishable from background. Thus, we conclude that the hydraulic oil is releasable under DOE Order 458.1 for recycling.

References:

Department of Energy (DOE), 2013. Radiation protection of the public and the environment. DOE Order 458.1, Change 3.

IAEA, 2003. Radiation protection and the management of radioactive waste in the oil and gas industry. IAEA Safety Report Series No. 34, Vienna.

Attachment 1.

Results for oil samples from radiochemical analysis for each of the uranium isotopes.

Field Sample ID	Parameter Name	Results (pCi/L)	Detected
WST35-17-132066	Uranium-234	48	N
WST35-17-132067	Uranium-234	241	Y
WST35-17-132068	Uranium-234	49	N
WST35-17-132069	Uranium-234	89	Y
WST35-17-132070	Uranium-234	74	Y
WST35-17-132071	Uranium-234	24	N
WST35-17-132072	Uranium-234	282	Y
WST35-17-132073	Uranium-234	220	Y
WST35-17-132074	Uranium-234	121	Y
WST35-17-132075	Uranium-234	49	Y
WST35-17-132076	Uranium-234	63	Y
WST35-17-132077	Uranium-234	83	Y
WST35-17-132078	Uranium-234	55	N
WST35-17-132079	Uranium-234	47	N
WST35-17-132080	Uranium-234	227	Y
WST35-17-132081	Uranium-234	328	Y
WST35-17-132082	Uranium-234	25	N
WST35-17-132083	Uranium-234	104	N
WST35-17-132084	Uranium-234	58	N
WST35-17-132085	Uranium-234	71	Y
WST35-17-132066	Uranium-235/236	0	N
WST35-17-132067	Uranium-235/236	0	N
WST35-17-132068	Uranium-235/236	0	N
WST35-17-132069	Uranium-235/236	6	N
WST35-17-132070	Uranium-235/236	-25	N
WST35-17-132071	Uranium-235/236	2	N
WST35-17-132072	Uranium-235/236	-8	N
WST35-17-132073	Uranium-235/236	-26	N
WST35-17-132074	Uranium-235/236	-7	N
WST35-17-132075	Uranium-235/236	-9	N
WST35-17-132076	Uranium-235/236	-7	N
WST35-17-132077	Uranium-235/236	5	N
WST35-17-132078	Uranium-235/236	25	N

Field Sample ID	Parameter Name	Results (pCi/L)	Detected
WST35-17-132079	Uranium-235/236	10	N
WST35-17-132080	Uranium-235/236	10	N
WST35-17-132081	Uranium-235/236	12	N
WST35-17-132082	Uranium-235/236	-15	N
WST35-17-132083	Uranium-235/236	-11	N
WST35-17-132084	Uranium-235/236	0	N
WST35-17-132085	Uranium-235/236	0	N
WST35-17-132066	Uranium-238	81	N
WST35-17-132067	Uranium-238	94	Y
WST35-17-132068	Uranium-238	22	N
WST35-17-132069	Uranium-238	78	N
WST35-17-132070	Uranium-238	65	Y
WST35-17-132071	Uranium-238	27	N
WST35-17-132072	Uranium-238	66	Y
WST35-17-132073	Uranium-238	38	N
WST35-17-132074	Uranium-238	58	N
WST35-17-132075	Uranium-238	56	Y
WST35-17-132076	Uranium-238	97	Y
WST35-17-132077	Uranium-238	78	Y
WST35-17-132078	Uranium-238	-17	N
WST35-17-132079	Uranium-238	64	N
WST35-17-132080	Uranium-238	4	N
WST35-17-132081	Uranium-238	-11	N
WST35-17-132082	Uranium-238	50	N
WST35-17-132083	Uranium-238	5	N
WST35-17-132084	Uranium-238	58	Y
WST35-17-132085	Uranium-238	66	Y

Attachment 1 (con't)
HPAL-Liquid Scintillaiton Analysis

HPAL ANALYSIS REPORT

FILE: 29114439

Sample Description	Analysis Information	Contact Information
Login Date: 04/25/16	**Instrument: TA3TC3**	**Name: MIMS DENNIS O**
Sample Type: Oil	**Analysis: Liquid Scint.**	**Phone: 667-8080**
Location TA: 3 Bldg: 35	**Date: 04/28/16**	**Email: dmims@lanl.gov**
Room: Base / Mech	**Analyst: CHILEN WILLIAM B**	
Priority: Routine		

Analyst Comments:

LLD (cpm): Alpha=16 Beta=12

Submitter Comments:

Need isotopic on all sample except # 5 6 & 10. Save sample

Sample ID	Alpha Activity (uCi/L)	2* sigma (%)	H-3 Beta Activity (uCi/L)	2* sigma (%)	Total Beta Activity (uCi/L)	2* sigma (%)
1	NDA	NDA	NDA	NDA	NDA	NDA
2*	NDA	NDA	NDA	NDA	NDA	NDA
3	NDA	NDA	NDA	NDA	NDA	NDA
4*	NDA	NDA	NDA	NDA	NDA	NDA
5	NDA	NDA	NDA	NDA	NDA	NDA
6*	NDA	NDA	NDA	NDA	NDA	NDA
7	NDA	NDA	NDA	NDA	NDA	NDA
8	NDA	NDA	NDA	NDA	NDA	NDA
9*	NDA	NDA	NDA	NDA	NDA	NDA
10	NDA	NDA	NDA	NDA	NDA	NDA

HPAL ANALYSIS REPORT

FILE: 29114460

Sample Description	Analysis Information	Contact Information
Login Date: 07/07/16	**Instrument:** TA3TC3	**Name:** BONSER BRYAN H
Sample Type: Oil	**Analysis:** Liquid Scint.	**Phone:** -
Location TA: 3 **Bldg:** 35	**Date:** 07/11/16	**Email:** bbonser@lanl.gov
Room: 112	**Analyst:** CHILEN WILLIAM B	
Priority: Routine		

Analyst Comments:

LLD (cpm): Alpha=15 Beta=12

Submitter Comments:

None

Sample ID	Alpha Activity (uCi/L)	2* sigma (%)	H-3 Beta Activity (uCi/L)	2* sigma (%)	Total Beta Activity (uCi/L)	2* sigma (%)
1	NDA	NDA	NDA	NDA	NDA	NDA

HPAL ANALYSIS REPORT

FILE: 29114636

Sample Description	Analysis Information	Contact Information
Login Date: 08/18/16	**Instrument:** TA3TC3	**Name:** LOZANO PATRICIA
Sample Type: Oil	**Analysis:** Liquid Scint.	**Phone:** -
Location TA: 3 **Bldg:** 35	**Date:** 08/19/16	**Email:** plozano@lanl.gov
Room: oil samples	**Analyst:** TRUJILLO ISAAC B	
Priority: Routine		

Analyst Comments:

LLD (cpm): Alpha=15 Beta=11

Submitter Comments:

None

Sample ID	Alpha Activity (uCi/L)	2* sigma (%)	H-3 Beta Activity (uCi/L)	2* sigma (%)	Total Beta Activity (uCi/L)	2* sigma (%)
1	NDA	NDA	NDA	NDA	NDA	NDA
2	NDA	NDA	NDA	NDA	NDA	NDA
3	NDA	NDA	NDA	NDA	NDA	NDA
4	NDA	NDA	NDA	NDA	NDA	NDA

HPAL ANALYSIS REPORT

FILE: 29114667

Sample Description	Analysis Information	Contact Information
Login Date: 10/19/16	Instrument: TA3TC2	Name: LOZANO PATRICIA
Sample Type: Oil	Analysis: Liquid Scint.	Phone: -
Location TA:3 Bldg: 35	Date: 10/20/16	Email: plozano@lanl.gov
Room: 101 Oil samples	Analyst: MEDINA ERLINDA T	
Priority: Routine		

Analyst Comments:
LLD (cpm): Alpha=14 Beta=13

Submitter Comments:
None

Sample ID	Alpha Activity (uCi/L)	2* sigma (%)	H-3 Beta Activity (uCi/L)	2* sigma (%)	Total Beta Activity (uCi/L)	2* sigma (%)
1	NDA	NDA	NDA	NDA	NDA	NDA
2	NDA	NDA	NDA	NDA	NDA	NDA
3	NDA	NDA	NDA	NDA	NDA	NDA
4	NDA	NDA	NDA	NDA	NDA	NDA
5	NDA	NDA	NDA	NDA	NDA	NDA
6	NDA	NDA	NDA	NDA	NDA	NDA
7	NDA	NDA	NDA	NDA	NDA	NDA
8	NDA	NDA	NDA	NDA	NDA	NDA
9	NDA	NDA	NDA	NDA	NDA	NDA
10	NDA	NDA	NDA	NDA	NDA	NDA
11	NDA	NDA	NDA	NDA	NDA	NDA
12	NDA	NDA	NDA	NDA	NDA	NDA

