

October 28,2019 Cardno 013613.R01a

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SUBJECT Report for Additional Soil Assessment and Proposed Remediation Plan Former State K Tank Battery No. 3 Vacuum Oil Field, Lea County, New Mexico NMOCD IRP No. 09-7-2239

Mr. Griswold:

At the request of ExxonMobil Environmental and Property Solutions¹, on behalf of ExxonMobil US Production Company, Cardno is submitting this *Report for Additional Soil Assessment and Proposed Remediation Plan* for the subject site. This report documents the field work completed in accordance with Cardno's *Work Plan for Additional Soil Assessment*, dated September 11, 2018, and subsequently approved by the State of New Mexico Oil Conservation Division in electronic correspondence dated September 19, 2018.

This report was originally submitted to Ms. Olivia Yu of the New Mexico Oil Conservation Division (NMOCD) on February 22, 2019. After submittal of the report and attempts to contact Ms. Yu to follow up, Cardno was informed by the NMOCD that Ms. Yu no longer worked for the agency. Following a conversation with Mr. Dylan Rose-Coss and Mr. Jim Griswald of the NMOCD on June 18, 2019, Cardno is resubmitting the report with updated chloride action levels in soil and a proposed remediation plan.

Please call the undersigned at 949.457.8941 if you have questions.

Sincerely,

David M. Purdy Senior Project Manager for Cardno Direct Line: 949.457.8941 Email: <u>dave.purdy@cardno.com</u>

cc: Ms. Marla D. Madden, ExxonMobil Environmental and Property Services Company Mr. Dylan Rose-Coss, State of New Mexico Oil Conservation Division

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¹ ExxonMobil Environmental Services changed its name to ExxonMobil Environmental and Property Solutions.

Report for Additional Soil Assessment and Proposed Remediation Plan

Former State K Tank Battery No. 3 Vacuum Oil Fields Lea County, New Mexico OCD No. AP038

Cardno 013613.R01a

Prepared for

ExxonMobil Environmental and Property Solutions Company

October 28, 2019



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1 Introduction

At the request of ExxonMobil Environmental and Property Services, on behalf ExxonMobil US Production Company (ExxonMobil), Cardno prepared this report and proposed remediation plan for the site. The purpose of the report is to document field observations and laboratory analytical data obtained from the advancement of 13 on-site soil borings to assess the lateral and vertical extent of constituents of concern beneath and surrounding the site, as proposed in Cardno's *Work Plan for Additional Soil Assessment* (Work Plan), dated September 11, 2018 (Cardno, 2018), which was approved by the New Mexico Oil Conservation Division (NMOCD) in electronic correspondence dated September 11, 2018 (Appendix A).

2 Site Description

The former State K Tank Battery No. 3 is located in the Vacuum Oil Field, Lea County, New Mexico. The property is located in the northwest corner of the northeast quarter of the southeast quarter of Section 32, Township 17 South, Range 35 East of the New Mexico Meridian and Baseline (Plate 1). The property is owned by the New Mexico State Land Office (NMSLO). An ExxonMobil Oil Corporation affiliate was the former oil and gas lease holder and operator of the tank battery. Prior to the divestment of the lease, the tank battery was decommissioned and removed from the site property. Chesapeake Energy Corporation currently holds an oil and gas lease for the site. The property is currently unoccupied. Photographs of the site can be found in Appendix B. NMOCD Site Assessment /Characterization Form C-141 is included in Appendix C of this report.

3 Geology and Hydrogeology

The site is located in northeastern Lea County, New Mexico, within the Maljamar-Vacuum field. The Maljamar-Vacuum field belongs to a larger system in the Permian basin. The field sediments are mainly Paleozoic carbonates with periodic siliciclastic and evaporate deposition dating from Ordovician through Permian ages with thicknesses exceeding 9 kilometers in the Southern Delaware Basin (Roche, 1997). Soils encountered during site investigations have included gravel, dense dry silt and clayey silty sand, calcareous silty sand, limestone, and sandstone to 50 feet bgs, the maximum depth investigated.

The primary source of water is the Ogallala Aquifer. The Ogallala formation is comprised of variably cemented calcic sands, silts, caliche, gravel and some clays, and ranges in thickness from 50 to 300 feet. Groundwater is being rapidly depleted in certain areas. Due to intensive groundwater pumping, water levels have declined and the direction of groundwater flow has shifted. In Lea County, groundwater levels have declined 50 to 100 feet (McGuire, 2014), with rates of decline up to 4 feet per year and averaging 0.59 foot per year for wells in Lea County (USGS, 2013).

3.1 Depth to Groundwater

A search of groundwater databases maintained by the New Mexico Office of the State Engineer (NMOSE) and the United States Geological Survey (USGS) was conducted to assess the average DTW within a 1-mile radius of the site and to identify any registered water wells within a ½-mile radius of the site. One water well (32465710329801) was discovered within a 1-mile radius from the site in the USGS National Water Information System (USGS, 2019). The well is listed as currently inactive. The last DTW measurement in the well was 95.01 feet bgs on January 15, 1991. A well location map with DTW information is provided in Appendix D.

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3.2 Nearest Karst, Cave, Mine, or Sink Hole

A review of an online geological features map showed that an Erosional Karst exists in the vicinity of the site (Szukalski, 2014). A map of the karst location is included in Appendix E.

A Review of USGS and Bureau of Land Management (BLM) data determined that there are no caves, mines, or sinkholes in the vicinity.

3.3 Regional Floodplain Data

The National Flood Hazard Layer in the Federal Emergency Management Agency's Map Service Center mapping portal does not show a floodplain located near or within the site (FEMA, 2019). A copy of the National Flood Hazard Layer map is included in Appendix F.

Based on observations in the general vicinity of the site and review of aerial photographs, there are no surface water bodies located within 1,000 feet of the site.

4 Regulatory Framework and Site Classification

The NMOCD has regulatory jurisdiction over oil and gas production operations in the State of New Mexico. The NMOCD requires that soil impacted by crude oil production activities be remediated in such a manner that the potential for future impacts to groundwater or the environment be minimized. The NMOCD hydrocarbon remediation levels are determined by ranking criteria on a site-by-site basis as outlined in the New Mexico Administrative Code (NMAC) Title 19 – Natural Resources and Wildlife, Chapter 15, Oil and Gas. The ranking criteria are based on three site characteristics: DTW, wellhead protection, and distance to surface water. As detailed in the following table, the site receives a score of 10 based on these critieria.

A copy of the State of New Mexico Energy and Natural Resourse Department C-141 form is completed and attatched in the appendices.

Characteristic	Selection	Score
DTW	50-99 feet	10
Wellhead Protection Area	>1,000 feet	0
Distance to Surface Water	>1,000 feet	0
	•	Total Score = 10

Ranking Criteria and Scoring

Based on this score, the soil hydrocarbon Recommended Remediation Action Levels (RRALs) in the following table apply to the site.

Soil Remediation Levels

Constituent of Concern	RRALs (mg/kg)
Benzene	10
Total BTEX	50
ТРН	1,000

Chloride Limits

Distance between the Chloride in Soil and the DTW	Chloride Limit (mg/kg)
<50 feet	600
50-100 feet	10,000

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>100 feet

20,000

5 Previous Work

Soil investigations have been conducted at the site since 2005. Previous work has included the drilling of soil borings, the excavation of soil containing naturally-occurring radioactive material (NORM), and subsurface investigations to assess the lateral and vertical extent of chloride in soil beneath the site. Cumulative soil analytical results are summarized in Table 1.

5.1 Site Assessment and Remediation Activities

May through August 2005. Conestoga-Rovers and Associates (CRA) conducted a NORM survey and excavated and disposed of soils exceeding the NORM remediation action level. Confirmation soil samples collected from remedial excavation areas did not contain NORM above remediation action levels. NORM assessment and remediation at the site has been completed (CRA, 2005).

In addition, CRA advanced 11 soil borings (SB-01 through SB-11) to assess petroleum hydrocarbon and chloride concentrations in soil beneath the site. TPH was reported above the RRAL in one soil sample collected from boring SB-02 (1 to 2 feet bgs). BTEX was not detected above RRALs in the soil samples. Chloride was detected in samples collected from each of the 11 borings up to a maximum concentration of 4,950 mg/kg. Chloride was not detected above reporting limits in a background soil sample collected from an off-site location (CRA, 2005).

The location of boring SB-05 from the 2005 CRA investigation is unknown as the boring does not appear on CRA's site maps.

March 2010. A geophysical survey of the site was conducted to estimate the extent of chloride concentrations and to select boring locations for sampling. The results of the survey indicated that there were three potential areas of increased conductivity (equating to elevated chloride concentrations) between the surface and 18 feet bgs. Three additional potential areas of increased conductivity between the depths of 18 to 49 feet were also identified (EMC, 2010).

April 2010. Kleinfelder performed additional soil investigation activities to assess the extent of chlorides in the subsurface. Based on the geophysical survey data, six soil borings (KSB-01, KSB-02, and KSB-04 through KSB-07) were advanced to 30 feet bgs. BTEX was not detected in soil samples collected from the borings. TPH were detected at concentrations below the RRALs. Chloride concentrations ranged from 43.2 to 4,800 mg/kg (Kleinfelder, 2012a). Previous soil borings are depicted on the Generalized Site Plan (Plate 2).

February 2012. Kleinfelder attended a meeting with the NMOCD to discuss the subsurface investigations previously conducted at the site and to come up with a pathway to environmental case closure. During the meeting, the NMOCD and Kleinfelder determined that based on the anticipated DTW at the site, chloride concentrations in soil must be vertically and horizontally delineated to the cleanup standard of 250 mg/kg. In the event that chloride concentrations do not drop below 250 mg/kg before reaching groundwater, upgradient and downgradient groundwater monitoring wells will be installed to assess chloride in groundwater. In the event that the lateral and vertical extent of chloride beneath the site property is adequately assessed to <250 mg/kg, the top 5 feet of soil will be excavated in the areas deemed to exceed the cleanup standard and will be backfilled with a sealing material (Kleinfelder, 2012b).

6 Subsurface Investigation

To determine the lateral and vertical extent of chloride in soil beneath the site, Cardno conducted additional subsurface investigation activities in October 2018. Cardno performed the fieldwork under the supervision of a professional geologist and in accordance with the Work Plan, the standard field protocols included in Appendix G, a site-specific health and safety plan, and applicable regulatory guidelines.

6.1 **Pre-Field Activities**

Prior to the onset of field activities, Cardno obtained a well installation permit from the NMOSE and a Right of Entry Remediation Permit from the New Mexico Commissioner of Public Lands (Appendix H). Cardno personnel visited the site to check for obstructions and to mark the proposed locations. New Mexico One Call was contacted and affected utility companies marked any underground lines. The property owner, NMOSE, and NMOCD were notified at least 48 hours prior to the onset of field activities.

6.2 Sampling and Soil Boring Activities

On October 26, 2018, Cardno cleared 13 boreholes for subsurface utilities to 5 feet bgs, or refusal, using an air knife rig. Several boreholes were cleared to less than 5 feet bgs due to the presence of native condensed caliche rock.

From October 27 through 29, 2018, Cardno supervised Yellow Jacket Drilling advance borings B1 through B13 using a Speedstar 50K CH air rotary drill rig equipped with 10-inch diameter rods. Soil samples were collected at 5-foot intervals to the total depth of each boring and were preserved for laboratory analysis. Groundwater was not encountered in any of the borings. Lithologic descriptions of the soil cuttings are presented on the boring logs included in Appendix I. Borings were advanced until field measurements indicated that chloride concentrations were below the NMOCD Chloride Limit established at the time of drilling (250 mg/kg).

6.3 Laboratory Analyses

Cardno submitted soil samples for analysis to Eurofins Calscience for the analyses and methods detailed in the laboratory analytical reports included in Appendix J and summarized in Tables 1 and 2.

6.4 Site Survey

On October 30, 2018, Cardno supervised John West Surveying Company survey the location and elevation of the soil borings. The survey data is included in Appendix K.

6.5 Waste Management Plan

The soil generated during drilling activities was temporarily stored on site in DOT-approved, 55-gallon drums. Soil cuttings were transported for recycling to Republic Tessman Landfill disposal facility in San Antonio, Texas. A copy of the waste manifests for the disposal of soil is included in Appendix L.

7 Results of Investigation

7.1 Site Lithology

During this investigation, soil cuttings observed consisted of poorly-graded sand, silt, and gravel with varying caliche, limestone, and sandstone rock layers, which is consistent with past investigations conducted at the site. Soil observed in borings B1 through B13 consisted of sand, silt, and mixtures of sand, silt, and gravel from the

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surface to 50 feet bgs, the maximum depth investigated. Groundwater was not encountered during this investigation.

7.2 Chloride In Soils

Chloride was detected in each soil sample collected during this investigation. The maximum chloride concentration detected was 1,600 mg/kg in boring B2 at 20 feet bgs. Chloride concentrations were detected above the current NMOCD Chloride Limit of 600 mg/kg in borings B1, B2, B3, B5, B8, and B11. Seven plume zones have been characterized as a result of this investigation. Cumulative chloride concentrations in soil are illustrated on Plate 3.

7.3 Hydrocarbons In Soil

Select soil samples were also analyzed for TPH and BTEX. TPH and BTEX were not detected above reporting limits in any of these samples.

7.4 Conclusions

The lithology observed in borings B1 through B13 was consistent with observations made during previous investigations at the site. Groundwater was not encountered in any of the borings, which were drilled to a maximum depth of 50 feet bgs.

The vertical extent of chloride in soil appears to have been adequately delineated, as the deepest soil sample from each boring did not contain chloride concentrations above the limit of 600 mg/kg, with the exception of the bottom sample collected from boring B5 at 25 feet bgs.

The lateral extent of chloride in soil has not been delineated in all directions; however, for the purposes of conducting a limited remedial excavation of shallow soil, a sufficient data set has been obtained to reasonably estimate the area of soil required for excavation. Additional delineation can be achieved during excavation activities by collecting selected excavation sidewall soil samples.

7.5 Recommendations

As groundwater was not encountered during this or previous investigations and the vertical extent of chloride in soil appears to have been adequately delineated, Cardno does not recommend further groundwater investigations. To remediate shallow soil with chloride concentrations exceeding 600 mg/kg, Cardno recommends preparation of a remediation plan for the site.

8 Proposed Remediation Plan

8.1 Detailed Description of Proposed Remediation Technique

NMOCD Remediation Plan Form C-141 is included in Appendix C of this report. Based on laboratory analytical results, site characteristics and field observations made during previous site assessment activities, Cardno proposes to remediate chloride in soil at concentrations greater than NMOCD action levels to advance the site toward closure. Cardno proposes to excavate and remove chloride containing soil to a depth of 4 feet bgs in the vicinity of the following seven plume zones:

- Excavation Area No. 1: Soil borings KSB-01, SB-01, B1, B2, and B3.
- Excavation Area No. 2: Soil borings B5, KSB-06, and SB-10.
- Excavation Area No. 3: Soil borings KSB-07, SB-03, and SB-04.
- Excavation Area No. 4: Soil borings KSB-02, SB-08, and B8.
- Excavation Area No. 5: Soil boring KSB-05.
- Excavation Area No. 6: Soil boring B11.
- Excavation Area No. 7: Soil boring KSB-04.

8.2 **Pre-Field Activities**

Prior to conducting the remedial excavation, Cardno will obtain a Right of Entry Remediation Permit from the New Mexico Commissioner of Public Lands and will notify the current lease holder of our intent to conduct this work scope. New Mexico One Call will be contacted and affected utility companies will mark any underground lines. Cardno will then conduct a geophysical survey to check for subsurface utilities or obstructions. Any subsurface pipeline or structure will be excavated using non-intrusive air knifing tools to confirm the location and depth and the subsurface object's location will be surveyed. Cardno will then locate by survey previously advanced boring locations and delineate each proposed excavaton area. The NMOSE and NMOCD will be notified at least 48 hours prior to the onset of field activities.

8.3 Soil Excavation and Sampling Activities

The proposed excavation locations are depicted on Plates 3 and 4. The procedures for excavating and soil sampling are described in the field protocol contained in Appendix G. The fieldwork will be conducted under the advisement of a professional geologist and in accordance with applicable regulatory guidelines.

Soil samples will be collected from select excavation sidewalls at locations indicated on Plates 3 and 4. Areas outside of the proposed excavation areas will be monitored for vegetation loss and excavated to a depth of approximate 6 inches to 1 foot bgs. It is estimated that approximately 3,787 cubic yards of impacted soil will be removed during remedial excavation activities.

8.4 Timeline and Estimated Volume of Soil to be Remediated

Based on soil sample analytical results from previous subsurface investigations conducted at the site, it is estimated that approximately 3,787 cubic yards of soil will be removed during remedial excavation activities. Remediation activities will be conducted within 90 days of receiving approval of the remediaton plan from the NMOCD.

8.5 Laboratory Analyses

Soil samples will be submitted for analysis to Eurofins Laboratories, Inc., a state-certified analytical laboratory, under COC protocol. Soil samples collected from the excavation sidewalls will be analyzed for chloride using EPA Method 300 and for chloride synthetic precipitation leaching procedure (SPLP) using EPA Method 9056.

8.6 Restoration, Reclamation and Re-Vegetation Plan

To the extent practicable, the areas affected by the remedial excavation will be restored to the condition that existed prior to the release. Following soil removal, the excavated areas will be backfilled with clean, locally sourced, "like" material. The backfilled areas will be contoured and/or compacted to obtain preservation of surface water flow, erosion control and stability. Affected areas associated with the remedial excavation will be reseeded with an agency-approved seed mixture during the first favourable growing season following remedial activities.

8.7 Waste Management Plan

The soil generated during excavation activities will be temporarily stored on site on an impermeable plastic membrane. The soil will be transported under non-hazardous waste manifest or bill of lading to Sundance Services, Inc., Eunice, New Mexico, an ExxonMobil and state – approved soil recycling facility. Copies of the manifests will be provided in the excavation closure report.

8.8 Site Safety Plan

The fieldwork will be performed in accordance with the site-specific safety plan.

8.9 Report

After completion of the proposed field activities, a report summarizing field and laboratory procedures, and laboratory results will be submitted to the NMOCD.

9 Contact Information

The responsible party contact is Ms. Marla D. Madden, ExxonMobil Environmental and Property Services Company, 18685 Main Street, Suite 101 PMB 601, Huntington Beach, California, 92648-1719.

The consultant contact is Mr. David M. Purdy, Cardno, 20505 Crescent Bay Drive, Lake Forest, California, 92630.

The agency contact is Mr. Jim Griswold, NMOCD, State of New Mexico Oil Conservation Division, 1625 North French Drive, Hobbs, New Mexico 88240.

10 Limitations

For documents cited that were not generated by Cardno, the data taken from those documents is used "as is" and is assumed to be accurate. Cardno does not guarantee the accuracy of this data and makes no warranties for the referenced work performed nor the inferences or conclusions stated in these documents.

This document and the work performed have been undertaken in good faith, with due diligence and with the expertise, experience, capability and specialized knowledge necessary to perform the work in a good and workmanlike manner and within all accepted standards pertaining to providers of environmental services in New Mexico at the time of investigation. No soil engineering or geotechnical references are implied or should be inferred. The evaluation of the geologic conditions at the site for this investigation is made from a limited number of data points. Subsurface conditions may vary away from these data points.

11 References

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12 Acronym List

µg/L	Micrograms per liter	NAPL	Non-aqueous phase liquid
µg/m³	Micrograms per cubic meter	NEPA	National Environmental Policy Act
μs	Microsiemens	NGVD	National Geodetic Vertical Datum
1,2-DCA	1,2-dichloroethane	NPDES	National Pollutant Discharge Elimination System
acfm	Actual cubic feet per minute	O&M	Operations and Maintenance
AS	Air sparge	ORP	Oxidation-reduction potential
AST	Aboveground storage tank	OSHA	Occupational Safety and Health Administration
bgs	Below ground surface	OVA	Organic vapor analyzer
BTEX	Benzene, toluene, ethylbenzene, and total xylenes	P&ID	Process and Instrumentation Diagram
cfm	Cubic feet per minute	PAH	Polycyclic aromatic (or polyaromatic) hydrocarbon
COC	Chain-of-Custody	PCB	Polychlorinated biphenyl
CPT	Cone Penetration (Penetrometer) Test	PCE	Tetrachloroethene or perchloroethylene
DIPE	Di-isopropyl ether	PID	Photo-ionization detector
DO	Dissolved oxygen	PLC	Programmable logic control
DOT	Department of Transportation	POTW	Publicly-owned treatment works
DPE	Dual-phase extraction	ppmv	Parts per million by volume
DTW	Depth to water	PQL	Practical quantitation limit
EDB	1,2-dibromoethane	psi	Pounds per square inch
EPA	Environmental Protection Agency	PVC	Polyvinyl chloride
ESL	Environmental screening level	QA/QC	Quality assurance/quality control
ETBE	Ethyl tertiary butyl ether	RBSL	Risk-based screening levels
FID	Flame-ionization detector	RCRA	Resource Conservation and Recovery Act
fpm	Feet per minute	RL	Reporting limit
GAC	Granular activated carbon	scfm	Standard cubic feet per minute
gpd	Gallons per day	SSTL	Site-specific target level
gpm	Gallons per minute	STLC	Soluble threshold limit concentration
GWPTS	Groundwater pump and treat system	SVE	Soil vapor extraction
HIT	High-intensity targeted	SVOC	Semi-volatile organic compound
HVOC	Halogenated volatile organic compound	TAME	Tertiary amyl methyl ether
J	Estimated value between MDL and PQL (RL)	TBA	Tertiary butyl alcohol
LEL	Lower explosive limit	TCE	Trichloroethene
LPC	Liquid-phase carbon	TOC	Top of well casing elevation; datum is msl
LRP	Liquid-ring pump	TOG	Total oil and grease
LUFT	Leaking underground fuel tank	TPH	Total petroleum hydrocarbons
LUST	Leaking underground storage tank	TPHd	Total petroleum hydrocarbons as diesel
MCL	Maximum contaminant level	TPHg	Total petroleum hydrocarbons as gasoline
MDL	Method detection limit	TPHmo	Total petroleum hydrocarbons as motor oil
mg/kg	Milligrams per kilogram	TPHs	Total petroleum hydrocarbons as stoddard solvent
mg/L	Milligrams per liter	TRPH	Total recoverable petroleum hydrocarbons
mg/m³	Milligrams per cubic meter	UCL	Upper confidence level
MPE	Multi-phase extraction	USCS	Unified Soil Classification System
MRL	Method reporting limit	USGS	United States Geologic Survey
msl	Mean sea level	UST	Underground storage tank
MTBE	Methyl tertiary butyl ether	VCP	Voluntary Cleanup Program
MTCA	Model Toxics Control Act	VOC	Volatile organic compound
NAI	Natural attenuation indicators	VPC	Vapor-phase carbon











Sampling Method			[EPA 8021B			EPA 8015B			EPA 525.2	EPA 9056	Saturated Paste	SM 4500-CI C		
						Ethyl-		Total	TPH as	TPH as	Total				
Sample		Sampling	Depth	Benzene	Toluene	benzene	Xylenes	BTEX	Diesel	Gasoline	TPH	Chloride	Chloride	Chloride	Chloride
ID	Boring	Date	(feet)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/L)
NMOCD RRALs				10				50			1,000				
NMOCD Chlorid	le Limits											600	600	600	600
2005 Subsur	face Inve	stigation													
SB1-0-2'	SB-01	08/22/05	0-2	<0.0012	<0.0012	<0.0012	<0.0012	BDL	<0.12	870	870	<12			
SB1-14-15'	SB-01	08/22/05	14-15	<0.0011	<0.0011	<0.0011	<0.0011	BDL	<0.11	<5.3	BDL	132			
SB1-19-20'	SB-01	08/22/05	19-20	<0.001	<0.001	<0.001	<0.001	BDL	<0.1	<5.2	BDL	955			
SB2-1-2'	SB-02	08/22/05	1-2	<0 001	0 0075	<0.001	0 002	0 0095	<0 1	4 200	4.200	91 9			
SB2-15-16'	SB-02	08/22/05	15-16	< 0.001	< 0.001	< 0.001	< 0.001	BDL	<0.1	32	32	25.6			
SB2-20-21'	SB-02	08/22/05	20-21	<0.001	<0.001	<0.001	<0.001	BDL	<0.1	19	19	91.3			
SB3 1 2'	SB 03	08/22/05	1 2	<0.0012	0 0073	<0.0012	<0.0012	0 0073	~0.12	160	160	4 590			
SB3-1/-15'	SB-03	08/22/05	1/_15	<0.0012	<0.0073	<0.0012	<0.0012	0.0073 RDI	<0.12	<0.54	BDI	4,390			
SB3 20 21'	SB-03	08/22/05	20.21	<0.0011	<0.0011	<0.0011	<0.0011	BDL	<0.11	<0.54	BDL	1,050			
303-20-21	30-03	00/22/03	20-21	\0.0011	\0.0011	VU.0011	\0.0011	DDL	~0.11	<0.55	DDL	1,470			
SB4-1-2'	SB-04	08/22/05	1-2	<0.0011	<0.0011	<0.0011	<0.0011	BDL	<0.11	250	250	1,930			
SB4-14-15'	SB-04	08/22/05	14-15	<0.001	<0.001	<0.001	<0.001	BDL	<0.1	11	11	877			
SB4-20-21'	SB-04	08/22/05	20-21	<0.0011	<0.0011	<0.0011	<0.0011	BDL	<0.11	14	14	1,220			
SB5-1-2'	SB-05	08/22/05	1-2	<0.0011	<0.0011	<0.0011	<0.0011	BDL	<0.11	<11	BDL	<10.6			
SB5-15-16'	SB-05	08/22/05	15-16	<0.001	<0.001	<0.001	<0.001	BDL	<0.1	<5.2	BDL	104			
SB5-20-21'	SB-05	08/22/05	20-21	<0.0011	<0.0011	<0.0011	<0.0011	BDL	<0.11	<5.3	BDL	138			
SB6-1-2'	SB-06	08/22/05	1_2	<0.0012	0.030	0.0018	0 0055	0.0463	<0.12	410	410	10 /			
SB6-15-16'	SB-06	08/22/05	15-16	<0.0012	<0.000	<0.0010	<0.0000	BDI	<0.12	<5.1	BDI	35			
SB6-20-21'	SB-06	08/22/05	20-21	<0.001	<0.001	< 0.001	< 0.001	BDL	<0.1	<5.1	BDL	31.9			
SB7-1-2'	SB-07	08/23/05	1-2	<0.0011	<0.0011	<0.0011	<0.0011	BDL	<0.11	<5.6	BDL	46.5			
SB7-15-16'	SB-07	08/23/05	15-16	<0.0011	<0.0011	<0.0011	<0.0011	BDL	<0.11	<5.6	BDL	117			
SB7-20-21'	SB-07	08/23/05	20-21	<0.0012	<0.0012	<0.0012	<0.0012	BDL	<0.12	<5.8	BDL	128			
SB8-1-2'	SB-08	08/23/05	1-2	<0.0013	<0.0013	<0.0013	<0.0013	BDL	<0.13	530	530	940			
SB8-15-16'	SB-08	08/23/05	15-16	<0.001	<0.001	<0.001	<0.001	BDL	<0.1	17	17	84			
SB8-20-21'	SB-08	08/23/05	20-21	<0.001	<0.001	<0.001	<0.001	BDL	<0.1	<5.2	BDL	41.7			

Sampling Method			EPA 8021B						EPA 8015B			EPA 9056	Saturated Paste	SM 4500-CI C	
						Ethyl-		Total	TPH as	TPH as	Total				
Sample		Sampling	Depth	Benzene	Toluene	benzene	Xylenes	BTEX	Diesel	Gasoline	TPH	Chloride	Chloride	Chloride	Chloride
ID	Boring	Date	(feet)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/L)
NMOCD RRALs				10				50			1,000		-		
NMOCD Chloride	e Limits											600	600	600	600
SB9-1-2'	SB-09	08/23/05	1-2	<0.0012	<0.0012	<0.0012	<0.0012	BDL	<0.12	<6.2	BDL	<12.4			
SB9-15-16'	SB-09	08/23/05	15-16	<0.0011	<0.0011	<0.0011	<0.0011	BDL	<0.11	<5.3	BDL	19.5			
SB9-15-16' Dup	SB-09	08/23/05	15-16	<0.001	<0.001	<0.001	<0.001	BDL	<0.1	<5.2	BDL	15.9			
SB9-21-21'	SB-09	08/23/05	21-21	<0.0012	<0.0012	<0.0012	<0.0012	BDL	<0.12	<6.2	BDL	<11.5			
SB10-1-2'	SB-10	08/23/05	1-2	<0.0011	<0.0011	<0.0011	<0.0011	BDL	<0.11	50	50	2,080			
SB10-15-16'	SB-10	08/23/05	15-16	<0.0011	<0.0011	<0.0011	<0.0011	BDL	<0.11	<5.3	BDL	887			
SB10-20-21'	SB-10	08/23/05	20-21	<0.0011	<0.0011	<0.0011	<0.0011	BDL	<0.11	<5.6	BDL	62			
SB11-1-2'	SB-11	08/23/05	1-2	<0.0012	<0.0012	<0.0012	<0.0012	BDL	<0.12	<61	BDL	203			
SB11-15-16'	SB-11	08/23/05	15-16	<0.001	<0.001	<0.001	0.0014	0.0014	<0.1	<5.2	BDL	300			
SB11-20-21'	SB-11	08/23/05	20-21	<0.0011	<0.0011	<0.0011	0.0016	0.0016	<0.11	<0.53	BDL	269			
Background		08/23/05	1-2									<12.6			
2010 Subsurf	ace Inves	tigation													
SB1 0-1	KSB-01	04/14/10	0-1										1.200 B1	1.207	
SB1 4-5	KSB-01	04/14/10	4-5										895 B1	1.793	
SB1 9-10	KSB-01	04/14/10	9-10	<0.000929	<0.000929	<0.000929	<0.000929	BDL	<4.84	<0.0929	BDL		866 B1		
SB1 14-15	KSB-01	04/14/10	14-15										962 B1		
SB1 19-20	KSB-01	04/14/10	19-20										4.800 B1		
SB1 24-5	KSB-01	04/14/10	24-25										4.420 B1		
SB1 29-30	KSB-01	04/14/10	29-30	<0.000931	<0.000931	<0.000931	<0.000931	BDL	<4.84	<0.0931	BDL		2,220 B1		
SB2 0-1	KSB-02	04/14/10	0-1										1,070 B1	1,146	
SB2 4-5	KSB-02	04/14/10	4-5										807 B1	821	
SB2 9-10	KSB-02	04/14/10	9-10										705 B1		
SB2 14-15	KSB-02	04/14/10	14-15										283 B1		
SB2 19-20	KSB-02	04/14/10	19-20										292 B1		
SB2 24-5	KSB-02	04/14/10	24-25	<0.000947	<0.000947	<0.000947	<0.000947	BDL	<4.88	<0.0947	BDL		64.3 B1		
SB2 29-30	KSB-02	04/14/10	29-30	<0.000943	<0.000943	<0.000943	<0.000943	BDL	10.9	<0.0943	10.9		289 B1		

Sampling Method		EPA 8021B						EPA 8015B			EPA 9056	Saturated Paste	SM 4500-CI C		
						Ethyl-		Total	TPH as	TPH as	Total				
Sample		Sampling	Depth	Benzene	Toluene	benzene	Xylenes	BTEX	Diesel	Gasoline	TPH	Chloride	Chloride	Chloride	Chloride
ID	Boring	Date	(feet)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/L)
NMOCD RRALs				10				50			1,000				
NMOCD Chlorid	e Limits											600	600	600	600
SB4 0-1	KSB-04	04/14/10	0-1										494	643	
SB4 4-5	KSB-04	04/14/10	4-5										43.2 B1	880	
SB4 9-10	KSB-04	04/14/10	9-10	<0.000873	<0.000873	<0.000873	<0.000873	BDL	5.69	<0.0873	5.69		732 B1		
SB4 14-15	KSB-04	04/14/10	14-15										958 B1		
SB4 19-20	KSB-04	04/14/10	19-20										163 B1		
SB4 24-5	KSB-04	04/14/10	24-25										552 B1		
SB4 29-30	KSB-04	04/14/10	29-30	<0.000926	<0.000926	<0.000926	<0.000926	BDL	12.0	<0.0926	12.0		520 B1		
SB5 0-1	KSB-05	04/14/10	0-1											5,223	
SB6 0-1	KSB-06	04/14/10	0-1											1,632	
SB7 0-1	KSB-07	04/14/10	0-1										521	555	
SB7 4-5	KSB-07	04/14/10	4-5										349 B1	19	
SB7 9-10	KSB-07	04/14/10	9-10	<0.000990	<0.000990	<0.000990	<0.000990	BDL	<4.86	<0.0990	BDL		94.6 B1		
SB7 14-15	KSB-07	04/14/10	14-15										1,150 B1		
SB7 19-20	KSB-07	04/14/10	19-20										1,450 B1		
SB7 24-5	KSB-07	04/14/10	24-25										155 B1		
SB7 29-30	KSB-07	04/14/10	29-30	<0.000904	<0.000904	<0.000904	<0.000904	BDL	<4.86	<0.0904	BDL		110 B1		
2018 Subsur	face Inves	stigation													
S-10-B1	B1	10/27/18	10										260 B		
S-15-B1	B1	10/27/18	15										120 B		
S-20-B1	B1	10/27/18	20										330 B		
S-25-B1	B1	10/27/18	25										670 B		
S-30-B1	B1	10/27/18	30										1,200 B		46
S-35-B1	B1	10/27/18	35										180 B		

Sampling Method		EPA 8021B						EPA 8015B			EPA 9056	Saturated Paste	SM 4500-CI C		
						Ethyl-		Total	TPH as	TPH as	Total				
Sample		Sampling	Depth	Benzene	Toluene	benzene	Xylenes	BTEX	Diesel	Gasoline	TPH	Chloride	Chloride	Chloride	Chloride
ID	Boring	Date	(feet)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/L)
NMOCD RRALs				10				50			1,000				
NMOCD Chloride	e Limits											600	600	600	600
S-5-B2	B2	10/29/18	5										560		
S-10-B2	B2	10/29/18	10										890		
S-15-B2	B2	10/29/18	15										840		
S-20-B2	B2	10/29/18	20										1,600		
S-30-B2	B2	10/29/18	30										260		
S-35-B2	B2	10/29/18	35										320		
S-40-B2	B2	10/29/18	40										340		
S-45-B2	B2	10/29/18	45										120		
S-50-B2 (a)	B2	10/29/18	50	<0.0050	<0.0050	<0.0050	<0.0050	BDL	<5.3	<0.49	BDL		56		
S-5-B3	B3	10/27/18	5										300		
S-10-B3	B3	10/27/18	10										1,000		
S-15-B3	B3	10/27/18	15										510		
S-20-B3	B3	10/27/18	20										63		
S-5-B4	B4	10/27/18	5	<0.0051	<0.0051	<0.0051	<0.0051	BDL		<0.50	BDL		35		
S-10-B4	B4	10/27/18	10	<0.0050	<0.0050	<0.0050	<0.0050	BDL		<0.50	BDL		63 B		
S-15-B4	B4	10/27/18	15	<0.0050	<0.0050	<0.0050	<0.0050	BDL		<0.50	BDL		23		
S-20-B4	B4	10/27/18	20	<0.0051	<0.0051	<0.0051	<0.0051	BDL		<0.50	BDL		100 B		
S-5-B5	B5	10/27/18	5										90		
S-10-B5	B5	10/27/18	10										64		
S-15-B5	B5	10/27/18	15										46		
S-20-B5	B5	10/27/18	20										880		
S-25-B5	B5	10/27/18	25										740		
S-5-B6	B6	10/27/18	5	<0.0050	<0.0050	<0.0050	<0.0050	BDL		<0.51	BDL		67		
S-10-B6	B6	10/27/18	10	<0.0050	<0.0050	<0.0050	<0.0050	BDL		<0.49	BDL		7.0 J		
S-15-B6	B6	10/27/18	15	<0.0050	<0.0050	<0.0050	<0.0050	BDL		<0.48	BDL		26		
S-20-B6	B6	10/27/18	20	<0.0050	<0.0050	<0.0050	<0.0050	BDL		<0.50	BDL		33		
S-25-B6	B6	10/27/18	25	<0.0051	<0.0051	<0.0051	<0.0051	BDL		<0.48	BDL		4.8 J		
S-30-B6	B6	10/27/18	30	<0.0050	<0.0050	<0.0050	<0.0050	BDL		<0.50	BDL		11		

Ethyl- Total TPH as TPH as Total Sample Sampling Depth Benzene Toluene benzene Xylenes BTEX Diesel Gasoline TPH Chloride Chloride Chloride ID Boring Date (feet) (mg/kg) (mg/kg) (mg/kg) (mg/kg) (mg/kg) (mg/kg) (mg/kg) (mg/kg) (mg/kg) (mg/kg)	Chloride (mg/L) 600
Sample Sampling Depth Benzene Toluene benzene Xylenes BTEX Diesel Gasoline TPH Chloride Chloride Chloride ID Boring Date (feet) (mg/kg)	Chloride (mg/L) 600
ID Boring Date (feet) (mg/kg) (mg/kg) (mg/kg) (mg/ka) (mg/ka) (mg/ka) (mg/ka) (mg/ka) (mg/ka) (mg/ka) (mg/ka)	(mg/L) 600
	 600
NMOCD RRALs 10 50 1,000	600
NMOCD Chloride Limits 600 600 600	
S-5-B7 B7 10/27/18 5 28	
S-10-B7 B7 10/27/18 10 14	
S-20-B7 B7 10/27/18 20 8.8 J	
S-25-B7 B7 10/27/18 25 5.3 J	
S-30-B7 B7 10/27/18 30 8.2 J	
S-5-B8 B8 10/28/18 5 690 B	
S-10-B8 B8 10/28/18 10 900	
S-15-B8 B8 10/28/18 15 180	
S-25-B8 B8 10/28/18 25 310	
S-30-B8 B8 10/28/18 30 110	
S-40-B8 B8 10/28/18 40 74	
S-5-B9 B9 10/29/18 5 <0.0052 <0.0052 <0.0052 BDL <0.51 BDL 28	
S-10-B9 B9 10/29/18 10 <0.0050 <0.0050 <0.0050 BDL <0.50 BDL 34	
S-15-B9 B9 10/29/18 15 <0.0050 <0.0050 <0.0050 BDL <0.51 BDL 54	
S-20-B9 B9 10/29/18 20 <0.0051 <0.0051 <0.0051 BDL <0.50 BDL 9.1 J	
S-5-B10 B10 10/29/18 5 <0.0051 <0.0051 <0.0051 <0.0051 BDI <0.49 BDI 29	
S-10-B10 B10 10/29/18 10 <0.0050 <0.0050 <0.0050 BDI <0.51 BDI 13	
S-15-B10 B10 10/29/18 15 <0.0051 <0.0051 <0.0051 BD1 <0.51 BD1 17	
S-20-B10 B10 10/29/18 20 0.00013 J <0.0050 <0.0050 BDI <0.52 BDI 30	
S-5-B11 B11 10/28/18 5 950	
S-10-B11 B11 10/28/18 10 40	
S-15-B11 B11 10/28/18 15 630	
S-20-B11 B11 10/28/18 20 930	
S-25-B11 B11 10/28/18 25 870	
S-30-B11 B11 10/28/18 30 830	
S-35-B11 B11 10/28/18 35 40	
S-40-B11 B11 10/28/18 40 110	

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Sampling Method					E	EPA 8021B				EPA 8015B		EPA 525.2	EPA 9056	Saturated Paste	SM 4500-CI C
						Ethyl-		Total	TPH as	TPH as	Total				
Sample		Sampling	Depth	Benzene	Toluene	benzene	Xylenes	BTEX	Diesel	Gasoline	TPH	Chloride	Chloride	Chloride	Chloride
ID	Boring	Date	(feet)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/L)
NMOCD RRALs				10				50			1,000				
NMOCD Chloride	e Limits											600	600	600	600
S 5 B12	B 10	10/28/18	5										270		
S-10-B12	B12 B12	10/28/18	10										180		
S-15-B12	B12	10/28/18	15										200		
S-20-B12	B12	10/28/18	20										74		
S-25-B12	B12	10/28/18	25										390		
S-35-B12	B12	10/28/18	35										140		
S-40-B12	B12	10/28/18	40										110		
S-5-B13	B13	10/29/18	5										92		
S-10-B13	B13	10/29/18	10										340		
S-15-B13	B13	10/29/18	15										450		
S-20-B13	B13	10/29/18	20										21		

Explanation	2
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BDL	=	Individual analyses below respective laboratory detection limits.
BTEX	=	Benzene, toluene, ethylbenzene, and total xylenes.
EPA	=	Environmental Protection Agency.
NMOCD	=	New Mexico Oil Conservation Division.
RRALs	=	Recommended Remediation Action Levels for Sites with Total Ranking Score <19.
SM	=	Standard Method.
TPH	=	Total petroleum hydrocarbons.
mg/kg	=	Milligrams per kilogram.
mg/L	=	Milligrams per liter.
<	=	Not detected at or above the stated laboratory reporting limit.
	=	Not analyzed/not available.
В	=	Analyte was present in the associated method blank.
B1	=	Analyte was detected in the associated Method Blank. Analyte concentration in the sample is greater than 10 times the concentration found in the Method Blank.
J	=	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
(a)	=	Analyzed for additional analytes. See laboratory analytical report for details.

