MAVERICK
NATURAL RESOURCES

2023 Annual Report

Vacuum Glorietta East Unit
Administrative/Environmental Order 1RP-744
Incident nPAC0605554033
Lea County, New Mexico

REVIEWED
By Mike Buchanan at 1:12 pm, Jul 16, 2024

Review of the 2023 Annual Report for Vacuum Glorietta East Unit, 1RP-744: content satisfactory
1. Continue gauging and groundwater monitoring events on a semi-annual schedule as planned.
2. Introduce a gravity fed Cool-Ox injection (ISCO) into BG-4 in order to expedite degradation of PSH.
3. Maverick may discontinue SVE remediation in replacement for the ISCO Cool-Ox injections.
4. Submit the 2024 Annual Report to OCD via the online portal by April 1, 2025.

#212C-HN-02008
January 31, 2024

TETRA TECH

2023 Annual Report

Vacuum Glorietta East Unit (1RP-744)
Administrative/Environmental Order 1RP-744
Incident nPAC0605554033
Lea County, New Mexico

#212C-HN-02008
February 07, 2024

PRESENTED TO

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TETRA TECH

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1.0 INTRODUCTION

This report details the continuing groundwater monitoring and remedial activities at the Maverick Permian, LLC (Maverick) Vacuum Glorietta East Unit Site in Lea County, New Mexico (Site). The Site is located on Buckeye Road approximately 17 miles west-northwest of Hobbs, New Mexico, and assigned New Mexico Oil Conservation Division (NMOCD) identifier 1RP-744. Groundwater monitoring and remediation at the Site are conducted under New Mexico Oil Conservation District (NMOCD) Administrative/Environmental Order AP-115-1. The Site and surrounding areas are rural grasslands used primarily for oil and gas production.

2.0 BACKGROUND AND PREVIOUS INVESTIGATIONS

In October 2002 the Site operator reported a Release Notification to the NMOCD for which the current impacts to soil and groundwater at the Site are believed to be associated. Approximately 80 barrels (bbls) of oil and 20 bbls of water were recovered after the release with an affected area of approximately 12,000 square feet.

B&H Environmental Services performed the initial investigation at the Site by in November 2002. The investigation included the installation of one groundwater monitor well which was subsequently destroyed during follow-on excavation works. The investigation indicated the presence of chlorides and petroleum hydrocarbons above NMOCD Recommended Remedial Action Limits (RRALs). Approximately 3,240 cubic yards (CY) of petroleum-impacted soil was excavated in August 2004, and another 1,000 CY of soil was removed in November and December 2008 after additional assessment.

Backfilling and reseeding of the excavation were completed in June 2009 along with the installation of three monitor wells, one in the excavation footprint, one upgradient of the excavation, and one downgradient of the excavation. Three additional groundwater monitor wells VG-5, VG-6, and VG-7 were installed in December 2013 to further assess the northern, western, and southern extent of hydrocarbon and chloride impacts in the groundwater.

Small quantities of phase-separated hydrocarbons (PSH) and benzene, toluene, ethylbenzene, and total xylenes (BTEX) and chloride at concentrations greater than New Mexico Water Quality Control Commission (NMWQCC) Groundwater Quality Standards have historically been reported in samples collected from monitoring well VG-4. Mobile dual-phase extraction (DPE) has been used as a remediation method at the Site previously at monitor well VG-4 in September 2014, May 2015, June 2019, May 2020, February 2021, and May 2021 by AcuVac Remediation, LLC (AcuVac) of Houston, Texas. Based on the absence of measurable PSH at the Site in 2021, 2022 remedial activities shifted to single-phase SVE events to target vapor-phase petroleum hydrocarbon recovery from soil and groundwater within the monitor well VG-4 zone of influence.

3.0 HYDROGEOLOGY

3.1 GEOLOGY

The Site is located in the Querecho Plains of southeastern New Mexico. This area generally consists of a thin cover of Quaternary sand dunes overlying the undivided Triassic Upper Chinle Group. The soil consists of well-drained sand and sandy clay loam. Typically, the surface layer is reddish-brown loamy fine sand. It is underlain by red light sandy clay. Below this is white moderately to well-indurated caliche. Underlying the caliche are dark reddish shales and thin sandstones of the undivided Triassic Upper Chinle Group. The Upper Chinle Group consists of silty shale, thin-bedded to massive, purplish red to reddish-brown with greenish reduction spots. The Upper Chinle Group is interbedded with thin beds of fine-grained sandstone with chert pebble gravel.