HPAL ANALYSIS REPORT

FILE: 29114668

Sample Description	Analysis Information	Contact Information
Login Date: 10/19/16	**Instrument:** TA3TC2	**Name:** LOZANO PATRICIA
Sample Type: Oil	**Analysis:** Liquid Scint.	**Phone:** -
Location TA: 3 **Bldg:** 35	**Date:** 10/24/16	**Email:** plozano@lanl.gov
Room: 101 PHOT Oil	**Analyst:** GADD MILAN S	
Priority: Routine		

Analyst Comments:

LLD (cpm): Alpha=14 Beta=13

Submitter Comments:

None

Sample ID	Alpha Activity (uCi/L)	2* sigma (%)	H-3 Beta Activity (uCi/L)	2* sigma (%)	Total Beta Activity (uCi/L)	2* sigma (%)
1	NDA	NDA	NDA	NDA	NDA	NDA
2	NDA	NDA	NDA	NDA	NDA	NDA
3	NDA	NDA	NDA	NDA	NDA	NDA

HPAL ANALYSIS REPORT

FILE: 29114715

Sample Description	Analysis Information	Contact Information
Login Date: 11/16/16	**Instrument:** TA3TC3	**Name:** ARNESON KIMBERLY
Sample Type: Oil	**Analysis:** Liquid Scint.	**Phone:** -
Location TA: 3 **Bldg:** 35	**Date:** 11/17/16	**Email:** karneson@lanl.gov
Room: 101 Pit	**Analyst:** VIGIL RALPH A	
Priority: Routine		

Analyst Comments:

LLD (cpm): Alpha=14 Beta=14

Submitter Comments:

None

Sample ID	Alpha Activity (uCi/L)	2* sigma (%)	H-3 Beta Activity (uCi/L)	2* sigma (%)	Total Beta Activity (uCi/L)	2* sigma (%)
1	NDA	NDA	NDA	NDA	NDA	NDA
2	NDA	NDA	NDA	NDA	NDA	NDA

HPAL ANALYSIS REPORT

FILE: 29114780

Sample Description	Analysis Information	Contact Information
Login Date: 12/20/16	**Instrument:** TA3TC2	**Name:** ARNESON KIMBERLY
Sample Type: Oil	**Analysis:** Liquid Scint.	**Phone:** -
Location TA: 3 **Bldg:** 35	**Date:** 12/21/16	**Email:** karneson@lanl.gov
Room: 101	**Analyst:** MEDINA ERLINDA T	
Priority: Routine		

Analyst Comments:

LLD (cpm): Alpha=15 Beta=14

Submitter Comments:

None

Sample ID	Alpha Activity (uCi/L)	2* sigma (%)	H-3 Beta Activity (uCi/L)	2* sigma (%)	Total Beta Activity (uCi/L)	2* sigma (%)
1	NDA	NDA	NDA	NDA	NDA	NDA
2	NDA	NDA	NDA	NDA	NDA	NDA
3	NDA	NDA	NDA	NDA	NDA	NDA
4	NDA	NDA	NDA	NDA	NDA	NDA
5	NDA	NDA	NDA	NDA	NDA	NDA
6	NDA	NDA	NDA	NDA	NDA	NDA

HPAL ANALYSIS REPORT

FILE: 29114781

Sample Description	Analysis Information	Contact Information
Login Date: 12/20/16	Instrument: TA3TC2	Name: ARNESON KIMBERLY
Sample Type: Oil	Analysis: Liquid Scint.	Phone: -
Location TA: 3 Bldg: 35	Date: 12/22/16	Email: karneson@lanl.gov
Room: 101	Analyst: MEDINA ERLINDA T	
Priority: Routine		

Analyst Comments:

LLD (cpm): Alpha=14 Beta=13

Submitter Comments:

None

Sample ID	Alpha Activity (uCi/L)	2* sigma (%)	H-3 Beta Activity (uCi/L)	2* sigma (%)	Total Beta Activity (uCi/L)	2* sigma (%)
1	NDA	NDA	NDA	NDA	NDA	NDA
2	NDA	NDA	NDA	NDA	NDA	NDA
3	NDA	NDA	NDA	NDA	NDA	NDA
4	NDA	NDA	NDA	NDA	NDA	NDA
5	NDA	NDA	NDA	NDA	NDA	NDA
6	NDA	NDA	NDA	NDA	NDA	NDA

HPAL ANALYSIS REPORT

FILE: 29114895

Sample Description	Analysis Information	Contact Information
Login Date: 02/22/17	**Instrument:** TA3TC3	**Name:** LOZANO PATRICIA
Sample Type: Oil	**Analysis:** Liquid Scint.	**Phone:** -
Location TA: 3 **Bldg:** 35	**Date:** 02/27/17	**Email:** plozano@lanl.gov
Room: Drums 21-25	**Analyst:** HOMAN VICTORIA M	
Priority: Routine		