TABLE 2 CUMULATIVE SOIL ANALYTICAL RESULTS - METALS New Mexico State K Tank Battery No. 3 Lea County, New Mexico Cardno 3613

Sampling Method											EPA 60	10B								EPA 7471A	SW-846	Chapter 7	EPA 1010A(M)	EPA 9045C
				Anti-									Molyb-					Vana-			Reactive	Reactive		
Sample		Sampling	Depth	mony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	denum	Nickel	Selenium	Silver	Thallium	dium	Zinc	Mercury	Sulfide	Cyanide	Ignitability	pН
ID	Boring	Date	(feet)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(deg F)	(su)
NMOCD RRAL																								
S-50-B2	B2	10/29/18	50	<0.769	<0.769	13.1	0.172 J	<0.513	6.67	0.288	1.22	0.738	<0.256	1.35	<0.769	<0.256	<0.769	10.7	1.88	0.00882 B,J	<2.0	<0.50	>212	8.13

Explanation:

NMOCD RRAL = New Mexico Oil Conservation Division Recommended Remediation Action Levels for Sites with Total Ranking Score <19.

- EPA = Environmental Protection Agency.
- deg F = Degrees Fahrenheit.
- mg/kg = Milligrams per kilogram.
- su = Standard units.
- = Not detected at or above the stated laboratory reporting limit.
- --- = Not analyzed/not available.
- B = Analyte was present in the associated method blank.
- J = Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.

APPENDIX A

CORRESPONDENCE

David Purdy

From:	Yu, Olivia, EMNRD <olivia.yu@state.nm.us></olivia.yu@state.nm.us>
Sent:	Wednesday, September 19, 2018 11:39 AM
То:	David Purdy; Mann, Ryan
Cc:	Patty Garcia
Subject:	RE: Work Plan for Additional Soil Assessment - Former State K Tank Battery No. 3,
	Vacuum Oil Field, Lea County, New Mexico (NMOCD IRP No. 09-7-2239)
Attachments:	approved_01361304.W01 Work Plan for Additional Soil Assessment 09-11-18.pdf

Mr. Purdy:

<u>Notes</u>

- All documents that you have previously sent to NMOCD has been uploaded to 1RP-2239. http://ocdimage.emnrd.state.nm.us/imaging/AEOrderCriteria.aspx
- Although no longer functional, there is a playa lake, which is a surface waterbody of New Mexico, approximately 500 ft. NE of the release location.

Thank you for your patience. NMOCD approves of the proposed additional release characterization for 1RP-2239. Please provide either on the soil bore logs or tabulated separately, the GPS coordinates of the soil bore locations.

Approval from NMSLO required. NMSLO may have additional concerns or stipulations.

Thanks,

Olivia Yu Environmental Specialist NMOCD, District I <u>Olivia.yu@state.nm.us</u> 575-393-6161 x113

OCD approval does not relieve the operator of liability should their operations fail to adequately investigate and remediate contamination that may pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the operator of responsibility for compliance with any other federal, state, local laws and/or regulations.

From: David Purdy <dave.purdy@cardno.com>
Sent: Tuesday, September 11, 2018 3:40 PM
To: Yu, Olivia, EMNRD <Olivia.Yu@state.nm.us>
Cc: Patty Garcia <patty.garcia@cardno.com>
Subject: Work Plan for Additional Soil Assessment - Former State K Tank Battery No. 3, Vacuum Oil Field, Lea County, New Mexico (NMOCD IRP No. 09-7-2239)
Importance: High

Ms. Yu:

Attached for your review, please find Cardno's Work Plan for Additional Soil Assessment prepared for Former State K Tank Battery No. 3, located at Vacuum Oil Field, Lea County, New Mexico (NMOCD IRP No. 09-7-2239).

Document Title

01361304.W01 Work Plan for Additional Soil Assessment.

Project Name

Former State K Tank Battery No.3

Project Identifiers

NMOCD IRP No. 09-7-2239

Regional Board Staff Name

Ms. Olivia Yu

Please contact me if you have any questions regarding this work plan, or if I need to electronically submit or upload it to another email/website.

Thank you.

Dave Purdy SR. PROJECT MANAGER CARDNO



We've moved! Please note our new address below.

Direct +1 949 457 8941 Mobile +1 949 355 4470 Fax +1 949 457 8956 Address 20505 Crescent Bay, Lake Forest, CA 92630 Email <u>dave.purdy@cardno.com</u> Web <u>www.cardno.com</u>

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APPENDIX B

SITE PHOTOGRAPHS

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SITE PHOTOGRAPHS

Former Tank Battery Lea County, NM October 18, 2018



 $32^{0}47^{\prime}25.81^{\prime\prime}$ N - $103^{0}28^{\prime}31.63^{\prime\prime}$ W



 $32^047'26.06''\ N$ - $\ 103^028'30.17''\ W$ looking north



 $32^{0}47^{\prime}25.58^{\prime\prime}$ N - $103^{0}28^{\prime}30.14^{\prime\prime}$ W looking north



32º47'26.43" N - 103º28'30.00" W looking north



32º47'24.97" N - 103º28'31.01" W looking north



32º47'24.97" N - 103º28'31.01" W looking northwest

APPENDIX C

NMOCD C-141 FORMS FOR SITE ASSESSMENT/ CHARACTERIZATION AND REMEDIATION PLAN

District I 1625 N. French Dr., Hobbs, NM 88240 District II 811 S. First St., Artesia, NM 88210 District III 1000 Rio Brazos Road, Aztec, NM 87410 District IV 1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico Energy Minerals and Natural Resources Department

Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505 Form C-141 Revised August 24, 2018 Submit to appropriate OCD District office

Incident ID	
District RP	N
Facility ID	
Application ID	

Release Notification

Responsible Party

Responsible Party ExxonMobil Oil Corporation	OGRID
Contact Name David Purdy, Consultant for ExxonMobil	Contact Telephone (949) 457-8941
Contact email dave.purdy@cardno.com	Incident # (assigned by OCD) NMOCD IRP No. 09-7-2239
Contact mailing address 20505 Crescent Bay Drive, Lake Forest California, 92630	

Location of Release Source

Latitude <u>32°47'25" N</u>

Longitude 103°28'30" W

(NAD 83 in decimal degrees to 5 decimal places)

Site Name Former State K Battery	Site Type Former Tank Battery Location
Date Release Discovered Unknown	API# (if applicable)

Unit Letter	Section	Township	Range	County	
	32	17 South	32 East	Lea	

Surface Owner: State Federal Tribal Private (Name:

Nature and Volume of Release

Material(s) Released (Select all that apply and attach calculations or specific justification for the volumes provided below)

Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
Produced Water	Volume Released (bbls)	Volume Recovered (bbls)
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	Yes No
Condensate	Volume Released (bbls)	Volume Recovered (bbls)
Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
Other (describe) Water containing chloride	Volume/Weight Released (provide units) Unknown	Volume/Weight Recovered (provide units) Unknown
Cause of Release Historic operations		

ge 2			Incident ID	
	Oil Cons	ervation Division	District RP	
	1.		Facility ID	
			Application ID	
XX7 .1 ' '				
Was this a major release as defined by 19.15.29.7(A) NMAC	?	eason(s) does the responsible pa	rty consider this a major release?	
🗌 Yes 🛛 No				
- e			14	~
LE VEC		CD_{2} D_{2} -1 -2 D_{2} -1 -2 W		
the second		Initial Respons	se	
The responsit	ble party must undertake the	following actions immediately unless th	ey could create a safety hazard that would	ld result in injury
\square The source of the r	release has been stoppe	d.		
The impacted area	has been secured to pro	otect human health and the envi	onment.	
Delessed motorials	have been contained a	is the use of homes or diless she	anhant nada, an athan aantainmaa	at darrigan
			orbent pads, or other containing	it devices.
		have been removed and manage	ed appropriately	
All free liquids and	d recoverable materials	have been removed and manage	a appropriatory.	
All free liquids and If all the actions described	d recoverable materials ibed above have <u>not</u> bee	en undertaken, explain why:		
All free liquids and If all the actions described	d recoverable materials bed above have <u>not</u> bee	en undertaken, explain why:		
All free liquids and If all the actions described	d recoverable materials ibed above have <u>not</u> bee	en undertaken, explain why:		
All free liquids and If all the actions descri	d recoverable materials ibed above have <u>not</u> bee	en undertaken, explain why:		
All free liquids and If all the actions described and the actions described at the second sec	d recoverable materials ibed above have <u>not</u> bee	en undertaken, explain why:		
All free liquids and If all the actions described and the actions described at the second sec	d recoverable materials ibed above have <u>not</u> bee	en undertaken, explain why:		
All free liquids and If all the actions described and the actions described at the second statement of	d recoverable materials	en undertaken, explain why:		
All free liquids and If all the actions describ Per 19.15.29.8 B. (4) N has begun, please attac within a lined containm	d recoverable materials ibed above have <u>not</u> been what have <u>not</u> been not been what have <u>not</u> been been a not be not been been been been been been been bee	party may commence remediations in the second secon	on immediately after discovery on ve been successfully completed ach all information needed for cl	f a release. If remediati l or if the release occurr osure evaluation.
All free liquids and If all the actions describ Per 19.15.29.8 B. (4) N has begun, please attac within a lined containm I hereby certify that the in regulations all operators a public health or the enviro failed to adequately inves addition, OCD acceptance and/or regulations.	NMAC the responsible p ch a narrative of action nent area (see 19.15.29. nformation given above is are required to report and/ onment. The acceptance of stigate and remediate cont- re of a C-141 report does n	party may commence remediations to date. If remedial efforts h. .11(A)(5)(a) NMAC), please att of true and complete to the best of my for file certain release notifications a of a C-141 report by the OCD does amination that pose a threat to groun not relieve the operator of responsib	on immediately after discovery of ave been successfully completed ach all information needed for cl v knowledge and understand that pur ind perform corrective actions for re not relieve the operator of liability s indwater, surface water, human healt lity for compliance with any other f	of a release. If remediating or if the release occurr osure evaluation. rsuant to OCD rules and leases which may endanger hould their operations have h or the environment. In rederal, state, or local laws
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All free liquids and If all the actions describ Per 19.15.29.8 B. (4) N has begun, please attac within a lined containm I hereby certify that the ir regulations all operators a public health or the envirt failed to adequately inves addition, OCD acceptance and/or regulations. Printed Name: Dav Signature:	WMAC the responsible p ch a narrative of action nent area (see 19.15.29. nformation given above is are required to report and/ onment. The acceptance of stigate and remediate contre of a C-141 report does n rid M. Purdy, Consultar	party may commence remediations to date. If remedial efforts h. .11(A)(5)(a) NMAC), please att to true and complete to the best of my for file certain release notifications a of a C-141 report by the OCD does amination that pose a threat to groun to relieve the operator of responsib the for ExxonMobil Title: Date:	on immediately after discovery of ave been successfully completed ach all information needed for cl v knowledge and understand that pur and perform corrective actions for re not relieve the operator of liability s ndwater, surface water, human healt ility for compliance with any other f <u>Sr. Project Manager</u> <u>8/15/2019</u>	of a release. If remediating or if the release occurring osure evaluation. resuant to OCD rules and leases which may endange hould their operations have hould their operations have hor the environment. In rederal, state, or local laws

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Received by:

Received by OCD: 10/31/2019 8:24:18 AM Form C-141 State of New Mexico

Oil Conservation Division

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District RP	
Facility ID	
Application ID	

Site Assessment/Characterization

This information must be provided to the appropriate district office no later than 90 days after the release discovery date.

What is the shallowest depth to groundwater beneath the area affected by the release?	<u>95'</u> (ft bgs)	
Did this release impact groundwater or surface water?		
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	🗌 Yes 🕅 No	
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	🗌 Yes 🛛 No	
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	🗌 Yes 🕅 No	
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	🗌 Yes 🛛 No	
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	🗌 Yes 🛛 No	
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	🗌 Yes 🛛 No	
Are the lateral extents of the release within 300 feet of a wetland?	🗌 Yes 🔀 No	
Are the lateral extents of the release overlying a subsurface mine?	🗋 Yes 🛛 No	
Are the lateral extents of the release overlying an unstable area such as karst geology?	🗌 Yes 🛛 No	
Are the lateral extents of the release within a 100-year floodplain?	🗌 Yes 🛛 No	
Did the release impact areas not on an exploration, development, production, or storage site?	🗌 Yes 🛛 No	

Attach a comprehensive report (electronic submittals in .pdf format are preferred) demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined. Refer to 19.15.29.11 NMAC for specifics.

Characterization Report Checklist: Each of the following items must be included in the report.

Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
 Field data

Data table of soil contaminant concentration data

Depth to water determination

Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release

Boring or excavation logs

Photographs including date and GIS information

- Topographic/Aerial maps
- Laboratory data including chain of custody

If the site characterization report does not include completed efforts at remediation of the release, the report must include a proposed remediation plan. That plan must include the estimated volume of material to be remediated, the proposed remediation technique, proposed sampling plan and methods, anticipated timelines for beginning and completing the remediation. The closure criteria for a release are contained in Table 1 of 19.15.29.12 NMAC, however, use of the table is modified by site- and release-specific parameters.

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Received by OCD: 10/31/2019 8:24:18 AM Form C 141		Page 35 of 171	
101111 C-141	State of INEW MIEXICO	Incident ID	
Page 4	Oil Conservation Division	District RP	
		Facility ID	
		Application ID	
I hereby certify the regulations all ope public health or the failed to adequated addition, OCD account and/or regulations Printed Name: Signature: email: 	hat the information given above is true and complete to the best of my knowledg erators are required to report and/or file certain release notifications and perform the environment. The acceptance of a C-141 report by the OCD does not relieve ely investigate and remediate contamination that pose a threat to groundwater, su ceptance of a C-141 report does not relieve the operator of responsibility for con- s. David M. Purdy Title: Sr. Project M Date: 8/15/1 e,purdy@cardno.com Telephon	e and understand that pursuant a corrective actions for releases the operator of liability should urface water, human health or the mpliance with any other federal. 1anager 9 ne: (949) 457-8941	to OCD rules and which may endanger their operations have se environment. In , state, or local laws
Received by:	Date:		

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Oil Conservation Division

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Incident ID	nRM2101347620
District RP	
Facility ID	
Application ID	

Remediation Plan

<u>Remediation Plan Checklist</u> : Each of the following items mus	t be included in the plan.	
Detailed description of proposed remediation technique		
Scaled sitemap with GPS coordinates showing delineation po	bints .	
Closure criteria is to Table 1 specifications subject to 19 15 2	29.12(C)(4) NMAC	
Proposed schedule for remediation (note if remediation plan	timeline is more than 90 days OCD approval is required)	
Deferral Requests Only: Each of the following items must be	confirmed as part of any request for deferral of remediation.	
Contamination must be in areas immediately under or around deconstruction.	l production equipment where remediation could cause a major facility	
Extents of contamination must be fully delineated.		
Contamination does not cause an imminent risk to human health, the environment, or groundwater.		
rules and regulations all operators are required to report and/or fi	blete to the best of my knowledge and understand that pursuant to OCD le certain release notifications and perform corrective actions for releases	
which may endanger public health or the environment. The acce	ptance of a C-141 report by the OCD does not relieve the operator of	
liability should their operations have failed to adequately investig	ate and remediate contamination that pose a threat to groundwater,	
responsibility for compliance with any other federal, state, or loca	al laws and/or regulations.	
Printed Name: David M. Burdy	Title: Sr. Project Manager	
Timed Name. David M. Turdy	True	
Signature: Jan 11. I unaly	Date: <u>8/15/19</u>	
email: dave.purdv@cardno.com	Telephone: (949) 457-8941	
OCD Only		
Received by:	Date:	
Approved Approved with Attached Conditions	of Approval Denied Deferral Approved	
Signature: Bradford Billings	Date: 07/12/2021	
APPENDIX D

WELL LOCATION MAP AND DEPTH TO GROUNDWATER DATA

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UEGE-3204657:103292801. 175.35E.31.43411

Lea County, New Mexico Latitude 32°47'08", Longitude 103°29'38" NAD27 Land-surface elevation 3,968.00 feet above NGVD29 The depth of the well is 146 feet below land surface. This well is completed in the Ogallala Formation (1210GLL) local aquifer.



Date \$	Time	٥	Water-level date-time accuracy	*	Water level, feet ¢ below land surface	Water level, feet above \$ specific vertical datum	Referenced vertical \$ datum	Ø Water-level \$ accuracy	0 Status
1961-02-1	6			D	63.92			2	
1966-03-1	7			D	65.63			2	
1971-02-1	2			D	67.38			2	
1976-03-0	4			D	71.12			2	
1981-01-2	0			D	82.27			2	
1981-06-1	7			D	83.25			2	
1986-04-0	4			D	91.89			2	
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APPENDIX E

KARST LOCATION MAP



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APPENDIX F FLOOD HAZARDS MAP



APPENDIX G

FIELD PROTOCOL



Soil Boring and Well Installation Field Protocol

Preliminary Activities

Prior to the onset of field activities at the site, Cardno obtains the appropriate permit(s) from the governing agency(s). Advance notification is made as required by the agency(s) prior to the start of work. Cardno marks the borehole locations and contacts the local one call utility locating service at least 48 hours prior to the start of work to mark buried utilities. Borehole locations may also be checked for buried utilities by a private geophysical surveyor. Prior to drilling, the borehole location is cleared in accordance with the client's procedures. Fieldwork is conducted under the advisement of a registered professional geologist and in accordance with an updated site-specific safety plan prepared for the project, which is available at the job site during field activities.

Drilling and Soil Sampling Procedures

Cardno contracts a licensed driller to advance the boring and collect soil samples. The specific drilling method (e.g., hollow-stem auger, direct push method, or sonic drilling), sampling method [e.g., core barrel or Californiamodified split spoon sampler (CMSSS)] and sampling depths are documented on the boring log and may be specified in a work plan. Soil samples are typically collected at the capillary fringe and at 5-foot intervals to the total depth of the boring. To determine the depth of the capillary fringe prior to drilling, the static groundwater level is measured with a water level indicator in the closest monitoring well to the boring location, if available.

The borehole is advanced to just above the desired sampling depth. For CMSSSs, the sampler is placed inside the auger and driven to a depth of 18 inches past the bit of the auger. The sampler is driven into the soil with a standard 140-pound hammer repeatedly dropped from a height of 30 inches onto the sampler. The number of blows required to drive the sampler each 6-inch increment is recorded on the boring log. For core samplers (e.g., direct push), the core is driven 18 inches using the rig apparatus.

Soil samples are preserved in the metal or plastic sleeve used with the CMSSS or core sampler, in glass jars or other manner required by the local regulatory agency (e.g., Environmental Protection Agency Method 5035). Sleeves are removed from the sample barrel, and the lowermost sample sleeve is immediately sealed with Teflon[™] tape, capped, labeled, placed in a cooler chilled to 4° Celsius and transported to a state-certified laboratory. The samples are transferred under chain-of-custody (COC) protocol.

Field Screening Procedures

Cardno places the soil from the middle of the sampling interval into a plastic re-sealable bag. The bag is placed away from direct sunlight for a period of time which allows volatilization of chemical constituents, after which the tip of a photo-ionization detector (PID) or similar device is inserted through the plastic bag to measure organic vapor concentrations in the headspace. The PID measurement is recorded on the boring log. At a minimum, the PID or other device is calibrated on a daily basis in accordance with manufacturer's specifications using a hexane or isobutylene standard. The calibration gas and concentrations of volatilized hydrocarbons, but they do not measure the concentration of petroleum hydrocarbons in the soil matrix with the same precision as laboratory analysis. Cardno trained personnel describe the soil in the bag according to the Unified Soil Classification System and record the description on the boring log, which is included in the final report.

Air Monitoring Procedures

Cardno performs a field evaluation for volatile hydrocarbon concentrations in the breathing zone using a calibrated photo-ionization detector or lower explosive level meter.

Cardno Soil Boring and Well Installation Field Protocol

Groundwater Sampling

A groundwater sample, if desired, is collected from the boring by using Hydropunch[™] sampling technology or installing a well in the borehole. In the case of using Hydropunch[™] technology, after collecting the capillary fringe soil sample, the boring is advanced to the top of the soil/groundwater interface and a sampling probe is pushed to approximately 2 feet below the top of the static water level. The probe is opened by partially withdrawing it and thereby exposing the screen. A new or decontaminated bailer is used to collect a water sample from the probe. The water sample is then emptied into laboratory-supplied containers constructed of the correct material and with the correct volume and preservative to comply with the proposed laboratory test. The container is slowly filled with the retrieved water sample until no headspace remains and then promptly sealed with a Teflon-lined cap, checked for the presence of bubbles, labeled, entered onto a COC record and placed in chilled storage at 4° Celsius. Laboratory-supplied trip blanks accompany the water samples as a quality assurance/quality control procedure. Equipment blanks may be collected as required. The samples are kept in chilled storage and transported under COC protocol to a client-approved, state-certified laboratory for analysis.

2

Backfilling of Soil Boring

If a well is not installed, the boring is backfilled from total depth to approximately 5 feet below ground surface (bgs) with either neat cement or bentonite grout using a tremie pipe and either the boring is backfilled from 5 feet bgs to approximately 1 foot bgs with hydrated bentonite chips or backfill is continued to just below grade with neat cement grout. The borehole is completed to surface grade with material that best matches existing surface conditions and meets local agency requirements. Site-specific backfilling details are shown on the respective boring log.

Well Construction

A well (if constructed) is completed using materials documented on the boring log or specified in a work plan. The well is constructed with slotted casing across the desired groundwater sampling depth(s) and completed with blank casing to within 6 inches of surface grade. No further construction is conducted on temporary wells. For permanent wells, the annular space of the well is backfilled with Monterey sand from the total depth to approximately 2 feet above the top of the screened casing. A hydrated granular bentonite seal is placed on top of the sand filter pack. Grout may be placed on top of the bentonite seal to the desired depth using a tremie pipe. The well may be completed to surface grade with a 1-foot thick concrete pad. A traffic-rated well vault and locking cap for the well casing may be installed to protect against surface-water infiltration and unauthorized entry. Site-specific well construction details including type of well, well depth, casing diameter, slot size, length of screen interval and sand size are documented on the boring log or specified in the work plan.

Well Development and Sampling

If a permanent groundwater monitoring well is installed, the grout is allowed to cure a minimum of 48 hours before development. Cardno personnel or a contracted driller use a submersible pump or surge block to develop the newly installed well. Prior to development, the pump is decontaminated by allowing it to run and re-circulate while immersed in a non-phosphate solution followed by successive immersions in potable water and de-ionized water baths. The well is developed until sufficient well casing volumes are removed so that turbidity is within allowable limits and pH, conductivity and temperature levels stabilize in the purge water. The volume of groundwater extracted is recorded on a log.

Following development, groundwater within the well is allowed to recharge until at least 80% of the drawdown is recovered. A new or decontaminated bailer is slowly lowered past the air/water interface in the well, and a water sample is collected and checked for the presence of non-aqueous phase liquid, sheen or emulsions. The water sample is then emptied into laboratory-supplied containers as discussed above.

3

Surveying

If required, wells are surveyed by a licensed land surveyor relative to an established benchmark of known elevation above mean sea level to an accuracy of +/- 0.01 foot. The casing is notched or marked on one side to identify a consistent surveying and measuring point.

Decontamination Procedures

Cardno Soil Boring and Well Installation Field Protocol

Cardno or the contracted driller decontaminates soil and water sampling equipment between each sampling event with a non-phosphate solution, followed by a minimum of two tap water rinses. De-ionized water may be used for the final rinse. Downhole drilling equipment is steam-cleaned prior to drilling the borehole and at completion of the borehole.

Waste Treatment and Soil Disposal

Soil cuttings generated from the drilling or sampling are stored on site in labeled, Department of Transportationapproved, 55-gallon drums or other appropriate storage container. The soil is removed from the site and transported under manifest to a client- and regulatory-approved facility for recycling or disposal. Decontamination fluids and purge water from well development and sampling activities, if conducted, are stored on site in labeled, regulatory-approved storage containers. Fluids are subsequently transported under manifest to a client- and regulatory-approved facility for disposal or treated with a permitted mobile or fixed-base carbon treatment system.



Excavation Field Protocol

Preliminary Activities

Prior to the onset of field activities at the site, Cardno or a licensed subcontractor obtains the appropriate permit(s) from the governing agency(s). Advance notification is made as required by the agency(s) prior to the start of work. Cardno or the general contractor marks the area to be excavated and contacts the local one call utility locating service at least 48 hours prior to the start of work to mark buried utilities. The excavation location may also be checked for buried utilities by a private geophysical surveyor. Prior to excavation, the area is cleared in accordance with the client's procedures. Fieldwork is conducted under the advisement of a registered professional geologist or civil engineer and in accordance with an updated site-specific safety plan prepared for the project, which is available at the site during field activities.

Excavation and Soil Sampling Procedures

The excavation is performed by a licensed general contractor. Air monitoring is conducted as required by the regulatory agency or client, and the readings are recorded on a log. Excavated soil is temporarily stockpiled, covered with an impervious material (e.g., plastic sheeting), secured and labeled, or immediately containerized into bins.

Upon reaching the planned limit of the excavation, soil samples are collected from the bottom and sidewalls of the excavation, as directed by the regulatory agency or as specified in the work plan. Soil samples are collected using the bucket of the excavating equipment (e.g., backhoe or excavator), and then the sample container (sleeve or glass jar) is pushed by hand into the soil near the teeth of the equipment bucket to ensure that soil from the limit of the excavation, not slough, is collected. Alternatively, a metal sleeve may be driven by slide hammer into the soil. Samples from the stockpile(s) are collected in the same manner.

Soil samples are preserved in the metal or plastic sleeve, in glass jars or other manner required by the local regulatory agency (e.g., Environmental Protection Agency Method 5035). Each sleeve is promptly sealed with Teflon[™] tape, capped, labeled, and placed in a cooler chilled to 4° Celsius. The samples are transferred under chain-of-custody protocol to a client-approved, state-certified laboratory for analysis.

Field Screening Procedures

Field screening is conducted during the excavation activities, and the excavated material is segregated into stockpiles based on concentrations above and below regulatory action levels. The stockpiled soil with concentrations above regulatory action levels is placed on an imperious surface (e.g., paving or plastic).

A photo-ionization detector (PID) or similar device is used to measure organic vapor concentration and segregate the excavated soil. The tip of the measuring device is placed approximately 3 inches above the excavated soil. At a minimum, the PID or other device is calibrated on a daily basis in accordance with manufacturer's specifications using a hexane or isobutylene standard. The calibration gas and concentration are recorded on a calibration log. Instruments such as the PID are useful for evaluating relative concentrations of volatilized hydrocarbons, but they do not measure the concentration of petroleum hydrocarbons in the soil matrix with the same precision as laboratory analysis.

Cardno trained personnel describe the soil according to the Unified Soil Classification System and record the description, sampling method and sampling depth on the field notes.

Backfilling of Excavation

The excavation is backfilled using excavated stockpile material with concentrations below regulatory action levels and/or clean import fill. Import fill typically is virgin material obtained from a quarry; if the material is obtained from another source, it is selectively sampled to verify it does not contain constituents of concern.

Cardno Well Destruction Field Protocol Decontamination Procedures

Cardno decontaminates soil sampling equipment between each sampling event with a non-phosphate solution, followed by a minimum of two tap water rinses. De-ionized water may be used for the final rinse. The bucket of the excavating equipment is not typically decontaminated between sampling events.

Waste Treatment and Soil Disposal

The stockpiled soil containing concentrations above regulatory action levels is removed from the site and transported under manifest to a client- and regulatory-approved facility for recycling or disposal, or remediated on site and placed back into the excavation. Decontamination fluids are stored on site in labeled, regulatory-approved storage containers. Fluids are subsequently transported under manifest to a client- and regulatory-approved facility for disposal or treated with a permitted mobile or fixed-base carbon treatment system.

APPENDIX H

PERMIT



Aubrey Dunn COMMISSIONER State of New Mexico Commissioner of Public Lands 310 OLD SANTA FE TRAIL

P.O. BOX 1148 SANTA FE, NEW MEXICO 87504-1148 COMMISSIONER'S OFFICE

Phone (505) 827-5760 Fax (505) 827-5766 www.nmstatelands.org

October 19, 2018

Cardno Inc. 20505 Crescent Bay Drive Lake Forest, CA 92630

Attn: Dave Purdy

Re: Right-of-Entry Permit No.: RE-4074 State K Tank Battery

Dear Mr. Purdy:

Enclosed is the completed captioned Right-of-Entry permit. If any corrections are necessary, please let us know and we will retype or amend this permit as necessary.

The New Mexico State Land Office requires you to notify any surface lessees that will be impacted by your project prior to construction.

If you have any questions, or if we may be of further assistance, please do not hesitate to contact Conrad Kegel at 505-827-5789.

Sincerely,

Ulter Dun Sn

Aubrey Dunn Commissioner of Public Lands

AD/ck

Enclosures



NEW MEXICO STATE LAND OFFICE Commissioner of Public Lands Aubrey Dunn New Mexico State Land Office Building P.O. Box 1148, Santa Fe, NM 87504-1148

RIGHT OF ENTRY PERMIT CONTRACT NO. RE - 4074

1. RIGHT OF ENTRY PERMIT

This permit is issued under the authority of NMSA 1978, Section 19-1-2. Therefore, and in consideration of and subject to the terms, covenants, conditions, agreements, obligations and reservations contained in the permit and all other existing rights, the Commissioner of Public Lands, New Mexico State Land Office, State Of New Mexico, hereinafter called "COMMISSIONER," grants to <u>Cardno Inc.</u>, whose address is <u>20505 Crescent Bay Drive, Lake Forest, CA 92630</u> called "PERMITTEE," authorized use of a specific tract(s) of State Trust Land only for the term, and only for the permitted use, described in this permit.

2. TERM AND LAND DESCRIPTION

Right of entry is granted for a term of **180 days**, commencing on the execution date of this document by the Commissioner of Public Lands, to the following State Trust Lands.

Section	Township	Range	Subdivision	County
32	17S	35E	NW4SW4	Lea
	a de la contra de la	- Y. 177		

3. APPLICATION and PROCESSING FEE

\$ 50.00 Application Fee \$ 500.00 Permit Fee \$ 550.00 Total Fee

4. PERMITTED USE, PERSONNEL, EQUIPMENT AND

MATERIALS

Permitted use is for the purpose of: Access to perform remediation and related activities related to the State K Tank Battery.

Personnel present on State Trust Land: Cardno personnel and contractors

Equipment & Materials present on State Trust Land: Vehicles, drill rig, and sampling kit

Prior to execution of project company must contact the Surface Lessees.

Only fresh water lines (less than 10,000 ppm tds) will be allowed.

The granting of this permit does not allow access across private lands.

