



DEPARTMENT OF THE AIR FORCE  
377TH AIR BASE WING (AFGSC)



Colonel Eric H. Froehlich  
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FEB 13 2017

Mr. John Kieling, Bureau Chief  
Hazardous Waste Bureau  
New Mexico Environment Department  
2905 Rodeo Park Drive East, Building 1  
Santa Fe NM 87505-6303



Dear Mr. Kieling

Attached please find attached the *Corrective Action Report for the Water/Condensate Release* associated with dismantlement of the soil vapor extraction system on February 1, 2017 at the Bulk Fuels Facility Spill, Solid Waste Management Unit ST-106/SS-111, Kirtland Air Force Base, New Mexico. This report is submitted pursuant to Part 1.27 (*Twenty-Four Hour and Subsequent Reporting*) of Hazardous Waste Treatment Facility Operating Permit (HWTF Permit No. NM9570024423 –“RCRA Permit”). The 30-gallon water/condensate release was originally reported to NMED via email on February 1, 2017, a few hours after the release occurred. The Air Force has implemented all planned corrective action activities identified in that notification. Soil samples contain no detectable hazardous constituents and indicate that the water/condensate released from the HDPE pipe did not impact the surrounding soil media. No further corrective action is recommended.

If you have any questions or concerns, please contact Mr. Scott Clark at (505) 846-9017 or at [scott.clark@us.af.mil](mailto:scott.clark@us.af.mil) or Dr. Adria Bodour at (210) 241-6276 or at [adria.bodour.1@us.af.mil](mailto:adria.bodour.1@us.af.mil).

Sincerely,

ERIC H. FROEHLICH, Colonel, USAF  
Commander

Attachment:

Corrective Action Report for Water/Condensate Release During Soil Vapor Extraction System Dismantlement, Solid Waste Management Unit ST-106/SS-111, Bulk Fuels Facility, Kirtland Air Force Base, New Mexico; 2 Hard Copies/2 CDs

cc:

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- NMED GWQB (Hunter), letter and CD
- EPA Region 6 (King, Ellinger), letter and CD
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KAFB4482



# **KIRTLAND AIR FORCE BASE ALBUQUERQUE, NEW MEXICO**

## **CORRECTIVE ACTION REPORT FOR WATER/CONDENSATE RELEASE DURING SOIL VAPOR EXTRACTION SYSTEM DISMANTLEMENT AT SOLID WASTE MANAGEMENT UNIT ST-106/SS-111, BULK FUELS FACILITY**

**February 2017**



**377 MSG/CEANR  
2050 Wyoming Blvd. SE  
Kirtland AFB, New Mexico 87117-5270**

**KIRTLAND AIR FORCE BASE  
ALBUQUERQUE, NEW MEXICO**

**CORRECTIVE ACTION REPORT FOR WATER/CONDENSATE  
RELEASE DURING SOIL VAPOR EXTRACTION SYSTEM  
DISMANTLEMENT AT SOLID WASTE MANAGEMENT UNIT  
ST-106/SS-111, BULK FUELS FACILITY**

**FEBRUARY 2017**

*Prepared for*

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Contract No. W9128F-13-D-0006/Delivery Order DM02

## NOTICE

This Corrective Action Report was prepared for the U.S. Army Corps of Engineers by EA Engineering, Science, and Technology, Inc., PBC to summarize the response to a water/condensate release at the Kirtland Air Force Base (AFB) Bulk Fuels Facility, Solid Waste Management Unit ST-106/SS-111. This work was performed under the U.S. Air Force Environmental Restoration Program, under requirements set forth in Part 1.27 (*Twenty-four Hour and Subsequent Reporting*) of the Resource Conservation and Recovery Act permit issued to Kirtland AFB, with the New Mexico Environment Department serving as the lead regulatory agency. This Corrective Action Report addresses the activities related to the corrective actions taken after a release of water/condensate during the dismantlement of a soil vapor extraction system on February 1, 2017.

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<b>9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b>  U.S. Army Corps of Engineers–Albuquerque District 4101 Jefferson Plaza NE Albuquerque, New Mexico 87109-3435			<b>10. SPONSOR/MONITOR'S ACRONYM(S)</b>		
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<b>12. DISTRIBUTION / AVAILABILITY STATEMENT</b>					
<b>13. SUPPLEMENTARY NOTES</b>					
<b>14. ABSTRACT</b> This report describes the corrective action response to the release of 30 gallons of water/condensate from a soil vapor extraction system during dismantlement operations at Solid Waste Management Unit ST-106/SS-111 at Kirtland Air Force Base, New Mexico. Approximately 1 cubic yard of wetted soil was removed from the release area and 80 gallons of water/condensate was removed from the high density polyethylene pipe. Soil samples were collected before and after soil removal and analyzed for volatile organic compounds (VOCs) using U.S. Environmental Protection Agency Method 8260B. No VOCs were detected in any soil samples. A water/condensate sample was collected from a sump in the pipeline and analyzed for VOCs. The water/condensate contained part per billion concentrations of VOCs related to hydrocarbon fuels and part per million concentrations of ketones.					
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## PREFACE

This Corrective Action Report was prepared by EA Engineering, Science, and Technology, Inc., PBC (EA) for the U.S. Army Corps of Engineers (USACE), under Contract Number W9128F-13-D-0006, Delivery Order DM02 and describes the corrective action response to the release of 30 gallons of water/condensate from a soil vapor extraction system during dismantlement operations at Solid Waste Management Unit ST-106/SS-111 at Kirtland Air Force Base (AFB), New Mexico. This report was prepared in accordance with Part 1.27 (*Twenty-four Hour and Subsequent Reporting*) of the permit issued to Kirtland AFB under the Resource Conservation and Recovery Act and applicable federal, state, and local laws and regulations. The report summarizes the response actions taken following the release and including soil removal and sample data analysis.

Mr. Trent Simpler, PE, is the USACE–Albuquerque District Project Manager. The Environmental Restoration Section Chief for this program is Mr. Scott Clark of Kirtland AFB. This report was prepared by Devon Jercinovic, P.G., C.P.G., PMP, the EA Project Manager.



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Devon Jercinovic, P.G., C.P.G., PMP  
EA Engineering, Science, and Technology, Inc., PBC  
Project Manager

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## ACRONYMS AND ABBREVIATIONS

µg/L	microgram(s) per liter
AFB	Air Force Base
BFF	Bulk Fuels Facility
EA	EA Engineering, Science, and Technology, Inc., PBC
EPA	U.S. Environmental Protection Agency
HDPE	high - density polyethylene
NMED	New Mexico Environment Department
RCRA	Resource Conservation and Recovery Act
SE	Southeast
SVE	soil vapor extraction
SWMU	Solid Waste Management Unit
USACE	U.S. Army Corps of Engineers
VOC	volatile organic compound

## **EXECUTIVE SUMMARY**

This Corrective Action Report was prepared by EA Engineering, Science, and Technology, Inc., PBC (EA) for the U.S. Army Corps of Engineers (USACE), under Contract Number W9128F-13-D-0006, Delivery Order DM02. This report describes the corrective action response to the release of 30 gallons of water/condensate from a soil vapor extraction (SVE) system during dismantlement operations at Solid Waste Management Unit (SWMU) ST-106/SS-111 at Kirtland Air Force Base (AFB), New Mexico. The accidental spill and corrective actions took place on February 1-2, 2017.

Approximately 1 cubic yard of wetted soil was removed from the release area and 80 gallons of water/condensate was removed from the high - density polyethylene (HDPE) pipe. Soil samples were collected before and after soil removal and analyzed for volatile organic compounds (VOCs) using U.S. Environmental Protection Agency (EPA) Method 8260B. No VOCs were detected in any soil samples. A water/condensate sample was also collected from a sump in the pipeline and analyzed for VOCs. The water/condensate contained part per billion concentrations of VOCs related to hydrocarbon fuels and part per million concentrations of ketones. Based on these soil analyses, no further corrective action is proposed. Waste profiles will be developed for the removed water/condensate and soil for final disposition.

# 1. INTRODUCTION

EA, under USACE Contract Number W9128F-13-D-0006, Delivery Order DM02, is performing dismantling of the SVE system at SWMU ST-106/SS-111, at Kirtland AFB, New Mexico. This SWMU is known as the Bulk Fuels Facility (BFF) site. Environmental restoration efforts at the BFF site are being conducted under requirements set forth in the Resource Conservation and Recovery Act (RCRA) Permit Number NM9570024423 (RCRA Permit) with the New Mexico Environment Department (NMED) serving as the lead regulatory agency (NMED 2010). An accidental release of water/condensate from an HDPE pipe occurred on the south side of the SVE area fence on February 1, 2017 during the SVE dismantlement at the BFF. This report is submitted pursuant to Part 1.27 of the RCRA Permit.

## 1.1 Description of the Release

On February 1, 2017, while dismantling the SVE HDPE influent pipe, a release of water/condensate occurred on the south side of SVE area fence adjacent to the BFF located on Fuel Drive, Southeast (SE) (Figure 1). Approximately 30 gallons of water/condensate was released from the SVE HDPE pipe onto the ground when a cut was made between the wellhead and the pipe (Appendix A). The condensate was produced from cooled water vapor trapped in the decommissioned SVE system. The release occurred at 0915 and the condensate was contained by 0930. The spill area was approximately 16 feet in length and between 2 and 4 feet in width. There were no potential hazardous waste or constituents released that would cause endangerment to a public drinking water supply and no private property was impacted.

## 1.2 Report Overview

This report describes the accidental water/condensate release associated with the dismantlement of the SVE system at SWMU ST-106/SS-111 and the corrective actions taken immediately after the release. The report consists of four sections:

- Section 1 includes an introduction, description of the condensate release from the SVE HDPE pipe
- Section 2 describes the corrective actions taken immediately after the release, characterization sampling (pre-excavation and post-excavation), and soil removal procedure.
- Section 3 summarizes the condensate and soil sample analytical results
- Section 4 provides a list of references cited.

Appendix A contains photographs of the release area and corrective actions. Appendix B contains the laboratory results of analyses performed on the condensate and soil samples.

## 2. CORRECTIVE ACTIONS

Field personnel responded immediately after the spill by elevating the HDPE pipe and covering the end to prevent additional condensate release (Appendix A). After the condensate was contained inside the HDPE pipe, the soil area impacted by the condensate was demarcated with pin flags based on wetted soil observed on the ground surface. The spill area was approximately 16 feet in length and between 2 and 4 feet in width (Figure 1). Once the site spill was secured, Mr. John Kieling, Chief of the NMED Hazardous Waste Bureau and Ms. Diane Agnew, NMED's Project Technical Lead, were notified regarding the incident via phone and email on February 1, 2017.

### 2.1 Soil Removal and Characterization Sampling – February 1, 2017

Three soil samples (pre-excavation) were collected in the spill area immediately after the release to characterize the potentially-contaminated soil (Figure 1). The samples were collected from the upper half of the release footprint closest to the HDPE pipe cut since the water/condensate saturated the deepest in this zone (Figure 2). Soil samples were collected immediately beneath the HDPE pipe (SP-01), in the midpoint of the upper half of the spill area (SP-02), and at the spill area midpoint (SP-03). Following pre-excavation sampling, the soil was excavated by hand to a depth of 4 inches throughout the length of the spill and to a depth of 8 inches directly under the HDPE pipe where the release originated. The criteria for excavation depth were removal of soil until dry soil was encountered and verification on a photoionization detector that no residual VOCs were measureable. Approximately 1 cubic yard of soil was removed and placed in five, plastic-lined 55-gallon drums. The drums were transported from the BFF to the EA investigation-derived waste yard for final waste disposition pending characterization.