Analyst Comments:

LLD (cpm): Alpha=4 Beta=4

Submitter Comments:

None

Sample ID	Alpha Activity (uCi/L)	2* sigma (%)	H-3 Beta Activity (uCi/L)	2* sigma (%)	Total Beta Activity (uCi/L)	2* sigma (%)
1	NDA	NDA	NDA	NDA	NDA	NDA
2	NDA	NDA	NDA	NDA	NDA	NDA
3	NDA	NDA	NDA	NDA	NDA	NDA
4	NDA	NDA	NDA	NDA	NDA	NDA
5	NDA	NDA	NDA	NDA	NDA	NDA

Attachment 1 (con't)- Oil drum contamination survey and release data package

Contamination/Radiation Survey Report 2017

RWP NUMBER : 2016-0088

TA-3-35 /Oil Sample Release Survey

Survey Form Revision 0

Survey Number:	Date/Time:
D&D-2017-00331	03/22/2017 @ 16:00

Location:	Surveyor:
TA-3-35	P. Lozano

Survey Type:

- ☐ Routine
- ☐ Pre-Job RWP
- ☐ Post-Job RWP
- ☐ RMI
- ☐ Drums / Bins
- ■ Equipment
- ☐ Material Release
- ☐ Material Receipt
- ☐ Vehicle Release
- ☐ Vehicle Receipt
- ☐ MARSSIM Survey

■ **Contamination** ☐ **Radiation**

NDA = No Dectable Activity.

Item #19 LANL Isotopic #29114843 results were positive

SMO results were negative for the same sample

N

A

Instrument	P/N #	Cal Due	Bkgd	MDA	units
E600	12501	11/22/2017	9.04	46	α dpm
SHP380AB	14822	12/2/2017	1147	367	βdpm
	N				
				A	

See attached data sheets for other instrument information.

RCT Signature: Patrick Lee

Supervisor: L. Priester

Signature _____

Item #	Location	Alpha			Beta			Tritium	Dose Rate (mrem/hr)					
	TA-3-35	Removable (dpm/100cm²)	Direct (dpm/100cm²)	Total (dpm/100cm²) Removable + Direct	Removable (dpm/100cm²)	Direct (dpm/100cm²)	Total (dpm/100cm²) Removable + Direct	Removable (dpm/100cm²)	Contact beta/gamma	Contact neutron	30 cm beta/gamma	30 cm neutron	1 Meter beta/gamma	1 Meter neutron
1	Drum #1 WST35-17-132066	NDA	NDA	NDA	NDA	NDA	NDA	N/A						
2	Drum #3 WST35-17-132067	NDA	NDA	NDA	NDA	NDA	NDA							
3	Drum #5 WST35-17-132068	NDA	NDA	NDA	NDA	NDA	NDA							
4	Drum #6 WST35-17-132069	NDA	NDA	NDA	NDA	NDA	NDA							
5	Drum #14 WST35-17-132070	NDA	NDA	NDA	NDA	NDA	NDA							
6	Drum #12 WST35-17-132071	NDA	NDA	NDA	NDA	NDA	NDA							
7	Drum #9 WST35-17-132072	NDA	NDA	NDA	NDA	NDA	NDA							
8	Drum #8 WST35-17-132073	NDA	NDA	NDA	NDA	NDA	NDA							
9	Drum #16 WST35-17-132074	NDA	NDA	NDA	NDA	NDA	NDA							
10	Drum #23 WST35-17-132075	NDA	NDA	NDA	NDA	NDA	NDA							
11	Drum #31 WST35-17-132076	NDA	NDA	NDA	NDA	NDA	NDA				N			
12	Drum #26 WST35-17-132077	NDA	NDA	NDA	NDA	NDA	NDA							
13	Drum #33 WST35-17-132078	NDA	NDA	NDA	NDA	NDA	NDA							
14	Drum #41 WST35-17-132079	NDA	NDA	NDA	NDA	NDA	NDA							
15	Drum #42 WST35-17-132080	NDA	NDA	NDA	NDA	NDA	NDA							
16	Drum #46 WST35-17-132081	NDA	NDA	NDA	NDA	NDA	NDA							
17	Drum #48 WST35-17-132082	NDA	NDA	NDA	NDA	NDA	NDA							
18	Drum #40 WST35-17-132083	NDA	NDA	NDA	NDA	NDA	NDA							
19	Drum #43 **SW2A** WST35-17-132084	NDA	NDA	NDA	NDA	NDA	NDA							
20	Plenum WST35-17-132085	NDA	NDA	NDA	NDA	NDA	NDA							
21	N/A													
22													A	
23														
24														
25			N											
26														
27														
28														
29														
30														
31														
32														
33														
34						A								
35														
36								N/A						