5. IMPROVEMENTS

No improvements shall be placed on the premises without the prior written consent of the Commissioner.

6. RESERVATIONS

Commissioner reserves the right to execute leases, rights of way, easements, permits, exchange agreements, sale agreements, permits and other lawful rights on or across the land covered by this permit, including but not limited to any such rights for mining purposes and for the extraction of oil, gas, salt, geothermal resources, and other mineral deposits there from and the right to go upon, explore for, mine, remove and sell same.

7. COMPLIANCE WITH LAWS

Permittee shall at its own expense comply fully with and be subject to all applicable regulations, rules, ordinances, and requirements of law or of the Commissioner, including but not limited to the regulations of the State Land Office; Chapter 19 NMSA governing State Trust Lands; federal and state environmental laws and regulations; and the New Mexico Cultural Properties Act, NMSA 1978 Sections 18-6-1 through 18-6-23. It is illegal for any person or his agent to appropriate, excavate, injure, or destroy any historic, or prehistoric ruin or monument, or any object of historical, archaeological, architectural, or scientific value situated on lands owned or controlled by the State Land Office without a valid permit issued by the Cultural Properties Review Committee and approved by the Commissioner of Public Lands.

LO :01 NV 61 100 8102

8. HOLD HARMLESS AND INDEMNIFICATION

Permittee shall save, hold harmless, indemnify and defend Commissioner, the State Land Office, the State of New Mexico, and any of their officers, employees or agents, in their official and individual capacities, of and from any and all liability, claims, losses, damages, costs, and fees arising out of or alleged to arise out of, or directly or indirectly connected with, the operations of Permittee under this permit on or off State Trust Lands or arising out of the presence on State Trust Lands of any equipment, material, agent, invitee, contractor or subcontractor of Permittee. This Hold Harmless and Indemnification clause covers any claim, including any brought in any court or before any administrative agency, of any loss or alleged loss, and any damages or alleged damages asserted with respect to any violation or alleged violation of any state, federal or local law or regulation, including but not limited to any environmental law or regulation, any cultural properties law (including the New Mexico Cultural Properties Act, cited above) or regulation, and any alleged damage to the property, rights or interests of any State Land Office lessee, right-of-way holder, or other permittee.

9. AMENDMENT

This permit shall not be altered, changed, or amended except by an instrument in writing executed by Commissioner and Permittee.

10. WITHDRAWAL

Commissioner reserves the right to withdraw any or all of the land authorized for use under this permit. If applicable, Permittee shall vacate the acreage specified within 30 days after receipt of written notification of withdrawal from the Commissioner.

11. CANCELLATION

The violation by Permittee of any of the terms, conditions, or covenants of this permit or the nonpayment by Permittee of the fees due under this permit shall at the option of the Commissioner be considered a default and shall cause the cancellation of this permit 30 days after Permittee has been sent written notice of such.

12. PRESERVE AND PROTECT

The Permittee agrees to preserve and protect the natural environmental conditions of the land encompassed in this permit, and to take those reclamation or corrective actions that are accepted soil and water conservation practices and that are deemed necessary by the Commissioner to protect the land from pollution, erosion, or other environmental degradation. The Permittee further agrees not to injure the property of, or interfere with the operations or rights of, any State Land Office lessee, right-of-way holder, easement holder or other permittee who has rights to use the State Trust Land subject to this permit.

TO SOLVA EL TOORIOS

13. PIPELINE IDENTIFICATION AND SPACING REQUIREMENTS

The Permittee shall label each aboveground pipeline crossing State Trust Lands with the Permittee's name, and contact information. Such information shall be placed at both the inlet and outlet of the pipeline, and every 2,500 feet between the two points. Pipelines must be spaced a minimum of 12" apart from existing surface pipelines to allow for livestock to cross. If the minimum line spacing cannot be met to allow livestock to cross, berms 3 feet in width must be placed in areas where established cattle trails exist, but no less than every tenth of a mile.

14. RECLAMATION, REMOVAL OF EQUIPMENT, MATERIALS, AND WASTE

The Permittee agrees to reclaim those areas that may be damaged by activities conducted thereon.

The Permittee agrees to remove from the State Trust Lands, no later than the end of the term of this permit, all equipment, and materials it has placed or brought upon the land and to clean up and remove from the land any trash, waste, effluent, or other products used or brought upon the land in connection with this permit.

15. SPECIAL INSTRUCTIONS AND/OR RESTRICTIONS

1. No off road traffic allowed.

2. No wood collection or tree cutting allowed.

3. Disturbing, dislodging, damaging, defacing, destroying or removing historical archaeological, paleontological or cultural sites or artifacts in a manner inconsistent with the provisions of the granted permit is prohibited.

4. Disturbing, dislodging, damaging, defacing, destroying any improvement, fixture, item, object or thing placed or located in, under or upon the land is prohibited.

5. This permit does not grant a right to enter State Trust Lands to which there is no public access.

6. Any uses or activities not within the scope of this permit are not allowed unless prior written approval from the Commissioner of Public Lands is granted.

7. Line pressure not to exceed 125 psi.

SOIB OCL | A WHO: OL

PERMITTEE: By: ACKNOWLEDGMENT STATE OF New Merico) ss. COUNTY OF Loc. The foregoing instrument was acknowledged before me this 18 day of OC+, 2018, by Cardno Xivid michgel Rudy of corporation, on behalf of said corporation. My Commission Expires:

112112021

NOTARY PUBLIC



STATE OF NEW MEXICO

BY: AUBREY DUNN COMMISSIONER OF PUBLIC LANDS Detolur 19 DATE: 10:01:11 61 730 8105

Released to Imaging: 7/12/2021 3:47:42 PM

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Received by OCD: 10/31/2019 8:24:18 AM

APPENDIX I

BORING LOGS

Project Site: Logged Review Signate	Project No.: : 013613U118 Site: : Former State K Tank Batte Logged By: : Vincent Nguyen Reviewed By: : Jens Walker, P.G. 9487 Signature: :						BORING LC No. 3, Lea County, New Mexico	Date Drilled Drilling Co. Drilling Method Sampling Method Borehole Diameter Casing Diameter Northing Easting Total Boring Dep First GW Depth		: 10/29/18 : Yellow Jacket Drilling : Air Rotary : 2" CA Modified Split Spoon : 6" : NA : 652408.2 N : 804946.7 E : 35' bgs : NA	
Depth (ft)	Blow Count / 6"	OVM/PID (ppmv)	Sample	Column	USCS		Boring: B1 Elevation: 3954.8'				
0						Dirt ar Boreh No Sa	nd caliche rocks at the surface nole was cleared to 1' bgs on 1 ample Recovery				
- - 10- -	. 50	0.6				Silty S poorly indura	SAND with gravel: fine grainec / graded, non-plastic, subroun ated caliche rocks, calcareous	l sand, white, dry, ded/subangular gra soil (0/30/55/15)	vel,	— Portland Cement Mixture	
	50	4.3			SM	Same (0/30/	as 10 feet bgs; tan, indurated /55/15)	I limestone rocks			
20-	50	0	7 <i>711</i> 2			Same	e as 15 feet bgs (0/30/55/15)				





Project No.: : 013613U118 Site: : Former State K Tank Batter Logged By: : Vincent Nguyen Reviewed By: : Jens Walker, P.G. 9487 Signature: :					K Tank	Battery	BORING LC	BORING LOG B2 (Page 2 of 3) Lea County, New Mexico 1 Date Drilling Ca Drilling M Sampling Borehole Casing Di Northing Easting Total Bori 1		: 10/29/18 : Yellow Jacket Drilling : Air Rotary : 2" CA Modified Split Spoor : 6" : NA : 652380.9 N : 804949.1 E : 50' bgs : NA	
Depth (ft)	Blow Count / 6"	OVM/PID (ymqq)	Sample	Column	nscs		ple Condition No Recovery Sampled Interval Described Sample Preserved Sample DESCRIPTION (%	Boring: B2 Elevation: 3955.4'			
- - 25-			\boxtimes		ML	No Sa	imple Recovery				
	50					SILT v non-pl indura	with sand and gravel: brown, lastic, fine grained sand, sub ted sandstone rocks, non-ca	dry, poorly graded, rounded/subangular Icareous soil (0/60/2	gravel, 0/20)	— Portland Cement Mixture	
- 35-	50				ML	Same	as 30 feet bgs (0/60/20/20)				
40-	50		77779 33333			Same	as 30 feet bgs (0/60/20/20)				



Project Site: Logged Review Signatu	No.: No.: d By: ved By ure:	C	: 0136 : Form : Vince : Jens :	13U118 her State I ent Nguye Walker, F	Tank n P.G. 94	Battery No. 3, Lea County, New Mexico	BORING LOG B3 Date Drilled (Page 1 of 1) Drilling Co. Drilling Method Sampling Method Borehole Diameter Casing Diameter Casing Diameter Northing Easting Total Boring Depth First GW Depth First GW Depth			
Depth (ft)	Depth (ft) Blow Count / 6" OVM/PID (ppmv) (ppmv) (ppmv) (ppmv) USCS USCS					Sample Condition No Recovery Sampled Interval Described Sample Preserved Sample DESCRIPTION (%6	Water Levels Groundwater Groundwater Clay/silt/sand/gr	After Completion During Drilling avel)	Boring: B3 Elevation: 3955.6'	
0						Dirt, caliche rocks, and light vegetation Borehole was cleared to 1' bgs on 10	id auger			
- - 5-	50		8772 3333		sw	SAND with silt and gravel: fine grain poorly graded, non-plastic, subround indurated caliche rocks, calcareous s	vel,			
- - 10- -	50				ML	Sandy SILT with gravel: tan, dry, poo grained sand, subrounded/rounded g indurated limestone rocks, calcareou	— Portland Cement Mixture			
- - 15-	. 50					Same as 10 feet bgs (0/60/30/10)				
- - 20-	50				GW	GRAVEL with silt and sand: whitish to medium grained sand, subrounde indurated limestone, calcareous soil	tan, dry, graded, no d/angular gravel, (0/20/20/60)	on-plastic, fine		
	-					The descriptive information for class soil is based on ASTM D2488 Stand and Identification of Soils (Visual-Ma	ification symbol and ard Practice for De inual Procedure).	d name of scription		

Project Site: Logged Review Signatu	Project No.: : 013613U118 Site: : Former State K Tank Battery Logged By: : Vincent Nguyen Reviewed By: : Jens Walker, P.G. 9487 Signature: :					BORING L Battery No. 3, Lea County, New Mexic 87	Date Drilled Drilling Co. Drilling Method Sampling Method Borehole Diameter Casing Diameter Northing Easting Total Boring Depth First GW Depth	: 10/27/18 : Yellow Jacket Drilling : Air Rotary : 2" CA Modified Split Spoon : 6" : NA : 652448.8 N : 804950.2 E : 20' bgs : NA	
Depth (ft)	Blow Count / 6"	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition No Recovery Sampled Interval Described Sample Preserved Sample DESCRIPTION	Water Levels	After Completion	Boring: B4 Elevation: 3954.3'
0 - - 5	50					Dirt, caliche rocks, and light vege Borehole was cleared to 2' bgs o Silty SAND with gravel: fine grain poorly graded, non-plastic, subar indurated caliche rocks, calcareo			
- - - 10 - -	50				SP	SAND with silt and gravel: fine gravel graded, non-plastic, subar indurated limestone rocks, calcar	— Portland Cement Mixture		
- - 15- -	50					Same as 10 feet bgs (0/25/60/15)		
20-	50					Same as 10 feet bgs (0/20/75/5) The descriptive information for c soil is based on ASTM D2488 St and Identification of Soils (Visua	lassification symbol an andard Practice for De -Manual Procedure).	d name of escription	
25-									

Project Site: Logged Review Signatu	No.: I By: ved By ure:	C	: 0136 : Form : Vince : Jens	13U118 her State H ent Nguye Walker, F	Tank n P.G.948	BORING LC Battery No. 3, Lea County, New Mexico	BORING LOG B5 (Page 1 of 1) a County, New Mexico County, New Mexico Casing Diameter Northing Easting Total Boring Depth First GW Depth					
Depth (ft)	Depth (ft) Blow Count / 6" OVM/PID (ppmv) (ppmv) Column USCS					Sample Condition No Recovery Sampled Interval Described Sample Preserved Sample DESCRIPTION (%	Implementation Water Levels Necovery Implementation pled Interval Implementation cribed Sample Implementation merved Sample Implementation DESCRIPTION (%clay/silt/sand/gravel) Boring: B5					
 	H					Dirt and light vegetation at the surfa Borehole was cleared to 2' bgs on						
- - 5- -	50	14.5	22222 000000			Silty SAND with gravel: fine graine poorly graded, non-plastic, subrour indurated caliche rocks, calcareous						
- - 10- -	50	53.1			SM	Same as 5 feet bgs; indurated lime						
- - 15- -	50	169.7				Same as 10 feet bgs (0/30/55/15)			- Portland Cement Mixture			
20-	50	77.3			ML	Sandy SILT with gravel: brown, dry fine grained sand, subangular grav calcareous soil (0/50/40/10)	/, poorly graded, nor el, indurated limesto	i-plastic, ne rocks,				
- 25–	50	51	2 <i>2002</i>			Same as 20 feet bgs (0/50/40/10)						
30-	-					The descriptive information for classil is based on ASTM D2488 Star and Identification of Soils (Visual-M	ssification symbol an Idard Practice for De Aanual Procedure).	d name of sscription				

Project No.: : 013613U118 Site: : Former State K Tank Battery Logged By: : Vincent Nguyen Reviewed By: : Jens Walker, P.G. 9487 Signature: :				n13U118 her State I ent Nguye Walker, I	K Tank en P.G. 94	BORING LC Battery No. 3, Lea County, New Mexico	BORING LOG B6 Date Drilled (Page 1 of 2) Drilling Method Lea County, New Mexico Sampling Method Lea County, New Mexico Easting Total Boring Depth First GW Depth		: 10/27/18 : Yellow Jacket Drilling : Air Rotary : 2" CA Modified Split Spoon : 6" : NA : 652370.8 N : 805034.6 E : 30' bgs : NA	
Depth (ft)	Image: Second structure Sample Condition Water Levels Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure Image: Second structure					r After Completion r During Drilling ravel)	Boring: B6 Elevation: 3956.4'			
-0						Dirt at the surface Borehole was cleared to 1.5' bgs or				
- - 5 -	. 50	0	<i>9772</i>		SM	SAND with silt: fine grained sand, v non-plastic (0/35/65/0)				
- - - - -	50	0.7			ML	Sandy SILT with gravel: tan, dry, g fine to medium grained sand, round indurated caliche rocks, calcareous	— Portland Cement Mixture			
- - - - - - -	15- 50 1.2 Image: GRAVEL with silt and sand: tan, dry, graded, non-plastic, fine to medium grained sand, subrounded/angular gravel, indurated caliche rocks, calcareous soil (0/15/10/75) GRAVEL with silt and sand: tan, dry, graded, non-plastic, fine to medium grained sand, subrounded/angular gravel, indurated caliche rocks, calcareous soil (0/15/10/75) GW									
20-	50	0.3	77772			Same as 15 feet bgs (0/15/10/75)				







Project Site: Logged Review Signatu	Project No.: Site: Logged By: Reviewed By: Signature: Content Nguyen Signature: Content Nguyen Signature: Content Nguyen Signature: Content Nguyen Signature: Content Nguyen					Battery	BORING LC y No. 3, Lea County, New Mexico	OG B8 (Page 1 of 2)	Date Drilled Drilling Co. Drilling Method Sampling Method Borehole Diameter Casing Diameter Northing Easting Total Boring Depth First GW Depth	: 10/28/18 : Yellow Jacket Drilling : Air Rotary : 2" CA Modified Split Spoon : 6" : NA : 652470.0 N : 805176.8 E : 40' bgs : NA	
Depth (ft)	Depth (ft) Blow Count / 6" OVM/PID (ppmv) Sample Column USCS				NSCS	Sam	nple Condition No Recovery Sampled Interval Described Sample Preserved Sample DESCRIPTION (%	Water Levels	r After Completion r During Drilling ravel)	Boring: B8 Elevation: 3954.4'	
0-	0 Dirt - Bore						and vegetation at the surface hole was cleared to 1' bgs on	10/26/18 using a ha	nd auger		
- - - - - - - - - - - - - - - - - - -	50	0			ML	Sand (0/70) SILT fine g indura	ly SILT: tan, dry, poorly grader //30/0) with sand and gravel: tan, dry grained sand, subrounded/sub rated caliche rocks, calcareous	-Portland Cement Mixture			
- 15— - -	50	0			GP	GRA\ non-p indura	VEL with silt and sand: red-br plastic, fine grained sand, sub rated caliche rocks, calcareous	own, dry, poorly grac rounded/subangular s soil (0/20/20/60)	ded, gravel,		
20- No Sample I						No Si	Sample Recovery				

Project Site: Logged	Project No.: : 013613U118 Site: : Former State K Tank Batter Logged By: : Vincent Nguyen Reviewed By: : Jens Walker, P.G., 9487					Battery	BORING LOG B8 Date Drilled (Page 2 of 2) Drilling Method No. 3, Lea County, New Mexico Sampling Method Borehole Diameter Casing Diameter Northing Easting Total Boring Depth			: 10/28/18 : Yellow Jacket Drilling : Air Rotary : 2" CA Modified Split Spoon : 6" : NA : 652470.0 N : 805176.8 E										
Depth (ft)	Blow Count / 6" :ai	OVM/PID (ymdd)	Sample	Column	nscs		Dele Condition No Recovery Sampled Interval Described Sample Preserved Sample DESCRIPTION (%	: NA Boring: B8 Elevation: 3954.4'												
24	50	2.7	27772 20000		ML	Sandy fine gr	/ SILT: brown, dry, poorly gra rained sand (0/65/35/0) as 25 feet bgs (0/65/35/0)	- Portland Cement Mixture												
	50	6.5			ML	No Sandy fine gr The d soil is and lo	V SILT: brown, dry, poorly gra rained sand (0/65/35/0) escriptive information for clas based on ASTM D2488 Star lentification of Soils (Visual-N													
Project Site: Logged Review Signatu	roject No.: : 013613U118 ite: : : O13613U118 ite: : : Former State K Tank Battery ogged By: : : Vincent Nguyen teviewed By: : : Jens Walker, P.G. 9487 ignature: : : : : : : : : : : : : : : : : : :			Battery	BORING LOG B9 (Page 1 of 1) No. 3, Lea County, New Mexico			Date Drilli Drilli Sam Bore Casi Norti East Tota First	Drilled ng Co. ng Method pling Method hole Diamel ng Diameter ning I Boring Dep GW Depth	d ter	: 10/29/ : Yellow : Air Roi : 2" CA : 6" : NA : 65237 : 80518 : 20' bg: : NA	18 Jacket tary Modified 3.5 N 5.1 E s	Drilling d Split Sp	boon						
---	---	-------------------	-----------------------	---------	---	------------------------------------	--	---	--	---	---	---	--	--	-----------------------	-----------------------	--	--	--	--
Depth (ft)	Blow Count / 6"	OVM/PID (ppmv)	Sample	Column	nscs		Sample Condition Water Levels Image: Condition Image: Condition Image: Condition						Boring: B9 Elevation: 3955.5'							
0-						Dirt ar Boreh	nd light v	eget clear	ation a red to	at the su 1' bgs o	urface	26/18 u	ising a hai	nd aug	er					
- - 5- -	50					Sandy fine gr indura	Y SILT wi rained sa ted calic	ith gr and, s the ro	ravel: v subrou ocks, c	white, di inded/si calcareo	ry, po ubang bus so	orly gra gular gr il (0/50	aded, non- avel, /30/20)	-plastic						
- 10-	50		00000		ML	Same	Same as 5 feet bgs; indurated limestone rocks (0/50/30/20)								— Port Cen Mixt	tland nent ture				
	. 50		<i>87778</i> 33333			SILT v fine gi indura	with sanc rained sa tted lime:	d and, stone	d grave subrou e rocks	el: tan, c unded/s s, calca	dry, po ubang reous	oorly gr gular gr soil (O	aded, nor avel, /55/20/25)	n-plastic	9,					
20-	- 50				GW	GRAV fine gr indura The d	/EL with rained sa ated lime: escriptive based o	silt a and, ston- e info	and tra non-pl e rocks formatio	ce sand lastic, su s, calca on for cl 2488 St	d: tan, ubrou reous lassifi tanda	dry, po nded/s soil (0 cation	oorly grade ubangular /20/10/70) symbol an tice for De	ed, r gravel) nd name escriptio	e of					
	-					and lo	lentificati	ion c	of Soils	s (Visual	I-Man	ual Pro	cedure).							

Project Site: Logged Review Signatu	Troject No.: : 013613U118 Site: : Former State K Tank Battery ogged By: : Vincent Nguyen Reviewed By: : Jens Walker, P.G. 9487 Signature: : June Marker, P.G. 9487			Tank m 2.G. 94	BORING LOO BORING LOO Battery No. 3, Lea County, New Mexico	G B10 (Page 1 of 1)	Date Drilled Drilling Co. Drilling Method Sampling Method Borehole Diameter Casing Diameter Northing Easting Total Boring Depth First GW Depth	: 10/29/18 : Yellow Jacket Drilling : Air Rotary : 2" CA Modified Split Spoon : 6" : NA : 652327.3 N : 805164.2 E : 20' bgs : NA				
Depth (ft)	Blow Count / 6"	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition No Recovery Sampled Interval Described Sample Preserved Sample DESCRIPTION (%	Sample Condition Water Levels Image: Sampled Interval Image: Groundwater After Completion Image: Sampled Interval Image: Groundwater During Drilling Image: Described Sample Image: Groundwater During Drilling					
0-						Dirt at the surface						
- - 5- - - 10- - -	50		8888 00000		ML	Sandy SILT with gravel: white, dry, fine to medium grained sand, subro indurated caliche rocks, calcareous Same as 5 feet bgs (0/50/30/20)	graded, non-plastic, unded/subangular g soil (0/50/30/20)	ravel,	—Portland Cement Mixture			
- 15— -	50					SILT with sand and gravel: tan, dry, fine grained sand, subrounded/suba indurated limestone rocks, calcareo	poorly graded, non- ngular gravel, us soil (0/55/20/25)	-plastic,				
- 20- - - - - 25-	50		22220			Gravelly SILT with sand: tan, dry, po fine grained sand, non-plastic, subro indurated limestone rocks, calcareo The descriptive information for class soil is based on ASTM D2488 Stand and Identification of Soils (Visual-M	borly graded, bunded/subangular us soil (0/45/20/35) sification symbol and dard Practice for De anual Procedure).	gravel, d name of scription				

Project Site: Logged Review Signatu	No.: H By: ved By ure:	C	: 0136 : Form : Vince : Jens	113U118 ner State I ent Nguye Walker, I	K Tank en P.G. 94	Battery	BORING LOO No. 3, Lea County, New Mexico	: 10/28/18 : Yellow Jacket Drilling : Air Rotary : 2" CA Modified Split Spoon : 6" : NA : 652416.1 N : 805211.0 E : 40' bgs : NA			
Depth (ft)	Blow Count / 6"	OVM/PID (ppmv)	Sample	Column	USCS		ple Condition No Recovery Sampled Interval Described Sample Preserved Sample DESCRIPTION (%	Boring: B11 Elevation: 3955.3'			
0						Dirt w Boreh	ith gravel at the surface ole was cleared to 8" bgs on 1	0/26/18 using a ha	nd auger		
	50	28.5			ML	Sandy graine indura	/ SILT with gravel: tan, dry, po ed sand, subrounded/subangu ted caliche rocks, calcareous				
- - 10- -	50	17.0			SP	SAND poorly indura) with silt and gravel: fine grain graded, non-plastic, subround ated limestone rocks, calcareo	- Portland Cement			
- - 15- -	50	7.9			GP	GRAVEL with silt and sand: red-brown, dry, poorly graded, non-plastic, fine grained sand, subrounded/subangular gravel, indurated limestone rocks, calcareous soil (0/50/25/25)					
20-	. 50	9.1			ML	SILT non-p indura	with sand and gravel: red-brov lastic, fine grained sand, suba ated limestone rocks, calcareo	vn, dry, poorly grado ngular/angular grav us soil (0/20/20/60)	ed, el,		

Project Site: Logget Review Signati	Diject No.: : <td:< td=""> <td:< th=""><th>BORING LC No. 3, Lea County, New Mexico</th><th>OG B11 (Page 2 of 2)</th><th>Date Drilled Drilling Co. Drilling Method Sampling Method Borehole Diameter Casing Diameter Northing Easting Total Boring Depth First GW Depth</th><th>: 10/28/18 : Yellow Jacket Drilling : Air Rotary : 2" CA Modified Split Spoon : 6" : NA : 652416.1 N : 805211.0 E : 40' bgs : NA</th></td:<></td:<>				BORING LC No. 3, Lea County, New Mexico	OG B11 (Page 2 of 2)	Date Drilled Drilling Co. Drilling Method Sampling Method Borehole Diameter Casing Diameter Northing Easting Total Boring Depth First GW Depth	: 10/28/18 : Yellow Jacket Drilling : Air Rotary : 2" CA Modified Split Spoon : 6" : NA : 652416.1 N : 805211.0 E : 40' bgs : NA		
Depth (ft)	Blow Count / 6"	OVM/PID (ppmv)	Sample	Column	nscs	Sam	ble Condition No Recovery Sampled Interval Described Sample Preserved Sample DESCRIPTION (⁴	Boring: B11 Elevation: 3955.3'		
- 29- - - - - - - - - - - - - - - - - -	50	33.1 9.5 15.1			ML	Sandy fine gr Same	SILT: brown, dry, poorly gra ained sand (0/65/35/0) as 25 feet bgs (0/65/35/0) as 25 feet bgs (0/65/35/0)	— Portland Cement Mixture		
39- - - 44-	_50_	11.4				Same The de soil is and Id	as 25 feet bgs (0/65/35/0) escriptive information for cla based on ASTM D2488 Star entification of Soils (Visual-N	ssification symbol and ndard Practice for De Manual Procedure).	d name of scription	

Project Site: Logged Review Signatu	BORI Cardno act No.: : : 013613U118 : Former State K Tank Battery No. 3, Lea County, N ed By: : Vincent Nguyen awed By: : Jens Walker, P.G. 9487 ature: : :				X Tank en P.G. 94	BORING LO Battery No. 3, Lea County, New Mexico	G B12 (Page 1 of 2)	Date Drilled Drilling Co. Drilling Method Sampling Method Borehole Diameter Casing Diameter Northing Easting Total Boring Depth First GW Depth	: 10/28/18 : Yellow Jacket Drilling : Air Rotary : 2" CA Modified Split Spoor : 6" : NA : 652428.9 N : 805339.9 E : 40' bgs : NA	
Depth (ft)	Blow Count / 6"	OVM/PID (ppmv)	Sample	Column	NSCS	Sample Condition No Recovery Sampled Interval Described Sample Preserved Sample DESCRIPTION (%)	Boring: B12 Elevation: 3954.4'			
0						Dirt with light vegetation at the surfa Borehole was cleared to 9" bgs on				
- 5- - - - - - - - - -	50	223.4			ML	Sandy SILT with trace gravel: tan, o non-plastic, fine grained sand, suba indurated caliche rocks, calcareous Same as 5 feet bgs; Increasing gra	dry, poorly graded, angular gravel, a soil (0/50/30/20) vel (0/45/30/25)	~		
- - - 15—	50	52.6			GP	GRAVEL with silt and sand: brown, fine grained sand, subrounded/sub- indurated sandstone rocks, non-cal	dry, poorly graded, angular gravel, Icareous soil (0/10/1	non-plastic, 0/80)	— Portland Cement Mixture	
- - 20-	50	47.9			ML	Gravelly SILT with sand: brown, dry fine grained sand, subangular/angu indurated sandstone rocks, non-cal				

Project Site: Logged Review Signate	color color roject No.: : ite: : ogged By: : eviewed By: : ignature: : : : : : : : : : : : : : : :				Battery	BORING LOG B12 (Page 2 of 2) y No. 3, Lea County, New Mexico Date Drilled Drilling Co. Drilling Method Sampling Method Borehole Diameter Casing Diameter Northing Easting Total Boring Depth First GW Depth				: 10/28/18 : Yellow Jacket Drilling : Air Rotary : 2" CA Modified Split Spoon : 6" : NA : 652428.9 N : 805339.9 E : 40' bgs : NA	
Depth (ft)	Blow Count / 6"	OVM/PID (ppmv)	Sample	Column	USCS	Samp	ble Condition No Recovery Sampled Interval Described Sample Preserved Sample DESCRIP	Boring: B12 Elevation: 3954.4'			
24- - - - - - - -	. 50	31.3			ML	Sandy fine gr indura	SILT with gravel: b ained sand, subang ted sandstone rock				
	50	50.1				No Sa SILT v fine gr	Sample Recovery — P C N T with sand: brown, dry, poorly graded, non-plastic, a grained sand (0/80/20/0)				
- 39- - - - - - - - - - - - -	50	24.9			ML	Same The de soil is and Id	as 35 feet bgs (0/8 escriptive informatic based on ASTM D2 lentification of Soils	0/20/0) on for classifi 2488 Standa (Visual-Man	cation symbol an d Practice for De ual Procedure).	d name of scription	

Project Site: Logged Review Signatu	Cardno BORING LOG B13 vject No.: : 013613U118 a: : Former State K Tank Battery No. 3, Lea County, New Mexico gged By: : Vincent Nguyen viewed By: : Jens Walker, P.G. 8360 nature: : Market : Sornela Countitien				G B13 (Page 1 of 1)	Date Drilled Drilling Co. Drilling Method Sampling Method Borehole Diameter Casing Diameter Northing Easting Total Boring Depth First GW Depth	: 10/29/18 : Yellow Jacket Drilling : Air Rotary : 2" CA Modified Split Spoo : 6" : NA : 652392.4 N : 805361.3 E : 20' bgs : NA			
epth (ft)	ow Count / 6"	UIM/MD Did/WA	ample	olumn	scs	Samp	DIE Condition No Recovery Sampled Interval Described Sample Preserved Sample	Boring: B13 Elevation: 3954.3'		
0-		08	<i>o</i>	0		Dirt an Boreho	nd light vegetation at the surfa			
- - 5- -	50		22222		GW	GRAVI poorly strongl	/EL with silt and sand: tan, dry graded, fine grained sand, su ly indurated limestone rocks,	/, non-plastic, ıbrounded/subangu calcareous soil (0/1	lar gravel, 5/10/75)	
- - 10- -	. 50		22222			SILT w fine gra	vith sand: tan, dry, non-plastic ained sand (0/80/20/0)	c, poorly graded,		— Portland Cement Mixture
- - 15—	. 50		22222		ML	Same	as 10 feet bgs (0/80/20/0)			
	50		7772		sw	Gravel poorly indurat	Ily SAND with silt: fine grained graded, non-plastic, subroun ted limestone rocks, calcareo	d sand, tan, dry, ded/subangular gra us soil (0/10/55/35)	vel,	
1 1	-				,	The de soil is l and Ide	escriptive information for class based on ASTM D2488 Stand lentification of Soils (Visual-M	sification symbol an dard Practice for De anual Procedure).	d name of escription	
25-										

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APPENDIX J

LABORATORY ANALYTICAL REPORTS

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Supplemental Report 1

Additional requested analyses have been added to the original report.

WORK ORDER NUMBER: 18-10-2309

The difference is service



AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For Client: Cardno Client Project Name: ExxonMobil NM K Battery No. 3, Vacuum Oil Field Attention: David Purdy 20505 Crescent Bay Drive Lake Forest, CA 92630-8825

Not for

Approved for release on 11/20/2018 by: Cecile deGuia Project Manager

ResultLink >

Email your PM >

Eurofins Calscience (Calscience) certifies that the test results provided in this report meet all NELAC Institute requirements for parameters for which accreditation is required or available. Any exceptions to NELAC Institute requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.

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CA ELAP ID: 2944 | CSDLAC ID: 10109

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4	Quality C 4.1 Matr 4.2 Matr 4.3 Labo 4.4 Labo	Control Sample Data.	15 15 17 19 21
5	Sample	Analysis Summary	22
6	Glossary	of Terms and Qualifiers	23
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Work Order: 18-10-2309

Page 1 of 1

Work Order Narrative

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 10/31/18. They were assigned to Work Order 18-10-2309.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

DoD Projects:

The test results contained in this report are accredited under the laboratory's ISO/IEC 17025:2005 and DoD-ELAP accreditation issued by the ANSI-ASQ National Accreditation Board. Refer to certificate and scope of accreditation ADE-1864.