Following excavation, three confirmation soil samples were collected. Sample SP-04 was collected from directly beneath the HDPE pipe (same location as SP-01). Sample SP-05 was collected at approximately the same location as SP-03. The third confirmation sample SP-06 was collected in the lower third of the release area (Figure 2). Additionally, a water/condensate sample was collected with a polyethylene bailer from a pipe sump in the HDPE line after removal of the flange. All samples were analyzed for VOCs by EPA Method 8260B at Hall Environmental Laboratories in Albuquerque, New Mexico. Condensate analytical results are provided in Table 1 and soil sample analytical results are provided in Table 2. Laboratory analytical reports are provided in Appendix B.

### 2.2 Residual Water/Condensate Removal from Soil Vapor Extraction Line – February 2, 2017

On February 2, 2017, residual condensate was removed from the HDPE pipe by a vacuum truck. The following steps were performed to remove the water/condensate from the HDPE pipe.

- The HDPE pipe was elevated at one end to get water/condensate to flow to low points so it could be more easily targeted by the vacuum truck
- At the low point, a hole was cut at the top of the HDPE pipe to allow the vacuum truck stinger to access all collected fluids; a cut tote container was placed underneath the pipe at all times to prevent residual water/condensate from dripping on the underlying soil. As the HDPE pipe was only partially full, no water/condensate could leak from the top hole cut for vacuum truck access.
- After free water/condensate was vacuumed out of the HDPE pipe, the vacuum truck crew moved to the next low point to repeat the process, and the pipe remained elevated on one end.

- After fluids were removed from each elevated section, the contractor cut those sections of elevated pipe that had been drained/vacuumed of all fluids. A cut tote container acted as a catch basin placed beneath the HDPE pipe where cutting occurred to capture any residual moisture that drained from the pipe (very little residual fluid remained in the pipe).
- Photoionization detector measurements were recorded at each point where the HDPE pipe was cut to vacuum out fluids.

### 3. SAMPLING RESULTS

Table 1 provides the VOC analytical results for the water/condensate sample. Table 2 summarizes the VOC analytical results for the six soil samples collected.

#### 3.1 Water/Condensate Sample

The water/condensate sample contained petroleum hydrocarbon compounds as well as ketones (Table 1), both groups of contaminants routinely detected in groundwater samples from the BFF source area. Benzene was detected at 54 micrograms per liter ( $\mu\text{g/L}$ ). Toluene and total xylenes were detected at concentrations of 280 and 270  $\mu\text{g/L}$ , respectively. Acetone was detected at a concentration of 3,500  $\mu\text{g/L}$  and 2-butanone was detected at a concentration of 900  $\mu\text{g/L}$ . Sample analytical results were conservatively compared to EPA Maximum Contaminant Levels and New Mexico Water Quality Control Commission Standards; however, no surface water or groundwater was impacted.

#### 3.2 Pre-Removal Soil Samples

Laboratory analytical results for the three soil samples (SP-01, SP-02, and SP-03) collected prior to excavation activities indicate the soil did not contain any VOCs above the method detection limit as all results were non-detect for these compounds.

#### 3.3 Post-Removal Soil Samples

Laboratory analytical results for the three confirmation soil samples (SP-04, SP-05, and SP-06) collected after excavation activities indicate the soil did not contain any VOCs above the method detection limit as all results were non-detect for these compounds.

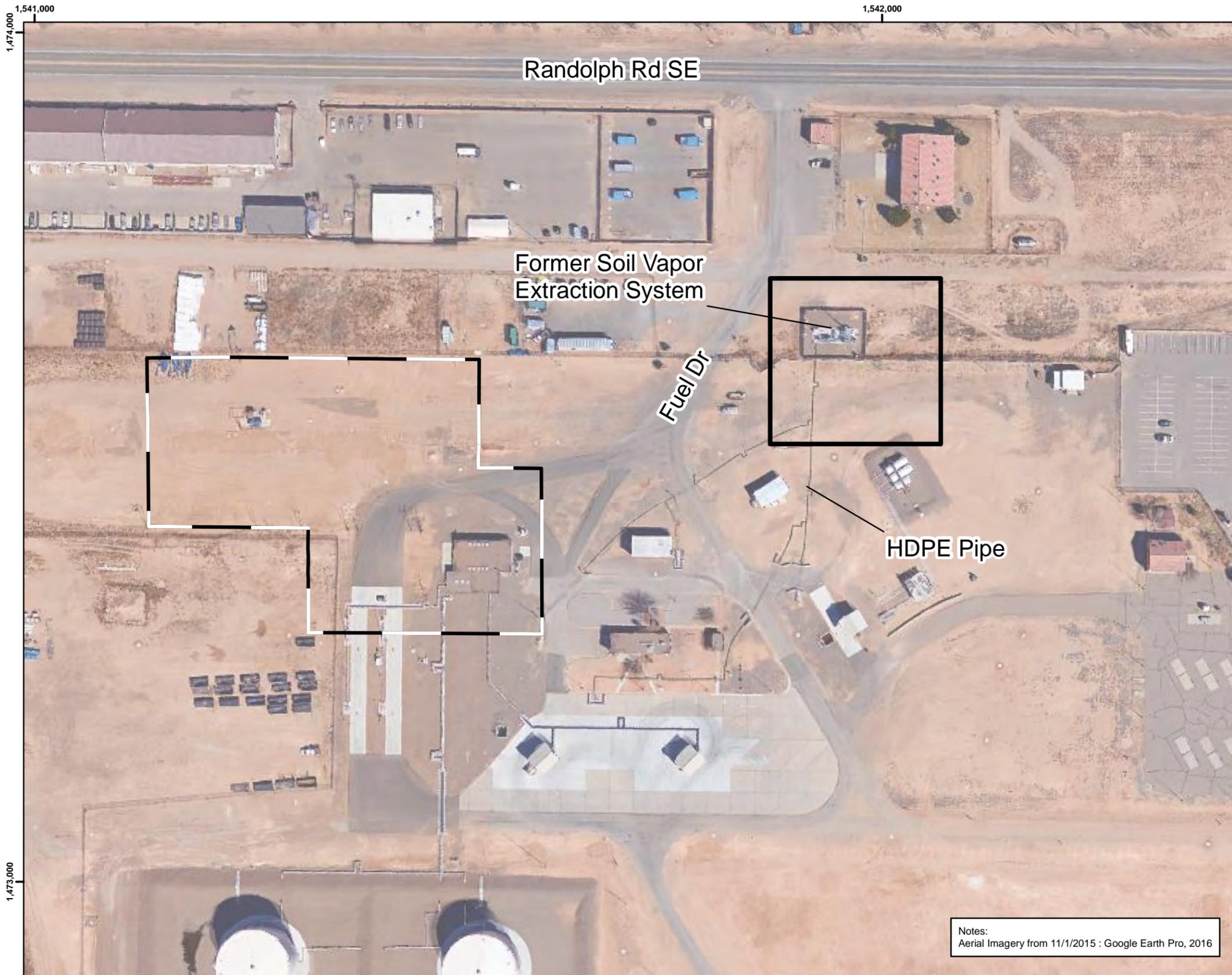
#### 3.4 Summary and Recommendation

Soil samples contain no detectable hazardous constituents and indicate that the water/condensate released from the HDPE pipe did not impact the surrounding soil media. No further corrective action is recommended.

## 4. REFERENCES

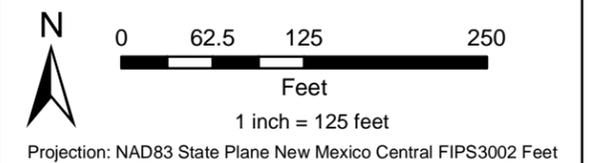
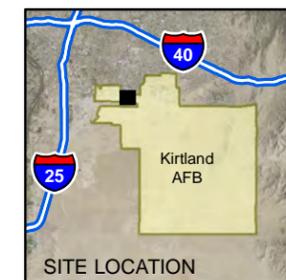
New Mexico Environment Department (NMED). 2010. Hazardous Waste Treatment Facility Operating Permit, EPA ID No. NM9570024423, Issued to U.S. Air Force for the Open Detonation Unit Located at Kirtland Air Force Base, Bernalillo County, New Mexico, by the NMED Hazardous Waste Bureau. July.

**FIGURES**



**Legend**

-  Source Area
-  Site Location

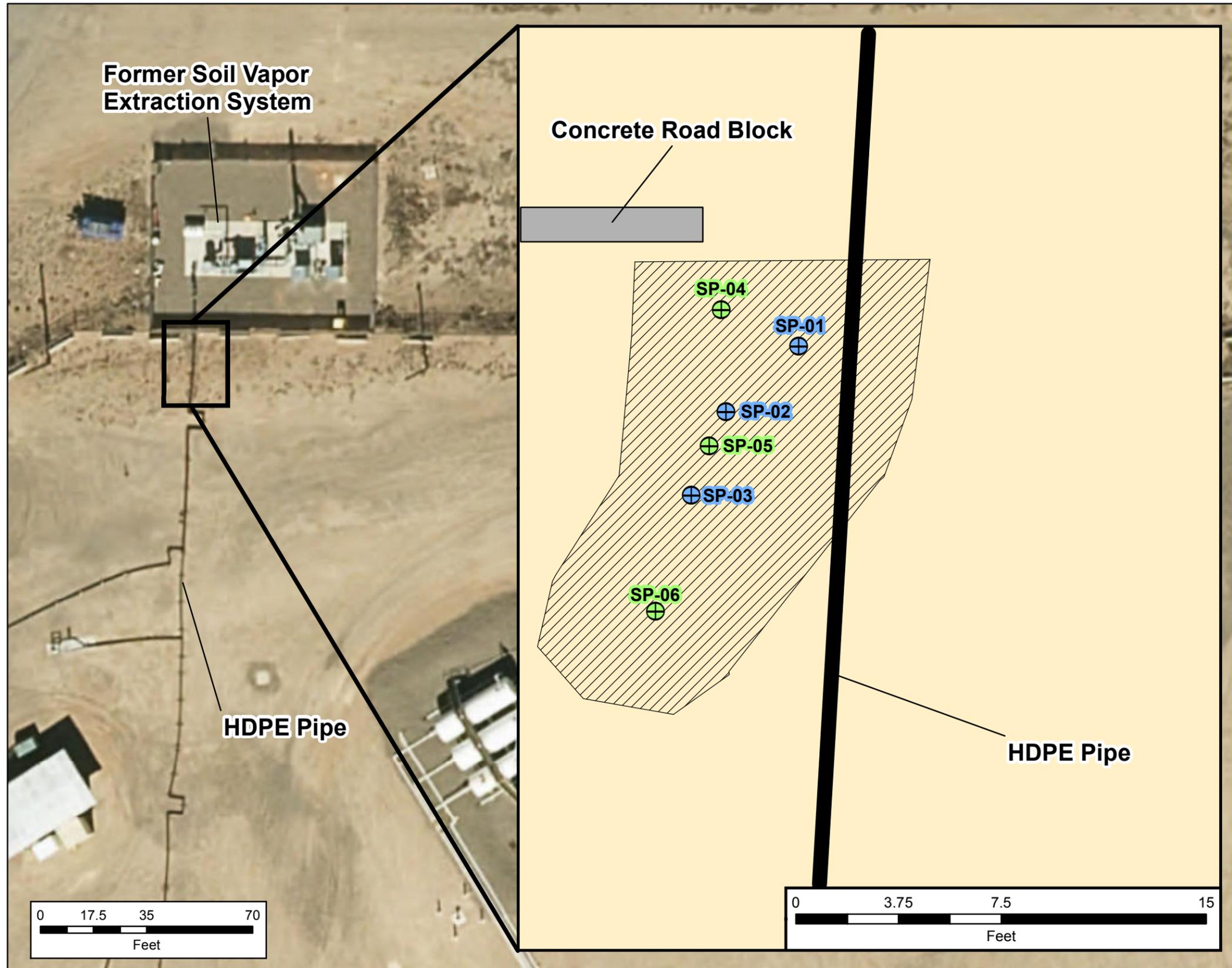


CORRECTIVE ACTION REPORT FOR  
WATER / CONDENSATE RELEASE  
BULK FUELS FACILITY  
SOLID WASTE MANAGEMENT UNIT ST-106/SS-111  
KIRTLAND AIR FORCE BASE, NEW MEXICO