3.2 SITE HYDROGEOLOGY

The water-bearing zone consists of the Pliocene-age Ogallala aquifer under unconfined conditions at the site. The Ogallala aquifer is located at the base of the Ogallala Formation. In general, the Ogallala Formation consists of quartz sand and gravel that is poorly to well-cemented with calcium carbonate and contains minor amounts of clay. The wells installed at the Site were drilled to depths of approximately 65 to 80 feet below ground surface (bgs) with static groundwater water levels at approximately 70 feet bgs.

4.0 GROUNDWATER MONITORING

The Site is currently the subject of semi-annual groundwater monitoring under the NMOCD-approved abatement plan. Tetra Tech performed the 2023 annual groundwater monitoring events in February 2023. Tetra Tech contracted Hydrologic Monitoring, LLC (HMI) to conduct groundwater sampling at the Site in September of 2023.

The current groundwater monitoring and remediation program approved by the NMOCD includes semi-annual groundwater gauging and sampling of the Site monitoring well network comprised of monitoring wells VG-2, VG-3, VG-4, VG-5, VG-6, and VG-7 for analysis of BTEX and chloride. In addition to the groundwater monitoring program, remedial activities at the Site have included quarterly soil vapor extraction (SVE) events at monitor well VG-4.

4.1 GROUNDWATER LEVEL MEASUREMENTS

Prior to purging and sampling the monitor well network, Tetra Tech or HMI personnel gauged each well to measure the depth to groundwater and the presence of PSH, if any. Monitoring wells containing PSH are gauged, but not sampled. Groundwater level and PSH measurements are presented in **Table 1** along with groundwater elevation calculations. PSH was identified in VG-4 during both 2023 groundwater monitoring events. **Figure 2** presents the site details map showing the current monitoring well network. All six (6) of the monitoring wells in the Site monitoring well network were gauged during the 2023 annual groundwater monitoring events.

In 2023, groundwater elevations ranged from 3,862.19 feet above mean sea level (AMSL) in VG-5 to 3,864.33 feet AMSL in VG-3. Groundwater potentiometric surface maps with calculated groundwater elevations are presented in **Figures 3** and **4**. Groundwater flow at the Site was shown to flow to the southeast with an approximate average hydraulic gradient of 0.00448 feet per foot in 2023, generally consistent with historical groundwater flow at the Site. Historical groundwater gauging data is provided in **Appendix C**.

4.2 GROUNDWATER SAMPLING

During the 2023 monitoring events, wells VG-4, VG-5, VG-6, and VG-7 were sampled. VG-2 and VG-3 both measured as dry during both 2023 sampling events and therefore were not sampled. Additionally, VG-4 was gauged but not sampled during two groundwater sampling events due to the presence of PSH in the well. Low-flow sampling methodology was utilized to purge and sample monitoring wells using either a decontaminated submersible pump with disposable tubing or a bladder pump with dedicated disposable tubing and bladders in accordance with United States Environmental Protection Agency (EPA) guidance. The bladder pump intake was set to the approximate center of the water column within the screened interval for each monitor well prior to purging. **Table 2** presents a summary of the groundwater field analytical parameters that were tested during the sampling of the wells.

Groundwater quality parameters including temperature, pH, Specific Conductivity (SC), Dissolved Oxygen (DO), Oxygen Reduction Potential (ORP), and turbidity were recorded during purging in addition to well drawdown and flow rate to document monitor well stabilization. Once field parameters stabilized at each well, samples were collected into laboratory-provided pre-preserved sample containers,

immediately placed on ice, and transported to Pace Analytical Services, LLC, in Dallas, Texas, and Pace Analytical National in Mount Juliette, Tennessee, under chain-of-custody documentation submitted for analysis of the following constituents of concern (COCs):

- Benzene, toluene, ethylbenzene, and xylenes (BTEX) by Method 8260; and
- Chloride by Method 9056A.

4.3 GROUNDWATER ANALYTICAL RESULTS

During the February 2023 sampling event, monitoring wells VG-5, VG-6, and VG-7 were sampled during both sampling events. During both events, VG-2 and VG-3 did not contain enough water to sample and VG-4 contained measurable quantities of PSH, therefore no samples were taken from these wells. BTEX constituents were not detected by the laboratory in any samples submitted during the 2023 sampling events.

Chloride was reported at a concentration of 316 mg/L in the sample collected from VG-5 in February 2023 and 257 mg/L in the sample collected in VG-6 in September 2023, greater than the NMWQCC standards of 250 mg/L.

Table 3 presents a summary of the groundwater analytical results screened against NMWQCC Groundwater Quality Standards. The laboratory analytical data packages including chain-of-custody documentation are provided in **Appendix A**, benzene and chloride concentration maps are provided in **Figures 4** through **6**. Historical groundwater analytical data summaries are provided in **Appendix D**.