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Client:	Cardno	Work Order:	18-10-2309
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
	Lake 1 01est, CA 32030-0023	PO Number:	013613U118
		Date/Time Received:	10/31/18 10:00
		Number of Containers:	30

Attn: David Purdy

Sample Summary

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
S-10-B1	18-10-2309-1	10/27/18 08:05	1	Solid
S-15-B1	18-10-2309-2	10/27/18 08:15	1	Solid
S-20-B1	18-10-2309-3	10/27/18 08:25	1	Solid
S-25-B1	18-10-2309-4	10/27/18 08:35	1	Solid
S-30-B1	18-10-2309-5	10/27/18 08:50	1	Solid
S-35-B1	18-10-2309-6	10/27/18 09:00	1	Solid
S-5-B4	18-10-2309-7	10/27/18 09:45	1	Solid
S-10-B4	18-10-2309-8	10/27/18 09:55	1	Solid
S-15-B4	18-10-2309-9	10/27/18 10:05	1	Solid
S-20-B4	18-10-2309-10	10/27/18 10:15	1	Solid
S-5-B5	18-10-2309-11	10/27/18 11:00	1	Solid
S-10-B5	18-10-2309-12	10/27/18 11:05	1	Solid
S-15-B5	18-10-2309-13	10/27/18 11:15	1	Solid
S-20-B5	18-10-2309-14	10/27/18 11:20	1	Solid
S-25-B5	18-10-2309-15	10/27/18 11:40	1	Solid
S-5-B3	18-10-2309-16	10/27/18 13:10	1	Solid
S-10-B3	18-10-2309-17	10/27/18 13:20	1	Solid
S-15-B3	18-10-2309-18	10/27/18 13:25	1	Solid
S-20-B3	18-10-2309-19	10/27/18 13:30	1	Solid
S-5-B6	18-10-2309-20	10/27/18 14:15	1	Solid
S-10-B6	18-10-2309-21	10/27/18 14:25	1	Solid
S-15-B6	18-10-2309-22	10/27/18 14:30	1	Solid
S-20-B6	18-10-2309-23	10/27/18 14:40	1	Solid
S-25-B6	18-10-2309-24	10/27/18 14:50	1	Solid
S-30-B6	18-10-2309-25	10/27/18 15:00	1	Solid
S-5-B7	18-10-2309-26	10/27/18 15:45	1	Solid
S-10-B7	18-10-2309-27	10/27/18 15:55	1	Solid
S-20-B7	18-10-2309-28	10/27/18 16:20	1	Solid
S-25-B7	18-10-2309-29	10/27/18 16:30	1	Solid
S-30-B7	18-10-2309-30	10/27/18 16:40	1	Solid

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Client:	Cardno				Work	Order:	18-1	0-2309		
	20505 Crescent Bay	Drive			Proje	ct Name:	Exx	onMobil NM K	Battery No. 3, V	Vacuum Oil
	Lake Forest, CA 926	30-8825			Date	Received	Fielo	ג 1/18		
• • •					Date	Received	. 10/3	1/10		
Attn:	David Purdy									
				An	alytica	al Repo	rt			
Analyte		Result	Flag	Units	MDL	RL	Dilution Factor	Analysis Date/Time	Method	Batch
Sample I	D: 1 (S-10-B1, Solid) Sample	ed: 10/27/18 0	8:05							
EPA 300.	0 Anions (Extraction Method:	N/A) Containe	er - A	- to the MDI	(DL) but a	< PL (LOO)	if found are	qualified with a " I"	flag	
Chloride		(DL), concern 260	B	mg/kg	1.5	10	1.00	11/04/18 01:32	EPA 300.0	181102L01P
~										
EPA 300	D: 2 (S-15-B1, Solid) Sample 0 Anions (Extraction Method:	N/A) Containe	98:15 er - A							
- Result	s were evaluated to the MDL	(DL), concent	rations >	= to the MDL	(DL) but <	< RL (LOQ),	if found, are	qualified with a "J"	flag.	
Chloride		120	В	mg/kg	1.5	10	1.00	11/04/18 03:14	EPA 300.0	181102L01P
Sample I	D: 3 (S-20-B1, Solid) Sample	ed: 10/27/18 0	8:25							
EPA 300. - Result	0 Anions (Extraction Method: s were evaluated to the MDL	N/A) Containe (DL), concent	er - A rations >:	= to the MDL	(DL) but <	< RL (LOQ),	if found, are	qualified with a "J"	flag.	
Chloride		330	В	mg/kg	1.5	10	1.00	11/04/18 03:34	EPA 300.0	181102L01P
Sample I	D: 4 (S-25-B1, Solid) Sample	ed: 10/27/18 0	8:35							
EPA 300. - Result	0 Anions (Extraction Method: s were evaluated to the MDL	N/A) Containe (DL), concent	er - A rations >:	= to the MDL	(DL) but <	< RL (LOQ),	if found, are	qualified with a "J"	flag.	
Chloride		670	В	mg/kg	1.5	10	1.00	11/04/18 03:54	EPA 300.0	181102L01P
Sample II	D: 5 (S-30-B1, Solid) Sample	ad: 10/27/18 (8.50							
EPA 300.	0 Anions (Extraction Method:	N/A) Containe	er - A rations >:	= to the MDI	(DL) but «	< RL (LOQ)	if found are	qualified with a ".I"	flag	
Chloride		1200	B	mg/kg	2.9	20	2.00	11/04/18 04:15	EPA 300.0	181102L01P
SM 4500-	CL C Chloride (Extraction Me	thod: EPA 13	12) Conta	ainer - A – to the MDI	(DL) but a	- RL (LOO)	if found are	qualified with a " I"	flag	
Chloride		46		mg/L	0.76	2.0	1.00	11/16/18 19:03	SM 4500-CI C	I1116CLCL1
	/									
EPA 300.	D: 6 (S-35-B1, Solid) Sample 0 Anions (Extraction Method:	ed: 10/27/18 0 N/A) Containe	9:00 er - A							
- Result Chloride	s were evaluated to the MDL	(DL), concent	rations >: B	= to the MDL ma/ka	(DL) but <	RL (LOQ),	if found, are	qualified with a "J"	flag.	181102L01P
onionae		100	D	iiig/kg	1.0	10	1.00	11/04/10 04:00	21700000	1011022011
Sample I	D: 7 (S-5-B4, Solid) Sampled	d: 10/27/18 09	:45							
EPA 300. - Result	0 Anions (Extraction Method: s were evaluated to the MDL	N/A) Containe (DL), concent	er - A rations >:	= to the MDL	(DL) but <	< RL (LOQ),	if found, are	qualified with a "J"	flag.	
Chloride		35		mg/kg	1.5	10	1.00	11/06/18 14:38	EPA 300.0	181106L01P
EPA 8015 - Result	B GRO (Extraction Method: I s were evaluated to the MDL	EPA 5030C) C (DL), concent	Container rations >	- A = to the MDL	(DL) but <	< RL (LOQ),	if found, are	qualified with a "J"	flag.	
Gasoline	Range Organics	ND		mg/kg	0.091	0.50	1.00	11/09/18 20:08	EPA 8015B	181109L032
Surr: 1.4-	Bromofluorobenzene (42-126	%) 77%						11/09/18 20:08	EPA 8015B	1811091032

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Client:	Cardno	Work Order:	18-10-2309
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
		Date Received:	10/31/18

Attn: David Purdy

Analyto Result Flag Units MDL RL Dilution Partofine Analytic Partofine Method Batch EPA 82009 BTEXINTEE (Extraction Method: EPA 5030C) Container - A - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag. 1100/1100/124 EPA 82008 181107L062 Benzene ND mg/kg 0.00051 1.00 1100/818 00:24 EPA 82008 181107L062 Envyleneznen ND mg/kg 0.00027 0.0051 1.00 1100/818 00:24 EPA 82008 181107L062 pim-Xylene ND mg/kg 0.00027 0.0051 1.00 1100/818 00:24 EPA 82008 181107L062 Surr: I/Derbinordhane (80-120%) 96% 11.00 1100/818 00:24 EPA 82008 181107L062 Surr: I/Derbinordhane (80-120%) 96% 1100/818 00:24 EPA 82008 181107L062 Surr: I/Derbinordhane (80-120%) 96% 1100/818 00:24 EPA 82008 181107L062 Surr: I/Derbinordhane (80-120%) 96% 1100/818 00:24 EPA 82008 181107L062	Analytical Report											
EPA 32008 BTEXMTBE (Extraction Method: EPA 5030C) Container - A - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOG), if found, are qualified with a "J" flag. Benzene ND mg/kg 0.00051 0.00 11/08/18 00:24 EPA 8260B 181107L062 Chuone ND mg/kg 0.00051 0.00 11/08/18 00:24 EPA 8260B 181107L062 Ehythonzano ND mg/kg 0.00057 0.0051 1.00 11/08/18 00:24 EPA 8260B 181107L062 Cyklene ND mg/kg 0.00027 0.0051 1.00 11/08/18 00:24 EPA 8260B 181107L062 Synthes (total) ND mg/kg 0.00027 0.0051 1.00 11/08/18 00:24 EPA 8260B 181107L062 Synthes (total) ND mg/kg 0.00027 0.051 1.00 11/08/18 00:24 EPA 8260B 181107L062 Synthes (total) ND mg/kg 0.00027 0.051 1.00 11/08/18 00:24 EPA 8260B 181107L062 Synthes (total) Synthes (total) ND mg/kg 0.00027 11/08/18 00:24 EPA 8260B 181107L062	Analyte	Result	Flag	Units	MDL	RL	Dilution Factor	Analysis Date/Time	Method	Batch		
Banzane ND mg/kg 0.0013 0.0051 1.00 11.08/18 00:24 EPA 82080 181107L062 Toluene ND mg/kg 0.0057 0.0051 1.00 11.08/18 00:24 EPA 82080 181107L062 0-Xylene ND mg/kg 0.0057 0.0051 1.00 11.08/18 00:24 EPA 82080 181107L062 0-Xylene ND mg/kg 0.0057 0.0051 1.00 11.08/18 00:24 EPA 82080 181107L062 Xirr. Diamodiuorobenzene (80-120%) 96% V V V 11.08/18 00:24 EPA 82080 181107L062 Surr. 1.4-Bromofluorobenzene (80-120%) 96% V V V 11.08/18 00:24 EPA 82080 181107L062 Surr. 1.2-Dichlorobenzene (70-133%) 94% V V V V EPA 82080 181107L062 Surr. 1.2-Dichlorobenzene (70-133%) 94% V V V V V V V V V V V V V V V <td>EPA 8260B BTEX/MTBE (Extraction Meth - Results were evaluated to the MDL (DI</td> <td>nod: EPA 5 L), concen</td> <td>i030C) Co trations >=</td> <td>ntainer - A = to the MDL</td> <td>_ (DL) but < I</td> <td>RL (LOQ),</td> <td>if found, are</td> <td>qualified with a "J"</td> <td>flag.</td> <td></td>	EPA 8260B BTEX/MTBE (Extraction Meth - Results were evaluated to the MDL (DI	nod: EPA 5 L), concen	i030C) Co trations >=	ntainer - A = to the MDL	_ (DL) but < I	RL (LOQ),	if found, are	qualified with a "J"	flag.			
Toluene ND mg/kg 0.00053 0.0051 1.00 11/08/18 00:24 EPA 82080 181107L062 Chylene ND mg/kg 0.00015 0.0051 1.00 11/08/18 00:24 EPA 82080 181107L062 p/m-Xylene ND mg/kg 0.00027 0.0051 1.00 11/08/18 00:24 EPA 82080 181107L062 p/m-Xylene ND mg/kg 0.00027 0.0051 1.00 11/08/18 00:24 EPA 82080 181107L062 Surr: 1.4760m/fluorobenzene (80-120%) 96% Surr Surr Surr 11/08/18 00:24 EPA 82080 181107L062 Surr: 1.4700m/fluorobenzene (80-120%) 96% Surr Surr 11/08/18 00:24 EPA 82080 181107L062 Surr: 1.20c/informethane-44 (71-155%) 99% Surr InterMise 00:24 EPA 82080 181107L062 Surr: 1.20c/informethane-44 (71-155%) 99% Surr InterMise 00:24 EPA 82080 181107L062 Sampe ID: S (S-10-04 Anions (Etraction Method IN/L) CU/171 UPST Surr	Benzene	ND		mg/kg	0.00013	0.0051	1.00	11/08/18 00:24	EPA 8260B	181107L062		
Ethylbenzene ND mg/kg 0.0015 0.0051 1.00 11/08/18 00:24 FPA 8208 181107L021 o-Xylane ND mg/kg 0.00057 0.0051 1.00 11/08/18 00:24 FPA 8208 181107L021 Dim-Xylanes (total) ND mg/kg 0.0027 0.0051 1.00 11/08/18 00:24 FPA 8208 181107L022 Surr: 1.4-Bromofluorobenzane (80-120%) 96%	Toluene	ND		mg/kg	0.00053	0.0051	1.00	11/08/18 00:24	EPA 8260B	181107L062		
o - X jene ND mg/g 0.00057 0.0051 1.00 11/08/18 00.24 EPA 82608 181107L062 p/m X jene (tail) ND mg/g 0.00027 0.0051 1.00 11/08/18 00.24 EPA 82608 181107L062 Surr: 1.4-Bromolluorobenzene (80-120%) 96% · · · · · · · · · · · · · · · · · · ·	Ethylbenzene	ND		mg/kg	0.00015	0.0051	1.00	11/08/18 00:24	EPA 8260B	181107L062		
pin-Xylene ND mg/kg 0.00027 0.0051 1.00 11/08/18 00.24 EPA 82608 181107L062 Xylenes (total) ND mg/kg 0.00027 0.0051 1.00 11/08/18 00.24 EPA 82608 181107L062 Surr: 1-2b-Cholknorethane-df (71-15%) 99% V V 11/08/18 00.24 EPA 82608 181107L062 Surr: 1-2b-Cholknorethane-df (71-15%) 99% V V 11/08/18 00.24 EPA 82608 181107L062 Surr: 1-2b-Cholknorethane-df (71-15%) 99% V V 11/08/18 00.24 EPA 82608 181107L062 Surr: 1-2b-Cholknorethane-df (71-15%) 99% V V V EPA 8001 EPA 80014 EPA 80016 EPA 80016 EPA 80169 181107L062 Surr: 1-2b-Cholknorethane-df (71-15%) 89% V 10 1.00 11/08/18 00.24 EPA 80168 181107L062 Surr: 1-2b-Cholknorethane-df (71-15%) 89% ND mg/kg 0.01 1.00 11/08/18 00.24 EPA 80168 181102L017 Choinde ND	o-Xylene	ND		mg/kg	0.00057	0.0051	1.00	11/08/18 00:24	EPA 8260B	181107L062		
Xylenes (total) ND mg/kg 0.00027 0.0051 1.00 11/08/18 00:24 EPA 8260B 181107L062 Surr: 1.4-Bromofluoromethane (70-133%) 94% 11/08/18 00:24 EPA 8260B 181107L062 Surr: 1.2-Dichloroethane (70-133%) 94% 11/08/18 00:24 EPA 8260B 181107L062 Surr: 1.2-Dichloroethane (47 (71-155%) 89% 11/08/18 00:24 EPA 8260B 181107L062 Sample DS (8-0-04, Solid) Samplet: U2718 <u278< td=""> U278 U278 EPA 8260B 181107L062 Sample DS (8-0-04, Solid) Samplet: U2718<u278< td=""> U278 U278 EPA 8260B 181107L062 Sample DS (8-0-04, Solid) Samplet: U2718<u278< td=""> U278 U278 U278 U278 Chlorido 63 mg/kg 1.0 1.0 11/08/18 00:5 EPA 80105 181102L01P Chlorido Character MBL (DL), concentrations >= to the MDL (DL), but < RL (LCQ), if ound, are qualified with a 'J' flag.</u278<></u278<></u278<>	p/m-Xylene	ND		mg/kg	0.00027	0.0051	1.00	11/08/18 00:24	EPA 8260B	181107L062		
Surr: 1.4-Bronnolluorobenzene (80-120%) 96% 11/08/18 00:24 EPA 8260B 181107L062 Surr: 1.2-Dichloroetinane (79-133%) 94% 11/08/18 00:24 EPA 8260B 181107L062 Surr: 1.2-Dichloroetinane (70-135%) 89% 11/08/18 00:24 EPA 8260B 181107L062 Surr: Toluane dB (80-120%) 98% 11/08/18 00:24 EPA 8260B 181107L062 Sample DS (S-0-64, Solid) Sampled: 10/2718 09:55 EPA 80105 EPA 80105 EPA 80100 181102L01P EPA 8015B GRO (Extraction Method: VA) Container · A - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a 'J' flag.	Xylenes (total)	ND		mg/kg	0.00027	0.0051	1.00	11/08/18 00:24	EPA 8260B	181107L062		
Surr. Dibromofluoromethane (79-133%) 94% 11/08/18 00.24 EPA 82608 181107L062 Surr. 1.2-Dichloroothane-04 (71-155%) 89% 11/08/18 00.24 EPA 82608 181107L062 Sample (D: 8) (61-048, Solid) Samples: U27/18 USTS 98% 11/08/18 00.24 EPA 82608 181107L062 Sample (D: 8) (61-048, Solid) Samples: U27/18 USTS UST 11/08/18 00.24 EPA 82608 181107L062 Sample (D: 8) (61-048, Solid) Samples: U27/18 USTS UST 11/08/18 00.24 EPA 82608 181107L062 PPA 300.0 Anions (Extraction Method: NA) Concamier - A	Surr: 1,4-Bromofluorobenzene (80-120%)	96%						11/08/18 00:24	EPA 8260B	181107L062		
Surr: 1,2-Dichloroethane-dd (71-155%) 89% 11/08/18 00:24 EPA 8260B 181107L062 Surr: Toluene-dd (80-120%) 98% 11/08/18 00:24 EPA 8260B 181107L062 Sample D: 8 (S-10-B4, Solid) Sampled: 10/27/18 U::S: String 10/2002 11/08/18 00:24 EPA 8260B 181107L062 Sample D: 8 (S-10-B4, Solid) Sampled: 10/27/18 U::S: String 10/2002 500 1.00 11/04/18 05:16 EPA 800.0 181102L01P PA 8200B R15K JRG (Extraction Method: IPA 5030C) Container - A - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a 'J' flag.	Surr: Dibromofluoromethane (79-133%)	94%						11/08/18 00:24	EPA 8260B	181107L062		
Surr: Toluone-d8 (80-120%) 98% 11/08/18 00:24 EPA 8260B 181107L062 Sample D: 8 (S-10-B4, Solid) Sample:: IUZT/18 U:S:S IUZ	Surr: 1,2-Dichloroethane-d4 (71-155%)	89%						11/08/18 00:24	EPA 8260B	181107L062		
Sample ID: 8 (S-10-B4, Solid) Samples: IV27/18 VD: 5 EPA 300.0 Anions (Extraction Method: N/A) Container - A - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a 'J' flag.	Surr: Toluene-d8 (80-120%)	98%						11/08/18 00:24	EPA 8260B	181107L062		
EPA 300.0 Anions (Extraction Method: VIA) Container - A - Results were evaluated to the MDL (DL). concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a 'J' flag.	Sample ID: 8 (S-10-B4, Solid) Sampled:	10/27/18	09:55									
Chloride 63 B mg/kg 1.5 10 1.00 11/04/18 05:16 EPA 300.0 181102L01P EPA 8015B GRO (Extraction Method: EPA 5030C) Container - A - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LCQ), if found, are qualified with a "J" flag. EPA 8015B 181109L032 Surr: 1,4-Bromofluorobenzene (42-126%) 84% 11/09/18 21:49 EPA 8015B 181109L032 EPA 8260B BTEX/MTBE (Extraction Method: EPA 5030C) Container - A - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LCQ), if found, are qualified with a "J" flag.	EPA 300.0 Anions (Extraction Method: N/ - Results were evaluated to the MDL (DI	A) Contain L), concen	er - A trations >=	= to the MDI	_ (DL) but < I	RL (LOQ),	if found, are	qualified with a "J"	flag.			
EPA 8015B GRO (Extraction Method: EPA 5030C) Container - A - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.	Chloride	63	В	mg/kg	1.5	10	1.00	11/04/18 05:16	EPA 300.0	181102L01P		
Gasoline Range Organics ND mg/kg 0.90 0.50 1.00 11/09/18 21:49 EPA 8015B 181109L032 Surr: 1,4-Bromofluorobenzene (42-126) 84% 11/09/18 21:49 EPA 8015B 181109L032 EPA 8260B BTEX/MTBE (Extraction Method: EPA 5030C) Container - A - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < <tr> UD mg/kg 0.00013 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 Benzene ND mg/kg 0.00051 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 Ethylbenzene ND mg/kg 0.00051 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 o-Xylene ND mg/kg 0.00057 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 xylenes (total) ND mg/kg 0.00027 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 xylenes (total) ND mg/kg 0.0027 0.0050 1.00 11/08/18 00:50 EPA 8260B 181</tr>	EPA 8015B GRO (Extraction Method: EPA - Results were evaluated to the MDL (DI	A 5030C) (L), concen	Container trations >=	- A = to the MDL	_ (DL) but < I	RL (LOQ),	if found, are	qualified with a "J"	flag.			
Surr. 1, 4-Bromofluorobenzene (42-126%) 84% 1/109/18 21:49 EPA 8015B 181109L032 ENA 8260B BTEX/INTBE (Extraction Method: EPA 5030C) concentrations >= to the MDL (DL) but < RL (LCQ), if found, are quilified with a "J" flag.	Gasoline Range Organics	ND		mg/kg	0.090	0.50	1.00	11/09/18 21:49	EPA 8015B	181109L032		
EPA 8260B BTEX/MTBE (Extraction Methols (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.	Surr: 1,4-Bromofluorobenzene (42-126%)	84%						11/09/18 21:49	EPA 8015B	181109L032		
Benzene ND mg/kg 0.00013 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 Toluene ND mg/kg 0.00051 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 Ethylbenzene ND mg/kg 0.00055 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 o-Xylene ND mg/kg 0.00055 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 p/m-Xylene ND mg/kg 0.00027 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 Xylenes (total) ND mg/kg 0.00027 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 Surr: 1,4-Bromofluorobenzene (80-120%) 97% - 11/08/18 00:50 EPA 8260B 181107L062 Surr: 7.0luene-d8 (80-120%) 97% - 11/08/18 00:50 EPA 8260B 181107L062 Surr: Toluene-d8 (80-120%) 99% - 11/08/18 00:50 EPA 8260B	EPA 8260B BTEX/MTBE (Extraction Meth - Results were evaluated to the MDL (DI	nod: EPA 5 L), concen	i030C) Co trations >=	ntainer - A = to the MDI	_ (DL) but < I	RL (LOQ),	if found, are	qualified with a "J"	flag.			
Toluene ND ng/kg 0.00051 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 Ethylbenzene ND mg/kg 0.00015 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 o-Xylene ND mg/kg 0.00027 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 p/m-Xylene ND mg/kg 0.00027 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 Xylenes (total) ND mg/kg 0.00027 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 Surr: 1,4-Bromofluorobenzene (80-120%) 97% Imag/kg 0.00027 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 Surr: 1,4-Bromofluorobenzene (80-120%) 97% Imag/kg 11/08/18 00:50 EPA 8260B 181107L062 Surr: Toluene-d8 (80-120%) 99% Imag/kg 11/08/18 00:50 EPA 8260B 181107L062 Surr: Toluene-d8 (80-120%) 99% Imag/kg Imag/kg Imag/kg Imag/kg Imag/kg Imag/kg Imag/kg	Benzene	ND		mg/kg	0.00013	0.0050	1.00	11/08/18 00:50	EPA 8260B	181107L062		
Ethylbenzene ND ng/kg 0.00015 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 o-Xylene ND mg/kg 0.00055 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 p/m-Xylene ND mg/kg 0.00027 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 Xylenes (total) ND mg/kg 0.00027 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 Surr: 1,4-Bromofluorobenzene (80-120%) 97% Imag/kg 0.00027 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 Surr: 1,2-Dichloroethane-d4 (71-155%) 97% Imag/kg Imag/kg <t< td=""><td>Toluene</td><td>ND</td><td></td><td>mg/kg</td><td>0.00051</td><td>0.0050</td><td>1.00</td><td>11/08/18 00:50</td><td>EPA 8260B</td><td>181107L062</td></t<>	Toluene	ND		mg/kg	0.00051	0.0050	1.00	11/08/18 00:50	EPA 8260B	181107L062		
o-Xylene ND mg/kg 0.00055 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 p/m-Xylene ND mg/kg 0.00027 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 Xylenes (total) ND mg/kg 0.00027 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 Surr: 1,4-Bromofluorobenzene (80-120%) 97% Img/kg 0.00027 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 Surr: 1,4-Bromofluorobenzene (80-120%) 97% Img/kg 0.00027 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 Surr: 1,2-Dichloroethane-d4 (71-155%) 91% Image: State Sta	Ethylbenzene	ND		mg/kg	0.00015	0.0050	1.00	11/08/18 00:50	EPA 8260B	181107L062		
p/m-Xylene ND mg/kg 0.00027 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 Xylenes (total) ND mg/kg 0.00027 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 Surr: 1,4-Bromofluorobenzene (80-120%) 97% Image: Start	o-Xylene	ND		mg/kg	0.00055	0.0050	1.00	11/08/18 00:50	EPA 8260B	181107L062		
Xylenes (total) ND mg/kg 0.00027 0.0050 1.00 11/08/18 00:50 EPA 8260B 181107L062 Surr: 1,4-Bromofluorobenzene (80-120%) 97% 11/08/18 00:50 EPA 8260B 181107L062 Surr: Dibromofluoromethane (79-133%) 96% 11/08/18 00:50 EPA 8260B 181107L062 Surr: 1,2-Dichloroethane-d4 (71-155%) 91% 11/08/18 00:50 EPA 8260B 181107L062 Surr: Toluene-d8 (80-120%) 99% 1 11/08/18 00:50 EPA 8260B 181107L062 Sample ID: 9 (S-15-B4, Solid) Sample:	p/m-Xylene	ND		mg/kg	0.00027	0.0050	1.00	11/08/18 00:50	EPA 8260B	181107L062		
Surr: 1,4-Bromofluorobenzene (80-120%) 97% 11/08/18 00:50 EPA 8260B 181107L062 Surr: Dibromofluoromethane (79-133%) 96% 11/08/18 00:50 EPA 8260B 181107L062 Surr: 1,2-Dichloroethane-d4 (71-155%) 91% 11/08/18 00:50 EPA 8260B 181107L062 Surr: Toluene-d8 (80-120%) 99% 11/08/18 00:50 EPA 8260B 181107L062 Sample ID: 9 (S-15-B4, Solid) Samplet: U27/18 10:05 11/08/18 00:50 EPA 8260B 181107L062 EPA 300.0 Anions (Extraction Method: N/A) Container - A - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.	Xylenes (total)	ND		mg/kg	0.00027	0.0050	1.00	11/08/18 00:50	EPA 8260B	181107L062		
Surr: Dibromofluoromethane (79-133%) 96% 11/08/18 00:50 EPA 8260B 181107L062 Surr: 1,2-Dichloroethane-d4 (71-155%) 91% 11/08/18 00:50 EPA 8260B 181107L062 Surr: Toluene-d8 (80-120%) 99% 11/08/18 00:50 EPA 8260B 181107L062 Sample ID: 9 (S-15-B4, Solid) Sampled: 10/27/18 10:05 EPA 300.0 Anions (Extraction Method: N/A) Container - A - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.	Surr: 1,4-Bromofluorobenzene (80-120%)	97%						11/08/18 00:50	EPA 8260B	181107L062		
Surr: 1,2-Dichloroethane-d4 (71-155%) 91% 11/08/18 00:50 EPA 8260B 181107L062 Surr: Toluene-d8 (80-120%) 99% 11/08/18 00:50 EPA 8260B 181107L062 Sample ID: 9 (S-15-B4, Solid) Sampled: 10/27/18 10:05 EPA 300.0 Anions (Extraction Method: N/A) Container - A - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.	Surr: Dibromofluoromethane (79-133%)	96%						11/08/18 00:50	EPA 8260B	181107L062		
Surr: Toluene-d8 (80-120%) 99% 11/08/18 00:50 EPA 8260B 181107L062 Sample ID: 9 (S-15-B4, Solid) Sampled: 10/27/18 10:05 EPA 300.0 Anions (Extraction Method: N/A) Container - A - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag. EPA 300.0 11/06/18 14:57 EPA 300.0 181106L01P	Surr: 1,2-Dichloroethane-d4 (71-155%)	91%						11/08/18 00:50	EPA 8260B	181107L062		
Sample ID: 9 (S-15-B4, Solid) Sampled: 10/27/18 10:05 EPA 300.0 Anions (Extraction Method: N/A) Container - A - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.	Surr: Toluene-d8 (80-120%)	99%						11/08/18 00:50	EPA 8260B	181107L062		
EPA 300.0 Anions (Extraction Method: N/A) Container - A - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.	Sample ID: 9 (S-15-B4, Solid) Sampled:	10/27/18 ⁻	10:05									
Chloride 23 mg/kg 1.5 10 1.00 11/06/18 14:57 EPA 300.0 181106L01P	EPA 300.0 Anions (Extraction Method: N/ - Results were evaluated to the MDL (DI	A) Contain L), concen	er - A trations >=	= to the MDI	_ (DL) but < I	RL (LOQ).	if found, are	qualified with a "J"	flag.			
	Chloride	23		mg/kg	1.5	10	1.00	11/06/18 14:57	EPA 300.0	181106L01P		

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181107L004

🔅 eurofins

Surr: Toluene-d8 (80-120%)

99%

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							40.4	0.0000			
Client:	Cardno				Work C	Order:	18-1	0-2309	_		
	20505 Crescent Bay Dr	rive			Project	Name:	Exxo	nMobil NM K	Battery No. 3,	Vacuum Oil	
	Lake Forest, CA 92630	-8825						1 (1 0			
					Date R	eceived	: 10/3	10/31/18			
Attn:	David Purdy										
				An	alytical	Repo	rt				
Analyte		Result	Flag	Units	MDL	RL	Dilution Factor	Analysis Date/Time	Method	Batch	
EPA 801 - Resul	5B GRO (Extraction Method: EP) ts were evaluated to the MDL (D	A 5030C) (L), concent	Container trations >:	- A = to the MDL	_ (DL) but < I	RL (LOQ), i	f found, are	qualified with a "J"	flag.		
Gasoline	Range Organics	ND		mg/kg	0.091	0.50	1.00	11/09/18 22:23	EPA 8015B	181109L032	
Surr: 1,4	Bromofluorobenzene (42-126%)	85%						11/09/18 22:23	EPA 8015B	181109L032	
EPA 826	0B BTEX/MTBE (Extraction Meth	nod: EPA 5	030C) Co	ontainer - A							
- Resul	ts were evaluated to the MDL (D	L), concent	trations >=	= to the MDL	_ (DL) but < I	RL (LOQ), i	f found, are	qualified with a "J"	flag.		
Benzene		ND		mg/kg	0.00013	0.0050	1.00	11/08/18 01:17	EPA 8260B	181107L062	
Toluene		ND		mg/kg	0.00052	0.0050	1.00	11/08/18 01:17	EPA 8260B	181107L062	
Ethylben	zene	ND		mg/kg	0.00015	0.0050	1.00	11/08/18 01:17	EPA 8260B	181107L062	
o-Xylene		ND		mg/kg	0.00056	0.0050	1.00	11/08/18 01:17	EPA 8260B	181107L062	
p/m-Xyle	ne	ND		mg/kg	0.00027	0.0050	1.00	11/08/18 01:17	EPA 8260B	181107L062	
Xylenes ((total)	ND		mg/kg	0.00027	0.0050	1.00	11/08/18 01:17	EPA 8260B	181107L062	
Surr: 1,4	Bromofluorobenzene (80-120%)	97%						11/08/18 01:17	EPA 8260B	181107L062	
Surr: Dib	romofluoromethane (79-133%)	95%						11/08/18 01:17	EPA 8260B	181107L062	
Surr: 1,2	-Dichloroethane-d4 (71-155%)	92%						11/08/18 01:17	EPA 8260B	181107L062	
Surr: Tol	uene-d8 (80-120%)	100%						11/08/18 01:17	EPA 8260B	181107L062	
Sample I	D: 10 (S-20-B4, Solid) Sampled	l: 10/27/18	10:15								
EPA 300 - Resul	.0 Anions (Extraction Method: N/ ts were evaluated to the MDL (D	A) Contain L). concent	er - A trations >:	= to the MDI	_ (DL) but < I	RL (LOQ). i	f found. are	qualified with a "J"	flag.		
Chloride	(100	В	mg/kg	1.5	10	1.00	11/04/18 05:57	EPA 300.0	181102L01P	
EPA 801	5B GRO (Extraction Method: EP	A 5030C) (Container	- A							
- Resul	ts were evaluated to the MDL (D	L), concent	trations >=	= to the MDL	_ (DL) but < I	RL (LOQ), i	f found, are	qualified with a "J"	flag.		
Gasoline	Range Organics	ND		mg/kg	0.090	0.50	1.00	11/09/18 22:57	EPA 8015B	181109L032	
Surr: 1,4	Bromofluorobenzene (42-126%)	87%						11/09/18 22:57	EPA 8015B	181109L032	
EPA 826 - Resul	0B BTEX/MTBE (Extraction Meth ts were evaluated to the MDL (D	nod: EPA 5 L), concent	030C) Co trations >=	ontainer - A = to the MDI	_ (DL) but < I	RL (LOQ), i	f found, are	qualified with a "J"	flag.		
Benzene		ND		mg/kg	0.00013	0.0051	1.00	11/07/18 19:03	EPA 8260B	181107L004	
Toluene		ND		mg/kg	0.00053	0.0051	1.00	11/07/18 19:03	EPA 8260B	181107L004	
Ethylben	zene	ND		mg/kg	0.00016	0.0051	1.00	11/07/18 19:03	EPA 8260B	181107L004	
o-Xylene		ND		mg/kg	0.00057	0.0051	1.00	11/07/18 19:03	EPA 8260B	181107L004	
p/m-Xyle	ne	ND		mg/kg	0.00028	0.0051	1.00	11/07/18 19:03	EPA 8260B	181107L004	
Xylenes	(total)	ND		mg/kg	0.00028	0.0051	1.00	11/07/18 19:03	EPA 8260B	181107L004	
Surry 1 A	Bromofluorobonzono (90.12001)	07%						11/07/10 10:00	EDA ODEOD	1811071 004	
Suit: 1,4		91%						11/07/18 19:03	EFA 0200B	101107L004	
Surre 1 0	Diablereethene d4 (74-153%)	94%						11/07/10 19.03	EFA 0200D	101107L004	
Jun 1,2	-Diomoroemane-04 (7 1-100%)	33/0						11/01/10 19.03	EFA 0200D	101107L004	

11/07/18 19:03

EPA 8260B

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The difference is service

Client:	Cardno				Work	Order:	18-1	0-2309		
	20505 Crescent Bay	Drive			Proje	ct Name:	Exxo	nMobil NM K	Battery No. 3	, Vacuum Oil
	Lake Forest, CA 9263	30-8825			Data	Received		1 1/18		
A 11 -					Date		10/0	1/10		
Attn:	David Purdy									
				An	alytica	al Repor	ť			
Analyte		Result	Flag	Units	MDL	RL	Dilution Factor	Analysis Date/Time	Method	Batch
Sample I	D: 11 (S-5-B5, Solid) Sample	ed: 10/27/18 1	1:00							
EPA 300. - Result	0 Anions (Extraction Method: ts were evaluated to the MDL	N/A) Contain (DL), concent	er - A rations >=	= to the MDL	_ (DL) but <	< RL (LOQ), i	f found, are	qualified with a "J"	flag.	
Chloride		90		mg/kg	1.5	10	1.00	11/09/18 17:32	EPA 300.0	181109L01P
Sample I	D: 12 (S-10-B5, Solid) Samp	led: 10/27/18	11:05							
EPA 300.	0 Anions (Extraction Method:	N/A) Containe	er - A							
- Result	ts were evaluated to the MDL	(DL), concent	rations >=	to the MDL	_ (DL) but ∢	< RL (LOQ), i	f found, are	qualified with a "J"	flag.	191100L01P
Chionde		04		тід/ку	1.5	10	1.00	11/09/10 17.50	EPA 300.0	1011092012
Sample I	D: 13 (S-15-B5, Solid) Samp	led: 10/27/18	11:15							
EPA 300. - Result	0 Anions (Extraction Method: ts were evaluated to the MDL	N/A) Containe (DL), concent	er - A rations >=	= to the MDL	_ (DL) but ∢	< RL (LOQ), i	f found, are	qualified with a "J"	flag.	
Chloride		46		mg/kg	1.5	10	1.00	11/09/18 18:09	EPA 300.0	181109L01P
Sample I	D: 14 (S-20-B5, Solid) Samp	led: 10/27/18	11:20							
EPA 300. - Result	0 Anions (Extraction Method: ts were evaluated to the MDL	N/A) Contain (DL). concent	er - A rations >=	= to the MDL	_ (DL) but <	< RL (LOQ). i	f found, are	qualified with a "J"	flag.	
Chloride		880		mg/kg	2.9	20	2.00	11/09/18 18:28	EPA 300.0	181109L01P
Sample I	D: 15 (S-25-B5, Solid) Samp	led: 10/27/18	11:40							
EPA 300.	0 Anions (Extraction Method:	N/A) Containe	er - A				fformed and		flag	
- Resul	is were evaluated to the MDL	(DL), concent 740	rations >=	mg/kg	1.5	2 RL (LOQ), 1 10	1.00 1.00	11/09/18 18:47	EPA 300.0	181109L01P
EPA 300	0 Anions (Extraction Method:	ed: 10/2//18 1	-r - A							
- Result	ts were evaluated to the MDL	(DL), concent	rations >=	to the MDL	_ (DL) but -	< RL (LOQ), i	f found, are	qualified with a "J"	flag.	
Chloride		300		mg/kg	1.5	10	1.00	11/09/18 19:06	EPA 300.0	181109L01P
Sample I	D: 17 (S-10-B3, Solid) Samp	led: 10/27/18	13:20							
EPA 300.	0 Anions (Extraction Method:	N/A) Containe	er - A	- to the MDI	(DL) but a	< RL (LOO) i	f found are	qualified with a " I"	flag	
Chloride		1000		mg/kg	2.9	20	2.00	11/09/18 19:25	EPA 300.0	181109L01P
Sample I	D: 18 (S-15-B3, Solid) Samp	led: 10/27/18	13:25							
EPA 300.	0 Anions (Extraction Method:	N/A) Containe	er - A	to the MDI	(DL) but a	< RL (LOO) i	f found are	qualified with a " I"	flag	
Chloride		510	- 40010	mg/kg	1.5	10	1.00	11/09/18 19:44	EPA 300.0	181109L01P
Sample	D: 19 (S-20-B3 Solid) Sama	ed: 10/27/19	13.30							
EPA 300.	0 Anions (Extraction Method:	N/A) Containe	er - A							
- Resul	ts were evaluated to the MDL	(DL), concent	rations >=	to the MDL	_ (DL) but <	< RL (LOQ), i	f found, are	qualified with a "J"	flag.	