FIGURE 1

WATER / CONDENSATE RELEASE  
LOCATION

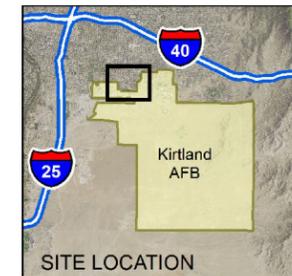
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**Legend**

**Sample Locations**

-  Pre Excavation Sample Site
-  Post Excavation Sample Site
-  Spill Area



Projection: NAD83 State Plane New Mexico Central FIPS3002 Feet

CORRECTIVE ACTION REPORT FOR  
 WATER / CONDENSATE RELEASE  
 BULK FUELS FACILITY  
 SOLID WASTE MANAGEMENT UNIT ST-106/SS-111  
 KIRTLAND AIR FORCE BASE, NEW MEXICO

FIGURE 2

WATER / CONDENSATE RELEASE  
 DETAIL AND SAMPLE LOCATIONS

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## TABLES

**Table 1**  
**Water/Condensate Analytical Results for Volatile Organic Compounds**

Parameter	EPA Method	Analyte	CAS RN	Field Sample ID:		Water/Condensate	
				Sample Date:		2/1/2017	
				Sample Type:		REG	
				NMAC NMWQCC <sup>a</sup> (µg/L)	EPA MCL <sup>b</sup> (µg/L)	Result (µg/L)	PQL
VOCs	SW8260B	1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	ND	50
		1,1,1-Trichloroethane	71-55-6	60	200	ND	50
		1,1,2,2-Tetrachloroethane	79-34-5	10	NS	ND	100
		1,1,2-Trichloroethane	79-00-5	10	5	ND	50
		1,1-Dichloroethane	75-34-3	25	NS	ND	50
		1,1-Dichloroethene	75-35-4	5	7	ND	50
		1,1-Dichloropropene	563-58-6	NS	NS	ND	50
		1,2,3-Trichlorobenzene	87-61-6	NS	NS	ND	50
		1,2,3-Trichloropropane	96-18-4	NS	NS	ND	100
		1,2,4-Trichlorobenzene	120-82-1	NS	70	ND	50
		1,2,4-Trimethylbenzene	95-63-6	NS	NS	ND	50
		1,2-Dibromo-3-chloropropane	96-12-8	NS	0.2	ND	100
		1,2-Dibromoethane (EDB)	106-93-4	0.1	0.05	ND	50
		1,2-Dichlorobenzene	95-50-1	600	600	ND	50
		1,2-Dichloroethane (EDC)	107-06-2	10	5	ND	50
		1,2-Dichloropropane	78-87-5	NS	5	ND	50
		1,3,5-Trimethylbenzene	108-67-8	NS	NS	ND	50
		1,3-Dichlorobenzene	541-73-1	600	600	ND	50
		1,3-Dichloropropane	142-28-9	NS	NS	ND	50
		1,4-Dichlorobenzene	106-46-7	NS	75	ND	50
		1-Methylnaphthalene <sup>c</sup>	90-12-0	30	NS	ND	200
		2,2-Dichloropropane	594-20-7	NS	NS	ND	100
		2-Butanone	78-93-3	NS	NS	900	500
		2-Chlorotoluene	95-49-8	NS	NS	ND	50
		2-Hexanone	591-78-6	NS	NS	ND	500
		2-Methylnaphthalene	91-57-6	NS	NS	ND	200
		4-Chlorotoluene	106-43-4	NS	NS	ND	50
		4-Isopropyltoluene	99-87-6	NS	NS	ND	50
		4-Methyl-2-pentanone	108-10-1	NS	NS	ND	500
		Acetone	67-64-1	NS	NS	3500	500
		Benzene	71-43-2	10	5	54	50
		Bromobenzene	108-86-1	NS	NS	ND	50
		Bromodichloromethane	75-27-4	NS	80	ND	50
		Bromoform	75-25-2	NS	80	ND	50
		Bromomethane	74-83-9	NS	NS	ND	150
		Carbon disulfide	75-15-0	NS	NS	ND	500
		Carbon tetrachloride	56-23-5	10	5	ND	50
		Chlorobenzene	108-90-7	NS	100	ND	50
		Chloroethane	75-00-3	NS	NS	ND	100
		Chloroform	67-66-3	100	80	ND	50
		Chloromethane	74-87-3	NS	NS	ND	150
		cis-1,2-Dichloroethene	156-59-2	NS	70	ND	50
		cis-1,3-Dichloropropene	10061-01-5	NS	NS	ND	50
		Dibromochloromethane	124-48-1	NS	80	ND	50
		Dibromomethane	74-95-3	NS	NS	ND	50
		Dichlorodifluoromethane	75-71-8	NS	NS	ND	50
		Ethylbenzene	100-41-4	750	700	ND	50
		Hexachlorobutadiene	87-68-3	NS	NS	ND	50
		Isopropylbenzene	98-82-8	NS	NS	ND	50
		Methyl tert-butyl ether (MTBE)	1634-04-4	NS	NS	ND	50
Methylene chloride	75-09-2	100	5	ND	150		
n-Butylbenzene	104-51-8	NS	NS	ND	150		
n-Propylbenzene	103-65-1	NS	NS	ND	50		
Naphthalene <sup>c</sup>	91-20-3	30	NS	ND	100		
sec-Butylbenzene	135-98-8	NS	NS	ND	50		
Styrene	100-42-5	NS	100	ND	50		
tert-Butylbenzene	98-06-6	NS	NS	ND	50		
Tetrachloroethene (PCE)	127-18-4	20	5	ND	50		
Toluene	108-88-3	750	1,000	280	50		
trans-1,2-DCE	156-60-5	NS	100	ND	50		
trans-1,3-Dichloropropene	10061-02-6	NS	NS	ND	50		
Trichloroethene (TCE)	79-01-6	100	5	ND	50		
Trichlorofluoromethane	75-69-4	NS	NS	ND	50		
Vinyl chloride	75-01-4	1	2	ND	50		
Xylenes, Total	1330-20-7	620	10,000	270	75		

**Table 1**  
**Water/Condensate Analytical Results for Volatile Organic Compounds**

Analytical data generated by Hall Environmental Analysis Laboratories, Inc., Albuquerque, New Mexico

<sup>a</sup> NMWQCC numeric standards per the New Mexico Administrative Code Title 20.6.2.3101A, Standards for Ground Water of 10,000 mg/L Total Dissolved Solids Concentration or Less (NMAC 2004).

<sup>b</sup> EPA National Primary Drinking Water Regulations, MCLs and Secondary MCLs, Title 40CFR Part 141, 143 (May 2009).

<sup>c</sup> NMWQCC specifies a standard for the sum of naphthalene and mononaphthalenes (1- and 2-methylnaphthalene).

µg/L = microgram per liter

CASRN = Chemical Abstracts Service Registry Number

CFR = Code of Federal Regulations

EPA = U.S. Environmental Protection Agency

MCL = maximum contaminant level

ND = not detected above the method detection limit

NMAC = New Mexico Administrative Code

NMWQCC = New Mexico Water Quality Control Commission

NS = not specified

PQL = practical quantitation limit

REG = normal field sample

SW = EPA SW-846 Test Methods for Evaluating Solid Waste, Third Edition, 1986 and Updates