5.0 QUALITY ASSURANCE/QUALITY CONTROL

A total of two primary groundwater samples from each well were collected and analyzed during each groundwater monitoring event in 2023, with the exception of VG-2, VG-3, and VG-4. Samples were not collected in February and November from VG-2 and VG-3 as the wells were dry and VG-4 as measurable quantities of PSH were present in the well. One field duplicate was collected and analyzed for each event.

5.1 FIELD AND LABORATORY PRECISION

The project measurement quality objectives are 30 percent for relative-percent-difference (RPD) between primary and duplicate sample results for inorganic analytes including chloride and 50 percent RPD between primary and duplicate sample results for organic analytes including BTEX. **Table 4** presents primary and duplicate sample results and RPD calculations. All primary-duplicate pair analytes for 2023 were within project DQOs.

5.2 LABORATORY DATA QUALIFICATION

No laboratory analytical results were qualified in the three analytical data packages during the two 2023 groundwater monitoring events.

5.3 DATA USABILITY

Groundwater analytical data are deemed useable for the purpose of determining groundwater COC concentrations at the Site. Field duplicate samples reported results within Data quality objectives.

6.0 REMEDIAL ACTIVITIES

In 2023, PSH recovery was conducted at the Site during two soil vapor extraction (SVE) events. The events were conducted between March 27 and 31 and December 11 and 15, 2023. During the events, Tetra Tech personnel mobilized to the Site to supervise remedial activities conducted by AcuVac. The event was conducted at VG-4 for both 2023 events.

6.1 OBJECTIVES

The objectives of the SVE events are to induce a vacuum and extract volatile vapor phase hydrocarbons from soils and groundwater at the VG-4 location which periodically exhibits measurable levels of PSH in the well or reports concentrations of benzene above NMWQCC Groundwater Quality Standards.

6.2 METHODOLOGY

The SVE system employed at the site consists of a vacuum pump driven by an internal combustion engine. The vacuum pump is connected to the extraction well and used to induce a vacuum on the well to volatilize light-end hydrocarbons in groundwater and surrounding vadose zone soil. Volatilized hydrocarbons flow through a moisture knockout tank to the vacuum pump and the internal combustion engine where they are burned as part of the normal combustion process. An auxiliary propane tank is fitted to the system as a supplementary fuel source to drive the engine during startup and when extracted well vapor cannot provide the required energy to drive the system.

Emissions from the engine pass through three catalytic converters to maximize the destruction of engine emissions. During SVE events the engine's fuel-to-air ratio is adjusted to maintain efficient combustion and minimize emissions. As the engine drives the entire system, the system stops when the engine stops preventing an uncontrolled release of hydrocarbons into the atmosphere. Since the System operates entirely under vacuum, any leaks in the system, leak the atmosphere into the System rather than allowing emission to the atmosphere.

Extracted Vapor phase hydrocarbon concentrations are measured after system startup and every 30 minutes during the daytime of SVE events while the SVE system is manned and under observation by AcuVac and Tetra Tech. Hydrocarbon vapor concentrations are analyzed with a modified Horiba Exhaust Gas Analyzer Photo Ionization Detector (PID) calibrated with hexane, carbon monoxide, and carbon dioxide. Vapor phase PSH volume recoveries reported by AcuVac are calculated using the TCEQ formula for the emissions of the AcuVac SVE system internal combustion engine.

6.3 SVE RESULTS

During 2014 and 2015 multi-phase recovery events liquid phase and vapor phase PSH was recovered during each event, however, liquid phase recovery was discontinued after 2015 as liquid phase recovery was very low compared to the quantities of generated waste groundwater during each event. From 2019 through 2021 SVE events have been increased to four (4) per year, as well as extended from 3-day/28-hour events to 5-day/100-hour events, resulting in progressively higher quantities of PSH recovery each year. In 2022 three (3) SVE Events were conducted and in 2023 two (2) SVE events were conducted.

In 2023, PSH recovery was conducted at the VG-4 monitoring well at the Site during two SVE events. The 2023 events were conducted March 27 through 31 and December 11 through 14. During each event, Tetra Tech personnel mobilized to the Site to supervise remedial activities conducted by AcuVac.

The March SVE event resulted in the vapor phase recovery of 22.18 gallons of PSH and the December SVE event resulted in vapor phase recovery of 20.47 gallons for a total of 42.65 gallons of PSH for 2023. Total PSH recovery to date from VG-4 from dual phase extraction (2014 and 2015) and SVE is 202.89 gallons.

A summary of the PSH recovery completed to date is provided in **Table 5**. The AcuVac SVE reports documenting remedial activities for 2023 are provided in **Appendix E**.