Contamination/Radiation Survey Report 2016 (Continuation)

Survey Number:	Date/Time:	Comments:
D&D-2017-00331	03/22/2017 @ 16:00	TA-3-35 /Oil Sample Release Survey
Location: TA-3-35	**Surveyor:** P. Lozano	

WST35-17-132085
20 Plenum

HJEA

Los Alamos NATIONAL LABORATORY EST. 1943

Ludlum 2929, 3030, and 3030E Sample Count Log

Sample Date 3/22/17

Performance Test Reference Readings*

Check Source	Isotope	Source ID	Efficiency (from calibration sticker)	Activity (dpm)	Net Check Source (cpm)	Expected -20%	Expected +20%	Instrument PN:	010785	Calibration Due Date:	6/1/17	Model Number:	Ludlum 3030E
Alpha	Pu239	45	0.39	6400	2438.10	1950.48	2925.72	TA:	3	Building:	SM30	Room:	W136C
Beta	SrY90	53	0.42	4010	1808.60	1446.88	2170.32						

*Values from RP-FORM-32, Performance Test Log

Daily Performance Tests

Time	Check Source	10-min Background (counts)	Background R_b (cpm) [=counts/10min]	MDA (dpm)	2-min Gross Check Source (counts)	Gross Check Source (cpm) [=counts/2min]	Net Check Source (cpm)	Pass / Fail	RCT Z Number	RCT Name	RCT Signature
6:30	Alpha	3	0.3	7.5	4840	2420	2420	PASS	304284	P. Lozano	
	Beta	763	76.3	56.3	3678	1839	1763	PASS			

Sample Results

		Alpha					Beta					
Time	Sample Description	Sample CF	Sample MDA (dpm)	2-min Sample (counts)	Sample (cpm) [=counts/2min]	Sample (dpm)	Sample CF	Sample MDA (dpm)	2-min Sample (counts)	Sample (cpm) [=counts/2min]	Sample (dpm)	RCT Z Number
16:00	Drum #1	1.00	7.5	2	1	NDA	1.00	56.3	156	78	NDA	304284
16:02	Drum #3	1.00	7.5	2	1	NDA	1.00	56.3	165	82.5	NDA	304284
16:04	Drum #5	1.00	7.5	2	1	NDA	1.00	56.3	148	74	NDA	304284
16:06	Drum #6	1.00	7.5	1	0.5	NDA	1.00	56.3	144	72	NDA	304284
16:08	Drum #14	1.00	7.5	2	1	NDA	1.00	56.3	155	77.5	NDA	304284
16:10	Drum #12	1.00	7.5	0	0	NDA	1.00	56.3	153	76.5	NDA	304284
16:12	Drum #9	1.00	7.5	1	0.5	NDA	1.00	56.3	162	81	NDA	304284
16:14	Drum #8	1.00	7.5	0	0	NDA	1.00	56.3	142	71	NDA	304284
16:16	Drum #16	1.00	7.5	1	0.5	NDA	1.00	56.3	158	79	NDA	304284
16:18	Drum #23	1.00	7.5	2	1	NDA	1.00	56.3	161	80.5	NDA	304284

Review Date: _____ Reviewer Name: _____ Signature: _____ Z Number: _____

Sample Results

		Alpha					Beta					
Time	Sample Description	Sample CF	Sample MDA (dpm)	2-min Sample (counts)	Sample (cpm) [=counts/2min]	Sample (dpm)	Sample CF	Sample MDA (dpm)	2-min Sample (counts)	Sample (cpm) [=counts/2min]	Sample (dpm)	RCT Z Number
16:20	Drum #31	1.00	7.5	3	1.5	NDA	1.00	56.3	148	74	NDA	304284
16:22	Drum #26	1.00	7.5	1	0.5	NDA	1.00	56.3	157	78.5	NDA	304284
16:24	Drum #33	1.00	7.5	2	1	NDA	1.00	56.3	139	69.5	NDA	304284
16:26	Drum #41	1.00	7.5	2	1	NDA	1.00	56.3	155	77.5	NDA	304284
16:28	Drum #42	1.00	7.5	2	1	NDA	1.00	56.3	144	72	NDA	304284
16:30	Drum #46	1.00	7.5	2	1	NDA	1.00	56.3	149	74.5	NDA	304284
16:32	Drum #48	1.00	7.5	1	0.5	NDA	1.00	56.3	151	75.5	NDA	304284
16:34	Drum #40	1.00	7.5	1	0.5	NDA	1.00	56.3	156	78	NDA	304284
16:36	Drum #43	1.00	7.5	0	0	NDA	1.00	56.3	162	81	NDA	304284
16:38	Plenum Sample	1.00	7.5	1	0.5	NDA	1.00	56.3	138	69	NDA	304284