VOC = Volatile organic compound

Shading = detected concentration above the PQL

**Bold = detected concentration exceeds the NMWQCC or EPA MCL value.**

**Table 2**  
**Soil Analytical Results for Volatile Organic Compound**

Parameter	EPA Method	Analyte	CASRN	Field Sample ID:		Cat Ox SP-01		Cat Ox SP-02		Cat Ox SP-03		Cat Ox SP-04		Cat Ox SP-05		Cat Ox SP-06	
				NMED Residential SSL <sup>a</sup>	EPA RSL <sup>b</sup>	Result (mg/kg)	PQL										
				Sample Date:	Sample Type:	2/1/2017		2/1/2017		2/1/2017		2/1/2017		2/1/2017		2/1/2017	
VOCs	SW8260B	1,1,1,2-Tetrachloroethane	630-20-6	28.1	20	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		1,1,1-Trichloroethane	71-55-6	14,400	8100	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		1,1,2,2-Tetrachloroethane	79-34-5	7.98	6	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		1,1,2-Trichloroethane	79-00-5	2.61	11	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		1,1-Dichloroethane	75-34-3	78.6	36	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		1,1-Dichloroethene	75-35-4	440	230	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		1,1-Dichloropropene	563-58-6	NS	NS	ND	0.099	ND	0.094	ND	0.092	ND	0.099	ND	0.098	ND	0.098
		1,2,3-Trichlorobenzene	87-61-6	NS	63	ND	0.099	ND	0.094	ND	0.092	ND	0.099	ND	0.098	ND	0.098
		1,2,3-Trichloropropane	96-18-4	0.051	0.051	ND	0.099	ND	0.094	ND	0.092	ND	0.099	ND	0.098	ND	0.098
		1,2,4-Trichlorobenzene	120-82-1	82.9	240	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		1,2,4-Trimethylbenzene	95-63-6	NS	58	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		1,2-Dibromo-3-chloropropane	96-12-8	0.0858	0.053	ND	0.099	ND	0.094	ND	0.092	ND	0.099	ND	0.098	ND	0.098
		1,2-Dibromoethane (EDB)	106-93-4	0.672	0.36	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		1,2-Dichlorobenzene	95-50-1	2,150	1800	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		1,2-Dichloroethane (EDC)	107-06-2	8.32	4.6	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		1,2-Dichloropropane	78-87-5	17.8	10	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		1,3,5-Trimethylbenzene	108-67-8	NS	780	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		1,3-Dichlorobenzene	541-73-1	NS	26	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		1,3-Dichloropropane	142-28-9	NS	1600	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		1,4-Dichlorobenzene	106-46-7	32.8	26	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		1-Methylnaphthalene	90-12-0	NS	18	ND	0.199	ND	0.188	ND	0.183	ND	0.198	ND	0.195	ND	0.195
		2,2-Dichloropropane	594-20-7	NS	NS	ND	0.099	ND	0.094	ND	0.092	ND	0.099	ND	0.098	ND	0.098
		2-Butanone	78-93-3	37,400	27000	ND	0.497	ND	0.470	ND	0.459	ND	0.495	ND	0.488	ND	0.488
		2-Chlorotoluene	95-49-8	1,560	1600	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		2-Hexanone	591-78-6	NS	200	ND	0.497	ND	0.470	ND	0.459	ND	0.495	ND	0.488	ND	0.488
		2-Methylnaphthalene	91-57-6	NS	24	ND	0.199	ND	0.188	ND	0.183	ND	0.198	ND	0.195	ND	0.195
		4-Chlorotoluene	106-43-4	NS	1600	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		4-Isopropyltoluene	99-87-6	NS	NS	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		4-Methyl-2-pentanone	108-10-1	5,810	33000	ND	0.497	ND	0.470	ND	0.459	ND	0.495	ND	0.488	ND	0.488
		Acetone	67-64-1	66,300	61000	ND	0.745	ND	0.706	ND	0.688	ND	0.743	ND	0.732	ND	0.732
		Benzene	71-43-2	17.8	12	ND	0.025	ND	0.024	ND	0.023	ND	0.025	ND	0.024	ND	0.024
		Bromobenzene	108-86-1	NS	290	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		Bromodichloromethane	75-27-4	6.19	2.9	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		Bromoform	75-25-2	674	190	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		Bromomethane	74-83-9	17.7	6.8	ND	0.149	ND	0.141	ND	0.138	ND	0.149	ND	0.146	ND	0.146
		Carbon disulfide	75-15-0	1,550	770	ND	0.497	ND	0.470	ND	0.459	ND	0.495	ND	0.488	ND	0.488
		Carbon tetrachloride	56-23-5	10.7	6.5	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		Chlorobenzene	108-90-7	378	280	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		Chloroethane	75-00-3	19,000	14000	ND	0.099	ND	0.094	ND	0.092	ND	0.099	ND	0.098	ND	0.098
		Chloroform	67-66-3	5.9	3.2	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		Chloromethane	74-87-3	41.1	110	ND	0.149	ND	0.141	ND	0.138	ND	0.149	ND	0.146	ND	0.146

**Table 2**  
**Soil Analytical Results for Volatile Organic Compound**

Parameter	EPA Method	Analyte	CASRN	Field Sample ID:		Cat Ox SP-01		Cat Ox SP-02		Cat Ox SP-03		Cat Ox SP-04		Cat Ox SP-05		Cat Ox SP-06	
				NMED Residential SSL <sup>a</sup>	EPA RSL <sup>b</sup>	Result (mg/kg)	PQL										
				Sample Date:	Sample Type:	REG											
VOCs	SW8260B	cis-1,2-Dichloroethene	156-59-2	156	160	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		cis-1,3-Dichloropropene	10061-01-5	29.3	18	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		Dibromochloromethane	124-48-1	13.9	83	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		Dibromomethane	74-95-3	57.9	24	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		Dichlorodifluoromethane	75-71-8	182	87	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		Ethylbenzene	100-41-4	75.1	58	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		Hexachlorobutadiene	87-68-3	61.6	1.2	ND	0.099	ND	0.094	ND	0.092	ND	0.099	ND	0.098	ND	0.098
		Isopropylbenzene	98-82-8	2,360	1900	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		Methyl tert-butyl ether (MTBE)	1634-04-4	975	470	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		Methylene chloride	75-09-2	409	570	ND	0.149	ND	0.141	ND	0.138	ND	0.149	ND	0.146	ND	0.146
		n-Butylbenzene	104-51-8	NS	3900	ND	0.149	ND	0.141	ND	0.138	ND	0.149	ND	0.146	ND	0.146
		n-Propylbenzene	103-65-1	NS	3800	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		Naphthalene	91-20-3	49.7	38	ND	0.099	ND	0.094	ND	0.092	ND	0.099	ND	0.098	ND	0.098
		sec-Butylbenzene	135-98-8	NS	7800	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		Styrene	100-42-5	7,260	6000	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		tert-Butylbenzene	98-06-6	NS	7800	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		Tetrachloroethene (PCE)	127-18-4	111	24	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		Toluene	108-88-3	5,230	4900	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		trans-1,2-Dichloroethene	156-60-5	295	1600	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
		trans-1,3-Dichloropropene	10061-02-6	29.3	18	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049
Trichloroethene (TCE)	79-01-6	6.77	9.4	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049		
Trichlorofluoromethane	75-69-4	1,230	23000	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049		
Vinyl chloride	75-01-4	0.742	0.59	ND	0.050	ND	0.047	ND	0.046	ND	0.050	ND	0.049	ND	0.049		
Xylenes, Total	1330-20-7	871	580	ND	0.099	ND	0.094	ND	0.092	ND	0.099	ND	0.098	ND	0.098		

Analytical data generated by Hall Environmental Analysis Laboratories, Inc., Albuquerque, New Mexico. Results are presented "as received" from the laboratory and have not been adjusted for moisture content.

<sup>a</sup> Residential land use SSLs from the NMED Risk Assessment Guidance for Site Investigations and Remediation, Appendix A, Table A-1, NMED SSLs. July 2015.

<sup>b</sup> USEPA Regional Screening Levels (RSLs) for residential land use scenario for hazard index = 1.0 for non-carcinogens and a 10-5 cancer risk level for carcinogens. May 2016.

CASRN = Chemical Abstracts Service Registry Number

EPA = U.S. Environmental Protection Agency

mg/kg = Milligram(s) per kilogram

ND = Not detected above the PQL

NMED = New Mexico Environment Department

PQL = practical quantification limit

RSL = Regional Screening Level

SSL = Soil Screening Level

SW = EPA SW-846 Test Methods for Evaluating Solid Waste, Third Edition, 1986 and Updates

VOC = Volatile organic compound

Shading = detected concentration above the PQL

**Bold = detected concentration exceeds the NMED SSL or EPA RSL value.**

**APPENDIX A**  
**PHOTOGRAPHS**



Address: BFF Kirtland AFB  
Description: Release location with impacted soil.  
Date: February 1, 2017

Direction: North



Address: BFF Kirtland AFB  
Description: Cut HDPE location where the release occurred.  
Date: February 1, 2017

Direction: North



Address: BFF Kirtland AFB  
Description: Release location with HDPE pipe elevated.  
Date: February 1, 2017

Direction: North



Address: BFF Kirtland AFB  
Description: Soil removal with shovels.  
Date: February 1, 2017

Direction: North



Address: BFF Kirtland AFB

Description: Release location after impacted soil removal and pin flags of release perimeter.

Date: February 1, 2017

Direction: North



Address: BFF Kirtland AFB

Description: Release perimeter identified by pin flags.

Date: February 1, 2017

Direction: North



Address: BFF Kirtland AFB  
Description: Overnight cover for exposed pipe section.  
Date: February 1, 2017

Direction: North



Address: BFF Kirtland AFB  
Description: Overnight cover for exposed pipe section.  
Date: February 1, 2017

Direction: North



Address: BFF Kirtland AFB

Description: HDPE pipe elevated to drain water/condensate to a low point.

Date: February 2, 2017

Direction: North



Address: BFF Kirtland AFB

Description: Cut poly drum placed under the low point to ensure no spillage to soil during condensate removal.

Date: February 2, 2017

Direction: North



Address: BFF Kirtland AFB

Description: Preparation to cut hole in top of HDPE for vacuum truck stinger access.

Date: February 2, 2017

Direction: North



Address: BFF, Kirtland AFB

Description: Vacuum truck connected to the HDPE pipe with removing water/condensate.

Date: February 2, 2017

Direction: North



Address: BFF, Kirtland AFB

Description: Cut HDPE pipe after condensate removed.

Date: February 2, 2017

Direction: North

**APPENDIX B**  
**LABORATORY ANALYTICAL REPORTS**



Hall Environmental Analysis Laboratory  
4901 Hawkins NE  
Albuquerque, NM 87109  
TEL: 505-345-3975 FAX: 505-345-4107  
Website: [www.hallenvironmental.com](http://www.hallenvironmental.com)

February 06, 2017

Devon Jercinovic  
EA Engineering  
320 Gold Ave SW Suite 1210  
Albuquerque, NM 87102  
TEL: (505) 224-9013  
FAX

RE: Cat Ox Removal

OrderNo.: 1702076

Dear Devon Jercinovic:

Hall Environmental Analysis Laboratory received 7 sample(s) on 2/1/2017 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to [www.hallenvironmental.com](http://www.hallenvironmental.com) or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a light blue horizontal line.

Andy Freeman  
Laboratory Manager  
4901 Hawkins NE  
Albuquerque, NM 87109

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1702076

Date Reported: 2/6/2017

CLIENT: EA Engineering

Client Sample ID: Cat Ox SP-01

Project: Cat Ox Removal

Collection Date: 2/1/2017 10:17:00 AM

Lab ID: 1702076-001

Matrix: SOIL

Received Date: 2/1/2017 4:33:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8260B: VOLATILES</b>							Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Toluene	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Ethylbenzene	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Methyl tert-butyl ether (MTBE)	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
1,2,4-Trimethylbenzene	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
1,3,5-Trimethylbenzene	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
1,2-Dichloroethane (EDC)	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
1,2-Dibromoethane (EDB)	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Naphthalene	ND	0.099		mg/Kg	1	2/3/2017 12:25:37 PM	30023
1-Methylnaphthalene	ND	0.20		mg/Kg	1	2/3/2017 12:25:37 PM	30023
2-Methylnaphthalene	ND	0.20		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Acetone	ND	0.74		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Bromobenzene	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Bromodichloromethane	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Bromoform	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Bromomethane	ND	0.15		mg/Kg	1	2/3/2017 12:25:37 PM	30023
2-Butanone	ND	0.50		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Carbon disulfide	ND	0.50		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Carbon tetrachloride	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Chlorobenzene	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Chloroethane	ND	0.099		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Chloroform	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Chloromethane	ND	0.15		mg/Kg	1	2/3/2017 12:25:37 PM	30023
2-Chlorotoluene	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
4-Chlorotoluene	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
cis-1,2-DCE	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
cis-1,3-Dichloropropene	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
1,2-Dibromo-3-chloropropane	ND	0.099		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Dibromochloromethane	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Dibromomethane	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
1,2-Dichlorobenzene	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
1,3-Dichlorobenzene	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
1,4-Dichlorobenzene	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Dichlorodifluoromethane	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
1,1-Dichloroethane	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
1,1-Dichloroethene	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
1,2-Dichloropropane	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
1,3-Dichloropropane	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
2,2-Dichloropropane	ND	0.099		mg/Kg	1	2/3/2017 12:25:37 PM	30023