7.0 2023 WORKPLAN

For 2023, Maverick proposes to continue semi-annual groundwater gauging and sampling with annual reporting. Additionally, Maverick proposes to discontinue SVE remediation for 2024 and replace SVE remedial activities with chemical oxidant injections to more aggressively and cost-effectively remove source zone hydrocarbons from the vicinity of VG-4 and drive the site toward regulatory closure. Upon receipt of NMED approval, DeepEarth Technologies, Inc. (DTI) will be contracted to conduct a single Cool-Ox® oxidant injection event at the Site into monitoring wells BG-4.

DTI and Tetra Tech will mobilize to the Site along with Cool-Ox® reagent, blending tanks, injection equipment, and potable water for DTI reagent blending and injection. The reagent will be blended in batches and 1,000-gallons of diluted Cool-Ox® reagent will be gravity-fed into monitor well VG-4.

Cool-Ox® is a hydrogen peroxide-based technology designed to address a wide variety of remedial challenges presented by organic contaminants in groundwater. Cool-Ox® is based on Fenton reaction chemistry that does not create heat or corrosion and is near-neutral pH. The Fenton reaction is a metal-catalyzed oxidation process which generates free radicals through the reaction between ferrous or ferric ions and hydrogen peroxide. The free radicals are employed to destruct the nonbiodegradable compounds into less-harmful entities.

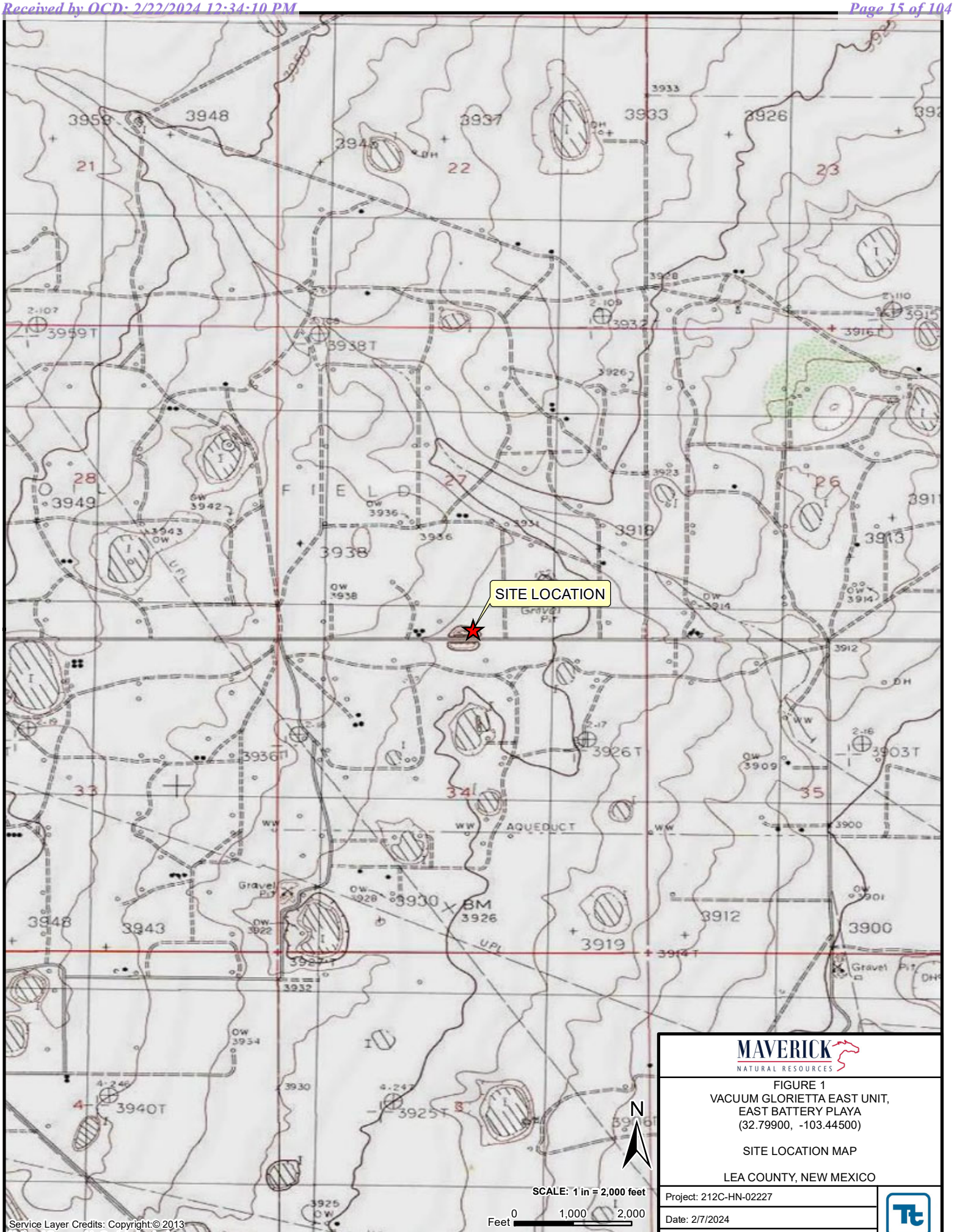
Cool-Ox® utilizes an aqueous suspension of solid peroxygen compounds that hydrolyze to generate hydrogen peroxide in the proximity of the contaminants. The relative insolubility of these compounds allows the oxidizers to be produced over an extended period of time (up to three months) to increase the probability of the oxidizing compounds contacting contaminants and providing an ongoing source of molecular oxygen, enhancing aerobic microbial proliferation. The Cool-Ox® SDS is provided in **Appendix G**.