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Client:	Cardno				Work C	Order:	18-1	0-2309			
	20505 Crescent Bay D	rive			Project	t Name:	Exxc	nMobil NM K	Battery No. 3,	Vacuum Oil	
	Lake Forest, CA 92630	-8825					Field		, , , , , , , , , , , , , , , , , , ,		
					Date R	eceived	10/3	10/31/18			
Attn:	David Purdy										
				An	alytical	Repor	ť				
Analyte		Result	Flag	Units	MDL	RL	Dilution Factor	Analysis Date/Time	Method	Batch	
Chloride		63		mg/kg	1.5	10	1.00	11/09/18 20:23	EPA 300.0	181109L01P	
Sample I	D: 20 (S-5-B6, Solid) Sampled:	10/27/18 1	4:15								
EPA 300. - Result	0 Anions (Extraction Method: N/	A) Containe L). concent	er - A rations >=	to the MDL	. (DL) but < I	RL (LOQ). i	f found. are	qualified with a "J"	flag.		
Chloride		67		mg/kg	1.5	10	1.00	11/09/18 20:42	EPA 300.0	181109L01P	
	EP CRO (Extraction Mothods ED		Sontoinor	^							
- Result	is were evaluated to the MDL (D	L), concent	rations >=	to the MDL	. (DL) but < I	RL (LOQ), i	f found, are	qualified with a "J"	flag.		
Gasoline	Range Organics	ND		mg/kg	0.092	0.51	1.00	11/09/18 23:30	EPA 8015B	181109L032	
Surr: 1,4-	Bromofluorobenzene (42-126%)	85%						11/09/18 23:30	EPA 8015B	181109L032	
EPA 8260	B BTEX/MTBE (Extraction Meth	nod: EPA 5	030C) Co	ntainer - A							
- Result	is were evaluated to the MDL (D	L), concent	rations >=	to the MDL	. (DL) but < I	RL (LOQ), i	f found, are	qualified with a "J"	flag.		
Benzene		ND		mg/kg	0.00013	0.0050	1.00	11/09/18 17:58	EPA 8260B	181109L046	
Toluene		ND		mg/kg	0.00052	0.0050	1.00	11/09/18 17:58	EPA 8260B	181109L046	
Ethylbenz	zene	ND		mg/kg	0.00015	0.0050	1.00	11/09/18 17:58	EPA 8260B	181109L046	
o-Xylene		ND		mg/kg	0.00056	0.0050	1.00	11/09/18 17:58	EPA 8260B	181109L046	
p/m-Xyler	ne	ND		mg/kg	0.00027	0.0050	1.00	11/09/18 17:58	EPA 8260B	181109L046	
Xylenes (total)	ND		mg/kg	0.00027	0.0050	1.00	11/09/18 17:58	EPA 8260B	181109L046	
Surr: 1,4-	Bromofluorobenzene (80-120%)	97%						11/09/18 17:58	EPA 8260B	181109L046	
Surr: Dibi	romofluoromethane (79-133%)	98%						11/09/18 17:58	EPA 8260B	181109L046	
Surr: 1,2-	Dichloroethane-d4 (71-155%)	93%						11/09/18 17:58	EPA 8260B	181109L046	
Surr: Tolu	uene-d8 (80-120%)	100%						11/09/18 17:58	EPA 8260B	181109L046	
Sample I	D: 21 (S-10-B6, Solid) Sampled	l: 10/27/18	14:25								
EPA 300.	0 Anions (Extraction Method: N/	A) Containe	er - A	to the MDI	(DL) but < I		f found are	gualified with a " I"	flag		
Chloride		7.0	.1	ma/ka	1 5	10	1 00	11/09/18 22·16	EPA 300 0	181109L01P	
EPA 8015	5B GRO (Extraction Method: EP	A 5030C) C	Sontainer	· A	1.5	10	1.00	11/03/10 22.10	EI A 300.0	1011032011	
- Result	is were evaluated to the MDL (D	L), concent	rations >=	to the MDL	. (DL) but < I	RL (LOQ), i	f found, are	qualified with a "J"	flag.		
Gasoline	Range Organics	ND		mg/kg	0.088	0.49	1.00	11/10/18 05:27	EPA 8015B	181109L055	
Surr: 1,4-	Bromofluorobenzene (42-126%)	80%						11/10/18 05:27	EPA 8015B	181109L055	
EPA 8260 - Result	DB BTEX/MTBE (Extraction Methes were evaluated to the MDL (D	nod: EPA 5 L), concent	030C) Co rations >=	ntainer - A to the MDL	. (DL) but < I	RL (LOQ), i	f found, are	qualified with a "J"	flag.		
Benzene		ND		mg/kg	0.00013	0.0050	1.00	11/09/18 18:25	EPA 8260B	181109L046	
Toluene		ND		mg/kg	0.00052	0.0050	1.00	11/09/18 18:25	EPA 8260B	181109L046	
Ethylbenz	zene	ND		mg/ka	0.00015	0.0050	1.00	11/09/18 18:25	EPA 8260B	181109L046	
o-Xvlene		ND		ma/ka	0.00056	0.0050	1.00	11/09/18 18:25	FPA 8260B	1811091 046	
n/m-Xyler	he	ND		ma/ka	0 00027	0.0050	1 00	11/09/18 18:25	EPA 8260B	1811001046	
	total)			mg/kg	0.00027	0.0050	1.00	11/00/10 10:20		1811001046	
					0.00021	0.0000	1.00	11,00/10 10.20		1011002040	

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Client:	Cardno				Work C	Order:	18-1	0-2309				
	20505 Crescent Bay Dr	ive			Project	Name:	Exxo Field	ExxonMobil NM K Battery No. 3, Vacuum Oil Field				
	Lake Forest, CA 92630	-0020			Date R	eceived	10/3	1/18				
Attn:	David Purdy											
				An	alytical	Repor	ť					
Analyte		Result	Flag	Units	MDL	RL	Dilution Factor	Analysis Date/Time	Method	Batch		
Surr: 1,4-	Bromofluorobenzene (80-120%)	97%						11/09/18 18:25	EPA 8260B	181109L040		
Surr: Dibi	romofluoromethane (79-133%)	100%						11/09/18 18:25	EPA 8260B	181109L040		
Surr: 1,2-	Dichloroethane-d4 (71-155%)	95%						11/09/18 18:25	EPA 8260B	181109L046		
Surr: Tolu	uene-d8 (80-120%)	99%						11/09/18 18:25	EPA 8260B	181109L046		
Sample I	D: 22 (S-15-B6, Solid) Sampled	: 10/27/18	14:30									
EPA 300.	0 Anions (Extraction Method: N/A	A) Containe	er - A	- to the MDI	(DL) but <		f found are	qualified with a " I"	flag			
Chloride		26		ma/ka	1.5	10	1.00	11/09/18 22:35	EPA 300.0	1811091 015		
		20			1.0	10	1.00	11,00,10 22.00	217100010	1011002011		
EPA 8015 - Result	5B GRO (Extraction Method: EPA	A 5030C) C	ontainer	- A - to the MDI	(DL) but <	RI (LOO) i	f found are	qualified with a ".I"	flag			
- Result	Range Organics			ma/ka	0.087	0.48		11/10/18 07·17	EPA 8015B	1811091.054		
Jasonne	Range Organics			iliy/ky	0.007	0.40	1.00	11/10/10 07.17	EFA 0013D	1011092030		
Surr: 1,4-	Bromofluorobenzene (42-126%)	67%						11/10/18 07:17	EPA 8015B	181109L05		
EPA 8260	B BTEX/MTBE (Extraction Meth	od: EPA 50	030C) Co	ntainer - A								
- Result	is were evaluated to the MDL (DL	.), concent	rations >=	to the MDI	_ (DL) but <	RL (LOQ), i	f found, are	qualified with a "J"	flag.			
Benzene		ND		mg/kg	0.00013	0.0050	1.00	11/07/18 19:30	EPA 8260B	181107L004		
Foluene		ND		mg/kg	0.00052	0.0050	1.00	11/07/18 19:30	EPA 8260B	181107L004		
Ethylbenz	zene	ND		mg/kg	0.00015	0.0050	1.00	11/07/18 19:30	EPA 8260B	181107L004		
o-Xylene		ND		mg/kg	0.00056	0.0050	1.00	11/07/18 19:30	EPA 8260B	181107L004		
o/m-Xyler	ne	ND		mg/kg	0.00027	0.0050	1.00	11/07/18 19:30	EPA 8260B	181107L004		
Kylenes (total)	ND		mg/kg	0.00027	0.0050	1.00	11/07/18 19:30	EPA 8260B	181107L004		
Surr: 1,4-	Bromofluorobenzene (80-120%)	95%						11/07/18 19:30	EPA 8260B	181107L004		
Surr: Dibi	romofluoromethane (79-133%)	95%						11/07/18 19:30	EPA 8260B	181107L004		
Surr: 1,2-	Dichloroethane-d4 (71-155%)	91%						11/07/18 19:30	EPA 8260B	181107L00-		
Surr: Tolı	uene-d8 (80-120%)	98%						11/07/18 19:30	EPA 8260B	181107L00-		
Sample	D: 23 (S-20-B6 Solid) Sampled	· 10/27/10	14.40									

- Results were evaluated to the I	MDL (DL), concentratio	ons >= to the MDL	_ (DL) but <	RL (LOQ),	if found, ar	e qualified with a "J"	flag.	
Chloride	33	mg/kg	1.5	10	1.00	11/09/18 22:54	EPA 300.0	181109L01P
EPA 8015B GRO (Extraction Meth - Results were evaluated to the I	nod: EPA 5030C) Conta MDL (DL), concentratio	ainer - A ons >= to the MDL	_ (DL) but <	RL (LOQ),	if found, ar	e qualified with a "J"	flag.	
Gasoline Range Organics	ND	mg/kg	0.090	0.50	1.00	11/10/18 07:54	EPA 8015B	181109L055
Surr: 1,4-Bromofluorobenzene (42	2-126%) 77%					11/10/18 07:54	EPA 8015B	181109L055
EPA 8260B BTEX/MTBE (Extracti - Results were evaluated to the I	on Method: EPA 50300 MDL (DL), concentratio	C) Container - A	_ (DL) but <	RL (LOQ),	if found, ar	e qualified with a "J"	flag.	
Benzene	ND	mg/kg	0.00013	0.0050	1.00	11/07/18 19:56	EPA 8260B	181107L004
Toluene	ND	mg/kg	0.00052	0.0050	1.00	11/07/18 19:56	EPA 8260B	181107L004

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Client:	Cardno	Work Order:	18-10-2309
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
	Lake Forest, CA 92630-8825	Date Received:	10/31/18

David Purdy Attn:

Analytical Report

Analyte	Result	Flag	Units	MDL	RL	Dilution Factor	Analysis Date/Time	Method	Batch
Ethylbenzene	ND		mg/kg	0.00015	0.0050	1.00	11/07/18 19:56	EPA 8260B	181107L004
o-Xylene	ND		mg/kg	0.00056	0.0050	1.00	11/07/18 19:56	EPA 8260B	181107L004
p/m-Xylene	ND		mg/kg	0.00027	0.0050	1.00	11/07/18 19:56	EPA 8260B	181107L004
Xylenes (total)	ND		mg/kg	0.00027	0.0050	1.00	11/07/18 19:56	EPA 8260B	181107L004
Surr: 1,4-Bromofluorobenzene (80-120%)	97%						11/07/18 19:56	EPA 8260B	181107L004
Surr: Dibromofluoromethane (79-133%)	96%						11/07/18 19:56	EPA 8260B	181107L004
Surr: 1,2-Dichloroethane-d4 (71-155%)	90%						11/07/18 19:56	EPA 8260B	181107L004
Surr: Toluene-d8 (80-120%)	99%						11/07/18 19:56	EPA 8260B	181107L004
Sample ID: 24 (S-25-B6, Solid) Sampled	I: 10/27/18	14:50							
EPA 300.0 Anions (Extraction Method: N/ - Results were evaluated to the MDL (DI	A) Containe L), concenti	er - A rations >=	to the MDL	(DL) but < F	RL (LOQ), i	f found, are o	qualified with a "J"	flag.	
Chloride	4.8	J	mg/kg	1.5	10	1.00	11/09/18 23:13	EPA 300.0	181109L01P
EPA 8015B GRO (Extraction Method: EPA - Results were evaluated to the MDL (DI	A 5030C) C L), concent	ontainer -	A to the MDL	. (DL) but < F	rl (Loq), i	f found, are o	ualified with a "J"	flag.	
Gasoline Range Organics	ND		mg/kg	0.087	0.48	1.00	11/10/18 08:31	EPA 8015B	181109L055
Surr: 1,4-Bromofluorobenzene (42-126%)	77%						11/10/18 08:31	EPA 8015B	181109L055
EPA 8260B BTEX/MTBE (Extraction Meth - Results were evaluated to the MDL (DI	nod: EPA 50 L), concent	030C) Con rations >=	itainer - A to the MDL	(DL) but < F	RL (LOQ), i	f found, are o	qualified with a "J"	flag.	
Benzene	ND		mg/kg	0.00013	0.0051	1.00	11/07/18 20:23	EPA 8260B	181107L004
Toluene	ND		mg/kg	0.00053	0.0051	1.00	11/07/18 20:23	EPA 8260B	181107L004
Ethylbenzene	ND		mg/kg	0.00016	0.0051	1.00	11/07/18 20:23	EPA 8260B	181107L004
o-Xylene	ND		mg/kg	0.00057	0.0051	1.00	11/07/18 20:23	EPA 8260B	181107L004
p/m-Xylene	ND		mg/kg	0.00028	0.0051	1.00	11/07/18 20:23	EPA 8260B	181107L004
Xylenes (total)	ND		mg/kg	0.00028	0.0051	1.00	11/07/18 20:23	EPA 8260B	181107L004
Surr: 1,4-Bromofluorobenzene (80-120%)	96%						11/07/18 20:23	EPA 8260B	181107L004
Surr: Dibromofluoromethane (79-133%)	97%						11/07/18 20:23	EPA 8260B	181107L004
Surr: 1,2-Dichloroethane-d4 (71-155%)	91%						11/07/18 20:23	EPA 8260B	181107L004
Surr: Toluene-d8 (80-120%)	100%						11/07/18 20:23	EPA 8260B	181107L004
Sample ID: 25 (S-30-B6, Solid) Sampled	l: 10/27/18	15:00							
EPA 300.0 Anions (Extraction Method: N/ - Results were evaluated to the MDL (DI	A) Containe L), concent	er - A rations >=	to the MDL	. (DL) but < F	RL (LOQ), i	f found, are o	qualified with a "J"	flag.	
Chloride	11		mg/kg	1.5	10	1.00	11/09/18 23:32	EPA 300.0	181109L01P
EPA 8015B GRO (Extraction Method: EP/ - Results were evaluated to the MDL (DI	A 5030C) C L), concent	ontainer - rations >=	A to the MDL	. (DL) but < F	rl (Loq), i	f found, are o	qualified with a "J"	flag.	
Gasoline Range Organics	ND		mg/kg	0.091	0.50	1.00	11/10/18 09:08	EPA 8015B	181109L055
Surr: 1,4-Bromofluorobenzene (42-126%)	79%						11/10/18 09:08	EPA 8015B	181109L055

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Client:	Cardno	Work Order:	18-10-2309
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
	Lake 1 01631, 0A 92030-0023	Date Received:	10/31/18

David Purdy Attn:

Analytical Report										
Analyte	Result	Flag	Units	MDL	RL	Dilution Factor	Analysis Date/Time	Method	Batch	
EPA 8260B BTEX/MTBE (Extraction Meth - Results were evaluated to the MDL (DI	od: EPA 5 _), concent	030C) Co rations >=	ntainer - A = to the MDL	. (DL) but < F	RL (LOQ), i	f found, are o	qualified with a "J"	flag.		
Benzene	ND		mg/kg	0.00013	0.0050	1.00	11/07/18 20:50	EPA 8260B	181107L004	
Toluene	ND		mg/kg	0.00051	0.0050	1.00	11/07/18 20:50	EPA 8260B	181107L004	
Ethylbenzene	ND		mg/kg	0.00015	0.0050	1.00	11/07/18 20:50	EPA 8260B	181107L004	
o-Xylene	ND		mg/kg	0.00055	0.0050	1.00	11/07/18 20:50	EPA 8260B	181107L004	
p/m-Xylene	ND		mg/kg	0.00027	0.0050	1.00	11/07/18 20:50	EPA 8260B	181107L004	
Xylenes (total)	ND		mg/kg	0.00027	0.0050	1.00	11/07/18 20:50	EPA 8260B	181107L004	
Surr: 1,4-Bromofluorobenzene (80-120%)	97%						11/07/18 20:50	EPA 8260B	181107L004	
Surr: Dibromofluoromethane (79-133%)	97%						11/07/18 20:50	EPA 8260B	181107L004	
Surr: 1,2-Dichloroethane-d4 (71-155%)	91%						11/07/18 20:50	EPA 8260B	181107L004	
Surr: Toluene-d8 (80-120%)	99%						11/07/18 20:50	EPA 8260B	181107L004	
Sample ID: 26 (S-5-B7, Solid) Sampled:	10/27/18 1	5:45								
EPA 300.0 Anions (Extraction Method: N// - Results were evaluated to the MDL (DI	A) Containe _), concent	er - A rations >=	to the MDL	. (DL) but < F	RL (LOQ), i	f found, are o	qualified with a "J"	flag.		
Chloride	28		mg/kg	1.5	10	1.00	11/09/18 23:51	EPA 300.0	181109L01P	
Sample ID: 27 (S-10-B7, Solid) Sampled	: 10/27/18	15:55								
EPA 300.0 Anions (Extraction Method: N// - Results were evaluated to the MDL (DI	A) Containe _), concent	er - A rations >=	to the MDL	. (DL) but < F	RL (LOQ), i	f found, are o	qualified with a "J"	flag.		
Chloride	14		mg/kg	1.5	10	1.00	11/10/18 00:10	EPA 300.0	181109L01P	
Sample ID: 28 (S-20-B7, Solid) Sampled	: 10/27/18	16:20								
EPA 300.0 Anions (Extraction Method: N// - Results were evaluated to the MDL (DI	A) Containe _), concent	er - A rations >=	to the MDL	. (DL) but < F	RL (LOQ), i	f found, are o	qualified with a "J"	flag.		
Chloride	8.8	J	mg/kg	1.5	10	1.00	11/10/18 00:29	EPA 300.0	181109L01P	
Sample ID: 29 (S-25-B7, Solid) Sampled	: 10/27/18	16:30								
EPA 300.0 Anions (Extraction Method: N// - Results were evaluated to the MDL (DI	A) Containe	er - A rations >=	to the MDL	. (DL) but < F	RL (LOQ), i	f found, are o	qualified with a "J"	flag.		
Chloride	5.3	J	mg/kg	1.5	10	1.00	11/10/18 00:48	EPA 300.0	181109L01P	
Sample ID: 30 (S-30-B7, Solid) Sampled	: 10/27/18	16:40								
EPA 300.0 Anions (Extraction Method: N/A) Container - A - Results were evaluated to the MDL (DL) concentrations >= to the MDL (DL) but < RL (LOO) if found are qualified with a ".!" flag										
Chloride	8.2	J	mg/kg	1.5	10	1.00	11/10/18 01:07	EPA 300.0	181109L01P	

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Client:	Cardno	Work Order:	18-10-2309
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
	Lake Forest, CA 92630-8825	Date Received:	10/31/18

David Purdy Attn:

PROJECT QUALITY CONTROL DATA Blank

Analyte	Blank Value	Qualifiers	Units	QC Batch	Lab Number	Analysis Date/Time
EFA 300.0 AMONS 000-12-022-1011						
Chloride	2.7	J	mg/kg	181102L01P	099-12-922-1011	11/03/18 21:48
EPA 300.0 Anions						
099-12-922-1012						
Chloride	ND		mg/kg	181106L01P	099-12-922-1012	11/06/18 12:32
EPA 300.0 Anions						
099-12-922-1016						
Chloride	ND		mg/kg	181109L01P	099-12-922-1016	11/09/18 16:54
SM 4500-CL C Chloride						
099-05-057-2239						
Chloride	ND		mg/L	I1116CLCL1	099-05-057-2239	11/16/18 19:03
EPA 8015B GRO						
099-12-024-1261			0		000 40 004 4004	
Gasoline Range Organics	ND		mg/kg	181109L032	099-12-024-1261	11/09/18 13:07
Surr: 1,4-Bromotiuorobenzene (42-126%)	88%			181109L032	099-12-024-1261	11/09/18 13:07
EPA 8015B GRO						
099-12-024-1262			ma/ka	1911001.055	000 12 024 1262	11/10/19 04.12
Surr: 1.4-Bromofluorobenzene (42-126%)	79%		iiig/kg	181109L055	099-12-024-1262	11/10/18 04:13
EPA 8260B BTEX/MTBE						
099-12-882-2148			malka	1911071 062	000 10 990 0149	11/07/10 00:00
			mg/kg	181107L002	099-12-002-2140	11/07/18 23:30
Ethylhonzono			mg/kg	191107L002	099-12-002-2140	11/07/10 23:30
			mg/kg	1811071062	000-12-882-2148	11/07/18 23:30
			mg/kg	1811071062	000-12-882-2148	11/07/18 23:30
Yylenes (total)	ND		mg/kg	1811071062	000-12-882-2148	11/07/18 23:30
Surr: 1 4-Bromofluorobenzene (80-120%)	07%		шуку	1811071062	000-12-882-2140	11/07/18 23:30
Surr: Dibromofluoromethane (70-120%)	97%			1811071062	000-12-882-2140	11/07/18 23:30
Surr: 1.2 Diobloroothana d4 (71, 155%)	97 /6			1811071062	000 12 002 2140	11/07/10 23:30
Surr: 1,2-Dichloroethane-u4 (77-155%)	92 % 100%			181107L002	000 12 002 2140	11/07/10 23.30
Sun. Toluene-us (80-120%)	100%			1811072002	099-12-002-2140	11/07/10 23.30
EPA 8260B BTEX/MTBE						
099-12-882-2137	ND			4044071004	000 40 000 0407	44/07/40 44:07
Benzene	ND		mg/kg	18110/L004	099-12-882-2137	11/0//18 11:2/
	ND		mg/kg	181107L004	099-12-882-2137	11/0//18 11:27
Ethylbenzene	ND		mg/kg	181107L004	099-12-882-2137	11/07/18 11:27

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Client:	Cardno	Work Order:	18-10-2309
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil
	Lake Forest, CA 92630-8825		i leid
		Date Received:	10/31/18

David Purdy Attn:

PROJECT QUALITY CONTROL DATA Blank

Analyte	Blank Value	Qualifiers	Units	QC Batch	Lab Number	Analysis Date/Time
o-Xylene	ND		mg/kg	181107L004	099-12-882-2137	11/07/18 11:27
p/m-Xylene	ND		mg/kg	181107L004	099-12-882-2137	11/07/18 11:27
Xylenes (total)	ND		mg/kg	181107L004	099-12-882-2137	11/07/18 11:27
Surr: 1,4-Bromofluorobenzene (80-120%)	97%			181107L004	099-12-882-2137	11/07/18 11:27
Surr: Dibromofluoromethane (79-133%)	97%			181107L004	099-12-882-2137	11/07/18 11:27
Surr: 1,2-Dichloroethane-d4 (71-155%)	91%			181107L004	099-12-882-2137	11/07/18 11:27
Surr: Toluene-d8 (80-120%)	99%			181107L004	099-12-882-2137	11/07/18 11:27
EPA 8260B BTEX/MTBE						
099-12-882-2149						
Benzene	ND		mg/kg	181109L046	099-12-882-2149	11/09/18 11:50
Toluene	ND		mg/kg	181109L046	099-12-882-2149	11/09/18 11:50
Ethylbenzene	ND		mg/kg	181109L046	099-12-882-2149	11/09/18 11:50
o-Xylene	ND		mg/kg	181109L046	099-12-882-2149	11/09/18 11:50
p/m-Xylene	ND		mg/kg	181109L046	099-12-882-2149	11/09/18 11:50
Xylenes (total)	ND		mg/kg	181109L046	099-12-882-2149	11/09/18 11:50
Surr: 1,4-Bromofluorobenzene (80-120%)	98%			181109L046	099-12-882-2149	11/09/18 11:50
Surr: Dibromofluoromethane (79-133%)	100%			181109L046	099-12-882-2149	11/09/18 11:50
Surr: 1,2-Dichloroethane-d4 (71-155%)	95%			181109L046	099-12-882-2149	11/09/18 11:50
Surr: Toluene-d8 (80-120%)	100%			181109L046	099-12-882-2149	11/09/18 11:50

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Client:	Cardno	Work Order:	18-10-2309
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
	Lake 1 01est, CA 32030-0025	Date Received:	10/31/18

QUALITY CONTROL Matrix Spike

					-					
Analyte	Orig. Val.	MS Val.	Qual.	Units	Spike Conc.	% Rec.	Target Range	Batch	Sample Spiked	Analysis Date/Time
	<u>.</u>					-				
EPA 300.0 Anions										
18-11-0078-1										
Chloride	34.05	534.7		mg/kg	500.0	100	80-120	181102S01P	18-11-0078-1	11/04/18 01:52
EPA 300.0 Anions										
18-10-2221-1										
Chloride	76.80	548.2		mg/kg	500.0	94	80-120	181106S01P	18-10-2221-1	11/06/18 13:42
EPA 300.0 Anions										
18-10-2309-11										
Chloride	90.32	643.0		mg/kg	500.0	111	80-120	181109S01P	18-10-2309-11	11/09/18 21:01
SM 4500 CL C Chlorido										
SM 4500-CL C Chionde										
Chloride	46.09	158.6		mg/L	100.0	112	80-120	I1116CLCS1	18-10-2309-5	11/16/18 19:03
				0						
EPA 8015B GRO										
18-10-2309-7										
Gasoline Range Organics	ND	6.906		mg/kg	10.00	69	66-108	181109S012	18-10-2309-7	11/09/18 20:41
EPA 8015B GRO										
18-10-2309-21										
Gasoline Range Organics	ND	7.782		mg/kg	10.00	78	66-108	181109S021	18-10-2309-21	11/10/18 06:04
EPA 8260B BTEX/MTBE										
18-10-2309-7										
Benzene	ND	0.03700		mg/kg	0.05000	74	61-127	181107S023	18-10-2309-7	11/08/18 01:44
Toluene	ND	0.03762		mg/kg	0.05000	75	63-123	181107S023	18-10-2309-7	11/08/18 01:44
Ethylbenzene	ND	0.03327		mg/kg	0.05000	67	57-129	181107S023	18-10-2309-7	11/08/18 01:44
o-Xylene	ND	0.03512		mg/kg	0.05000	70	70-130	181107S023	18-10-2309-7	11/08/18 01:44
p/m-Xylene	ND	0.06128	HX	mg/kg	0.1000	61	70-130	181107S023	18-10-2309-7	11/08/18 01:44
EPA 8260B BTEX/MTBE										
18-11-0417-1										
Benzene	ND	0.04088		mg/kg	0.05000	82	61-127	181107S008	18-11-0417-1	11/07/18 13:14
Toluene	ND	0.04357		mg/kg	0.05000	87	63-123	181107S008	18-11-0417-1	11/07/18 13:14
Ethylbenzene	ND	0.04190		mg/kg	0.05000	84	57-129	181107S008	18-11-0417-1	11/07/18 13:14
o-Xylene	ND	0.04186		mg/kg	0.05000	84	70-130	181107S008	18-11-0417-1	11/07/18 13:14
p/m-Xylene	ND	0.08217		mg/kg	0.1000	82	70-130	181107S008	18-11-0417-1	11/07/18 13:14
EPA 8260B BTEX/MTBE										
18-11-0640-2										
Benzene	ND	0.04530		mg/kg	0.05000	91	61-127	181109S010	18-11-0640-2	11/09/18 14:34
Toluene	ND	0.04741		mg/kg	0.05000	95	63-123	181109S010	18-11-0640-2	11/09/18 14:34
Ethylbenzene	ND	0.04559		mg/kg	0.05000	91	57-129	181109S010	18-11-0640-2	11/09/18 14:34
o-Xylene	ND	0.04499		mg/kg	0.05000	90	70-130	181109S010	18-11-0640-2	11/09/18 14:34

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Client:	Cardno	Work Order:	18-10-2309
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
		Date Received:	10/31/18

QUALITY CONTROL
Matrix Spike

Analyte	Orig. Val.	MS Val.	Qual.	Units	Spike Conc.	% Rec.	Target Range	Batch	Sample Spiked	Analysis Date/Time
p/m-Xylene	ND	0.08823		mg/kg	0.1000	88	70-130	181109S010	18-11-0640-2	11/09/18 14:34

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Client:	Cardno	Work Order:	18-10-2309
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
		Date Received:	10/31/18

QUALITY CONTROL Matrix Spike Duplicate

Analyte	Orig. Val.	Duplicate	Qual.	Units	Spike Conc.	% Rec.	Target Range	RPD	Limit	Batch	Sample Duplicated	Analysis Date/Time
EPA 300 0 Anions												
18-11-0078-1												
Chloride	34.05	534.3		mg/kg	500.0	100	80-120	0	0-20	181102S01P	18-11-0078-1	11/04/18 02:13
EPA 300.0 Anions												
18-10-2221-1 Chloride	76.80	556.2		mg/kg	500.0	96	80-120	1	0-20	181106S01P	18-10-2221-1	11/06/18 14:01
FPA 300 0 Anions												
18-10-2309-11												
Chloride	90.32	645.9		mg/kg	500.0	111	80-120	0	0-20	181109S01P	18-10-2309-11	11/09/18 21:20
SM 4500-CL C Chloride												
18-10-2309-5												
Chloride	46.09	160.6		mg/L	100.0	114	80-120	1	0-25	I1116CLCS1	18-10-2309-5	11/16/18 19:03
EPA 8015B GRO												
18-10-2309-7												
Gasoline Range Organics	ND	6.660		mg/kg	10.00	67	66-108	4	0-18	181109S012	18-10-2309-7	11/09/18 21:15
EPA 8015B GRO												
18-10-2309-21		7 000			10.00	70	CC 400	2	0.40	4044000004	40.40.0000.04	11/10/10 00:10
Gasoline Range Organics	ND	7.620		mg/kg	10.00	76	60-108	Ζ	0-18	1811095021	18-10-2309-21	11/10/18 06:40
EPA 8260B BTEX/MTBE												
18-10-2309-7				_								
Benzene	ND	0.03887		mg/kg	0.05000	78	61-127	5	0-20	181107S023	18-10-2309-7	11/08/18 02:11
Toluene	ND	0.03965		mg/kg	0.05000	79	63-123	5	0-20	181107S023	18-10-2309-7	11/08/18 02:11
Ethylbenzene	ND	0.03662		mg/kg	0.05000	73	57-129	10	0-22	181107S023	18-10-2309-7	11/08/18 02:11
o-Xylene	ND	0.03722		mg/kg	0.05000	74	70-130	6	0-30	181107S023	18-10-2309-7	11/08/18 02:11
p/m-Xylene	ND	0.07094		mg/kg	0.1000	71	70-130	15	0-30	181107S023	18-10-2309-7	11/08/18 02:11
EPA 8260B BTEX/MTBE												
18-11-0417-1		0.04440		malka	0.05000	80	61 107	0	0.20	1011070000	10 11 0417 1	11/07/10 10:41
Toluono		0.04440		mg/kg	0.05000	03	62 122	0 7	0-20	1011075000	10-11-0417-1	11/07/10 13.41
Ethylhonzono		0.04072		mg/kg	0.05000	93	57 120	7	0-20	1011075000	10-11-0417-1	11/07/10 13.41
		0.04484		mg/kg	0.05000	90	57-129	7	0-22	1811075008	18-11-0417-1	11/07/18 13:41
o-Xylene	ND	0.04495		mg/кg	0.05000	90	70-130	7	0-20	1811075008	18-11-0417-1	11/07/18 13:41
p/m-Xylene	ND	0.08757		mg/kg	0.1000	88	70-130	6	0-20	181107S008	18-11-0417-1	11/07/18 13:41
EPA 8260B BTEX/MTBE												
1 8-11-0640-2 Benzene	ND	0.03568	BA	ma/ka	0.05000	71	61-127	24	0-20	1811095010	18-11-0640-2	11/09/18 15:00
Toluene	ND	0.037/1	RΔ	ma/ka	0.05000	75	63-122	- ' 24	0-20	1811005010	18-11-06/0-2	11/09/18 15:00
Ethylbenzene		0.03570	RΔ	mg/kg	0.05000	72	57-120	2-7 24	0-22	1811005010	18-11-06/0-2	11/09/18 15:00
		0.03506	DA	ma/ka	0.05000	72	70-120	<u>∠</u> ¬ 22	0-20	1811095010	18-11-06/0-2	11/09/18 15:00
U AYIGHU		0.00030		шу/ку	0.00000	12	10-100	~~	0-00	1011030010	10-11-0040-2	11/03/10 13:00

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Client:	Cardno	Work Order:	18-10-2309
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
		Date Received:	10/31/18

QUALITY CONTROL Matrix Spike Duplicate

Analyte	Orig. Val.	Duplicate	Qual.	Units	Spike Conc.	% Rec.	Target Range	RPD	Limit	Batch	Sample Duplicated	Analysis Date/Time
p/m-Xylene	ND	0.07025		mg/kg	0.1000	70	70-130	23	0-30	181109S010	18-11-0640-2	11/09/18 15:00



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Client:	Cardno	Work Order:	18-10-2309
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
	Lake 1 01031, 077 52050 0025	Date Received:	10/31/18

PROJECT QUALITY CONTROL DATA Laboratory Control Sample

A	K		Qual	-	0/ D-	T (Detal	A
Analyte	Known Val.	Analyzed	Qual.	Units	% Rec.	rarget Range	Batch	Analysis Date/Time
EPA 300.0 Anions								
099-12-922-1011								
Chloride	500.0	509.6		mg/kg	102	90-110	181102L01P	11/03/18 22:08
EPA 300.0 Anions								
099-12-922-1012								
Chloride	500.0	478.5		mg/kg	96	90-110	181106L01P	11/06/18 12:51
EPA 300.0 Anions								
099-12-922-1016								
Chloride	500.0	497.3		mg/kg	99	90-110	181109L01P	11/09/18 17:13
SM 4500-CL C Chloride								
099-05-057-2239								
Chloride	100.0	101.6		mg/L	102	80-120	I1116CLCL1	11/16/18 19:03
EPA 8015B GRO								
099-12-024-1261								
Gasoline Range Organics	10.00	8.580		mg/kg	86	70-118	181109L032	11/09/18 12:33
EPA 8015B GRO								
099-12-024-1262								
Gasoline Range Organics	10.00	7.088		mg/kg	71	70-118	181109L055	11/10/18 02:59
EPA 8260B BTEX/MTBE								
099-12-882-2148								
Benzene	0.05000	0.04211		mg/kg	84	80-120	181107L062	11/07/18 22:37
Toluene	0.05000	0.04372		mg/kg	87	80-120	181107L062	11/07/18 22:37
Ethylbenzene	0.05000	0.04260		mg/kg	85	80-120	181107L062	11/07/18 22:37
o-Xylene	0.05000	0.04217		mg/kg	84	75-125	181107L062	11/07/18 22:37
p/m-Xylene	0.1000	0.08309		mg/kg	83	75-125	181107L062	11/07/18 22:37
EPA 8260B BTEX/MTBE								
099-12-882-2137								
Benzene	0.05000	0.05021		mg/kg	100	80-120	181107L004	11/07/18 10:14
Toluene	0.05000	0.05283		mg/kg	106	80-120	181107L004	11/07/18 10:14
Ethylbenzene	0.05000	0.05167		mg/kg	103	80-120	181107L004	11/07/18 10:14
o-Xylene	0.05000	0.05064		mg/kg	101	75-125	181107L004	11/07/18 10:14
p/m-Xylene	0.1000	0.1006		mg/kg	101	75-125	181107L004	11/07/18 10:14
EPA 8260B BTEX/MTBE								
099-12-882-2149								
Benzene	0.05000	0.04821		mg/kg	96	80-120	181109L046	11/09/18 10:21
Toluene	0.05000	0.04966		mg/kg	99	80-120	181109L046	11/09/18 10:21
Ethylbenzene	0.05000	0.04852		mg/kg	97	80-120	181109L046	11/09/18 10:21
o-Xylene	0.05000	0.04714		mg/kg	94	75-125	181109L046	11/09/18 10:21

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Client:	Cardno	Work Order:	18-10-2309
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
	Lake Forest, CA 92630-8825	Date Received:	10/31/18

PROJECT QUALITY CONTROL DATA Laboratory Control Sample

Analyte	Known Val.	Analyzed	Qual.	Units	% Rec.	Target Range	Batch	Analysis Date/Time
p/m-Xylene	0.1000	0.09433		mg/kg	94	75-125	181109L046	11/09/18 10:21





Client:	Cardno	Work Order:	18-10-2309
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
	Earch 61631, 6A 52636 6625	Date Received:	10/31/18

PROJECT QUALITY CONTROL DATA Laboratory Control Sample Duplicate

Analyte	LCS Val.	Duplicate	Qual.	Units	% Rec.	Target Range	RPD	Limit	Batch	Sample Duplicated	Analysis Date/Time
SM 4500-CL C Chloride 099-05-057-2239 Chloride	100.0	105.6		mg/L	106	80-120	4	0-20	I1116CLCL1	099-05-057-2239	11/16/18 19:03
EPA 8015B GRO 099-12-024-1262 Gasoline Range Organics	10.00	7.002		mg/kg	70	70-118	1	0-28	181109L055	099-12-024-1262	11/10/18 03:36

Qual - Qualifiers RPD: Relative Percent Difference

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The difference is service

Work Order: 18-10-2309

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	Sample Analysis S	ummary R	eport	
Method	Extraction	Chemist ID	Instrument	Analytical Location
EPA 300.0	N/A	27	IC 7	1
EPA 300.0	N/A	27	IC 9	1
EPA 8015B	EPA 5030C	715	GC 4	2
EPA 8015B	EPA 5030C	1161	GC 24	2
EPA 8260B	EPA 5030C	316	GC/MS Q	2
EPA 8260B	EPA 5030C	1176	GC/MS Q	2
SM 4500-CI C	EPA 1312	1168	BUR02	1



Location 1: 7440 Lincoln Way, Garden Grove, CA 92841 Location 2: 7445 Lampson Avenue, Garden Grove, CA 92841

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The difference is service

Work Order: 18-10-2309

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Glossary of Terms and Qualifiers

Qualifiers	Definition
AZ	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
В	Analyte was present in the associated method blank.
BA	The MS/MSD RPD was out of control due to suspected matrix interference.
BB	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
CI	See case narrative.
DF	Reporting limits elevated due to matrix interferences.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
GE	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
HD	Chromat. profile inconsistent with pattern(s) of ref. fuel stnds.
HO	High concentration matrix spike recovery out of limits
HT	Analytical value calculated using results from associated tests.
HX	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS was in control.
IL	Relative percent difference out of control.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
LD	Analyte presence was not confirmed by second column or GC/MS analysis.
LP	The LCS and/or LCSD recoveries for this analyte were above the upper control limit. The associated sample was non-detected. Therefore, the sample data was reported without further clarification.
LQ	LCS recovery above method control limits.
LR	LCS recovery below method control limits.
ND	Parameter not detected at the indicated reporting limit.
QO	Compound did not meet method-described identification guidelines. Identification was based on additional GC/MS characteristics.
RU	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
SG	A silica gel cleanup procedure was performed.
SN	See applicable analysis comment.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

Released to Imaging: 7/12/2021 3:47:42 PM

Cecile L de Guia

From:	David Purdy <dave.purdy@cardno.com></dave.purdy@cardno.com>
Sent:	Wednesday, November 14, 2018 12:35 PM
То:	Cecile L de Guia
Cc:	Vincent Nguyen; Stephen Hunter
Subject:	FW: ExxonMobil NM K Battery No. 3, Vacuum Oil Field / CEL 18-10-2309
Attachments:	18-10-2309.pdf; 18102309.xls

EXTERNAL EMAIL*

Cecile:

Please analyze Sample ID 18 (S-25-B5) for SPLP by Method SM 4500-CI C. A revised COC is attached.