HPAL ANALYSIS REPORT

FILE: 29114867

Sample Description	Analysis Information	Contact Information
Login Date: 02/10/17	Instrument: GEM-33	Name: LOZANO PATRICIA
Sample Type: Oil	Analysis: Isotopic	Phone: -
Location TA:3 Bldg:35	Date: 02/17/17	Email: plozano@lanl.gov
Room: Press Oil	Analyst: GARCIA JUDY V	
Priority: Routine		

Analyst Comments:

Sample ID or Description: Oil Sample #8..

Submitter Comments:

None

Isotope Name	Activity	2* sigma	MDA
	(pCi/g)	(pct)	(pCi/g)
U-238	7.22E+00	5.06E+01	3.58E+00
U-235	NDA	NDA	3.20E-01
Am-241	NDA	NDA	3.30E-01

RP-SVS HPAL SAMPLE SUBMITTAL FORM

RP-SVS-HPAL-FORM-001
Effecitve Date: 17-Dec-15

1

Submit Date: Feb 10, 2017 No. Samples: 9

Sample TA: 3 Bldg.: 35 Room: Press Oil

Submitter: P. Lozano Z No: 304284

Contact: Leroy Priester Z No: 259816

Phone/Pager/e-mail: 505-500-7373 DSESH Group: CPCS

2 ☐ PRIORITY ☐ EMERGENCY

3 **Tracking Number**

29114867

4 **Sample Types and Analyses**

	NuCon	Air Filter	Activity Report	LSC/H-3 Smear	Liquid	Oil	Nasal Smear	H-3 Air Filter	Charcoal Filter	Other
Gross α/β	☐	☐	☐							Contact
Liquid Scint.				☐	☐	☐	☐	☐		Contact
Isotopic	☐	☐	Contact	Contact	☐	☒	Contact		☐	☐
Leak Test	☐			☐						☐
Source Std										☐

Isotopic, Leak Test, and Source Std.: Field Screen

Isotopes(s): PU, AM, U dpm α <10K dpm β <10K

5 **Comments to HPAL**

If Activity found save samples

6 **RPO/RWP No.**

D&D-2016-0088

7

☐ Samples with ≥20k dpm alpha, ≥100k dpm or ≥0.5 mR/hr on contact beta/gamma, or ≥400k dpm tritium ☐ Special Tritium Compound (STC).

☐ Hazardous Materials KNOWN or Likely to be present. List: STC Type:

8 **SAMPLE TYPE: SMEARS/LIQUID/OTHER**

	Sample ID	Sample Date/Time	Description (Location, volume, etc.)
1	1	2/6/17 @1200	Press Oil NW 1A
2	2	2/6/17 @1200	Press Oil NW 1B
3	3	2/6/17 @1200	Press Oil NW 2A
4	4	2/6/17 @1200	Press Oil NW 2B
5	5	2/6/17 @1200	Press Oil NW 3A

9 **SAMPLE TYPE: AIR FILTER/CAM FILTER/FAS/CHARCOAL** Flow Rate Units: ☐ CFM ☐ LPM

	Sample On			Sample Off		
Location or Description	Date	Time	Flow Rate	Date	Time	Flow Rate
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

10 **SAMPLE TYPE: NASAL SMEAR** Type: Routine ☐ Special ☐

Name	Z No	Group	Resp.	Date	Time
1			☐		
2			☐		
3			☐		
4			☐		
5			☐		
6			☐		
7			☐		
8			☐		
9			☐		
10			☐		

RP-SVS HPAL SAMPLE SUBMITTAL FORM - Continuation

RP-SVS-HPAL-FORM-001,
Effective Date: 17-Dec-15

1

Submit Date: 2017-02-10

Contact: Leroy Priester Z No: 259816

Phone/Pager/e-mail:

Page _____ of _____

3 **Tracking Number**

29114867

8 **SAMPLE TYPE: SMEARS/LIQUID/OTHER**

	Sample ID	Sample Date/Time	Description (Location, volume, etc.)
6	6	2/6/17 @1200	Press Oil NW 3B
7	7	2/6/17 @1200	Press Oil SW 1A
8	8	2/6/17 @1200	Press Oil SW 2A
9	9	2/6/17 @1200	Press Oil SW 3A
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

9 **SAMPLE TYPE: AIR FILTER/CAM FILTER/FAS/CHARCOAL** Flow Rate Units: ☐ CFM ☐ LPM

	Sample On			Sample Off		
Location or Description	Date	Time	Flow Rate	Date	Time	Flow Rate
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						

10 **SAMPLE TYPE: NASAL SMEAR** Type: Routine ☐ Special ☐

Name	Z No	Group	Resp.	Date	Time
11			☐		
12			☐		
13			☐		
14			☐		
15			☐		
16			☐		
17			☐		
18			☐		
19			☐		
20			☐		

Field Sample ID	Location ID	Sample Date	Parameter Name	Report Result	Report Units	Lab Qualifier
WST35-17-132066	WST-RCRA	03/22/2017	Uranium-234	0.048	pCi/g	U
WST35-17-132066	WST-RCRA	03/22/2017	Uranium-235/236	0.0	pCi/g	U
WST35-17-132066	WST-RCRA	03/22/2017	Uranium-238	0.081	pCi/g	U
WST35-17-132067	WST-RCRA	03/22/2017	Uranium-234	0.241	pCi/g	
WST35-17-132067	WST-RCRA	03/22/2017	Uranium-235/236	0.0	pCi/g	U
WST35-17-132067	WST-RCRA	03/22/2017	Uranium-238	0.094	pCi/g	
WST35-17-132068	WST-RCRA	03/22/2017	Uranium-234	0.049	pCi/g	U
WST35-17-132068	WST-RCRA	03/22/2017	Uranium-235/236	0.0	pCi/g	U
WST35-17-132068	WST-RCRA	03/22/2017	Uranium-238	0.022	pCi/g	U
WST35-17-132069	WST-RCRA	03/22/2017	Uranium-234	0.089	pCi/g	
WST35-17-132069	WST-RCRA	03/22/2017	Uranium-235/236	0.006	pCi/g	U
WST35-17-132069	WST-RCRA	03/22/2017	Uranium-238	0.078	pCi/g	U
WST35-17-132070	WST-RCRA	03/22/2017	Uranium-234	0.074	pCi/g	
WST35-17-132070	WST-RCRA	03/22/2017	Uranium-235/236	-0.025	pCi/g	U
WST35-17-132070	WST-RCRA	03/22/2017	Uranium-238	0.065	pCi/g	
WST35-17-132071	WST-RCRA	03/22/2017	Uranium-234	0.024	pCi/g	U
WST35-17-132071	WST-RCRA	03/22/2017	Uranium-235/236	0.002	pCi/g	U
WST35-17-132071	WST-RCRA	03/22/2017	Uranium-238	0.027	pCi/g	U
WST35-17-132072	WST-RCRA	03/22/2017	Uranium-234	0.282	pCi/g	
WST35-17-132072	WST-RCRA	03/22/2017	Uranium-235/236	-0.008	pCi/g	U
WST35-17-132072	WST-RCRA	03/22/2017	Uranium-238	0.066	pCi/g	
WST35-17-132073	WST-RCRA	03/22/2017	Uranium-234	0.22	pCi/g	
WST35-17-132073	WST-RCRA	03/22/2017	Uranium-235/236	-0.026	pCi/g	U
WST35-17-132073	WST-RCRA	03/22/2017	Uranium-238	0.038	pCi/g	U
WST35-17-132074	WST-RCRA	03/22/2017	Uranium-234	0.121	pCi/g	
WST35-17-132074	WST-RCRA	03/22/2017	Uranium-235/236	-0.007	pCi/g	U
WST35-17-132074	WST-RCRA	03/22/2017	Uranium-238	0.058	pCi/g	U
WST35-17-132075	WST-RCRA	03/22/2017	Uranium-234	0.049	pCi/g	
WST35-17-132075	WST-RCRA	03/22/2017	Uranium-235/236	-0.009	pCi/g	U
WST35-17-132075	WST-RCRA	03/22/2017	Uranium-238	0.056	pCi/g	
WST35-17-132076	WST-RCRA	03/22/2017	Uranium-234	0.063	pCi/g	
WST35-17-132076	WST-RCRA	03/22/2017	Uranium-235/236	-0.007	pCi/g	U
WST35-17-132076	WST-RCRA	03/22/2017	Uranium-238	0.097	pCi/g	
WST35-17-132077	WST-RCRA	03/22/2017	Uranium-234	0.083	pCi/g	
WST35-17-132077	WST-RCRA	03/22/2017	Uranium-235/236	0.005	pCi/g	U
WST35-17-132077	WST-RCRA	03/22/2017	Uranium-238	0.078	pCi/g	
WST35-17-132078	WST-RCRA	03/22/2017	Uranium-234	0.055	pCi/g	U
WST35-17-132078	WST-RCRA	03/22/2017	Uranium-235/236	0.025	pCi/g	U
WST35-17-132078	WST-RCRA	03/22/2017	Uranium-238	-0.017	pCi/g	U
WST35-17-132079	WST-RCRA	03/22/2017	Uranium-234	0.047	pCi/g	U
WST35-17-132079	WST-RCRA	03/22/2017	Uranium-235/236	0.01	pCi/g	U
WST35-17-132079	WST-RCRA	03/22/2017	Uranium-238	0.064	pCi/g	U
WST35-17-132080	WST-RCRA	03/22/2017	Uranium-234	0.227	pCi/g	
WST35-17-132080	WST-RCRA	03/22/2017	Uranium-235/236	0.01	pCi/g	U
WST35-17-132080	WST-RCRA	03/22/2017	Uranium-238	0.004	pCi/g	U
WST35-17-132081	WST-RCRA	03/22/2017	Uranium-234	0.328	pCi/g	
WST35-17-132081	WST-RCRA	03/22/2017	Uranium-235/236	0.012	pCi/g	U
WST35-17-132081	WST-RCRA	03/22/2017	Uranium-238	-0.011	pCi/g	U
WST35-17-132082	WST-RCRA	03/22/2017	Uranium-234	0.025	pCi/g	U
WST35-17-132082	WST-RCRA	03/22/2017	Uranium-235/236	-0.015	pCi/g	U
WST35-17-132082	WST-RCRA	03/22/2017	Uranium-238	0.05	pCi/g	U
WST35-17-132083	WST-RCRA	03/22/2017	Uranium-234	0.104	pCi/g	U
WST35-17-132083	WST-RCRA	03/22/2017	Uranium-235/236	-0.011	pCi/g	U
WST35-17-132083	WST-RCRA	03/22/2017	Uranium-238	0.005	pCi/g	U
WST35-17-132084	WST-RCRA	03/22/2017	Uranium-234	0.058	pCi/g	U
WST35-17-132084	WST-RCRA	03/22/2017	Uranium-235/236	0.0	pCi/g	U
WST35-17-132084	WST-RCRA	03/22/2017	Uranium-238	0.058	pCi/g	