The proposed oxidant injection event is intended to treat residual PSH mass at the Site in an attempt to reduce residual hydrocarbon mass sufficiently so that the practical endpoint of PSH recovery at the Site will be reached and groundwater monitored natural attenuation may be used moving forward as the remedial action. Remedial strategies will be re-evaluated at the end of 2024 to assess the effectiveness of oxidant injections and determine if a return to SVE or absorbent socks will be warranted for 2025.

8.0 REFERENCES

Nicholson Jr., A. and Clebsch Jr., A.. (1961). Geology and Ground-Water Conditions in Souther Lea County, New Mexico. Socorro, NM: State Bureau of Mines and Mineral Resources and New Mexico Institute of Mining & Technology Campus Stationuthor.

FIGURES



MAVERICK NATURAL RESOURCES

FIGURE 1
VACUUM GLORIETTA EAST UNIT,
EAST BATTERY PLAYA
(32.79900, -103.44500)

SITE LOCATION MAP

LEA COUNTY, NEW MEXICO

Project: 212C-HN-02227	
Date: 2/7/2024	
File: Figure 1 Vacuum Glorietta	

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MAVERICK NATURAL RESOURCES

FIGURE 2

SITE MAP

VACUUM GLORIETTA EAST UNIT

LEA COUNTY, NEW MEXICO

Project: 212C-HN-02227	
Date: 2/7/2024	
File: Figure 2 Vacuum Glorietta	

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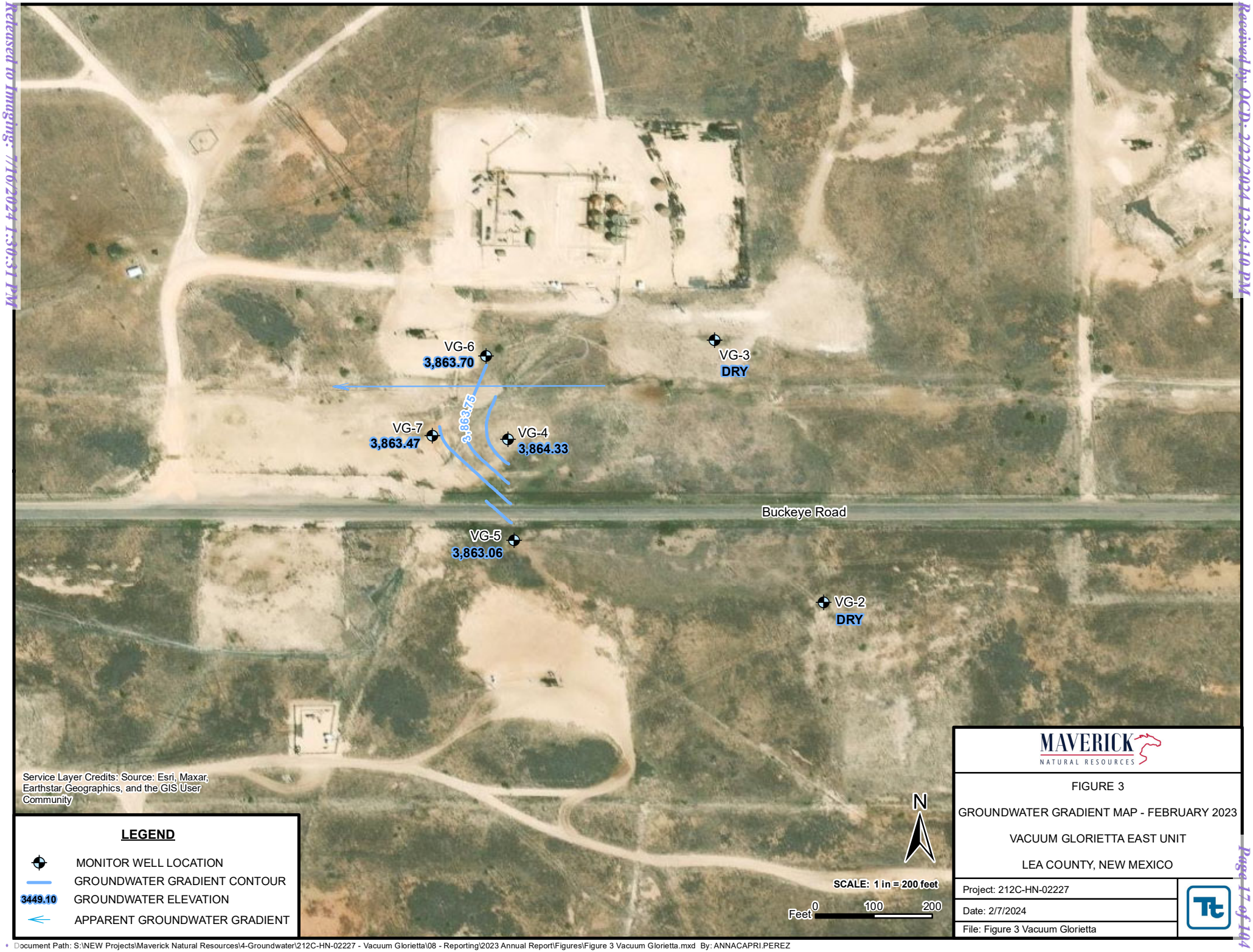