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1702076

Date Reported: 2/6/2017

CLIENT: EA Engineering

Client Sample ID: Cat Ox SP-01

Project: Cat Ox Removal

Collection Date: 2/1/2017 10:17:00 AM

Lab ID: 1702076-001

Matrix: SOIL

Received Date: 2/1/2017 4:33:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8260B: VOLATILES</b>							Analyst: DJF
1,1-Dichloropropene	ND	0.099		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Hexachlorobutadiene	ND	0.099		mg/Kg	1	2/3/2017 12:25:37 PM	30023
2-Hexanone	ND	0.50		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Isopropylbenzene	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
4-Isopropyltoluene	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
4-Methyl-2-pentanone	ND	0.50		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Methylene chloride	ND	0.15		mg/Kg	1	2/3/2017 12:25:37 PM	30023
n-Butylbenzene	ND	0.15		mg/Kg	1	2/3/2017 12:25:37 PM	30023
n-Propylbenzene	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
sec-Butylbenzene	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Styrene	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
tert-Butylbenzene	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
1,1,1,2-Tetrachloroethane	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
1,1,2,2-Tetrachloroethane	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Tetrachloroethene (PCE)	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
trans-1,2-DCE	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
trans-1,3-Dichloropropene	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
1,2,3-Trichlorobenzene	ND	0.099		mg/Kg	1	2/3/2017 12:25:37 PM	30023
1,2,4-Trichlorobenzene	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
1,1,1-Trichloroethane	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
1,1,2-Trichloroethane	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Trichloroethene (TCE)	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Trichlorofluoromethane	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
1,2,3-Trichloropropane	ND	0.099		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Vinyl chloride	ND	0.050		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Xylenes, Total	ND	0.099		mg/Kg	1	2/3/2017 12:25:37 PM	30023
Surr: Dibromofluoromethane	99.1	70-130		%Rec	1	2/3/2017 12:25:37 PM	30023
Surr: 1,2-Dichloroethane-d4	96.4	70-130		%Rec	1	2/3/2017 12:25:37 PM	30023
Surr: Toluene-d8	103	70-130		%Rec	1	2/3/2017 12:25:37 PM	30023
Surr: 4-Bromofluorobenzene	96.5	70-130		%Rec	1	2/3/2017 12:25:37 PM	30023

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1702076

Date Reported: 2/6/2017

CLIENT: EA Engineering

Client Sample ID: Cat Ox SP-02

Project: Cat Ox Removal

Collection Date: 2/1/2017 10:19:00 AM

Lab ID: 1702076-002

Matrix: SOIL

Received Date: 2/1/2017 4:33:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8260B: VOLATILES</b>							Analyst: DJF
Benzene	ND	0.024		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Toluene	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Ethylbenzene	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Methyl tert-butyl ether (MTBE)	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
1,2,4-Trimethylbenzene	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
1,3,5-Trimethylbenzene	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
1,2-Dichloroethane (EDC)	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
1,2-Dibromoethane (EDB)	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Naphthalene	ND	0.094		mg/Kg	1	2/3/2017 12:55:03 PM	30023
1-Methylnaphthalene	ND	0.19		mg/Kg	1	2/3/2017 12:55:03 PM	30023
2-Methylnaphthalene	ND	0.19		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Acetone	ND	0.71		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Bromobenzene	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Bromodichloromethane	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Bromoform	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Bromomethane	ND	0.14		mg/Kg	1	2/3/2017 12:55:03 PM	30023
2-Butanone	ND	0.47		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Carbon disulfide	ND	0.47		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Carbon tetrachloride	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Chlorobenzene	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Chloroethane	ND	0.094		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Chloroform	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Chloromethane	ND	0.14		mg/Kg	1	2/3/2017 12:55:03 PM	30023
2-Chlorotoluene	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
4-Chlorotoluene	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
cis-1,2-DCE	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
cis-1,3-Dichloropropene	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
1,2-Dibromo-3-chloropropane	ND	0.094		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Dibromochloromethane	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Dibromomethane	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
1,2-Dichlorobenzene	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
1,3-Dichlorobenzene	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
1,4-Dichlorobenzene	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Dichlorodifluoromethane	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
1,1-Dichloroethane	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
1,1-Dichloroethene	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
1,2-Dichloropropane	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
1,3-Dichloropropane	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
2,2-Dichloropropane	ND	0.094		mg/Kg	1	2/3/2017 12:55:03 PM	30023

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1702076

Date Reported: 2/6/2017

CLIENT: EA Engineering

Client Sample ID: Cat Ox SP-02

Project: Cat Ox Removal

Collection Date: 2/1/2017 10:19:00 AM

Lab ID: 1702076-002

Matrix: SOIL

Received Date: 2/1/2017 4:33:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8260B: VOLATILES</b>							Analyst: DJF
1,1-Dichloropropene	ND	0.094		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Hexachlorobutadiene	ND	0.094		mg/Kg	1	2/3/2017 12:55:03 PM	30023
2-Hexanone	ND	0.47		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Isopropylbenzene	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
4-Isopropyltoluene	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
4-Methyl-2-pentanone	ND	0.47		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Methylene chloride	ND	0.14		mg/Kg	1	2/3/2017 12:55:03 PM	30023
n-Butylbenzene	ND	0.14		mg/Kg	1	2/3/2017 12:55:03 PM	30023
n-Propylbenzene	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
sec-Butylbenzene	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Styrene	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
tert-Butylbenzene	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
1,1,1,2-Tetrachloroethane	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
1,1,2,2-Tetrachloroethane	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Tetrachloroethene (PCE)	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
trans-1,2-DCE	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
trans-1,3-Dichloropropene	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
1,2,3-Trichlorobenzene	ND	0.094		mg/Kg	1	2/3/2017 12:55:03 PM	30023
1,2,4-Trichlorobenzene	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
1,1,1-Trichloroethane	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
1,1,2-Trichloroethane	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Trichloroethene (TCE)	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Trichlorofluoromethane	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
1,2,3-Trichloropropane	ND	0.094		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Vinyl chloride	ND	0.047		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Xylenes, Total	ND	0.094		mg/Kg	1	2/3/2017 12:55:03 PM	30023
Surr: Dibromofluoromethane	95.7	70-130		%Rec	1	2/3/2017 12:55:03 PM	30023
Surr: 1,2-Dichloroethane-d4	96.6	70-130		%Rec	1	2/3/2017 12:55:03 PM	30023
Surr: Toluene-d8	104	70-130		%Rec	1	2/3/2017 12:55:03 PM	30023
Surr: 4-Bromofluorobenzene	86.9	70-130		%Rec	1	2/3/2017 12:55:03 PM	30023

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1702076

Date Reported: 2/6/2017

CLIENT: EA Engineering

Client Sample ID: Cat Ox SP-03

Project: Cat Ox Removal

Collection Date: 2/1/2017 10:21:00 AM

Lab ID: 1702076-003

Matrix: SOIL

Received Date: 2/1/2017 4:33:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8260B: VOLATILES</b>							Analyst: DJF
Benzene	ND	0.023		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Toluene	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Ethylbenzene	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Methyl tert-butyl ether (MTBE)	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
1,2,4-Trimethylbenzene	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
1,3,5-Trimethylbenzene	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
1,2-Dichloroethane (EDC)	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
1,2-Dibromoethane (EDB)	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Naphthalene	ND	0.092		mg/Kg	1	2/3/2017 2:51:38 PM	30023
1-Methylnaphthalene	ND	0.18		mg/Kg	1	2/3/2017 2:51:38 PM	30023
2-Methylnaphthalene	ND	0.18		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Acetone	ND	0.69		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Bromobenzene	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Bromodichloromethane	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Bromoform	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Bromomethane	ND	0.14		mg/Kg	1	2/3/2017 2:51:38 PM	30023
2-Butanone	ND	0.46		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Carbon disulfide	ND	0.46		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Carbon tetrachloride	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Chlorobenzene	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Chloroethane	ND	0.092		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Chloroform	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Chloromethane	ND	0.14		mg/Kg	1	2/3/2017 2:51:38 PM	30023
2-Chlorotoluene	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
4-Chlorotoluene	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
cis-1,2-DCE	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
cis-1,3-Dichloropropene	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
1,2-Dibromo-3-chloropropane	ND	0.092		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Dibromochloromethane	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Dibromomethane	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
1,2-Dichlorobenzene	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
1,3-Dichlorobenzene	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
1,4-Dichlorobenzene	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Dichlorodifluoromethane	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
1,1-Dichloroethane	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
1,1-Dichloroethene	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
1,2-Dichloropropane	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
1,3-Dichloropropane	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
2,2-Dichloropropane	ND	0.092		mg/Kg	1	2/3/2017 2:51:38 PM	30023

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1702076

Date Reported: 2/6/2017

CLIENT: EA Engineering

Client Sample ID: Cat Ox SP-03

Project: Cat Ox Removal

Collection Date: 2/1/2017 10:21:00 AM

Lab ID: 1702076-003

Matrix: SOIL

Received Date: 2/1/2017 4:33:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8260B: VOLATILES</b>							Analyst: DJF
1,1-Dichloropropene	ND	0.092		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Hexachlorobutadiene	ND	0.092		mg/Kg	1	2/3/2017 2:51:38 PM	30023
2-Hexanone	ND	0.46		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Isopropylbenzene	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
4-Isopropyltoluene	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
4-Methyl-2-pentanone	ND	0.46		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Methylene chloride	ND	0.14		mg/Kg	1	2/3/2017 2:51:38 PM	30023
n-Butylbenzene	ND	0.14		mg/Kg	1	2/3/2017 2:51:38 PM	30023
n-Propylbenzene	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
sec-Butylbenzene	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Styrene	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
tert-Butylbenzene	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
1,1,1,2-Tetrachloroethane	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
1,1,2,2-Tetrachloroethane	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Tetrachloroethene (PCE)	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
trans-1,2-DCE	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
trans-1,3-Dichloropropene	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
1,2,3-Trichlorobenzene	ND	0.092		mg/Kg	1	2/3/2017 2:51:38 PM	30023
1,2,4-Trichlorobenzene	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
1,1,1-Trichloroethane	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
1,1,2-Trichloroethane	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Trichloroethene (TCE)	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Trichlorofluoromethane	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
1,2,3-Trichloropropane	ND	0.092		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Vinyl chloride	ND	0.046		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Xylenes, Total	ND	0.092		mg/Kg	1	2/3/2017 2:51:38 PM	30023
Surr: Dibromofluoromethane	97.2	70-130		%Rec	1	2/3/2017 2:51:38 PM	30023
Surr: 1,2-Dichloroethane-d4	93.4	70-130		%Rec	1	2/3/2017 2:51:38 PM	30023
Surr: Toluene-d8	110	70-130		%Rec	1	2/3/2017 2:51:38 PM	30023
Surr: 4-Bromofluorobenzene	95.2	70-130		%Rec	1	2/3/2017 2:51:38 PM	30023