WST35-17-132085	WST-RCRA	03/22/2017	Uranium-234	0.071	pCi/g	
WST35-17-132085	WST-RCRA	03/22/2017	Uranium-235/236	0.0	pCi/g	U
WST35-17-132085	WST-RCRA	03/22/2017	Uranium-238	0.066	pCi/g	

Detected	Sample Matrix	Sample Purpose	Sample Type	Validation Qualifier	Validation Reason Codes	COC #
N	OIL	REG	OIL	U	R5	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
Y	OIL	REG	OIL	J-	R12a	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
Y	OIL	REG	OIL	J	R10d	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
Y	OIL	REG	OIL	J-	R3a	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
N	OIL	REG	OIL	UJ	R3a	2017-1255
Y	OIL	REG	OIL	J-	R12a	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
Y	OIL	REG	OIL	J	R10d	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
Y	OIL	REG	OIL	J-	R12a	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
Y	OIL	REG	OIL	J	R10d	2017-1255
Y	OIL	REG	OIL	J-	R12a	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
Y	OIL	REG	OIL	J-	R3a	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
Y	OIL	REG	OIL	J-	R12a	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
Y	OIL	REG	OIL	J	R10d	2017-1255
Y	OIL	REG	OIL	J-	R3a	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
Y	OIL	REG	OIL	J-	R3a	2017-1255
Y	OIL	REG	OIL	J-	R12a	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
Y	OIL	REG	OIL	J	R10d	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
N	OIL	REG	OIL	UJ	R10d	2017-1255
Y	OIL	REG	OIL	J-	R12a	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
Y	OIL	REG	OIL	J-	R12a	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
Y	OIL	REG	OIL	J	R10d	2017-1255

Y	OIL	REG	OIL	J-	R12a	2017-1255
N	OIL	REG	OIL	U	R5	2017-1255
Y	OIL	REG	OIL	J	R10d	2017-1255