MAVERICK NATURAL RESOURCES

FIGURE 3

GROUNDWATER GRADIENT MAP - FEBRUARY 2023

VACUUM GLORIETTA EAST UNIT

LEA COUNTY, NEW MEXICO

Project: 212C-HN-02227	
Date: 2/7/2024	
File: Figure 3 Vacuum Glorietta	

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FIGURE 4

GROUNDWATER GRADIENT MAP - SEPTEMBER 2023

VACUUM GLORIETTA EAST UNIT

LEA COUNTY, NEW MEXICO

Project: 212C-HN-02227	
Date: 2/7/2024	
File: Figure 4 Vacuum Glorietta_	

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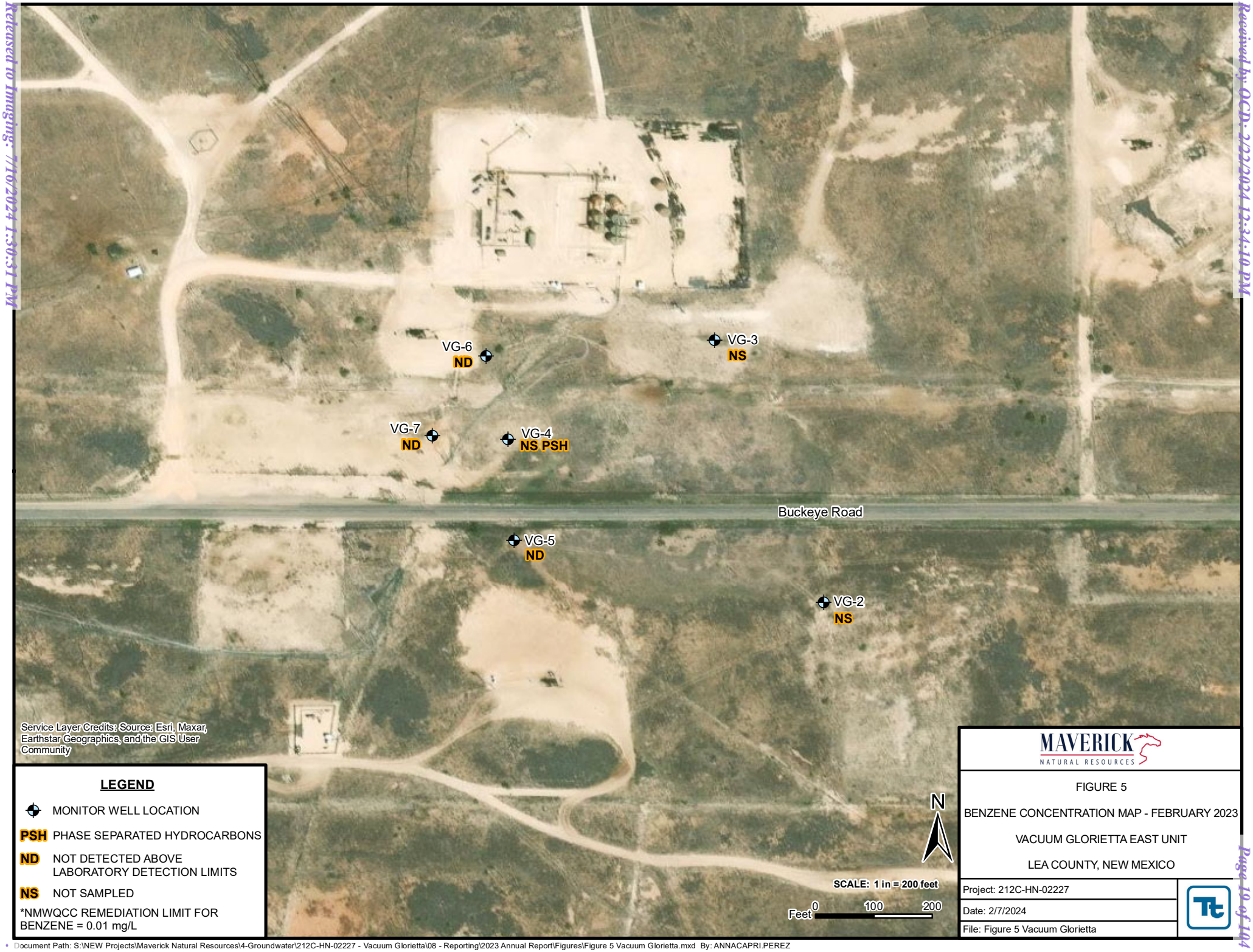