Thank you.

Dave Purdy SR. PROJECT MANAGER CARDNO

We've moved! Please notice our address change below.

Direct +1 949 457 8941 Mobile +1 949 355 4470 Fax +1 949 457 8956 Address 20505 Crescent Bay, Lake Forest, CA 92630 Email <u>dave.purdy@cardno.com</u> Web <u>www.cardno.com</u>

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From: Cecile L de Guia [mailto:CecileLdeGuia@eurofinsUS.com]
Sent: Wednesday, November 14, 2018 11:51 AM
To: David Purdy <<u>dave.purdy@cardno.com</u>
Cc: geotracker01@cardno.com
Subject: ExxonMobil NM K Battery No. 3, Vacuum Oil Field / CEL 18-10-2309

Hello,

Report & EDD are attached.

Thanks, Sandy

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WORK ORDER NUMBER: 18-10- 23

SAMPLE ANOMALY REPORT

DATE: 10 / 3/ / 2018

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Sample(s) NOT RECEIVED but listed on COC Sample(s) received but NOT LISTED on COC Holding time expired (list client or ECI sample ID and analysis) Improper container(s) used (list analysis) Improper preservative used (list analysis) PH outside acceptable range (list analysis) Chert sample label(s) lingbib (list container type and analysis) Chert sample label(s) lingbib (list container type and analysis) Chert sample label(s) lingbib (list container type and analysis) Chert sample label(s) due to not match COC (comment) Project information Chert sample label(s) due to not match COC (comment) Chert sample label(s) due to not match COC (comment) Chert sample label(s) due to not match COC (comment) Chert sample label(s) due to not match COC (comment) Chert sample container(s) Requested analysis Sample container(s) Requested analysis Sample container(s) compromised (comment) Chert sample container(s) Comments Chert sample container(s) Comments Chert sample container(s) Chert samp	SAMPLE	S, CONTAIN	ERS, AN	D LABEL	S:		Commer	nts		
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WORK ORDER NUMBER: 18-10-2310

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AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For Client: Cardno Client Project Name: ExxonMobil NM K Battery No. 3, Vacuum Oil Field Attention: David Purdy 20505 Crescent Bay Drive Lake Forest, CA 92630-8825

sitt for

Approved for release on 11/14/2018 by: Cecile deGuia Project Manager

ResultLink >

Email your PM >

Eurofins Calscience (Calscience) certifies that the test results provided in this report meet all NELAC Institute requirements for parameters for which accreditation is required or available. Any exceptions to NELAC Institute requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.

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Work Order: 18-10-2310

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Work Order Narrative

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 10/31/18. They were assigned to Work Order 18-10-2310.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

DoD Projects:

The test results contained in this report are accredited under the laboratory's ISO/IEC 17025:2005 and DoD-ELAP accreditation issued by the ANSI-ASQ National Accreditation Board. Refer to certificate and scope of accreditation ADE-1864.

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Client:	Cardno	Work Order:	18-10-2310
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
		PO Number:	013613U118
		Date/Time Received:	10/31/18 10:00
		Number of Containers:	21

Attn: David Purdy

Sample Summary

Sample Identification	Lab Number	Collection Date and Time	Number of	Matrix
S-5-B8	18-10-2310-1	10/28/18 07:50	1	Solid
S-10-B8	18-10-2310-2	10/28/18 08:00	1	Solid
S-15-B8	18-10-2310-3	10/28/18 08:08	1	Solid
S-25-B8	18-10-2310-4	10/28/18 08:20	1	Solid
S-30-B8	18-10-2310-5	10/28/18 08:30	1	Solid
S-40-B8	18-10-2310-6	10/28/18 09:05	1	Solid
S-5-B12	18-10-2310-7	10/28/18 10:00	1	Solid
S-10-B12	18-10-2310-8	10/28/18 10:10	1	Solid
S-15-B12	18-10-2310-9	10/28/18 10:20	1	Solid
S-20-B12	18-10-2310-10	10/28/18 10:30	1	Solid
S-25-B12	18-10-2310-11	10/28/18 10:40	1	Solid
S-35-B12	18-10-2310-12	10/28/18 11:00	1	Solid
S-40-B12	18-10-2310-13	10/28/18 11:30	1	Solid
S-5-B11	18-10-2310-14	10/28/18 12:20	1	Solid
S-10-B11	18-10-2310-15	10/28/18 12:25	1	Solid
S-15-B11	18-10-2310-16	10/28/18 12:35	1	Solid
S-20-B11	18-10-2310-17	10/28/18 12:40	1	Solid
S-25-B11	18-10-2310-18	10/28/18 12:45	1	Solid
S-30-B11	18-10-2310-19	10/28/18 12:55	1	Solid
S-35-B11	18-10-2310-20	10/28/18 13:15	1	Solid
S-40-B11	18-10-2310-21	10/28/18 13:30	1	Solid

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Client:	Cardno				Work	Order:	18-1	0-2310		
	20505 Crescent Bay	Drive			Proje	ct Name:	Exxo	nMobil NM K	Battery No. 3	, Vacuum Oil
	Lake Forest, CA 926	30-8825			Date	Received	Fieic d: 10/3	1/18		
Attn	David Purdy									
/	Baviar aray			Δn	alvtica	al Reno	rt			
Analyte		Result	Flag	Units	MDL	RL	Dilution	Analysis	Method	Batch
							Factor	Date/Time		
Sample I	D: 1 (S-5-B8, Solid) Sample	d: 10/28/18 07	7:50							
- Result	s were evaluated to the MDL	. (DL), concent	rations >=	to the MDL	. (DL) but <	< RL (LOQ),	if found, are	qualified with a "J"	' flag.	
Chloride		690	В	mg/kg	1.5	10	1.00	11/04/18 06:17	EPA 300.0	181102L01P
Sample I	D: 2 (S-10-B8, Solid) Sampl	ed: 10/28/18 0	8:00							
EPA 300. - Result	0 Anions (Extraction Method	: N/A) Containe (DL), concent	er - A rations >=	to the MDI	. (DL) but «	< RL (LOO)	if found are	gualified with a ""	' flag.	
Chloride		900		mg/kg	2.9	20	2.00	11/10/18 12:11	EPA 300.0	181109L03P
Sample	D. 3 (S-15-BB Salid) Samu	ad. 10/29/10 0	8.06							
EPA 300.	0 Anions (Extraction Method	: N/A) Containe	er - A							
- Result	is were evaluated to the MDL	(DL), concent	rations >=	to the MDL	. (DL) but <	< RL (LOQ),	if found, are	qualified with a "J"	flag.	
Chloride		180		mg/kg	1.5	10	1.00	11/10/18 12:30	EPA 300.0	181109L03P
Sample I	D: 4 (S-25-B8, Solid) Sampl	ed: 10/28/18 0	8:20							
EPA 300. - Result	0 Anions (Extraction Method	: N/A) Containe (DL), concent	er - A rations >=	to the MDI	. (DL) but <	< RL (LOO)	if found. are	qualified with a ".J"	' flag.	
Chloride		310		mg/kg	1.5	10	1.00	11/10/18 12:49	EPA 300.0	181109L03P
Sample I	D: 5 (S-30-B8, Solid) Sampl	ed: 10/28/18 0	8:30							
EPA 300.	0 Anions (Extraction Method	N/A) Containe	er - A				if found and		1 fl	
- Result	is were evaluated to the MDL	. (DL), concent 110	rations >=	to the MDL ma/ka	. (DL) but < 1.5	RL (LOQ), 10	If found, are	qualified with a "J" 11/10/18 13:08	FPA 300.0	181109I 03P
omonuo		110		iiig/kg	1.0	10	1.00			1011002001
Sample I	D: 6 (S-40-B8, Solid) Sampl	ed: 10/28/18 0	9:05							
- Result	is were evaluated to the MDL	. (DL), concent	rations >=	to the MDL	. (DL) but <	< RL (LOQ),	if found, are	qualified with a "J"	' flag.	
Chloride		74		mg/kg	1.5	10	1.00	11/10/18 13:27	EPA 300.0	181109L03P
Sample I	D: 7 (S-5-B12, Solid) Sampl	ed: 10/28/18 1	0:00							
EPA 300.	0 Anions (Extraction Method	N/A) Containe	er - A	to the MDI	(DL) but		if found are	qualified with a " I"	flog	
- Result Chloride	is were evaluated to the MDL	270 (DL), concent	rations >=	to the MDL mg/kg	. (DL) but < 1.5	< RL (LOQ), 10	1.00	qualified with a "J" 11/10/18 13:46	EPA 300.0	181109L03P
				5. 5						
Sample I	u: ס (ס-זע-שזע, Solid) Sam 0 Anions (Extraction Method	Diea: 10/28/18 : N/A) Containe	1 0:10 er - A							
- Result	s were evaluated to the MDL	. (DL), concent	rations >=	to the MDL	. (DL) but <	< RL (LOQ),	if found, are	qualified with a "J"	' flag.	
Chloride		180		mg/kg	1.5	10	1.00	11/10/18 14:05	EPA 300.0	181109L03P
Sample I	D: 9 (S-15-B12, Solid) Samı	oled: 10/28/18	10:20							
EPA 300. - Result	0 Anions (Extraction Method is were evaluated to the MDI	: N/A) Containe . (DL). concent	er - A rations >=	to the MDI	. (DL) but <	< RL (LOQ)	if found. are	qualified with a ".J"	' flag.	
Chloride		200		mg/kg	1.5	10	1.00	11/10/18 14:24	EPA 300.0	181109L03P
				-						

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Client:	Cardno				Work	Order:	18-1	0-2310		
	20505 Crescent Bay	Drive			Proje	ct Name:	Exx	nMobil NM K	Battery No. 3	, Vacuum Oil
	Lake Forest, CA 926	30-8825			Date	Received		1 1/18		
					Date	Received	. 10/3	1/10		
Attn:	David Purdy									
				An	alytica	al Repo	rt			
Analyte		Result	Flag	Units	MDL	RL	Dilution Factor	Analysis Date/Time	Method	Batch
Sample I	D: 10 (S-20-B12, Solid) Sam	pled: 10/28/1	8 10:30							
EPA 300.	0 Anions (Extraction Method:	N/A) Containe	er - A	to the MDI			if found are	qualified with a " !"	flog	
- Result		(DL), concent 74	rations >=	ma/ka	_ (DL) but < 1.5	< RL (LOQ), 10	1.00 1.00	11/10/18 14:43	EPA 300.0	181109L03P
				0 0						
Sample I	D: 11 (S-25-B12, Solid) Sam	pled: 10/28/1	B 10:40							
- Result	ts were evaluated to the MDL	(DL), concent	rations >=	= to the MDL	_ (DL) but -	< RL (LOQ),	if found, are	qualified with a "J"	flag.	
Chloride		390		mg/kg	1.5	10	1.00	11/10/18 15:02	EPA 300.0	181109L03P
Sample I	D: 12 (S-35-B12, Solid) Sam	pled: 10/28/1	B 11:00							
EPA 300.	0 Anions (Extraction Method:	N/A) Containe	er - A		(51) 1					
- Result	ts were evaluated to the MDL	(DL), concent	rations >=	to the MDL ma/ka	_ (DL) but ∢ 1 5	< RL (LOQ), 10	if found, are	qualified with a "J"	flag. EPA 300.0	181109L03P
Chionde		140		iiig/kg	1.0	10	1.00	11/10/10 10:00	EI A 300.0	1011032001
Sample I	D: 13 (S-40-B12, Solid) Sam	pled: 10/28/1	8 11:30							
EPA 300. - Result	.0 Anions (Extraction Method: ts were evaluated to the MDL	N/A) Containe (DL), concent	er - A rations >=	= to the MDL	_ (DL) but ∢	< RL (LOQ),	if found, are	qualified with a "J"	flag.	
Chloride		110		mg/kg	1.5	10	1.00	11/10/18 16:55	EPA 300.0	181109L03P
Sample I	D: 14 (S-5-B11 Solid) Samn	lod: 10/28/18	12.20							
EPA 300.	.0 Anions (Extraction Method:	N/A) Containe	er - A							
- Result	ts were evaluated to the MDL	(DL), concent	rations >=	= to the MDL	_ (DL) but <	< RL (LOQ),	if found, are	qualified with a "J"	flag.	
Chloride		950		mg/kg	2.9	20	2.00	11/10/18 17:14	EPA 300.0	181109L03P
Sample I	D: 15 (S-10-B11, Solid) Sam	pled: 10/28/1	8 12:25							
EPA 300.	0 Anions (Extraction Method:	N/A) Containe	er - A				if found and		floor	
- Result		40	rations >=	ma/ka	_ (DL) but < 1.5	< RL (LOQ), 10	1.00 1.00	11/10/18 17:33	EPA 300.0	181109L03P
				3 3						
Sample I	D: 16 (S-15-B11, Solid) Sam	pled: 10/28/1	8 12:35							
EPA 300. - Result	.0 Anions (Extraction Method: ts were evaluated to the MDL	N/A) Containe (DL), concent	er - A rations >=	= to the MDL	_ (DL) but -	< RL (LOQ),	if found, are	qualified with a "J"	flag.	
Chloride		630		mg/kg	1.5	10	1.00	11/10/18 17:52	EPA 300.0	181109L03P
Sample I	D: 17 (S-20-B11, Solid) Sam	pled: 10/28/1	8 12:40							
EPA 300 - Result	.0 Anions (Extraction Method: ts were evaluated to the MDL	N/A) Containe (DL), concent	er - A rations >=	= to the MDL	_ (DL) but <	< RL (LOQ).	if found, are	qualified with a "J"	flag.	
Chloride		930		mg/kg	1.5	10	1.00	11/10/18 18:11	EPA 300.0	181109L03P
Sample	D: 18 (9-25-811 Calid) Cam	plad: 10/20/4	8 12.45							
EPA 300.	.0 Anions (Extraction Method:	N/A) Containe	er - A							
- Resul	ts were evaluated to the MDL	(DL), concent	rations >=	= to the MDL	_ (DL) but <	< RL (LOQ),	if found, are	qualified with a "J"	flag.	

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Client:	Cardno				Work	Order:	18-	10-2310		
	20505 Crescent Bay	Drive			Proje	ct Name:	Exx	onMobil NM K	Battery No. 3	, Vacuum Oil
	Lake Forest, CA 9263	30-8825			_		Fiel	ld		
					Date	Received:	10/3	31/18		
Attn:	David Purdy									
				An	alytica	al Repor	t			
Analyte		Result	Flag	Units	MDL	RL	Dilution Factor	Analysis Date/Time	Method	Batch
Chloride		870		mg/kg	1.5	10	1.00	11/10/18 18:30	EPA 300.0	181109L03P
Sample I	D: 19 (S-30-B11, Solid) Samı	pled: 10/28/18	3 12:55							
EPA 300. - Result	0 Anions (Extraction Method: s were evaluated to the MDL	N/A) Containe (DL), concent	er - A rations >=	to the MDL	_ (DL) but ·	< RL (LOQ), if	found, are	e qualified with a "J"	flag.	
Chloride		830		mg/kg	1.5	10	1.00	11/10/18 18:49	EPA 300.0	181109L03P
Sample I	D: 20 (S-35-B11, Solid) Sam	pled: 10/28/18	3 13:15							
EPA 300. - Result	0 Anions (Extraction Method: s were evaluated to the MDL	N/A) Containe (DL), concent	er - A rations >=	to the MDL	_ (DL) but ·	< RL (LOQ), if	found, are	e qualified with a "J"	flag.	
Chloride		40		mg/kg	1.5	10	1.00	11/10/18 19:08	EPA 300.0	181109L03P
Sample I	D: 21 (S-40-B11, Solid) Samı	pled: 10/28/18	3 13:30							
EPA 300. - Result	0 Anions (Extraction Method: s were evaluated to the MDL	N/A) Containe (DL), concent	er - A rations >=	to the MDL	. (DL) but ·	< RL (LOQ), if	found, are	e qualified with a "J"	flag.	
Chloride		110		mg/kg	1.5	10	1.00	11/10/18 19:26	EPA 300.0	181109L03P

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Client:	Cardno	Work Order:	18-10-2310
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
	Lake 1 01031, 077 52050 0025	Date Received:	10/31/18

Attn: David Purdy

PROJECT QUALITY CONTROL DATA Blank

Analyte	Blank Value	Qualifiers	Units	QC Batch	Lab Number	Analysis Date/Time
EPA 300.0 Anions 099-12-922-1011 Chloride	2.7	J	mg/kg	181102L01P	099-12-922-1011	11/03/18 21:48
EPA 300.0 Anions 099-12-922-1015 Chloride	ND		mg/kg	181109L03P	099-12-922-1015	11/10/18 11:33

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Client:	Cardno	Work Order:	18-10-2310
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
	Lake Forest, CA 92630-8825	Date Received:	10/31/18

QUALITY CONTROL Matrix Spike Orig. Val. MS Val. Spike Conc. Target Range Analysis Date/Time Qual. Units % Rec. Analyte Batch Sample Spiked EPA 300.0 Anions 18-11-0078-1 mg/kg Chloride 34.05 534.7 500.0 100 80-120 181102S01P 18-11-0078-1 11/04/18 01:52 EPA 300.0 Anions 18-10-2310-7 271.0 807.2 11/10/18 15:20 Chloride mg/kg 500.0 107 80-120 181109S03P 18-10-2310-7

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Client:	Cardno	Work Order:	18-10-2310
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
	Lake Fulesi, CA 92050-0025	Date Received:	10/31/18

QUALITY CONTROL Matrix Spike Duplicate

Analyte	Orig. Val.	Duplicate	Qual.	Units	Spike Conc.	% Rec.	Target Range	RPD	Limit	Batch	Sample Duplicated	Analysis Date/Time
EPA 300.0 Anions 18-11-0078-1 Chloride	34.05	534.3		mg/kg	500.0	100	80-120	0	0-20	181102S01P	18-11-0078-1	11/04/18 02:13
EPA 300.0 Anions 18-10-2310-7 Chloride	271.0	799.6		mg/kg	500.0	106	80-120	1	0-20	181109S03P	18-10-2310-7	11/10/18 15:39





Client:	Cardno	Work Order:	18-10-2310
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
	Earch 61631, 6A 52636 6625	Date Received:	10/31/18

PROJECT QUALITY CONTROL DATA Laboratory Control Sample

Analyte	Known Val.	Analyzed	Qual.	Units	% Rec.	Target Range	Batch	Analysis Date/Time
EPA 300.0 Anions 099-12-922-1011 Chloride	500.0	509.6		mg/kg	102	90-110	181102L01P	11/03/18 22:08
EPA 300.0 Anions 099-12-922-1015 Chloride	500.0	467.4		mg/kg	93	90-110	181109L03P	11/10/18 11:52

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Work Order: 18-10-2310

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	Sample Analysis Su	immary Re	port	
Method	Extraction	Chemist ID	<u>Instrument</u>	Analytical Location
EPA 300.0	N/A	1027	IC 7	1
EPA 300.0	N/A	1027	IC 9	1

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Location 1: 7440 Lincoln Way, Garden Grove, CA 92841

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Work Order: 18-10-2310

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Glossary of Terms and Qualifiers

Qualifiers	Definition
AZ	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
В	Analyte was present in the associated method blank.
BA	The MS/MSD RPD was out of control due to suspected matrix interference.
BB	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
CI	See case narrative.
DF	Reporting limits elevated due to matrix interferences.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
GE	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
HD	Chromat. profile inconsistent with pattern(s) of ref. fuel stnds.
HO	High concentration matrix spike recovery out of limits
HT	Analytical value calculated using results from associated tests.
HX	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS was in control.
IL	Relative percent difference out of control.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
LD	Analyte presence was not confirmed by second column or GC/MS analysis.
LP	The LCS and/or LCSD recoveries for this analyte were above the upper control limit. The associated sample was non-detected. Therefore, the sample data was reported without further clarification.
LQ	LCS recovery above method control limits.
LR	LCS recovery below method control limits.
ND	Parameter not detected at the indicated reporting limit.
QO	Compound did not meet method-described identification guidelines. Identification was based on additional GC/MS characteristics.
RU	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
SG	A silica gel cleanup procedure was performed.
SN	See applicable analysis comment.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

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Consultant PM and Phone #	David M. Purdy (94	19) 457-894	-					08 bo	300 A	94 M						
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		SAMPLE RECEIPT	CHECKLIST	(COOLEF	، c)F
LIENT:	CARDI	NO		DAT	ге: <u>10</u>	1311:	2018
TEMPERATURE:	(Criteria: 0.0°C – 6	.0°C, not frozen except sedir	nent/tissue)				
Thermometer ID:	SC6 (CF: 0.0°C); Te	emperature (w/o CF): <u>l · 9</u>	°C (w/ CF): <u>1 .</u>	<u>9</u> °c;	Blank	(🗆 Sa	ample
Sample(s) o	utside temperature	criteria (PM/APM contacted I	oy:)		;		
□ Sample(s) o	utside temperature	criteria but received on ice/cl	nilled on same day o	of sampling			
□ Sample(s) rece	ived at ambient tem	perature; placed on ice for tr	ansport by courier				
Ambient Tempera	ture: 🗆 Air 🛛 Filte	r .			Check	ed by: <u>V</u>	160
CUSTODY SEAL							
Cooler DF	resent and Intact	Present but Not Intact	□ Not Present	□ N/A	Check	ed by: 👤	1168
Sample(s)	Present and Intact	Present but Not Intact	D Not Present	🗆 N/A	Check	ed by: <u>#</u>	4/NV
					Vac		
Chain-of-Custody	(COC) document/c) received with samples					
COC document(s)		received with samples		······································			
	te E Samaling tim	ne □ Matrix □ Number of a	containers		استو	-	•
				- 	•		
	requested LINOT			iquisneu uni	์ 🖌		г
Sampler's name in	ndicated on COC		· · · <i>· ·</i> · · · · · · · · · · · · · ·				
Sample container	iabel(s) consistent				<u>2</u>		۔۔
Sample container	(s) intact and in goo		• • • • • • • • • • • • • • • • • • • •	•••) <u> </u>		
Proper containers	for analyses reque	sted					ے ب
Sufficient volume/	mass for analyses r	requested					- -
Samples received	within holding time	· · · · · · · · · · · · · · · · · · ·			لطح		
Aqueous samp	les for certain analy	yses received within 15-minu	te holding time			-	
□ pH □ Resi	dual Chlorine D	issolved Sulfide Dissolve	d Oxygen		U		کر ص
Proper preservatio	on chemical(s) note	d on COC and/or sample cor	ntainer	• • • • • • • • • • • • • • • • • • •	U		X
Unpreserved a	queous sample(s) r	eceived for certain analyses					
Volatile Org	anics 🛛 Total Meta	als Dissolved Metals			_	-	
Acid/base preserv	ved samples - pH wi	ithin acceptable range	••••••••••••	• • • • • • • • • • • • • • • • • • •	U		~
Container(s) for c	ertain analysis free	of headspace			··· LJ ·	L	7
Volatile Org	anics Dissolved		ivea Oxygen (SM 4)	500) a a h)			
Carbon Dio	kide (SM 4500)	Ferrous Iron (SM 3500)	yarogen Sulfide (H	acn)	—	-	
Tedlar™ bag(s) fr	ee of condensation	•••••••••••••••••••••••••••••••••••••••	••••••	•••••	ப	L	Ŷ
CONTAINER TYP	PE:	•i	🤹 ָ (Trip Bla	nk Lot Num	ber:		
Aqueous: 🗆 VOA	□ VOAh □ VOAna₂	□ 100PJ □ 100PJna2 □ 125AG	B 🗆 125AGBĥ 🗆 12	5AGBp 🖾 128	5PB 🗆 128	5PB znna (pH9
□ 250AGB □ 250C	GB □ 250CGBs (pH	2) 🗆 250PB 🗖 250PBn (pH_	_2) 🗆 500AGB 🗆 50	ØAGJ □ 500/	AGJs (pH	_2) □ 50	0PB
🗆 1AGB 🗖 1AGBn	a₂ □ 1AGBs (pH_2)		3na (pH12) □	- Lei Lain	C□	_ U	<u></u>
Solid: 40zCGJ	∃ 8ozCGJ □ 16ozCG		() ⊔ ⊺erraCores° () [] <u>>(C2)</u>	-₩		
Air: □ Tedlar™ □	Canister D Sorbent T			_/· · · · · · · · · · · · · · · · · · ·		U	
			- Ior P - Plastic and	$\pi Z = Z \ln \ln c/R$	esealable	080 0	
Container: A = Amb	ber, B = Bottle, C = Cl	ear, E = Envelope, G = Glass, J	- Jai, F - Flastic, and				1/ AA

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Supplemental Report 1

Additional requested analyses have been added to the original report.

WORK ORDER NUMBER: 18-10-2311

The difference is service



AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For Client: Cardno Client Project Name: ExxonMobil NM K Battery No. 3, Vacuum Oil Field Attention: David Purdy 20505 Crescent Bay Drive Lake Forest, CA 92630-8825

Not for

Approved for release on 11/14/2018 by: Cecile deGuia Project Manager

ResultLink >

Email your PM >

Eurofins Calscience (Calscience) certifies that the test results provided in this report meet all NELAC Institute requirements for parameters for which accreditation is required or available. Any exceptions to NELAC Institute requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.

7440 Lincoln Way, Garden Grove, CA 92841-1432 * TEL: (714) 895-5494 * FAX: (714) 894-7501 * www.calscience.com

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Work Order: 18-10-2311

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Work Order Narrative

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 10/31/18. They were assigned to Work Order 18-10-2311.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

DoD Projects:

The test results contained in this report are accredited under the laboratory's ISO/IEC 17025:2005 and DoD-ELAP accreditation issued by the ANSI-ASQ National Accreditation Board. Refer to certificate and scope of accreditation ADE-1864.

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Client:	Cardno	Work Order:	18-10-2311
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
	Lake 1 01631, OA 32030-0023	PO Number:	013613U118
		Date/Time Received:	10/31/18 10:00
		Number of Containers:	21

Attn: David Purdy

Sample Summary

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
S-5-B9	18-10-2311-1	10/29/18 08:20	1	Solid
S-10-B9	18-10-2311-2	10/29/18 08:25	1	Solid
S-15-B9	18-10-2311-3	10/29/18 08:30	1	Solid
S-20-B9	18-10-2311-4	10/29/18 08:35	1	Solid
S-5-B10	18-10-2311-5	10/29/18 09:10	1	Solid
S-10-B10	18-10-2311-6	10/29/18 09:15	1	Solid
S-15-B10	18-10-2311-7	10/29/18 09:25	1	Solid
S-20-B10	18-10-2311-8	10/29/18 09:35	1	Solid
S-5-B13	18-10-2311-9	10/29/18 10:15	1	Solid
S-10-B13	18-10-2311-10	10/29/18 10:20	1	Solid
S-15-B13	18-10-2311-11	10/29/18 10:30	1	Solid
S-20-B13	18-10-2311-12	10/29/18 10:40	1	Solid
S-5-B2	18-10-2311-13	10/29/18 11:15	1	Solid
S-10-B2	18-10-2311-14	10/29/18 11:20	1	Solid
S-15-B2	18-10-2311-15	10/29/18 11:25	1	Solid
S-20-B2	18-10-2311-16	10/29/18 11:30	1	Solid
S-45-B2	18-10-2311-17	10/29/18 12:45	1	Solid
S-30-B2	18-10-2311-18	10/29/18 11:45	1	Solid
S-35-B2	18-10-2311-19	10/29/18 12:00	1	Solid
S-40-B2	18-10-2311-20	10/29/18 12:15	1	Solid
S-50-B2	18-10-2311-21	10/29/18 13:00	1	Solid

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Client:	Cardno				Work C	Order:	18-1	0-2311			
	20505 Crescent Bay Dr	ive			Project	Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil				
	Lake Forest CA 92630	-8825					Field				
		0010			Date Received:		10/3	1/18			
Attn:	David Purdv										
	20.101 0.09			An	alvtical	Repor	t				
Analvte		Result	Flag	Units	MDL	RL	Dilution	Analysis	Method	Batch	
							Factor	Date/Time			
Sample I	D: 1 (S-5-B9. Solid) Sampled: 1	0/29/18 08:	20								
EPA 300. - Result	0 Anions (Extraction Method: N//	A) Containe	r - A ations >=	to the MDL	. (DL) but < F	rl (Loq). if	found, are	qualified with a "J"	flag.		
Chloride		28		mg/kg	1.5	10	1.00	11/10/18 06:27	EPA 300.0	181109L02P	
FPA 8015	5B GRO (Extraction Method: EP/	A 5030C) Co	ontainer -	A							
- Result	is were evaluated to the MDL (DI	_), concentra	ations >=	to the MDL	. (DL) but < I	RL (LOQ), if	found, are	qualified with a "J"	flag.		
Gasoline	Range Organics	ND		mg/kg	0.092	0.51	1.00	11/10/18 13:35	EPA 8015B	181110L019	
Surr: 1,4-	Bromofluorobenzene (42-126%)	90%						11/10/18 13:35	EPA 8015B	181110L019	
EPA 8260 - Result	DB BTEX/MTBE (Extraction Meth ts were evaluated to the MDL (DI	od: EPA 50 _), concentra	30C) Cor ations >=	ntainer - A to the MDL	. (DL) but < I	RL (LOQ), if	found, are	qualified with a "J"	flag.		
Benzene		ND		mg/kg	0.00013	0.0052	1.00	11/03/18 14:43	EPA 8260B	181103L011	
Toluene		ND		mg/kg	0.00053	0.0052	1.00	11/03/18 14:43	EPA 8260B	181103L011	
Ethylbenz	zene	ND		mg/kg	0.00016	0.0052	1.00	11/03/18 14:43	EPA 8260B	181103L011	
o-Xylene		ND		mg/kg	0.00057	0.0052	1.00	11/03/18 14:43	EPA 8260B	181103L011	
p/m-Xyler	ne	ND		mg/kg	0.00028	0.0052	1.00	11/03/18 14:43	EPA 8260B	181103L011	
Xylenes (total)	ND		mg/kg	0.00028	0.0052	1.00	11/03/18 14:43	EPA 8260B	181103L011	
Surr: 1,4-	Bromofluorobenzene (80-120%)	96%						11/03/18 14:43	EPA 8260B	181103L011	
Surr: Dibr	romofluoromethane (79-133%)	102%						11/03/18 14:43	EPA 8260B	181103L011	
Surr: 1.2-	Dichloroethane-d4 (71-155%)	96%						11/03/18 14:43	EPA 8260B	181103L011	
Surr: Tolu	uene-d8 (80-120%)	99%						11/03/18 14:43	EPA 8260B	181103L011	
Sample I	D: 2 (S-10-B9. Solid) Sampled:	10/29/18 08	3:25								
EPA 300.	0 Anions (Extraction Method: N/	A) Containe	r - A	to the MDI			formed and		flag		
- Result		_), concentra 34	alions >=		1 5	10 xL (LOQ), II	1 00		Πάξ. ΕΡΔ 300 0	181109L02P	
EPA 8015	5B GRO (Extraction Method: EPA	54 (5030C) Co	ontainer -	A	1.5		1.00		LFA 300.0	1011092021	
- Result	is were evaluated to the MDL (DI	_), concentra	ations >=	to the MDL	. (DL) but < I	≺L (LOQ), if	found, are	qualified with a "J"	flag.		
Gasoline	Range Organics	ND		mg/kg	0.091	0.50	1.00	11/10/18 14:09	EPA 8015B	181110L019	
Surr: 1,4-	Bromofluorobenzene (42-126%)	85%						11/10/18 14:09	EPA 8015B	181110L019	
EPA 8260 - Result	DB BTEX/MTBE (Extraction Meth is were evaluated to the MDL (DI	iod: EPA 50 _), concentr	30C) Cor ations >=	ntainer - A to the MDL	. (DL) but < f	RL (LOQ), if	found, are	qualified with a "J"	flag.		
Benzene		ND		mg/kg	0.00013	0.0050	1.00	11/03/18 15:11	EPA 8260B	181103L011	
Toluene		ND		mg/kg	0.00052	0.0050	1.00	11/03/18 15:11	EPA 8260B	181103L011	
Ethylbenz	zene	ND		mg/kg	0.00015	0.0050	1.00	11/03/18 15:11	EPA 8260B	181103L011	
o-Xylene		ND		mg/kg	0.00056	0.0050	1.00	11/03/18 15:11	EPA 8260B	181103L011	
p/m-Xyler	ne	ND		mg/kg	0.00027	0.0050	1.00	11/03/18 15:11	EPA 8260B	181103L011	
Xylenes (total)	ND		mg/kg	0.00027	0.0050	1.00	11/03/18 15:11	EPA 8260B	181103L011	