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1702076

Date Reported: 2/6/2017

CLIENT: EA Engineering

Client Sample ID: Cat Ox SP-04

Project: Cat Ox Removal

Collection Date: 2/1/2017 3:20:00 PM

Lab ID: 1702076-004

Matrix: SOIL

Received Date: 2/1/2017 4:33:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8260B: VOLATILES</b>							Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Toluene	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Ethylbenzene	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Methyl tert-butyl ether (MTBE)	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
1,2,4-Trimethylbenzene	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
1,3,5-Trimethylbenzene	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
1,2-Dichloroethane (EDC)	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
1,2-Dibromoethane (EDB)	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Naphthalene	ND	0.099		mg/Kg	1	2/3/2017 1:24:37 PM	30023
1-Methylnaphthalene	ND	0.20		mg/Kg	1	2/3/2017 1:24:37 PM	30023
2-Methylnaphthalene	ND	0.20		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Acetone	ND	0.74		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Bromobenzene	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Bromodichloromethane	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Bromoform	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Bromomethane	ND	0.15		mg/Kg	1	2/3/2017 1:24:37 PM	30023
2-Butanone	ND	0.50		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Carbon disulfide	ND	0.50		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Carbon tetrachloride	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Chlorobenzene	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Chloroethane	ND	0.099		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Chloroform	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Chloromethane	ND	0.15		mg/Kg	1	2/3/2017 1:24:37 PM	30023
2-Chlorotoluene	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
4-Chlorotoluene	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
cis-1,2-DCE	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
cis-1,3-Dichloropropene	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
1,2-Dibromo-3-chloropropane	ND	0.099		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Dibromochloromethane	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Dibromomethane	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
1,2-Dichlorobenzene	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
1,3-Dichlorobenzene	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
1,4-Dichlorobenzene	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Dichlorodifluoromethane	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
1,1-Dichloroethane	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
1,1-Dichloroethene	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
1,2-Dichloropropane	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
1,3-Dichloropropane	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
2,2-Dichloropropane	ND	0.099		mg/Kg	1	2/3/2017 1:24:37 PM	30023

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1702076

Date Reported: 2/6/2017

CLIENT: EA Engineering

Client Sample ID: Cat Ox SP-04

Project: Cat Ox Removal

Collection Date: 2/1/2017 3:20:00 PM

Lab ID: 1702076-004

Matrix: SOIL

Received Date: 2/1/2017 4:33:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8260B: VOLATILES</b>							Analyst: DJF
1,1-Dichloropropene	ND	0.099		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Hexachlorobutadiene	ND	0.099		mg/Kg	1	2/3/2017 1:24:37 PM	30023
2-Hexanone	ND	0.50		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Isopropylbenzene	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
4-Isopropyltoluene	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
4-Methyl-2-pentanone	ND	0.50		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Methylene chloride	ND	0.15		mg/Kg	1	2/3/2017 1:24:37 PM	30023
n-Butylbenzene	ND	0.15		mg/Kg	1	2/3/2017 1:24:37 PM	30023
n-Propylbenzene	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
sec-Butylbenzene	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Styrene	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
tert-Butylbenzene	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
1,1,1,2-Tetrachloroethane	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
1,1,2,2-Tetrachloroethane	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Tetrachloroethene (PCE)	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
trans-1,2-DCE	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
trans-1,3-Dichloropropene	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
1,2,3-Trichlorobenzene	ND	0.099		mg/Kg	1	2/3/2017 1:24:37 PM	30023
1,2,4-Trichlorobenzene	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
1,1,1-Trichloroethane	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
1,1,2-Trichloroethane	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Trichloroethene (TCE)	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Trichlorofluoromethane	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
1,2,3-Trichloropropane	ND	0.099		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Vinyl chloride	ND	0.050		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Xylenes, Total	ND	0.099		mg/Kg	1	2/3/2017 1:24:37 PM	30023
Surr: Dibromofluoromethane	95.4	70-130		%Rec	1	2/3/2017 1:24:37 PM	30023
Surr: 1,2-Dichloroethane-d4	97.3	70-130		%Rec	1	2/3/2017 1:24:37 PM	30023
Surr: Toluene-d8	104	70-130		%Rec	1	2/3/2017 1:24:37 PM	30023
Surr: 4-Bromofluorobenzene	88.2	70-130		%Rec	1	2/3/2017 1:24:37 PM	30023

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1702076

Date Reported: 2/6/2017

CLIENT: EA Engineering

Client Sample ID: Cat Ox SP-05

Project: Cat Ox Removal

Collection Date: 2/1/2017 3:19:00 PM

Lab ID: 1702076-005

Matrix: SOIL

Received Date: 2/1/2017 4:33:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8260B: VOLATILES</b>							Analyst: DJF
Benzene	ND	0.024		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Toluene	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Ethylbenzene	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Methyl tert-butyl ether (MTBE)	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
1,2,4-Trimethylbenzene	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
1,3,5-Trimethylbenzene	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
1,2-Dichloroethane (EDC)	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
1,2-Dibromoethane (EDB)	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Naphthalene	ND	0.098		mg/Kg	1	2/3/2017 1:53:18 PM	30023
1-Methylnaphthalene	ND	0.20		mg/Kg	1	2/3/2017 1:53:18 PM	30023
2-Methylnaphthalene	ND	0.20		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Acetone	ND	0.73		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Bromobenzene	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Bromodichloromethane	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Bromoform	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Bromomethane	ND	0.15		mg/Kg	1	2/3/2017 1:53:18 PM	30023
2-Butanone	ND	0.49		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Carbon disulfide	ND	0.49		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Carbon tetrachloride	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Chlorobenzene	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Chloroethane	ND	0.098		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Chloroform	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Chloromethane	ND	0.15		mg/Kg	1	2/3/2017 1:53:18 PM	30023
2-Chlorotoluene	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
4-Chlorotoluene	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
cis-1,2-DCE	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
cis-1,3-Dichloropropene	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
1,2-Dibromo-3-chloropropane	ND	0.098		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Dibromochloromethane	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Dibromomethane	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
1,2-Dichlorobenzene	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
1,3-Dichlorobenzene	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
1,4-Dichlorobenzene	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Dichlorodifluoromethane	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
1,1-Dichloroethane	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
1,1-Dichloroethene	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
1,2-Dichloropropane	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
1,3-Dichloropropane	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
2,2-Dichloropropane	ND	0.098		mg/Kg	1	2/3/2017 1:53:18 PM	30023

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1702076

Date Reported: 2/6/2017

CLIENT: EA Engineering

Client Sample ID: Cat Ox SP-05

Project: Cat Ox Removal

Collection Date: 2/1/2017 3:19:00 PM

Lab ID: 1702076-005

Matrix: SOIL

Received Date: 2/1/2017 4:33:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8260B: VOLATILES</b>							Analyst: DJF
1,1-Dichloropropene	ND	0.098		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Hexachlorobutadiene	ND	0.098		mg/Kg	1	2/3/2017 1:53:18 PM	30023
2-Hexanone	ND	0.49		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Isopropylbenzene	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
4-Isopropyltoluene	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
4-Methyl-2-pentanone	ND	0.49		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Methylene chloride	ND	0.15		mg/Kg	1	2/3/2017 1:53:18 PM	30023
n-Butylbenzene	ND	0.15		mg/Kg	1	2/3/2017 1:53:18 PM	30023
n-Propylbenzene	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
sec-Butylbenzene	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Styrene	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
tert-Butylbenzene	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
1,1,1,2-Tetrachloroethane	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
1,1,2,2-Tetrachloroethane	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Tetrachloroethene (PCE)	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
trans-1,2-DCE	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
trans-1,3-Dichloropropene	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
1,2,3-Trichlorobenzene	ND	0.098		mg/Kg	1	2/3/2017 1:53:18 PM	30023
1,2,4-Trichlorobenzene	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
1,1,1-Trichloroethane	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
1,1,2-Trichloroethane	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Trichloroethene (TCE)	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Trichlorofluoromethane	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
1,2,3-Trichloropropane	ND	0.098		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Vinyl chloride	ND	0.049		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Xylenes, Total	ND	0.098		mg/Kg	1	2/3/2017 1:53:18 PM	30023
Surr: Dibromofluoromethane	95.3	70-130		%Rec	1	2/3/2017 1:53:18 PM	30023
Surr: 1,2-Dichloroethane-d4	96.0	70-130		%Rec	1	2/3/2017 1:53:18 PM	30023
Surr: Toluene-d8	109	70-130		%Rec	1	2/3/2017 1:53:18 PM	30023
Surr: 4-Bromofluorobenzene	96.0	70-130		%Rec	1	2/3/2017 1:53:18 PM	30023

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1702076

Date Reported: 2/6/2017

CLIENT: EA Engineering

Client Sample ID: Cat Ox SP-06

Project: Cat Ox Removal

Collection Date: 2/1/2017 3:18:00 PM

Lab ID: 1702076-006

Matrix: SOIL

Received Date: 2/1/2017 4:33:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8260B: VOLATILES</b>							Analyst: DJF
Benzene	ND	0.024		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Toluene	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Ethylbenzene	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Methyl tert-butyl ether (MTBE)	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
1,2,4-Trimethylbenzene	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
1,3,5-Trimethylbenzene	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
1,2-Dichloroethane (EDC)	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
1,2-Dibromoethane (EDB)	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Naphthalene	ND	0.098		mg/Kg	1	2/3/2017 2:22:24 PM	30023
1-Methylnaphthalene	ND	0.20		mg/Kg	1	2/3/2017 2:22:24 PM	30023
2-Methylnaphthalene	ND	0.20		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Acetone	ND	0.73		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Bromobenzene	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Bromodichloromethane	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Bromoform	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Bromomethane	ND	0.15		mg/Kg	1	2/3/2017 2:22:24 PM	30023
2-Butanone	ND	0.49		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Carbon disulfide	ND	0.49		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Carbon tetrachloride	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Chlorobenzene	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Chloroethane	ND	0.098		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Chloroform	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Chloromethane	ND	0.15		mg/Kg	1	2/3/2017 2:22:24 PM	30023
2-Chlorotoluene	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
4-Chlorotoluene	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
cis-1,2-DCE	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
cis-1,3-Dichloropropene	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
1,2-Dibromo-3-chloropropane	ND	0.098		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Dibromochloromethane	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Dibromomethane	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
1,2-Dichlorobenzene	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
1,3-Dichlorobenzene	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
1,4-Dichlorobenzene	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Dichlorodifluoromethane	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
1,1-Dichloroethane	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
1,1-Dichloroethene	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
1,2-Dichloropropane	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
1,3-Dichloropropane	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
2,2-Dichloropropane	ND	0.098		mg/Kg	1	2/3/2017 2:22:24 PM	30023