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FIGURE 5

BENZENE CONCENTRATION MAP - FEBRUARY 2023

VACUUM GLORIETTA EAST UNIT

LEA COUNTY, NEW MEXICO

Project: 212C-HN-02227

Date: 2/7/2024

File: Figure 5 Vacuum Glorietta

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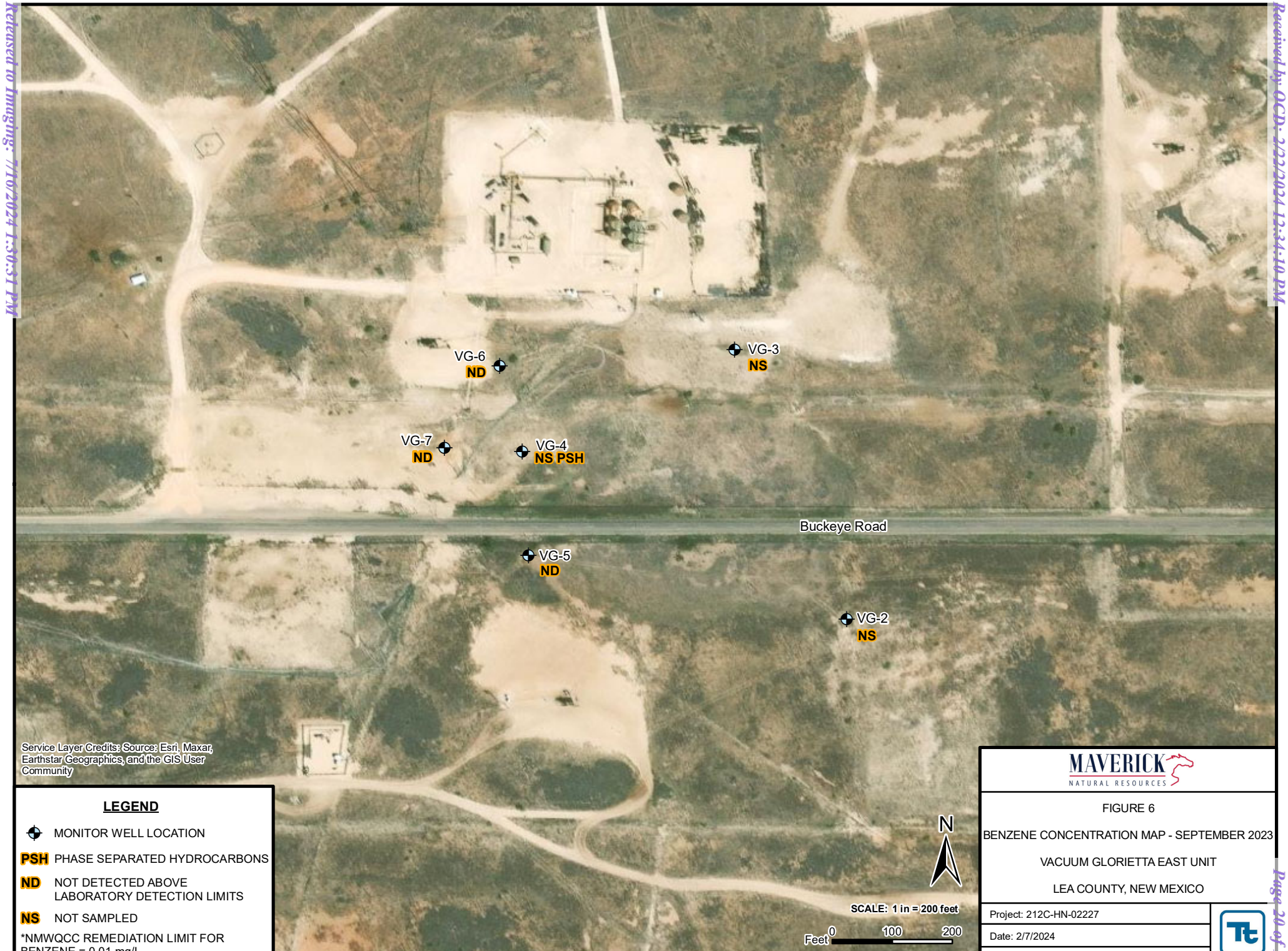