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Client:	Cardno	Work Order:	18-10-2311
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
	Lake 1 01631, CA 92030-0023	Date Received:	10/31/18

David Purdy Attn:

			An	alytical	Repo	rt			
Analyte	Result	Flag	Units	MDL	RL	Dilution Factor	Analysis Date/Time	Method	Batch
Surr: 1,4-Bromofluorobenzene (80-120%)	97%						11/03/18 15:11	EPA 8260B	181103L011
Surr: Dibromofluoromethane (79-133%)	95%						11/03/18 15:11	EPA 8260B	181103L011
Surr: 1,2-Dichloroethane-d4 (71-155%)	99%						11/03/18 15:11	EPA 8260B	181103L011
Surr: Toluene-d8 (80-120%)	101%						11/03/18 15:11	EPA 8260B	181103L011
Sample ID: 3 (S-15-B9, Solid) Sampled:	10/29/18 (08:30							
EPA 300.0 Anions (Extraction Method: N/ - Results were evaluated to the MDL (DI	A) Contain _), concent	er - A rations >=	= to the MDL	. (DL) but < I	RL (LOQ),	if found, are	qualified with a "J"	flag.	
Chloride	54		mg/kg	1.5	10	1.00	11/10/18 07:08	EPA 300.0	181109L02P
EPA 8015B GRO (Extraction Method: EPA	A 5030C) (- A	(DL) but < [if found are	qualified with a " I"	flag	
Gasoline Range Organics				0 002	0.51		11/10/18 1/·/3	EPA 8015B	1811101 010
Gasoline Kange Organics	ND		iiig/kg	0.092	0.51	1.00	11/10/10 14:43	LFA 0015B	1011102019
Surr: 1,4-Bromofluorobenzene (42-126%)	84%						11/10/18 14:43	EPA 8015B	181110L019
EPA 8260B BTEX/MTBE (Extraction Meth - Results were evaluated to the MDL (DI	iod: EPA 5 _), concent	030C) Co rations >=	ntainer - A = to the MDL	. (DL) but < I	RL (LOQ),	if found, are	qualified with a "J"	flag.	
Benzene	ND		mg/kg	0.00013	0.0050	1.00	11/03/18 17:33	EPA 8260B	181103L011
Toluene	ND		mg/kg	0.00051	0.0050	1.00	11/03/18 17:33	EPA 8260B	181103L011
Ethylbenzene	ND		mg/kg	0.00015	0.0050	1.00	11/03/18 17:33	EPA 8260B	181103L011
o-Xylene	ND		mg/kg	0.00056	0.0050	1.00	11/03/18 17:33	EPA 8260B	181103L011
p/m-Xylene	ND		mg/kg	0.00027	0.0050	1.00	11/03/18 17:33	EPA 8260B	181103L011
Xylenes (total)	ND		mg/kg	0.00027	0.0050	1.00	11/03/18 17:33	EPA 8260B	181103L011
Surr: 1,4-Bromofluorobenzene (80-120%)	97%						11/03/18 17:33	EPA 8260B	181103L011
Surr: Dibromofluoromethane (79-133%)	97%						11/03/18 17:33	EPA 8260B	181103L011
Surr: 1,2-Dichloroethane-d4 (71-155%)	101%						11/03/18 17:33	EPA 8260B	181103L011
Surr: Toluene-d8 (80-120%)	101%						11/03/18 17:33	EPA 8260B	181103L011
Sample ID: 4 (S-20-B9, Solid) Sampled:	10/29/18 (8:35							
EPA 300.0 Anions (Extraction Method: N/A - Results were evaluated to the MDL (DI	 A) Contain _), concent 	er - A rations >=	= to the MDL	. (DL) but < I	RL (LOQ),	if found, are	qualified with a "J"	flag.	
Chloride	9.1	J	mg/kg	1.5	10	1.00	11/10/18 07:28	EPA 300.0	181109L02P
EPA 8015B GRO (Extraction Method: EPA	A 5030C) (- A - to the MDI	(DL) but < F		if found are	qualified with a " I"	flag	
Gasoline Range Organics	ND		mg/kg	0.090	0.50	1.00	11/12/18 16:56	EPA 8015B	181112L033
Surr: 1,4-Bromofluorobenzene (42-126%)	76%						11/12/18 16:56	EPA 8015B	181112L033
EPA 8260B BTEX/MTBE (Extraction Meth	od: EPA 5	030C) Co	ntainer - A	(DL) but – F		if found are	qualified with a ".I"	flag	
Benzene	ND		ma/ka	0.00013	0.0051	1.00	11/03/18 18:02	FPA 8260B	1811031 011
Toluene	ND		ma/ka	0.00013	0.0051	1.00	11/03/18 18:02	EPA 8260B	1811031 011
Ethylbenzene	ND		ma/ka	0.00016	0.0051	1.00	11/03/18 18:02	EPA 8260B	1811031 011
Larybenzene			iiig/kg	0.00010	0.0001	1.00	11/03/10 10.02		TOTTOSEUTT

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Client:	Cardno	Work Order:	18-10-2311
•	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
	Lake Folesi, CA 92030-0025	Date Received:	10/31/18

David Purdy Attn:

Analytical Report

Analyte	Result	Flag	Units	MDL	RL	Dilution Factor	Analysis Date/Time	Method	Batch
o-Xylene	ND		mg/kg	0.00057	0.0051	1.00	11/03/18 18:02	EPA 8260B	181103L011
, p/m-Xylene	ND		mg/kg	0.00028	0.0051	1.00	11/03/18 18:02	EPA 8260B	181103L011
Xylenes (total)	ND		mg/kg	0.00028	0.0051	1.00	11/03/18 18:02	EPA 8260B	181103L011
Surr: 1,4-Bromofluorobenzene (80-120%)	96%						11/03/18 18:02	EPA 8260B	181103L011
Surr: Dibromofluoromethane (79-133%)	94%						11/03/18 18:02	EPA 8260B	181103L011
Surr: 1,2-Dichloroethane-d4 (71-155%)	97%						11/03/18 18:02	EPA 8260B	181103L011
Surr: Toluene-d8 (80-120%)	100%						11/03/18 18:02	EPA 8260B	181103L011
Sample ID: 5 (S-5-B10, Solid) Sampled:	10/29/18 0	9:10							
EPA 300.0 Anions (Extraction Method: N/A - Results were evaluated to the MDL (DL	A) Containe	r - A ations >=	to the MDI	(DL) but < F		f found, are	qualified with a "J"	flag	
Chloride	29		mg/kg	1.5	10	1.00	11/10/18 07:49	EPA 300.0	181109L02P
EPA 8015B GRO (Extraction Method: EPA - Results were evaluated to the MDL (DI	A 5030C) C	ontainer - ations >=	A to the MDL	. (DL) but < F	rl (Loq).	f found. are	qualified with a "J"	flaq.	
Gasoline Range Organics	ND		ma/ka	0.088	0.49	1.00	11/10/18 15:50	EPA 8015B	181110L019
				0.000	0110			217100102	
Surr: 1,4-Bromofluorobenzene (42-126%)	87%						11/10/18 15:50	EPA 8015B	181110L019
EPA 8260B BTEX/MTBE (Extraction Meth - Results were evaluated to the MDL (DI	od: EPA 50 _), concentr	30C) Con ations >=	tainer - A to the MDL	. (DL) but < F	rl (Loq), i	f found, are	qualified with a "J"	flag.	
Benzene	ND		mg/kg	0.00013	0.0051	1.00	11/03/18 18:30	EPA 8260B	181103L011
Toluene	ND		mg/kg	0.00052	0.0051	1.00	11/03/18 18:30	EPA 8260B	181103L011
Ethylbenzene	ND		mg/kg	0.00015	0.0051	1.00	11/03/18 18:30	EPA 8260B	181103L011
o-Xylene	ND		mg/kg	0.00056	0.0051	1.00	11/03/18 18:30	EPA 8260B	181103L011
p/m-Xylene	ND		mg/kg	0.00027	0.0051	1.00	11/03/18 18:30	EPA 8260B	181103L011
Xylenes (total)	ND		mg/kg	0.00027	0.0051	1.00	11/03/18 18:30	EPA 8260B	181103L011
Surr: 1,4-Bromofluorobenzene (80-120%)	98%						11/03/18 18:30	EPA 8260B	181103L011
Surr: Dibromofluoromethane (79-133%)	102%						11/03/18 18:30	EPA 8260B	181103L011
Surr: 1,2-Dichloroethane-d4 (71-155%)	102%						11/03/18 18:30	EPA 8260B	181103L011
Surr: Toluene-d8 (80-120%)	101%						11/03/18 18:30	EPA 8260B	181103L011
Sample ID: 6 (S-10-B10, Solid) Sampled	: 10/29/18	09:15							
EPA 300.0 Anions (Extraction Method: N/A - Results were evaluated to the MDL (DL	A) Containe	r - A ations >=	to the MDL	. (DL) but < F	rl (Loq), i	f found, are	qualified with a "J"	flag.	
Chloride	13		mg/kg	1.5	10	1.00	11/10/18 08:09	EPA 300.0	181109L02P
EPA 8015B GRO (Extraction Method: EPA - Results were evaluated to the MDL (DI	A 5030C) C _), concentr	ontainer - ations >=	A to the MDL	. (DL) but < F	RL (LOQ), i	f found, are	qualified with a "J"	flag.	
Gasoline Range Organics	ND		mg/kg	0.092	0.51	1.00	11/10/18 16:24	EPA 8015B	181110L019
Surr: 1,4-Bromofluorobenzene (42-126%)	96%						11/10/18 16:24	EPA 8015B	181110L019

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Client:	Cardno	Work Order:	18-10-2311
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
		Date Received:	10/31/18

Attn: David Purdy

			An	alytical	Repo	rt			
Analyte	Result	Flag	Units	MDL	RL	Dilution Factor	Analysis Date/Time	Method	Batch
EPA 8260B BTEX/MTBE (Extraction Meth - Results were evaluated to the MDL (D	hod: EPA 5 L), concen	030C) Co trations >:	ntainer - A = to the MDI	L (DL) but < I	RL (LOQ),	if found, are	qualified with a "J"	flag.	
Benzene	ND		mg/kg	0.00013	0.0050	1.00	11/03/18 18:58	EPA 8260B	181103L011
Toluene	ND		mg/kg	0.00052	0.0050	1.00	11/03/18 18:58	EPA 8260B	181103L011
Ethylbenzene	ND		mg/kg	0.00015	0.0050	1.00	11/03/18 18:58	EPA 8260B	181103L011
o-Xylene	ND		mg/kg	0.00056	0.0050	1.00	11/03/18 18:58	EPA 8260B	181103L011
p/m-Xylene	ND		mg/kg	0.00027	0.0050	1.00	11/03/18 18:58	EPA 8260B	181103L011
Xylenes (total)	ND		mg/kg	0.00027	0.0050	1.00	11/03/18 18:58	EPA 8260B	181103L011
Surr: 1,4-Bromofluorobenzene (80-120%)) 97%						11/03/18 18:58	EPA 8260B	181103L011
Surr: Dibromofluoromethane (79-133%)	100%						11/03/18 18:58	EPA 8260B	181103L011
Surr: 1,2-Dichloroethane-d4 (71-155%)	102%						11/03/18 18:58	EPA 8260B	181103L011
Surr: Toluene-d8 (80-120%)	100%						11/03/18 18:58	EPA 8260B	181103L011
Sample ID: 7 (S-15-B10, Solid) Sample	d: 10/29/18	09:25							
EPA 300.0 Anions (Extraction Method: N/ - Results were evaluated to the MDL (D	/A) Contain /L), concen	er - A trations >⊧	= to the MDI	L (DL) but < I	RL (LOQ),	if found, are	qualified with a "J"	flag.	
Chloride	17		mg/kg	1.5	10	1.00	11/10/18 08:29	EPA 300.0	181109L02P
EPA 8015B GRO (Extraction Method: EP - Results were evaluated to the MDL (D	A 5030C) (L), concen	Container trations >:	- A = to the MDI	L (DL) but < I	RL (LOQ).	if found, are	qualified with a "J"	flaq.	
Gasoline Range Organics	ND		mg/kg	0.093	0.51	1.00	11/10/18 16:58	EPA 8015B	181110L019
Surr: 1,4-Bromofluorobenzene (42-126%)) 98%						11/10/18 16:58	EPA 8015B	181110L019
EPA 8260B BTEX/MTBE (Extraction Meth - Results were evaluated to the MDL (D	hod: EPA 5 L). concen	i030C) Co trations >:	ntainer - A = to the MDI	L (DL) but < I	RL (LOQ).	if found. are	qualified with a "J"	flag.	
Benzene	ND		mg/kg	0.00013	0.0051	1.00	11/03/18 19:26	EPA 8260B	181103L011
Toluene	ND		mg/kg	0.00053	0.0051	1.00	11/03/18 19:26	EPA 8260B	181103L011
Ethylbenzene	ND		mg/kg	0.00015	0.0051	1.00	11/03/18 19:26	EPA 8260B	181103L011
o-Xylene	ND		mg/kg	0.00057	0.0051	1.00	11/03/18 19:26	EPA 8260B	181103L011
p/m-Xylene	ND		mg/kg	0.00027	0.0051	1.00	11/03/18 19:26	EPA 8260B	181103L011
Xylenes (total)	ND		mg/kg	0.00027	0.0051	1.00	11/03/18 19:26	EPA 8260B	181103L011
Surr: 1,4-Bromofluorobenzene (80-120%,) 98%						11/03/18 19:26	EPA 8260B	181103L011
Surr: Dibromofluoromethane (79-133%)	102%						11/03/18 19:26	EPA 8260B	181103L011
Surr: 1,2-Dichloroethane-d4 (71-155%)	104%						11/03/18 19:26	EPA 8260B	181103L011
Surr: Toluene-d8 (80-120%)	100%						11/03/18 19:26	EPA 8260B	181103L011
Sample ID: 8 (S-20-B10, Solid) Sample	d: 10/29/18	09:35							
EPA 300.0 Anions (Extraction Method: N/ - Results were evaluated to the MDL (D	A) Contain L), concen	er - A trations >=	= to the MDI	L (DL) but < I	RL (LOQ),	if found, are	qualified with a "J"	flag.	
Chloride	30		mg/kg	1.5	10	1.00	11/10/18 08:50	EPA 300.0	181109L02P

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Client [.]	Cardno				Work ()rder:	18-1	18-10-2311				
Chorne.	20505 Crescent Ray D	rive			Project	Name	Evv	ExxonMobil NM K Rattery No. 3. Vacuum Oil				
	20000 Crescent Bay Di				Појес	name.	Field					
	Lake Forest, CA 92630	-8825			Date R	Date Received:		10/31/18				
• • •												
Attn:	David Purdy											
				An	alytical	Repor	t					
Analyte		Result	Flag	Units	MDL	RL	Dilution Factor	Analysis Date/Time	Method	Batch		
EPA 801	5B GRO (Extraction Method: EP/	A 5030C) C	Container	- A								
- Resul	ts were evaluated to the MDL (DI	L), concent	rations >=	to the MDL	_ (DL) but < I	RL (LOQ), if	found, are	qualified with a "J"	flag.			
Gasoline	Range Organics	ND		mg/kg	0.094	0.52	1.00	11/10/18 17:32	EPA 8015B	181110L019		
Surr: 1,4	Bromofluorobenzene (42-126%)	63%						11/10/18 17:32	EPA 8015B	181110L019		
EPA 826	0B BTEX/MTBE (Extraction Meth	od: EPA 5	030C) Co	ntainer - A			formed one		flag			
- Resul	is were evaluated to the MDL (DI	 _), concent 	rations >=	= to the MDL	(DL) DU(< 1)		1 00	11/03/18 10:55	EDA 8260B	1811031 011		
Toluono		0.00013	J	mg/kg	0.00013	0.0050	1.00	11/03/18 19:55	EPA 8260B	1811032011		
Ethylbon	7000			mg/kg	0.00052	0.0050	1.00	11/03/18 19:55	EPA 8260B	181103L011		
	26116			mg/kg	0.00013	0.0050	1.00	11/03/18 19:55	EPA 8260B	1811031011		
n/m-Xyle	20			mg/kg	0.00030	0.0050	1.00	11/03/18 10:55	EPA 8260B	1811031011		
Xylenes /	(total)			mg/kg	0.00027	0.0050	1.00	11/03/18 19:55	EPA 8260B	1811031011		
Ayleries (ND		iiig/kg	0.00027	0.0050	1.00	11/03/10 19.33		1011032011		
Surr: 1,4	-Bromofluorobenzene (80-120%)	97%						11/03/18 19:55	EPA 8260B	181103L011		
Surr: Dib	romofluoromethane (79-133%)	101%						11/03/18 19:55	EPA 8260B	181103L011		
Surr: 1,2	-Dichloroethane-d4 (71-155%)	99%						11/03/18 19:55	EPA 8260B	181103L011		
Surr: Tol	uene-d8 (80-120%)	100%						11/03/18 19:55	EPA 8260B	181103L011		
Sample I	D: 9 (S-5-B13, Solid) Sampled:	10/29/18 1	0:15									
EPA 300 - Resul	.0 Anions (Extraction Method: N// ts were evaluated to the MDL (DI	A) Containe L), concent	er - A rations >=	= to the MDL	_ (DL) but < I	RL (LOQ), if	found, are	qualified with a "J"	flag.			
Chloride		92		mg/kg	2.9	20	2.00	11/10/18 09:10	EPA 300.0	181109L02P		
Sample I	D: 10 (S-10-B13, Solid) Sample	d· 10/29/1	8 10.20									
EPA 300	.0 Anions (Extraction Method: N/	A) Containe	er - A									
- Resul	ts were evaluated to the MDL (DI), concent	rations >=	to the MDL	_ (DL) but < I	RL (LOQ), if	found, are	qualified with a "J"	flag.			
Chloride		340		mg/kg	1.5	10	1.00	11/10/18 09:31	EPA 300.0	181109L02P		
Sample I	D: 11 (S-15-B13, Solid) Sample	d: 10/29/1	8 10:30									
EPA 300 - Resul	.0 Anions (Extraction Method: N/, ts were evaluated to the MDL (DI	A) Containe L), concent	er - A rations >=	= to the MDL	_ (DL) but < I	RL (LOQ), if	found, are	qualified with a "J"	flag.			
Chloride	(450		mg/kg	1.5	10	1.00	11/10/18 10:32	EPA 300.0	181109L02P		
Sample	D: 12 (S-20-R13 Solid) Sample	d. 10/20/4	8 10-40									
EPA 300	0 Anions (Extraction Method: N/	$(\Delta) Contain($	-r-Δ									
- Resul	ts were evaluated to the MDL (DI	L), concent	rations >=	= to the MDL	_ (DL) but < I	RL (LOQ), if	found, are	qualified with a "J"	flag.			
Chloride		21		mg/kg	1.5	10	1.00	11/10/18 10:52	EPA 300.0	181109L02P		
Sample I	D: 13 (S-5-B2, Solid) Sampled:	10/29/18 1	1:15									
EPA 300 - Resul	.0 Anions (Extraction Method: N/	A) Containe	er - A rations >=	= to the MDI	_ (DL) but < I	RL (LOQ), if	found, are	qualified with a ".!"	flag			

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181109L02P

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10

1.00

11/10/18 11:13 EPA 300.0

1.5

mg/kg

560

Chloride

🔅 eurofins

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Client:	Cardno				Work	Order:	18-1	0-2311				
	20505 Crescent Bay	Drive			Proje	ct Name:	Exxo	ExxonMobil NM K Battery No. 3, Vacuum Oil				
	Lake Forest, CA 926	30-8825			Data	Pacaivad		FIEID				
					Dale	Received	. 10/3	1/10				
Attn:	David Purdy											
				An	alytica	al Repoi	rt					
Analyte		Result	Flag	Units	MDL	RL	Dilution Factor	Analysis Date/Time	Method	Batch		
Sample I	D: 14 (S-10-B2, Solid) Samp	led: 10/29/18	11:20									
EPA 300.	0 Anions (Extraction Method:	N/A) Contain	er - A	- to the MDI	(DL) but a		if found are	qualified with a " I"	flag			
Chloride		(DL), concern 890		mg/kg	1.5	10	1.00	11/10/18 11:33	EPA 300.0	181109L02P		
	- /-/- /											
Sample I	D: 15 (S-15-B2, Solid) Samp	led: 10/29/18 N/A) Contain	er - A									
- Result	ts were evaluated to the MDL	(DL), concent	trations >=	= to the MDL	. (DL) but -	< RL (LOQ),	if found, are	qualified with a "J"	flag.			
Chloride		840		mg/kg	1.5	10	1.00	11/10/18 11:53	EPA 300.0	181109L02P		
Sample I	D: 16 (S-20-B2, Solid) Samp	led: 10/29/18	11:30									
EPA 300. - Result	.0 Anions (Extraction Method: ts were evaluated to the MDL	N/A) Contain (DL), concent	er - A trations >=	= to the MDL	. (DL) but ∢	< RL (LOQ), i	if found, are	qualified with a "J"	flaq.			
Chloride		1600		mg/kg	2.9	20	2.00	11/10/18 12:14	EPA 300.0	181109L02P		
Sample I	D: 17 (S-45-B2, Solid) Samp	led: 10/29/18	12:45									
EPA 300.	0 Anions (Extraction Method:	N/A) Contain	er - A						()			
- Result Chloride	ts were evaluated to the MDL	(DL), concent 120	trations >=	mg/kg	. (DL) but « 1.5	10 RL (LOQ), 1	1.00	qualified with a "J" 11/10/18 12:34	EPA 300.0	181109L02P		
				0.0								
Sample I	D: 18 (S-30-B2, Solid) Samp	led: 10/29/18	11:45									
- Result	ts were evaluated to the MDL	(DL), concent	trations >=	= to the MDL	. (DL) but -	< RL (LOQ),	if found, are	qualified with a "J"	flag.			
Chloride		260		mg/kg	1.5	10	1.00	11/10/18 12:54	EPA 300.0	181109L02P		
Sample I	D: 19 (S-35-B2, Solid) Samp	led: 10/29/18	12:00									
EPA 300. - Result	0 Anions (Extraction Method: ts were evaluated to the MDL	N/A) Contain (DL), concent	er - A trations >=	= to the MDL	. (DL) but <	< RL (LOQ), i	if found, are	qualified with a "J"	flaq.			
Chloride		320		mg/kg	1.5	10	1.00	. 11/10/18 13:15	EPA 300.0	181109L02P		
Sample I	D: 20 (S-40-B2, Solid) Samp	led: 10/29/18	12:15									
EPA 300.	0 Anions (Extraction Method:	N/A) Contain	er - A	- to the MDI	(DL) but		if found are	qualified with a " I"	flag			
Chloride		340		mg/kg	1.5	10	1.00	11/10/18 13:35	EPA 300.0	181109L02P		
Sample I	D: 21 (S-50-B2 Solid) Samn	lad: 10/20/18	13.00									
EPA 300.	.0 Anions (Extraction Method:	N/A) Contain	er - A				if found are	qualified with a " !"	flag			
- Result Chloride	is were evaluated to the MDL	56	uauons >=	mg/kg	י זטע <i>ו</i> בן. 1.5	10 x rxL (LOQ), 1	1.00 1.00	11/01/18 16:57	EPA 300.0	181101L01P		
EPA 101	0A(M) Ignitability (Extraction N	lethod: N/A) (Container	- A	(DL) but		if found are		flog			
- Result	is were evaluated to the MDL	(L), concent >212	uations >=	= to the MDL ⁰F	- סע (גע) but א 70	< rkl (LUQ), 1 70	1.00 1.00	quaimed with a "J" 11/01/18 12:00	nag. EPA 1010A(M)	I1101FPD1		
.												

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Client:	Cardno					Work Order:		18-10-2311				
	20505 Crescent Bay Drive Lake Forest, CA 92630-8825				Project Name: Date Received:		Exxo Field	ExxonMobil NM K Battery No. 3, Vacuum Oil Field 10/31/18				
							10/3					
Attn:	David Purdy											
Analytical Report												
Analyte		Result	Flag	Units	MDL	RL	Dilution Factor	Analysis Date/Time	Method	Batch		
EPA 9045 - Results	C pH (Extraction Method: I s were evaluated to the ME	N/A) Container - DL (DL), concent	A rations >=	to the MDL	(DL) but <	RL (LOQ), i	f found, are	qualified with a "J"	flag.			
pН		8.13		pH units	0.01	0.01	1.00	11/01/18 09:45	EPA 9045C	I1101PHD2		
SW-846 C	hapter 7 Reactive Cyanide	e (Extraction Met	thod: N/A)	Container -	A							
- Results	s were evaluated to the ME	DL (DL), concent	rations >=	to the MDL	(DL) but <	RL (LOQ), i	f found, are	qualified with a "J"	flag.			
Jyanide, F	Reactive	ND		mg/kg	0.24	0.50	1.00	11/01/18 12:53	SW-846, Chapter 7	11101RCNB		
SW-846 C - Results	hapter 7 Reactive Sulfide were evaluated to the ME	(Extraction Meth DL (DL), concent	nod: N/A) rations >=	Container -	A . (DL) but <	RL (LOQ), i	f found, are	qualified with a "J"	flag.			
Sulfide, Re	eactive	ND		mg/kg	1.2	2.0	1.00	10/01/18 16:00	SW-846, Chapter 7	I1031RSB2		
EPA 8015	B DRO (Extraction Method	I: EPA 3550B) C	ontainer -	A								
- Results	s were evaluated to the MD	DL (DL), concent	rations >=	to the MDL	(DL) but <	RL (LOQ),	f found, are	qualified with a "J"	flag.			
Diesel Rar	nge Organics	ND		mg/kg	1.3	5.3	1.00	11/01/18 13:42	EPA 8015B	181031B12		
Surr: n-Oc	stacosane (42-162%)	110%						11/01/18 13:42	EPA 8015B	181031B12		
EPA 8015	B GRO (Extraction Method	: EPA 5030C) C	Container	- A			f farmal and		fla r			
- Results	s were evaluated to the ML	DL (DL), concent	rations >=	= to the MDL	(DL) but <	RL (LOQ), I	1 100nd, are			1910211 050		
Gasoline r	Varige Organics	ND		nig/kg	0.089	0.49	1.00	10/31/18 20.39	EFA 6015B	1010312038		
Surr: 1,4-E	Bromofluorobenzene (42-1	26%) 76%						10/31/18 20:39	EPA 8015B	181031L059		
EPA 6010	B/7471A CAC Title 22 Met	als (Extraction N	/lethod: El	PA 3050B) (to the MDI	Container - / (DL) but <	A RL (LOQ), i	f found, are	qualified with a ".I"	flag			
Antimony		ND		mg/kg	0.153	0.769	1.03	11/01/18 13:43	EPA 6010B	181031L04		
Arsenic		ND		mg/kg	0.266	0.769	1.03	11/01/18 13:43	EPA 6010B	181031L04		
Barium		13.1		mg/kg	0.158	0.513	1.03	11/01/18 13:43	EPA 6010B	181031L04		
Beryllium		0.172	J	mg/kg	0.140	0.256	1.03	11/01/18 13:43	EPA 6010B	181031L04		
Cadmium		ND		mg/kg	0.139	0.513	1.03	11/01/18 13:43	EPA 6010B	181031L04		
Chromium	L	6.67		mg/kg	0.146	0.256	1.03	11/01/18 13:43	EPA 6010B	181031L04		
Cobalt		0.288		mg/kg	0.152	0.256	1.03	11/01/18 13:43	EPA 6010B	181031L04		
Copper		1.22		mg/kg	0.138	0.513	1.03	11/01/18 13:43	EPA 6010B	181031L04		
_ead		0.738		mg/kg	0.135	0.513	1.03	11/01/18 13:43	EPA 6010B	181031L04		
Molybden	um	ND		mg/kg	0.135	0.256	1.03	11/01/18 13:43	EPA 6010B	181031L04		
Nickel		1.35		mg/kg	0.148	0.256	1.03	11/01/18 13:43	EPA 6010B	181031L04		
Selenium		ND		mg/kg	0.307	0.769	1.03	11/01/18 13:43	EPA 6010B	181031L04		
Silver		ND		mg/kg	0.0879	0.256	1.03	11/01/18 13:43	EPA 6010B	181031L04		
Thallium		ND		mg/kg	0.156	0.769	1.03	11/01/18 13:43	EPA 6010B	181031L04		
√anadium		10.7		mg/kg	0.145	0.256	1.03	11/01/18 13:43	EPA 6010B	181031L04		
Zinc		1.88		mg/kg	0.182	1.03	1.03	11/01/18 13:43	EPA 6010B	181031L04		
EPA 7471	A Mercury (Extraction Met	hod: EPA 7471A	Total) Co	ontainer - A			f found are	gualified with a " !"	flag			
- Results	s were evaluated to the ML	DL), concent	1au0115 >=		(DL) but <	RL(LOQ),	i iouria, are	quaimeu with a "J"	nay.			

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Client:	Cardno	Work Order:	18-10-2311
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
	Lake 1 01est, CA 32030-0023	Date Received:	10/31/18

Attn: David Purdy

Analytical Report

				•	•				
Analyte	Result	Flag	Units	MDL	RL	Dilution Factor	Analysis Date/Time	Method	Batch
EPA 8260B BTEX/MTRE (Extraction Meth	od EPA 5		ntainer - Δ						
- Results were evaluated to the MDL (DL	L), concent	rations >=	to the MDL	_ (DL) but < F	RL (LOQ), i	f found, are	qualified with a "J"	flag.	
Benzene	ND		mg/kg	0.00013	0.0050	1.00	10/31/18 16:18	EPA 8260B	181031L010
Toluene	ND		mg/kg	0.00052	0.0050	1.00	10/31/18 16:18	EPA 8260B	181031L010
Ethylbenzene	ND		mg/kg	0.00015	0.0050	1.00	10/31/18 16:18	EPA 8260B	181031L010
o-Xylene	ND		mg/kg	0.00056	0.0050	1.00	10/31/18 16:18	EPA 8260B	181031L010
p/m-Xylene	ND		mg/kg	0.00027	0.0050	1.00	10/31/18 16:18	EPA 8260B	181031L010
Xylenes (total)	ND		mg/kg	0.00027	0.0050	1.00	10/31/18 16:18	EPA 8260B	181031L010
Surr: 1 4-Bromofluorobenzene (80-120%)	92%						10/31/18 16:18	FPA 8260B	1810311 010
Surr: Dibromofluoromethane (79-133%)	101%						10/31/18 16:18	EPA 8260B	181031L010
Surr: 1,2-Dichloroethane-d4 (71-155%)	101%						10/31/18 16:18	EPA 8260B	181031L010
Surr: Toluene-d8 (80-120%)	96%						10/31/18 16:18	EPA 8260B	181031L010

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Client:	Cardno	Work Order:	18-10-2311
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
	Lake 1 01651, CA 32030-0023	Date Received:	10/31/18

David Purdy Attn:

PROJECT QUALITY CONTROL DATA Blank

Analyte	Blank Value	Qualifiers	Units	QC Batch	Lab Number	Analysis Date/Time	
EBA 200.0 Anione							
000-12-022-1014							
Chloride	ND		mg/kg	181109L02P	099-12-922-1014	11/10/18 05:47	
EPA 300.0 Anions							
099-12-922-1010							
Chloride	ND		mg/kg	181101L01P	099-12-922-1010	11/01/18 17:54	
SW-846 Chapter 7 Reactive Cyanide							
099-05-031-2446							
Cyanide, Reactive	ND		mg/kg	11101RCNB1	099-05-031-2446	11/01/18 12:53	
SW-846 Chapter 7 Reactive Sulfide							
099-05-033-3401							
Sulfide, Reactive	ND		mg/kg	11031RSB2	099-05-033-3401	10/01/18 16:00	
EPA 8015B DRO							
099-15-414-1192							
Diesel Range Organics	ND		mg/kg	181031B12	099-15-414-1192	11/01/18 04:06	
Surr: n-Octacosane (42-162%)	97%			181031B12	099-15-414-1192	11/01/18 04:06	
EPA 8015B GRO							
099-12-024-1263							
Gasoline Range Organics	ND		mg/kg	181110L019	099-12-024-1263	11/10/18 09:05	
Surr: 1,4-Bromofluorobenzene (42-126%)	93%			181110L019	099-12-024-1263	11/10/18 09:05	
EPA 8015B GRO							
099-12-024-1264							
Gasoline Range Organics	ND		mg/kg	181112L033	099-12-024-1264	11/12/18 15:49	
Surr: 1,4-Bromofluorobenzene (42-126%)	82%			181112L033	099-12-024-1264	11/12/18 15:49	
EPA 8015B GRO							
099-12-024-1258							
Gasoline Range Organics	ND		mg/kg	181031L059	099-12-024-1258	10/31/18 19:35	
Surr: 1,4-Bromofluorobenzene (42-126%)	72%			181031L059	099-12-024-1258	10/31/18 19:35	
EPA 6010B/7471A CAC Title 22 Metals							
097-01-002-27179							
Antimony	ND		mg/kg	181031L04	097-01-002-27179	11/01/18 10:53	
Arsenic	ND		mg/kg	181031L04	097-01-002-27179	11/01/18 10:53	
Barium	ND		mg/kg	181031L04	097-01-002-27179	11/01/18 10:53	
Beryllium	ND		mg/kg	181031L04	097-01-002-27179	11/01/18 10:53	
- Cadmium	ND		ma/ka	181031L04	097-01-002-27179	11/01/18 10.53	
Chromium			ma/ka	1810311.04	097-01-002-27179	11/01/18 10:53	
Cobalt	ND		mg/kg	1810311 04	007-01-002-27170	11/01/18 10:53	
oubait			шулу	101031204	037-01-002-27179	11/01/10 10.00	

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Client:	Cardno	Work Order:	18-10-2311
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
	Lake Foresi, CA 92030-0023	Date Received:	10/31/18

Attn: David Purdy

PROJECT QUALITY CONTROL DATA Blank

Analyte	Blank Value Qualifiers Units QC Batch		QC Batch	Lab Number	Analysis Date/Time	
0	ND			101001101	007.04.000.07170	44/04/40 40 50
Copper	ND		mg/kg	181031L04	097-01-002-27179	11/01/18 10:53
Lead	ND		mg/kg	181031L04	097-01-002-27179	11/01/18 10:53
Molybdenum	ND		mg/kg	181031L04	097-01-002-27179	11/01/18 10:53
Nickel	ND		mg/kg	181031L04	097-01-002-27179	11/01/18 10:53
Selenium	ND		mg/kg	181031L04	097-01-002-27179	11/01/18 10:53
Silver	ND		mg/kg	181031L04	097-01-002-27179	11/01/18 10:53
Thallium	ND		mg/kg	181031L04	097-01-002-27179	11/01/18 10:53
Vanadium	ND		mg/kg	181031L04	097-01-002-27179	11/01/18 10:53
Zinc	ND		mg/kg	181031L04	097-01-002-27179	11/01/18 10:53
EPA 7471A Mercury						
099-16-272-4240			r			
Mercury	0.0124	J	mg/kg	181101L01A	099-16-272-4240	11/01/18 14:09
EPA 8260B BTEX/MTBE						
099-12-882-2131						
Benzene	ND		mg/kg	181103L011	099-12-882-2131	11/03/18 13:46
Toluene	ND		mg/kg	181103L011	099-12-882-2131	11/03/18 13:46
Ethylbenzene	ND		mg/kg	181103L011	099-12-882-2131	11/03/18 13:46
o-Xylene	ND		mg/kg	181103L011	099-12-882-2131	11/03/18 13:46
p/m-Xylene	ND		mg/kg	181103L011	099-12-882-2131	11/03/18 13:46
Xylenes (total)	ND		mg/kg	181103L011	099-12-882-2131	11/03/18 13:46
Surr: 1,4-Bromofluorobenzene (80-120%)	97%			181103L011	099-12-882-2131	11/03/18 13:46
Surr: Dibromofluoromethane (79-133%)	99%			181103L011	099-12-882-2131	11/03/18 13:46
Surr: 1,2-Dichloroethane-d4 (71-155%)	100%			181103L011	099-12-882-2131	11/03/18 13:46
Surr: Toluene-d8 (80-120%)	100%			181103L011	099-12-882-2131	11/03/18 13:46
EPA 8260B BTEX/MTBE						
099-12-882-2127						
Benzene	ND		mg/kg	181031L010	099-12-882-2127	10/31/18 14:56
Toluene	ND		mg/kg	181031L010	099-12-882-2127	10/31/18 14:56
Ethylbenzene	ND		mg/kg	181031L010	099-12-882-2127	10/31/18 14:56
o-Xylene	ND		mg/kg	181031L010	099-12-882-2127	10/31/18 14:56
p/m-Xylene	ND		mg/kg	181031L010	099-12-882-2127	10/31/18 14:56
Xylenes (total)	ND		mg/kg	181031L010	099-12-882-2127	10/31/18 14:56
Surr: 1,4-Bromofluorobenzene (80-120%)	92%			181031L010	099-12-882-2127	10/31/18 14:56
Surr: Dibromofluoromethane (79-133%)	102%			181031L010	099-12-882-2127	10/31/18 14:56
Surr: 1,2-Dichloroethane-d4 (71-155%)	103%			181031L010	099-12-882-2127	10/31/18 14:56
Surr: Toluene-d8 (80-120%)	96%			181031L010	099-12-882-2127	10/31/18 14:56