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1702076

Date Reported: 2/6/2017

CLIENT: EA Engineering

Client Sample ID: Cat Ox SP-06

Project: Cat Ox Removal

Collection Date: 2/1/2017 3:18:00 PM

Lab ID: 1702076-006

Matrix: SOIL

Received Date: 2/1/2017 4:33:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8260B: VOLATILES</b>							Analyst: DJF
1,1-Dichloropropene	ND	0.098		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Hexachlorobutadiene	ND	0.098		mg/Kg	1	2/3/2017 2:22:24 PM	30023
2-Hexanone	ND	0.49		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Isopropylbenzene	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
4-Isopropyltoluene	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
4-Methyl-2-pentanone	ND	0.49		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Methylene chloride	ND	0.15		mg/Kg	1	2/3/2017 2:22:24 PM	30023
n-Butylbenzene	ND	0.15		mg/Kg	1	2/3/2017 2:22:24 PM	30023
n-Propylbenzene	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
sec-Butylbenzene	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Styrene	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
tert-Butylbenzene	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
1,1,1,2-Tetrachloroethane	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
1,1,2,2-Tetrachloroethane	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Tetrachloroethene (PCE)	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
trans-1,2-DCE	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
trans-1,3-Dichloropropene	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
1,2,3-Trichlorobenzene	ND	0.098		mg/Kg	1	2/3/2017 2:22:24 PM	30023
1,2,4-Trichlorobenzene	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
1,1,1-Trichloroethane	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
1,1,2-Trichloroethane	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Trichloroethene (TCE)	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Trichlorofluoromethane	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
1,2,3-Trichloropropane	ND	0.098		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Vinyl chloride	ND	0.049		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Xylenes, Total	ND	0.098		mg/Kg	1	2/3/2017 2:22:24 PM	30023
Surr: Dibromofluoromethane	100	70-130		%Rec	1	2/3/2017 2:22:24 PM	30023
Surr: 1,2-Dichloroethane-d4	98.3	70-130		%Rec	1	2/3/2017 2:22:24 PM	30023
Surr: Toluene-d8	106	70-130		%Rec	1	2/3/2017 2:22:24 PM	30023
Surr: 4-Bromofluorobenzene	94.6	70-130		%Rec	1	2/3/2017 2:22:24 PM	30023

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1702076

Date Reported: 2/6/2017

CLIENT: EA Engineering

Client Sample ID: Cat Ox Condensate

Project: Cat Ox Removal

Collection Date: 2/1/2017 3:53:00 PM

Lab ID: 1702076-007

Matrix: AQUEOUS

Received Date: 2/1/2017 4:33:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8260B: VOLATILES</b>							Analyst: <b>BCN</b>
Benzene	54	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
Toluene	280	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
Ethylbenzene	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
Methyl tert-butyl ether (MTBE)	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
1,2,4-Trimethylbenzene	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
1,3,5-Trimethylbenzene	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
1,2-Dichloroethane (EDC)	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
1,2-Dibromoethane (EDB)	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
Naphthalene	ND	100		µg/L	50	2/3/2017 10:37:00 AM	R40492
1-Methylnaphthalene	ND	200		µg/L	50	2/3/2017 10:37:00 AM	R40492
2-Methylnaphthalene	ND	200		µg/L	50	2/3/2017 10:37:00 AM	R40492
Acetone	3500	500		µg/L	50	2/3/2017 10:37:00 AM	R40492
Bromobenzene	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
Bromodichloromethane	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
Bromoform	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
Bromomethane	ND	150		µg/L	50	2/3/2017 10:37:00 AM	R40492
2-Butanone	900	500		µg/L	50	2/3/2017 10:37:00 AM	R40492
Carbon disulfide	ND	500		µg/L	50	2/3/2017 10:37:00 AM	R40492
Carbon Tetrachloride	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
Chlorobenzene	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
Chloroethane	ND	100		µg/L	50	2/3/2017 10:37:00 AM	R40492
Chloroform	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
Chloromethane	ND	150		µg/L	50	2/3/2017 10:37:00 AM	R40492
2-Chlorotoluene	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
4-Chlorotoluene	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
cis-1,2-DCE	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
cis-1,3-Dichloropropene	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
1,2-Dibromo-3-chloropropane	ND	100		µg/L	50	2/3/2017 10:37:00 AM	R40492
Dibromochloromethane	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
Dibromomethane	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
1,2-Dichlorobenzene	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
1,3-Dichlorobenzene	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
1,4-Dichlorobenzene	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
Dichlorodifluoromethane	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
1,1-Dichloroethane	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
1,1-Dichloroethene	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
1,2-Dichloropropane	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
1,3-Dichloropropane	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
2,2-Dichloropropane	ND	100		µg/L	50	2/3/2017 10:37:00 AM	R40492

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1702076

Date Reported: 2/6/2017

CLIENT: EA Engineering

Client Sample ID: Cat Ox Condensate

Project: Cat Ox Removal

Collection Date: 2/1/2017 3:53:00 PM

Lab ID: 1702076-007

Matrix: AQUEOUS

Received Date: 2/1/2017 4:33:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8260B: VOLATILES</b>							Analyst: <b>BCN</b>
1,1-Dichloropropene	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
Hexachlorobutadiene	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
2-Hexanone	ND	500		µg/L	50	2/3/2017 10:37:00 AM	R40492
Isopropylbenzene	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
4-Isopropyltoluene	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
4-Methyl-2-pentanone	ND	500		µg/L	50	2/3/2017 10:37:00 AM	R40492
Methylene Chloride	ND	150		µg/L	50	2/3/2017 10:37:00 AM	R40492
n-Butylbenzene	ND	150		µg/L	50	2/3/2017 10:37:00 AM	R40492
n-Propylbenzene	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
sec-Butylbenzene	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
Styrene	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
tert-Butylbenzene	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
1,1,1,2-Tetrachloroethane	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
1,1,2,2-Tetrachloroethane	ND	100		µg/L	50	2/3/2017 10:37:00 AM	R40492
Tetrachloroethene (PCE)	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
trans-1,2-DCE	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
trans-1,3-Dichloropropene	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
1,2,3-Trichlorobenzene	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
1,2,4-Trichlorobenzene	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
1,1,1-Trichloroethane	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
1,1,2-Trichloroethane	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
Trichloroethene (TCE)	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
Trichlorofluoromethane	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
1,2,3-Trichloropropane	ND	100		µg/L	50	2/3/2017 10:37:00 AM	R40492
Vinyl chloride	ND	50		µg/L	50	2/3/2017 10:37:00 AM	R40492
Xylenes, Total	270	75		µg/L	50	2/3/2017 10:37:00 AM	R40492
Surr: 1,2-Dichloroethane-d4	109	70-130		%Rec	50	2/3/2017 10:37:00 AM	R40492
Surr: 4-Bromofluorobenzene	111	70-130		%Rec	50	2/3/2017 10:37:00 AM	R40492
Surr: Dibromofluoromethane	105	70-130		%Rec	50	2/3/2017 10:37:00 AM	R40492
Surr: Toluene-d8	103	70-130		%Rec	50	2/3/2017 10:37:00 AM	R40492

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1702076

07-Feb-17

**Client:** EA Engineering  
**Project:** Cat Ox Removal

Sample ID: <b>mb-30023</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8260B: Volatiles</b>
Client ID: <b>PBS</b>	Batch ID: <b>30023</b>	RunNo: <b>40507</b>
Prep Date: <b>2/2/2017</b>	Analysis Date: <b>2/3/2017</b>	SeqNo: <b>1269600</b> Units: <b>mg/Kg</b>

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Methyl tert-butyl ether (MTBE)	ND	0.050								
1,2,4-Trimethylbenzene	ND	0.050								
1,3,5-Trimethylbenzene	ND	0.050								
1,2-Dichloroethane (EDC)	ND	0.050								
1,2-Dibromoethane (EDB)	ND	0.050								
Naphthalene	ND	0.10								
1-Methylnaphthalene	ND	0.20								
2-Methylnaphthalene	ND	0.20								
Acetone	ND	0.75								
Bromobenzene	ND	0.050								
Bromodichloromethane	ND	0.050								
Bromoform	ND	0.050								
Bromomethane	ND	0.15								
2-Butanone	ND	0.50								
Carbon disulfide	ND	0.50								
Carbon tetrachloride	ND	0.050								
Chlorobenzene	ND	0.050								
Chloroethane	ND	0.10								
Chloroform	ND	0.050								
Chloromethane	ND	0.15								
2-Chlorotoluene	ND	0.050								
4-Chlorotoluene	ND	0.050								
cis-1,2-DCE	ND	0.050								
cis-1,3-Dichloropropene	ND	0.050								
1,2-Dibromo-3-chloropropane	ND	0.10								
Dibromochloromethane	ND	0.050								
Dibromomethane	ND	0.050								
1,2-Dichlorobenzene	ND	0.050								
1,3-Dichlorobenzene	ND	0.050								
1,4-Dichlorobenzene	ND	0.050								
Dichlorodifluoromethane	ND	0.050								
1,1-Dichloroethane	ND	0.050								
1,1-Dichloroethene	ND	0.050								
1,2-Dichloropropane	ND	0.050								
1,3-Dichloropropane	ND	0.050								
2,2-Dichloropropane	ND	0.10								

**Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1702076

07-Feb-17

**Client:** EA Engineering  
**Project:** Cat Ox Removal

Sample ID <b>mb-30023</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8260B: Volatiles</b>
Client ID: <b>PBS</b>	Batch ID: <b>30023</b>	RunNo: <b>40507</b>
Prep Date: <b>2/2/2017</b>	Analysis Date: <b>2/3/2017</b>	SeqNo: <b>1269600</b> Units: <b>mg/Kg</b>

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	0.10								
Hexachlorobutadiene	ND	0.10								
2-Hexanone	ND	0.50								
Isopropylbenzene	ND	0.050								
4-Isopropyltoluene	ND	0.050								
4-Methyl-2-pentanone	ND	0.50								
Methylene chloride	ND	0.15								
n-Butylbenzene	ND	0.15								
n-Propylbenzene	ND	0.050								
sec-Butylbenzene	ND	0.050								
Styrene	ND	0.050								
tert-Butylbenzene	ND	0.050								
1,1,1,2-Tetrachloroethane	ND	0.050								
1,1,2,2-Tetrachloroethane	ND	0.050								
Tetrachloroethene (PCE)	ND	0.050								
trans-1,2-DCE	ND	0.050								
trans-1,3-Dichloropropene	ND	0.050								
1,2,3-Trichlorobenzene	ND	0.10								
1,2,4-Trichlorobenzene	ND	0.050								
1,1,1-Trichloroethane	ND	0.050								
1,1,2-Trichloroethane	ND	0.050								
Trichloroethene (TCE)	ND	0.050								
Trichlorofluoromethane	ND	0.050								
1,2,3-Trichloropropane	ND	0.10								
Vinyl chloride	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: Dibromofluoromethane	0.49		0.5000		98.0	70	130			
Surr: 1,2-Dichloroethane-d4	0.49		0.5000		97.9	70	130			
Surr: Toluene-d8	0.53		0.5000		107	70	130			
Surr: 4-Bromofluorobenzene	0.47		0.5000		93.6	70	130			

Sample ID <b>ics-30023</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8260B: Volatiles</b>
Client ID: <b>LCSS</b>	Batch ID: <b>30023</b>	RunNo: <b>40507</b>
Prep Date: <b>2/2/2017</b>	Analysis Date: <b>2/3/2017</b>	SeqNo: <b>1269601</b> Units: <b>mg/Kg</b>

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.96	0.025	1.000	0	95.7	70	130			
Toluene	1.1	0.050	1.000	0	106	70	130			
Chlorobenzene	1.0	0.050	1.000	0	102	70	130			

**Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1702076

07-Feb-17

**Client:** EA Engineering  
**Project:** Cat Ox Removal

Sample ID	<b>Ics-30023</b>		SampType: <b>LCS</b>	TestCode: <b>EPA Method 8260B: Volatiles</b>						
Client ID:	<b>LCSS</b>		Batch ID: <b>30023</b>	RunNo: <b>40507</b>						
Prep Date:	<b>2/2/2017</b>		Analysis Date: <b>2/3/2017</b>	SeqNo: <b>1269601</b>	Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloroethene	1.0	0.050	1.000	0	104	72	146			
Trichloroethene (TCE)	0.94	0.050	1.000	0	94.3	70	130			
Surr: Dibromofluoromethane	0.47		0.5000		94.3	70	130			
Surr: 1,2-Dichloroethane-d4	0.49		0.5000		97.4	70	130			
Surr: Toluene-d8	0.53		0.5000		105	70	130			
Surr: 4-Bromofluorobenzene	0.48		0.5000		96.1	70	130			

Sample ID	<b>1702076-001ams</b>		SampType: <b>MS</b>	TestCode: <b>EPA Method 8260B: Volatiles</b>						
Client ID:	<b>Cat Ox SP-01</b>		Batch ID: <b>30023</b>	RunNo: <b>40507</b>						
Prep Date:	<b>2/2/2017</b>		Analysis Date: <b>2/3/2017</b>	SeqNo: <b>1269602</b>	Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.90	0.024	0.9766	0	92.1	61.9	146			
Toluene	1.1	0.049	0.9766	0.03817	105	70	130			
Chlorobenzene	1.0	0.049	0.9766	0	102	70	130			
1,1-Dichloroethene	0.92	0.049	0.9766	0	94.7	37.1	170			
Trichloroethene (TCE)	0.92	0.049	0.9766	0	94.2	49.8	150			
Surr: Dibromofluoromethane	0.47		0.4883		96.2	70	130			
Surr: 1,2-Dichloroethane-d4	0.47		0.4883		96.7	70	130			
Surr: Toluene-d8	0.53		0.4883		108	70	130			
Surr: 4-Bromofluorobenzene	0.45		0.4883		93.1	70	130			

Sample ID	<b>1702076-001amsd</b>		SampType: <b>MSD</b>	TestCode: <b>EPA Method 8260B: Volatiles</b>						
Client ID:	<b>Cat Ox SP-01</b>		Batch ID: <b>30023</b>	RunNo: <b>40507</b>						
Prep Date:	<b>2/2/2017</b>		Analysis Date: <b>2/3/2017</b>	SeqNo: <b>1269603</b>	Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.81	0.023	0.9183	0	88.6	61.9	146	9.96	20	
Toluene	0.95	0.046	0.9183	0.03817	99.8	70	130	11.1	20	
Chlorobenzene	0.88	0.046	0.9183	0	96.0	70	130	12.7	20	
1,1-Dichloroethene	0.88	0.046	0.9183	0	95.6	37.1	170	5.21	20	
Trichloroethene (TCE)	0.81	0.046	0.9183	0	87.9	49.8	150	13.1	20	
Surr: Dibromofluoromethane	0.44		0.4591		95.3	70	130	0	0	
Surr: 1,2-Dichloroethane-d4	0.45		0.4591		97.2	70	130	0	0	
Surr: Toluene-d8	0.49		0.4591		107	70	130	0	0	
Surr: 4-Bromofluorobenzene	0.43		0.4591		94.0	70	130	0	0	

**Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1702076

07-Feb-17

**Client:** EA Engineering  
**Project:** Cat Ox Removal

Sample ID <b>100ng lcs2</b>	SampType: <b>LCS</b>		TestCode: <b>EPA Method 8260B: VOLATILES</b>							
Client ID: <b>LCSW</b>	Batch ID: <b>R40476</b>		RunNo: <b>40476</b>							
Prep Date:	Analysis Date: <b>2/2/2017</b>		SeqNo: <b>1268410</b>		Units: <b>%Rec</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	11		10.00		115	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		110	70	130			
Surr: Dibromofluoromethane	11		10.00		111	70	130			
Surr: Toluene-d8	10		10.00		103	70	130			

Sample ID <b>rb</b>	SampType: <b>MBLK</b>		TestCode: <b>EPA Method 8260B: VOLATILES</b>							
Client ID: <b>PBW</b>	Batch ID: <b>R40476</b>		RunNo: <b>40476</b>							
Prep Date:	Analysis Date: <b>2/2/2017</b>		SeqNo: <b>1268411</b>		Units: <b>%Rec</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	11		10.00		114	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		105	70	130			
Surr: Dibromofluoromethane	11		10.00		113	70	130			
Surr: Toluene-d8	10		10.00		103	70	130			

Sample ID <b>rb</b>	SampType: <b>MBLK</b>		TestCode: <b>EPA Method 8260B: VOLATILES</b>							
Client ID: <b>PBW</b>	Batch ID: <b>R40492</b>		RunNo: <b>40492</b>							
Prep Date:	Analysis Date: <b>2/3/2017</b>		SeqNo: <b>1269341</b>		Units: <b>µg/L</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								

**Qualifiers:**

- |   |   |
|---|---|
| * Value exceeds Maximum Contaminant Level.              | B Analyte detected in the associated Method Blank           |
| D Sample Diluted Due to Matrix                          | E Value above quantitation range                            |
| H Holding times for preparation or analysis exceeded    | J Analyte detected below quantitation limits                |
| ND Not Detected at the Reporting Limit                  | P Sample pH Not In Range                                    |
| R RPD outside accepted recovery limits                  | RL Reporting Detection Limit                                |
| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1702076

07-Feb-17

**Client:** EA Engineering  
**Project:** Cat Ox Removal

Sample ID	rb	SampType:	MBLK		TestCode:	EPA Method 8260B: VOLATILES				
Client ID:	PBW	Batch ID:	R40492		RunNo:	40492				
Prep Date:		Analysis Date:	2/3/2017		SeqNo:	1269341	Units:	µg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								

### Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
R RPD outside accepted recovery limits	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1702076

07-Feb-17

**Client:** EA Engineering  
**Project:** Cat Ox Removal

Sample ID	rb	SampType:	MBLK		TestCode:	EPA Method 8260B: VOLATILES				
Client ID:	PBW	Batch ID:	R40492		RunNo:	40492				
Prep Date:		Analysis Date:	2/3/2017		SeqNo:	1269341	Units:	µg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	11		10.00		110	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		107	70	130			
Surr: Dibromofluoromethane	11		10.00		105	70	130			
Surr: Toluene-d8	10		10.00		103	70	130			

Sample ID	100ng lcs2	SampType:	LCS		TestCode:	EPA Method 8260B: VOLATILES				
Client ID:	LCSW	Batch ID:	R40492		RunNo:	40492				
Prep Date:		Analysis Date:	2/3/2017		SeqNo:	1269478	Units:	µg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	23	1.0	20.00	0	115	70	130			
Toluene	21	1.0	20.00	0	107	70	130			
Chlorobenzene	21	1.0	20.00	0	106	70	130			
1,1-Dichloroethene	23	1.0	20.00	0	115	70	130			
Trichloroethene (TCE)	22	1.0	20.00	0	111	70	130			
Surr: 1,2-Dichloroethane-d4	11		10.00		110	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		107	70	130			
Surr: Dibromofluoromethane	11		10.00		107	70	130			
Surr: Toluene-d8	10		10.00		103	70	130			

Sample ID	rb	SampType:	MBLK		TestCode:	EPA Method 8260B: VOLATILES				
Client ID:	PBW	Batch ID:	W40507		RunNo:	40507				
Prep Date:		Analysis Date:	2/3/2017		SeqNo:	1269582	Units:	%Rec		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	10		10.00		101	70	130			
Surr: 4-Bromofluorobenzene	9.5		10.00		95.0	70	130			
Surr: Dibromofluoromethane	10		10.00		101	70	130			
Surr: Toluene-d8	11		10.00		107	70	130			

**Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1702076

07-Feb-17

**Client:** EA Engineering

**Project:** Cat Ox Removal

Sample ID: <b>100ng lcs</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8260B: VOLATILES</b>								
Client ID: <b>LCSW</b>	Batch ID: <b>W40507</b>	RunNo: <b>40507</b>								
Prep Date:	Analysis Date: <b>2/3/2017</b>	SeqNo: <b>1269583</b>			Units: <b>%Rec</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	9.5		10.00		95.1	70	130			
Surr: 4-Bromofluorobenzene	9.4		10.00		93.6	70	130			
Surr: Dibromofluoromethane	9.8		10.00		98.4	70	130			
Surr: Toluene-d8	11		10.00		106	70	130			

**Qualifiers:**

- |   |   |
|---|---|
| * Value exceeds Maximum Contaminant Level.              | B Analyte detected in the associated Method Blank           |
| D Sample Diluted Due to Matrix                          | E Value above quantitation range                            |
| H Holding times for preparation or analysis exceeded    | J Analyte detected below quantitation limits                |
| ND Not Detected at the Reporting Limit                  | P Sample pH Not In Range                                    |
| R RPD outside accepted recovery limits                  | RL Reporting Detection Limit                                |
| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |



Hall Environmental Analysis Laboratory  
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 Albuquerque, NM 87109  
 TEL: 505-345-3975 FAX: 505-345-4107  
 Website: www.hallenvironmental.com

# Sample Log-In Check List

Client Name: EA Engineering Alb

Work Order Number: 1702076

RcptNo: 1

Received by/date: AG 02/01/17

Logged By: Ashley Gallegos 2/1/2017 4:33:00 PM AG

Completed By: Ashley Gallegos 2/2/2017 9:51:50 AM AG

Reviewed By: IO 2/2/17

**Chain of Custody**

- 1. Custody seals intact on sample bottles? Yes  No  Not Present
- 2. Is Chain of Custody complete? Yes  No  Not Present
- 3. How was the sample delivered? Client

**Log In**

- 4. Was an attempt made to cool the samples? Yes  No  NA
- 5. Were all samples received at a temperature of >0° C to 6.0°C Yes  No  NA
- 6. Sample(s) in proper container(s)? Yes  No
- 7. Sufficient sample volume for indicated test(s)? Yes  No
- 8. Are samples (except VOA and ONG) properly preserved? Yes  No
- 9. Was preservative added to bottles? Yes  No  NA
- 10. VOA vials have zero headspace? Yes  No  No VOA Vials
- 11. Were any sample containers received broken? Yes  No
- 12. Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes  No
- 13. Are matrices correctly identified on Chain of Custody? Yes  No
- 14. Is it clear what analyses were requested? Yes  No
- 15. Were all holding times able to be met? (If no, notify customer for authorization.) Yes  No

# of preserved bottles checked for pH: \_\_\_\_\_  
 (<2 or >12 unless noted)  
 Adjusted? \_\_\_\_\_  
 Checked by: \_\_\_\_\_

**Special Handling (if applicable)**

- 16. Was client notified of all discrepancies with this order? Yes  No  NA

Person Notified: \_\_\_\_\_ Date: \_\_\_\_\_  
 By Whom: \_\_\_\_\_ Via:  eMail  Phone  Fax  In Person  
 Regarding: \_\_\_\_\_  
 Client Instructions: \_\_\_\_\_

17. Additional remarks:

**18. Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	7.5	Good	Not Present			