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Client:	Cardno	Work Order:	18-10-2311
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
		Date Received:	10/31/18

QUALITY CONTROL Matrix Spike

Analyte	Orig. Val.	MS Val.	Qual.	Units	Spike Conc.	% Rec.	Target Range	Batch	Sample Spiked	Analysis Date/Time
	-				-	-				
EPA 300.0 Anions										
18-10-2311-17										
Chloride	123.3	726.8	НХ	mg/kg	500.0	121	80-120	181109S02P	18-10-2311-17	11/10/18 13:56
EPA 300.0 Anions										
18-10-2311-21										
Chloride	56.45	574.2		mg/kg	500.0	104	80-120	181101S01P	18-10-2311-21	11/01/18 17:16
EPA 8015B DRO										
18-10-2353-3										
Diesel Range Organics	13770	3297	HX	mg/kg	400.0	0	33-153	181031S12	18-10-2353-3	11/01/18 06:57
EPA 8015B GRO										
18-11-0838-1										
Gasoline Range Organics	ND	5.792	HX	mg/kg	10.00	58	66-108	181110S007	18-11-0838-1	11/10/18 12:27
EPA 8015B GRO										
18-10-2311-4										
Gasoline Range Organics	ND	6.459	HX	mg/kg	10.00	65	66-108	181112S010	18-10-2311-4	11/12/18 18:04
EPA 8015B GRO										
18-10-2311-21										
Gasoline Range Organics	ND	8.409		mg/kg	10.00	84	66-108	181031S021	18-10-2311-21	10/31/18 21:11
EPA 6010B/7471A CAC Title 22 Meta	Is									
18-10-2390-1										
Antimony	ND	9.810	HX	mg/kg	25.00	39	50-115	181031S04	18-10-2390-1	11/01/18 11:01
Arsenic	6.421	29.30		mg/kg	25.00	92	75-125	181031S04	18-10-2390-1	11/01/18 11:01
Barium	90.79	107.5	HX	mg/kg	25.00	67	75-125	181031S04	18-10-2390-1	11/01/18 11:01
Beryllium	0.5391	24.94		mg/kg	25.00	98	75-125	181031S04	18-10-2390-1	11/01/18 11:01
Cadmium	ND	24.56		mg/kg	25.00	98	75-125	181031S04	18-10-2390-1	11/01/18 11:01
Chromium	11.59	33.98		mg/kg	25.00	90	75-125	181031S04	18-10-2390-1	11/01/18 11:01
Cobalt	5.481	29.01		mg/kg	25.00	94	75-125	181031S04	18-10-2390-1	11/01/18 11:01
Copper	11.17	34.17		mg/kg	25.00	92	75-125	181031S04	18-10-2390-1	11/01/18 11:01
Lead	3.029	27.27		mg/kg	25.00	97	75-125	181031S04	18-10-2390-1	11/01/18 11:01
Molybdenum	ND	21.75		mg/kg	25.00	87	75-125	181031S04	18-10-2390-1	11/01/18 11:01
Nickel	6.079	28.55		mg/kg	25.00	90	75-125	181031S04	18-10-2390-1	11/01/18 11:01
Selenium	ND	21.79		mg/kg	25.00	87	75-125	181031S04	18-10-2390-1	11/01/18 11:01
Silver	ND	11.95		mg/kg	12.50	96	75-125	181031S04	18-10-2390-1	11/01/18 11:01
Thallium	ND	23.02		mg/kg	25.00	92	75-125	181031S04	18-10-2390-1	11/01/18 11:01
Vanadium	39.70	59.91		mg/kg	25.00	81	75-125	181031S04	18-10-2390-1	11/01/18 11:01
Zinc	28.04	50.92		mg/kg	25.00	92	75-125	181031S04	18-10-2390-1	11/01/18 11:01

EPA 7471A Mercury

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Client:	Cardno	Work Order:	18-10-2311
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
	Lake 1 01631, OA 32030-0023	Date Received:	10/31/18

QUALITY CONTROL Matrix Spike

Analyte	Orig. Val.	MS Val.	Qual.	Units	Spike Conc.	% Rec.	Target Range	Batch	Sample Spiked	Analysis Date/Time
18-10-2390-1										
Mercury	ND	0.9663		mg/kg	0.8350	116	75-125	181101S01	18-10-2390-1	11/01/18 14:16
EPA 8260B BTEX/MTBE										
18-10-2311-1										
Benzene	ND	0.04296		mg/kg	0.05000	86	61-127	181103S004	18-10-2311-1	11/03/18 15:40
Toluene	ND	0.04432		mg/kg	0.05000	89	63-123	181103S004	18-10-2311-1	11/03/18 15:40
Ethylbenzene	ND	0.04547		mg/kg	0.05000	91	57-129	181103S004	18-10-2311-1	11/03/18 15:40
o-Xylene	ND	0.04508		mg/kg	0.05000	90	70-130	181103S004	18-10-2311-1	11/03/18 15:40
p/m-Xylene	ND	0.08981		mg/kg	0.1000	90	70-130	181103S004	18-10-2311-1	11/03/18 15:40
EPA 8260B BTEX/MTBE										
18-10-2102-13										
Benzene	ND	0.04162		mg/kg	0.05000	83	61-127	181031S003	18-10-2102-13	10/31/18 17:40
Toluene	ND	0.04326		mg/kg	0.05000	87	63-123	181031S003	18-10-2102-13	10/31/18 17:40
Ethylbenzene	ND	0.04176		mg/kg	0.05000	84	57-129	181031S003	18-10-2102-13	10/31/18 17:40
o-Xylene	ND	0.04213		mg/kg	0.05000	84	70-130	181031S003	18-10-2102-13	10/31/18 17:40
p/m-Xylene	ND	0.08405		mg/kg	0.1000	84	70-130	181031S003	18-10-2102-13	10/31/18 17:40

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Client:	Cardno	Work Order:	18-10-2311
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
		Date Received:	10/31/18

QUALITY CONTROL Matrix Spike Duplicate

Analyte	Orig. Val.	Duplicate	Qual.	Units	Spike Conc.	% Rec.	Target Range	RPD	Limit	Batch	Sample Duplicated	Analysis Date/Time
EBA 200 0 Anions												
18-10-2311-17												
Chloride	123.3	727.4	HX	mg/kg	500.0	121	80-120	0	0-20	181109S02P	18-10-2311-17	11/10/18 14:16
EPA 300.0 Anions												
18-10-2311-21 Chloride	56.45	557.4		mg/kg	500.0	100	80-120	3	0-20	181101S01P	18-10-2311-21	11/01/18 17:35
19-10-2353-3												
Diesel Range Organics	13770	4250	ΗХ	mg/kg	400.0	0	33-153	25	0-32	181031S12	18-10-2353-3	11/01/18 07:18
EPA 8015B GRO												
18-11-0838-1												
Gasoline Range Organics	ND	5.820	HX	mg/kg	10.00	58	66-108	0	0-18	181110S007	18-11-0838-1	11/10/18 13:01
EPA 8015B GRO												
18-10-2311-4		0.005	D 4		10.00		00.400	~-	0.40	4044400040	10.10.0011.1	
Gasoline Range Organics	ND	8.325	ВА	mg/kg	10.00	83	66-108	25	0-18	181112S010	18-10-2311-4	11/12/18 18:38
EPA 8015B GRO												
18-10-2311-21		0.540			10.00		00.400		0.40	4040040004	10.10.0011.01	
Gasoline Range Organics	ND	8.512		mg/kg	10.00	85	66-108	1	0-18	1810318021	18-10-2311-21	10/31/18 21:43
EPA 6010B/7471A CAC Title 22	Metals											
18-10-2390-1		0 0 7	ШΥ	ma/ka	25.00	25	50 115	11	0.20	101021504	19 10 2200 1	11/01/19 11.02
Antimony	ND 6 421	30.43	ПА	ma/ka	25.00	96	75-125	4	0-20	181031504	18-10-2390-1	11/01/18 11:03
Barium	90.79	119.3		ma/ka	25.00	114	75-125	10	0-20	181031504	18-10-2390-1	11/01/18 11:03
Bervllium	0.5391	26.00		ma/ka	25.00	102	75-125	4	0-20	181031504	18-10-2390-1	11/01/18 11:03
Cadmium	ND	25.78		ma/ka	25.00	103	75-125	5	0-20	181031504	18-10-2390-1	11/01/18 11:03
Chromium	11.59	36.03		ma/ka	25.00	98	75-125	6	0-20	181031S04	18-10-2390-1	11/01/18 11:03
Cobalt	5.481	30.78		mg/kg	25.00	101	75-125	6	0-20	181031S04	18-10-2390-1	11/01/18 11:03
Copper	11.17	35.97		mg/kg	25.00	99	75-125	5	0-20	181031S04	18-10-2390-1	11/01/18 11:03
Lead	3.029	28.58		mg/kg	25.00	102	75-125	5	0-20	181031S04	18-10-2390-1	11/01/18 11:03
Molybdenum	ND	22.72		mg/kg	25.00	91	75-125	4	0-20	181031S04	18-10-2390-1	11/01/18 11:03
Nickel	6.079	29.97		mg/kg	25.00	96	75-125	5	0-20	181031S04	18-10-2390-1	11/01/18 11:03
Selenium	ND	23.16		mg/kg	25.00	93	75-125	6	0-20	181031S04	18-10-2390-1	11/01/18 11:03
Silver	ND	12.57		mg/kg	12.50	101	75-125	5	0-20	181031S04	18-10-2390-1	11/01/18 11:03
Thallium	ND	24.49		mg/kg	25.00	98	75-125	6	0-20	181031S04	18-10-2390-1	11/01/18 11:03
Vanadium	39.70	65.04		mg/kg	25.00	101	75-125	8	0-20	181031S04	18-10-2390-1	11/01/18 11:03
Zinc	28.04	56.18		mg/kg	25.00	113	75-125	10	0-20	181031S04	18-10-2390-1	11/01/18 11:03

EPA 7471A Mercury

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Client:	Cardno	Work Order:	18-10-2311
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
		Date Received:	10/31/18

QUALITY CONTROL Matrix Spike Duplicate

Analyte	Orig. Val.	Duplicate	Qual.	Units	Spike Conc.	% Rec.	Target Range	RPD	Limit	Batch	Sample Duplicated	Analysis Date/Time
18-10-2390-1												
Mercury	ND	0.9879		mg/kg	0.8350	118	75-125	2	0-20	181101S01	18-10-2390-1	11/01/18 14:18
EPA 8260B BTEX/MTBE												
18-10-2311-1												
Benzene	ND	0.04028		mg/kg	0.05000	81	61-127	6	0-20	181103S004	18-10-2311-1	11/03/18 16:08
Toluene	ND	0.04238		mg/kg	0.05000	85	63-123	4	0-20	181103S004	18-10-2311-1	11/03/18 16:08
Ethylbenzene	ND	0.04250		mg/kg	0.05000	85	57-129	7	0-22	181103S004	18-10-2311-1	11/03/18 16:08
o-Xylene	ND	0.04220		mg/kg	0.05000	84	70-130	7	0-30	181103S004	18-10-2311-1	11/03/18 16:08
p/m-Xylene	ND	0.08386		mg/kg	0.1000	84	70-130	7	0-30	181103S004	18-10-2311-1	11/03/18 16:08
EPA 8260B BTEX/MTBE												
18-10-2102-13												
Benzene	ND	0.04089		mg/kg	0.05000	82	61-127	2	0-20	181031S003	18-10-2102-13	10/31/18 18:07
Toluene	ND	0.04285		mg/kg	0.05000	86	63-123	1	0-20	181031S003	18-10-2102-13	10/31/18 18:07
Ethylbenzene	ND	0.03957		mg/kg	0.05000	79	57-129	5	0-22	181031S003	18-10-2102-13	10/31/18 18:07
o-Xylene	ND	0.04027		mg/kg	0.05000	81	70-130	5	0-30	181031S003	18-10-2102-13	10/31/18 18:07
p/m-Xylene	ND	0.08104		mg/kg	0.1000	81	70-130	4	0-30	181031S003	18-10-2102-13	10/31/18 18:07

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Client:	Cardno	Work Order:	18-10-2311
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
	Lake 1 01631, CA 32030-0023	Date Received:	10/31/18

QUALITY CONTROL Post Digestion Spike

Analyte	Orig. Val.	PDS Val.	Qual.	Units	Spike Conc.	% Rec.	Target Range	Batch	Sample Spiked	Analysis Date/Time
EPA 6010B/7471A CAC	Fitle 22 Metals	5								
18-10-2390-1										
Antimony	ND	24.46		mg/kg	25.00	98	75-125	181031S04	18-10-2390-1	11/01/18 11:05
Arsenic	6.421	30.66		mg/kg	25.00	97	75-125	181031S04	18-10-2390-1	11/01/18 11:05
Barium	90.79	113.2		mg/kg	25.00	90	75-125	181031S04	18-10-2390-1	11/01/18 11:05
Beryllium	0.5391	24.71		mg/kg	25.00	97	75-125	181031S04	18-10-2390-1	11/01/18 11:05
Cadmium	ND	24.43		mg/kg	25.00	98	75-125	181031S04	18-10-2390-1	11/01/18 11:05
Chromium	11.59	35.10		mg/kg	25.00	94	75-125	181031S04	18-10-2390-1	11/01/18 11:05
Cobalt	5.481	29.45		mg/kg	25.00	96	75-125	181031S04	18-10-2390-1	11/01/18 11:05
Copper	11.17	36.45		mg/kg	25.00	101	75-125	181031S04	18-10-2390-1	11/01/18 11:05
Lead	3.029	27.31		mg/kg	25.00	97	75-125	181031S04	18-10-2390-1	11/01/18 11:05
Molybdenum	ND	24.67		mg/kg	25.00	99	75-125	181031S04	18-10-2390-1	11/01/18 11:05
Nickel	6.079	29.91		mg/kg	25.00	95	75-125	181031S04	18-10-2390-1	11/01/18 11:05
Selenium	ND	23.45		mg/kg	25.00	94	75-125	181031S04	18-10-2390-1	11/01/18 11:05
Silver	ND	11.14		mg/kg	12.50	89	75-125	181031S04	18-10-2390-1	11/01/18 11:05
Thallium	ND	23.49		mg/kg	25.00	94	75-125	181031S04	18-10-2390-1	11/01/18 11:05
Vanadium	39.70	63.02		mg/kg	25.00	93	75-125	181031S04	18-10-2390-1	11/01/18 11:05
Zinc	28.04	51.39		mg/kg	25.00	93	75-125	181031S04	18-10-2390-1	11/01/18 11:05
EPA 7471A Mercury										
18-10-2390-1										
Mercury	ND	0.9431		mg/kg	0.8350	113	75-125	181101S01	18-10-2390-1	11/01/18 14:21

Qual: Qualifiers

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Client:	Cardno	Work Order:	18-10-2311
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
	Lake Folesi, CA 92050-0025	Date Received:	10/31/18

QUALITY CONTROL Sample Duplicate

Analyte	Orig. Val.	Duplicate	Qual.	Units	RPD	Limit	Batch	Sample Duplicated	Analysis Date/Time
EPA 1010A(M) Ignitability 18-10-1991-2 Ignitability	⊳ 212	⊳ 212		٥F	1	0-25	11101FPD1	18-10-1991-2	11/01/18 12:00
EPA 9045C pH	2212	2212		·	I	0-23		10-10-1331-2	11/01/10 12:00
18-10-2311-21 рН	8.130	8.550		pH units	5	0-25	I1101PHD2	18-10-2311-21	11/01/18 09:45
SW-846 Chapter 7 Reactive Cyanide 18-10-2349-1 Cyanide, Reactive	ND	ND		mg/kg	N/A	0-25	I1101RCND1	18-10-2349-1	11/01/18 12:53
SW-846 Chapter 7 Reactive Sulfide 18-10-2349-1 Sulfide, Reactive	ND	ND		mg/kg	N/A	0-25	11031RSD2	18-10-2349-1	10/01/18 16:00

RPD: Relative Percent Difference.

Calscience



Client:	Cardno	Work Order:	18-10-2311
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
	Lake 1 01031, 077 52050 0025	Date Received:	10/31/18

PROJECT QUALITY CONTROL DATA Laboratory Control Sample

Analyte	Known Val.	Analyzed	Qual.	Units	% Rec.	Target	Batch	Analysis
		-				Kange		Date/Time
FPA 300 0 Anions								
099-12-922-1014								
Chloride	500.0	514.5		mg/kg	103	90-110	181109L02P	11/10/18 06:07
EPA 300.0 Anions								
099-12-922-1010								
Chloride	50.00	51.78		mg/kg	104	90-110	181101L01P	11/01/18 16:38
EPA 8015B DRO								
099-15-414-1192								
Diesel Range Organics	400.0	341.6		mg/kg	85	67-121	181031B12	11/01/18 04:28
EPA 8015B GRO								
099-12-024-1263								
Gasoline Range Organics	10.00	7.489		mg/kg	75	70-118	181110L019	11/10/18 08:31
EPA 8015B GRO								
099-12-024-1264								
Gasoline Range Organics	10.00	9.111		mg/kg	91	70-118	181112L033	11/12/18 15:15
EPA 8015B GRO								
099-12-024-1258	10.00	0.007				70.440	1010011050	
Gasoline Range Organics	10.00	8.867		mg/kg	89	70-118	181031L059	10/31/18 18:00
EPA 6010B/7471A CAC Title 22 Metals								
097-01-002-27179	05.00	04.00			05	00.400	4040041.04	44/04/40 40:00
Anumony	25.00	21.28		mg/kg	80	80-120	181031L04	11/01/18 10:08
Arsenic	25.00	19.74	LR,RU	mg/kg	79	80-120	181031L04	11/01/18 16:08
Barium	25.00	23.08		mg/kg	92	80-120	181031L04	11/01/18 16:08
Beryllium	25.00	20.97		mg/kg	84	80-120	181031L04	11/01/18 16:08
Cadmium	25.00	22.50		mg/kg	90	80-120	181031L04	11/01/18 16:08
Chromium	25.00	21.99		mg/kg	88	80-120	181031L04	11/01/18 16:08
Cobalt	25.00	23.36		mg/kg	93	80-120	181031L04	11/01/18 16:08
Copper	25.00	22.58		mg/kg	90	80-120	181031L04	11/01/18 16:08
Lead	25.00	27.65		mg/kg	111	80-120	181031L04	11/01/18 16:08
Molybdenum	25.00	22.42		mg/kg	90	80-120	181031L04	11/01/18 16:08
Nickel	25.00	23.17		mg/kg	93	80-120	181031L04	11/01/18 16:08
Selenium	25.00	21.61		mg/kg	86	80-120	181031L04	11/01/18 16:08
Silver	12.50	9.942		mg/kg	80	80-120	181031L04	11/01/18 16:08
Thallium	25.00	23.87		mg/kg	95	80-120	181031L04	11/01/18 16:08
Vanadium	25.00	20.98		mg/kg	84	80-120	181031L04	11/01/18 16:08
Zinc	25.00	26.19		mg/kg	105	80-120	181031L04	11/01/18 16:08

Total number of LCS compounds: 16

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Client:	Cardno	Work Order:	18-10-2311
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
	Earch 61631, 6A 52636 6625	Date Received:	10/31/18

PROJECT QUALITY CONTROL DATA Laboratory Control Sample

Analyte	Known Val.	Analyzed	Qual.	Units	% Rec.	Target Range	Batch	Analysis Date/Time
Total number of ME compounds: 1								
Total number of ME compounds allowed: 1								
LCS ME CL validation result: Pass								
EPA 7471A Mercury								
099-16-272-4240								
Mercury	0.8350	0.9590		mg/kg	115	85-121	181101L01A	11/01/18 14:12
EPA 8260B BTEX/MTBE								
099-12-882-2131								
Benzene	0.05000	0.04076		mg/kg	82	80-120	181103L011	11/03/18 12:43
Toluene	0.05000	0.04262		mg/kg	85	80-120	181103L011	11/03/18 12:43
Ethylbenzene	0.05000	0.04354		mg/kg	87	80-120	181103L011	11/03/18 12:43
o-Xylene	0.05000	0.04357		mg/kg	87	75-125	181103L011	11/03/18 12:43
p/m-Xylene	0.1000	0.08584		mg/kg	86	75-125	181103L011	11/03/18 12:43
EPA 8260B BTEX/MTBE								
099-12-882-2127								
Benzene	0.05000	0.05232		mg/kg	105	80-120	181031L010	10/31/18 12:40
Toluene	0.05000	0.05377		mg/kg	108	80-120	181031L010	10/31/18 12:40
Ethylbenzene	0.05000	0.05318		mg/kg	106	80-120	181031L010	10/31/18 12:40
o-Xylene	0.05000	0.05286		mg/kg	106	75-125	181031L010	10/31/18 12:40
p/m-Xylene	0.1000	0.1082		mg/kg	108	75-125	181031L010	10/31/18 12:40

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Client:	Cardno	Work Order:	18-10-2311
	20505 Crescent Bay Drive	Project Name:	ExxonMobil NM K Battery No. 3, Vacuum Oil Field
	Lake 1 01631, 0A 32030-0023	Date Received:	10/31/18

PROJECT QUALITY CONTROL DATA Laboratory Control Sample Duplicate

Analyte	LCS Val.	Duplicate	Qual.	Units	% Rec.	Target Range	RPD	Limit	Batch	Sample Duplicated	Analysis Date/Time
EPA 8015B GRO 099-12-024-1258 Gasoline Range Organics	10.00	8.916		mg/kg	89	70-118	1	0-28	181031L059	099-12-024-1258	10/31/18 18:32

Qual - Qualifiers RPD: Relative Percent Difference

Calscience

The difference is service

Work Order: 18-10-2311

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	Sample Analysis Summary Report							
Method	Extraction	Chemist ID	Instrument	Analytical Location				
EPA 1010A(M)	N/A	1050	FP 4	1				
EPA 300.0	N/A	1027	IC 7	1				
EPA 300.0	N/A	1027	IC 9	1				
EPA 6010B	EPA 3050B	110	ICP 8300	1				
EPA 7471A	EPA 7471A Total	110	Mercury 08	1				
EPA 8015B	EPA 3550B	972	GC 49	1				
EPA 8015B	EPA 5030C	607	GC 56	2				
EPA 8015B	EPA 5030C	715	GC 4	2				
EPA 8260B	EPA 5030C	867	GC/MS LL	2				
EPA 8260B	EPA 5030C	1176	GC/MS OO	2				
EPA 9045C	N/A	1086	PH 4	1				
SW-846, Chapter 7	N/A	1155	BUR04	1				
SW-846, Chapter 7	N/A	1155	UV 9	1				

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Location 1: 7440 Lincoln Way, Garden Grove, CA 92841 Location 2: 7445 Lampson Avenue, Garden Grove, CA 92841

Calscience

The difference is service

Work Order: 18-10-2311

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Glossary of Terms and Qualifiers

<u>Qualifiers</u>	Definition
AZ	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
В	Analyte was present in the associated method blank.
BA	The MS/MSD RPD was out of control due to suspected matrix interference.
BB	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
CI	See case narrative.
DF	Reporting limits elevated due to matrix interferences.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
GE	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
HD	Chromat. profile inconsistent with pattern(s) of ref. fuel stnds.
HO	High concentration matrix spike recovery out of limits
HT	Analytical value calculated using results from associated tests.
HX	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS was in control.
IL	Relative percent difference out of control.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
LD	Analyte presence was not confirmed by second column or GC/MS analysis.
LP	The LCS and/or LCSD recoveries for this analyte were above the upper control limit. The associated sample was non-detected. Therefore, the sample data was reported without further clarification.
LQ	LCS recovery above method control limits.
LR	LCS recovery below method control limits.
ND	Parameter not detected at the indicated reporting limit.
QO	Compound did not meet method-described identification guidelines. Identification was based on additional GC/MS characteristics.
RU	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
SG	A silica gel cleanup procedure was performed.
SN	See applicable analysis comment.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

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Released to Imaging: 7/12/2021 3:47:42 PM

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calscience	440 Lincoln Way, Garden Grove, CA 92841-1427	Facility#/SID:	bite Address: NM K Battery No. 3, V	ExxonMobil PM Marla Madden	Consultant/Office:	Consultant PM and Phone #	Sampler: Nincent Naryor	State of sample collection:	Samole Identification	5-5-B9	5-10-69	S- 15-69	5-20-00	6-5-810	3-10-310	31K1 BID	5-20-610	5-5-813	5-5-613 S-10-B13 -00	Turnaround Time Reques (Rush TAT is subject to Lancaster Lal	Standard 5 day 4 day	Data Package Options	Full Validation (Levi	Please check requried EDD Format(s): Goetra	

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Facility#/SID:	-		Analyses R	equested	Page: <u>of</u>
Site Address: NM K Battery No. 3, Vacuum Oil Field, Lea County, New Me	kico Mati		\$	9	coc#:
ExxonMobil PM Marla Madden Center/AFE: Consultant/Office: Cardno - SCAL		809	0-CI C W0	slob y	comments: outry S-50-B2 has a
Consultant PM and Phone # David M. Purdy (949) 457-8941		108 bo	300.0	sli enter	24 m TAT
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Curo	Calscience					<u>v - c</u>	<u></u>
		SAMPLE RECEIPT	CHECKLIST	C	OOLER	<u> </u>	F
LIENT:	<u> </u>	YØ		DAT	E: <u>10 /</u>	312	<u>2018</u>
TEMPERAT	URE: (Criteria: 0.0°C – 6	.0°C, not frozen except sedim	ient/tissue)		/		
Thermomete	er ID: SC6 (CF: 0.0°C); Te	emperature (w/o CF): <u>2 - 2</u>	└°C (w/ CF): _2	. 2_°C;	Blank	🗆 Sa	mple
Sample	e(s) outside temperature	criteria (PM/APM contacted b	y:)				
Sample	e(s) outside temperature	criteria but received on ice/ch	illed on same day o	f sampling			
□ Sample(s) received at ambient tem	perature; placed on ice for tra	ansport by courier				1/6
Ambient Ter	nperature:	r			Checke	d by: <u>V</u>	<u>J6 9</u>
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Sampler's n	ame indicated on COC			.40.01.00			Г
Sample cont	tainer label(s) consistent :	with COC					Ľ
Sample cont	tainer(s) intact and in goo	d condition					C
Proper conta	ainers for analyses reque	sted					Ľ
Sufficient vo	lume/mass for analyses reque	requested					
Samples réc	eived within holding time						С
Aqueous	samples for certain analy	ses received within 15-minute	e holding time				
ПрН П	Residual Chlorine	issolved Sulfide Dissolved	l Oxygen				R
Proper prese	ervation chemical(s) note	d on COC and/or sample cont	tainer				Ţ
Unpreser	ved aqueous sample(s) r	eceived for certain analyses					1
	e Organics 🔲 Total Meta	als Dissolved Metals					
Acid/base pr	reserved samples - pH wi	thin acceptable range			. 🗆		Z
Container(s)) for certain analysis free	of headspace			🗆		Ţ
U Volatil	e Organics 🛛 Dissolved	Gases (RSK-175) Dissol	ved Oxygen (SM 45	600)			
Carbo	n Dioxide (SM 4500)	Ferrous Iron (SM 3500)	ydrogen Sulfide (Ha	ach)			
Tedlar™ bag	g(s) free of condensation	·····			. 🗆		Z
CONTAINE	R TYPE:	ş	(Trip Blan	ik Lot Numb	er:		
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250AGB C] 250CGB □ 250CGBs (pH_	2) 🗖 250PB 🗖 250PBn (pH	2) 🗆 500AGB 🖾 500)AGJ □ 500A	GJs (pH	2) 🗆 500	PB
	AGBna ₂ IAGBs (pH_2)		na (pH12)	0		□	
Solid: 4oz0 Air: Tedlar ¹	GJ Ø 8ozCGJ □ 16ozCG. C-17, C-1 M □ Canister □ Sorbent Ti	J) □ TerraCores [®] (_ ⁻ Matrix () 🗆): 🗆	_ 0 0	□	
Container: A	= Amber, B = Bottle, C = Clo	ear, E = Envelope, G = Glass, J =	= Jar, P = Plastic, and	Z = Ziploc/Re	sealable Ba	ag	
Preservative:	b = buffered, f = filtered, h =	= HCl, n = HNO ₃ , na = NaOH, <mark>na</mark>	n₂ = Na₂S₂O₃, p = H₃P	O₄, Labele	d/Checke	d by	5
	$s = H_2SO_4$, $u = ultra-pure$, >	κ = Na₂SO₃+NaHSO₄.H₂O, znna	= Zn (CH ₃ CO ₂) ₂ + Na	ОН	Reviewe	ed by	Mu

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st eurofins

WORK ORDER NUMBER: <u>18-10</u>-2

SAMPLE ANOMALY REPORT

DATE: <u>10 / 3/ / 2018</u>

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□ Sample(s) NOT RECEIVED but listed on COC □ Sample(s) received but NOT LISTED on COC □ Holding time expired (list client or ECI sample ID and analysis) □ Improper container(s) used (list analysis) □ Improper preservative used (list analysis) □ Project notainer(s) used (list analysis) □ No preservative noted on COC or label (list analysis) □ Chern sample label(s) do not match COC (comment) □ Project information □ Client sample label(s) do not match COC (comment) □ Project information □ Client sample label(s) do not match COC (comment) □ Project information □ Client sample container(s) □ Requested analysis □ Requested analysis □ Water present in sample container □ Water present in sample container(s) □ Water present in sample container □ Water present in sample container □ Water present in sample container □ Water present in sample container(s) □ Water present in sample container □ Leaking (transferred into ECI Tedler™ bags*) □ Leaking (transferred into ECI Tedler™ bags*) □ Leaking (transferred into ECI Tedler™ bags*) □ Leaking (transferred into Generia Tedlesing analysis) Sample	SAMPLES	6, CONTAIN	IERS, AN	D LABELS	S:		Commen	ts		
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□ Water present in sample container	🗆 Broke	en								
□ Air sample container(s) compromised (comment)	🗆 Wate	r present in s	ample cont	ainer						
□ Flat	🗆 Air samp	le container(s	s) compron	nised (comr	nent)		<u> </u>			
□ Very low in volume	Flat									
□ Leaking (not transferred; duplicate bag submitted)	□ Very	low in volume	•							
□ Leaking (transferred into Cil Tedlar™ bags*)	🗆 Leaki	ing (not transf	ferred; dup	licate bag s	ubmitted)					
□ Leaking (transferred into client's Tedlar™ bags*) • Transferred at client's request. MISCELLANEOUS: (Describe)	🗆 Leaki	ing (transferre	ed into ECI	Tedlar™ ba	ags*)					
* Transferred at client's request. MISCELLANEOUS: (Describe) Comments	🗆 Leaki	ing (transferre	ed into clier	nt's Tedlar™	⁴ bags*)					
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APPENDIX K

SURVEY DATA

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	COOR COORDINATES V NORTH AMERICAN L ELEVATIONS ARE	PRDINATE TA ALUES SHOWN ARE R DATUM 1983, "NEW M RELATIVE TO THE N VERTICAL DATUM 198	ABLE VELATIVE TO THE VEXICO EAST ZONE". VORTH AMERICAN 8
A LONG TO	SOIL BORE	COORDINATES	ELEVATIONS
	SB #1	652408.2 N 804946.7 E	3954.8'
	SB #2	652380.9 N 804949.1 E	3955.4'
	SB #3	652358.2 N 804959.3 E	3955.6'
	SB #4	652448.8 N 804950.2 E	3954.3'
	SB #5	652476.7 N 804955.0 E	3953.6'
	SB #6	652370.8 N 805034.6 E	3956.4'
N 20	SB #7	652448.3 N 805068.6 E	3954.4'
	SB #8	652470.0 N 805176.8 E	3954.4'
and the second	SB #9	652373.5 N 805185.1 E	3955.5'
Contraction of the	SB #10	652327.3 N 805164.2 E	3955.9'
A Constant	SB #11	652416.1 N 805211.0 E	3955.3'
Steph St.	SB #12	652428.9 N 805339.9 E	3954.4'
A ALLER	SB ∦13	652392.4 N 805361.3 E	3954.3'
	N <u>LEG</u> → - SB #1 ⊠ - ⊕ -	END: DENOTES CARDNO DENOTES SOIL BOR DENOTES VALVE DENOTES RISER	BENCHMARK E HOLE LOCATION
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LEA COUNTY, NEW MEXICO

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APPENDIX L

WASTE DISPOSAL DOCUMENTATION

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UNIFORM HAZARDOUS 1.	Generator ID Number	New York	2. Page 1 of	3. Emergency Respons	se Phone	4. Manifes	t Tracking No	umber	AC	PE
WASTE MANIFEST	D0035	-	1	800-322-5085	a (if different th		1338	244	4 6	IDL
5. Generator's Name and Mailing / ExconMobil Oil Co	poration		Exxor	Mobil Oil Corporat	tion	an mailing addr	855)			
8941 Atianta Avan	10, #384	1 1005	Form	er State K Tank Ba	ttery No. 3,	Vacuum Oi	Field			100
Huntington Beach, Generator's Phone:	CA 92646 713-96	4-4935	Lea	County, New N	lexico		1			
6. Transporter 1 Company Name						U.S. EPA ID	Number	2		
7. Transporter 2 Company Name						U.S. EPA ID	Number	1.444		
Alamo	5			and the state		TXF	RODDOG	0442		
8. Designated Facility Name and S	ite Address Repub	lic Tessman Landfill				U.S. EPA ID	Number			
	7000 1	110 East				TXR	000084614		. 110	
210-661	4104 San Ar	ntonio, TX 78219				1		+1	1410)
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HM and Packing Group (if any))			No.	Туре	Quantity	Wt./Vol.	13. \	Waste Codes	1
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DESIGNATED FACILITY TO GENERATOR STATE (IF REQUIRED)

District I 1625 N. French Dr., Hobbs, NM 88240 Phone:(575) 393-6161 Fax:(575) 393-0720 District II

811 S. First St., Artesia, NM 88210 Phone:(575) 748-1283 Fax:(575) 748-9720

District III

1000 Rio Brazos Rd., Aztec, NM 87410 Phone:(505) 334-6178 Fax:(505) 334-6170

District IV

1220 S. St Francis Dr., Santa Fe, NM 87505 Phone: (505) 476-3470 Fax: (505) 476-3462

State of New Mexico Energy, Minerals and Natural Resources Oil Conservation Division 1220 S. St Francis Dr. Santa Fe, NM 87505

CONDITIONS

Operator:	OGRID:
XTO ENERGY, INC	5380
6401 Holiday Hill Road	Action Number:
Midland, TX 79707	2179
	Action Type:
	[C-141] Release Corrective Action (C-141)

CONDITIONS

Created By	Condition	Condition Date
bbillings	None	7/12/2021

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