LEGEND

- MONITOR WELL LOCATION
- **PSH** PHASE SEPARATED HYDROCARBONS
- **ND** NOT DETECTED ABOVE LABORATORY DETECTION LIMITS
- **NS** NOT SAMPLED

*NMWQCC REMEDIATION LIMIT FOR BENZENE = 0.01 mg/L

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FIGURE 6

BENZENE CONCENTRATION MAP - SEPTEMBER 2023

VACUUM GLORIETTA EAST UNIT

LEA COUNTY, NEW MEXICO

Project: 212C-HN-02227	
Date: 2/7/2024	
File: Figure 6 Vacuum Glorietta	

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LEGEND

- MONITOR WELL LOCATION
- **58.9** CHLORIDE CONCENTRATION (mg/L)
- **PSH** PHASE SEPARATED HYDROCARBONS
- **NS** NOT SAMPLED
- *NMWQCC REMEDIATION LIMIT FOR CHLORIDE = 250 mg/L

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FIGURE 7

CHLORIDE CONCENTRATION MAP - FEBRUARY 2023

VACUUM GLORIETTA EAST UNIT

LEA COUNTY, NEW MEXICO

Project: 212C-HN-02227	
Date: 2/7/2024	
File: Figure 7 Vacuum Glorietta	

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LEGEND

- MONITOR WELL LOCATION
- **58.9** CHLORIDE CONCENTRATION (mg/L)
- **PSH** PHASE SEPARATED HYDROCARBONS
- **NS** NOT SAMPLED
- **J6** MATRIX INTERFERENCE RESULTED IN ESTIMATED CONCENTRATION

*NMWQCC REMEDIATION LIMIT FOR CHLORIDE = 250 mg/L

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FIGURE 8

CHLORIDE CONCENTRATION MAP - SEPTEMBER 2023

VACUUM GLORIETTA EAST UNIT

LEA COUNTY, NEW MEXICO

Project: 212C-HN-02227	
Date: 2/7/2024	
File: Figure 8 Vacuum Glorietta	

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TABLES

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Table 1
Groundwater Elevation Summary
Vacuum Glorietta East Unit
Lea County, New Mexico

Well ID	Gauging Date	Well Total Depth (feet)	Depth to PSH (feet BTOC)	Depth to Water (feet BTOC)	PSH Thickness (feet)	Top of Casing Elevation (feet AMSL)	PSH Corrected Groundwater Elevation (feet AMSL)
VG-2	2/28/2023	67.70	**Dry**				
	9/13/2023	67.70	**Dry**				
VG-3	2/28/2023	68.6	**Dry**				
	9/13/2023	68.6	**Dry**				
VG-4	2/28/2023	70.70	67.56	67.74	0.18	3,931.93	**3,864.33**
	9/13/2023	70.70	69.48	69.61	0.13	3,931.93	**3,862.42**
VG-5	2/28/2023	75.15	-	67.46	-	3,930.52	**3,863.06**
	9/13/2023	75.15	-	68.33	-	3,930.52	**3,862.19**
VG-6	2/28/2023	79.72	-	71.46	-	3,935.16	**3,863.70**
	9/13/2023	79.72	-	72.48	-	3,935.16	**3,862.68**
VG-7	2/28/2023	79.86	-	71.31	-	3,934.78	**3,863.47**
	9/13/2023	79.86	-	72.38	-	3,934.78	**3,862.40**

Notes:

BTOC: Below Top of Casing

AMSL: Above Mean Sea Level

PSH: Phase-Separated Hydrocarbons

PSH Corrected Groundwater Elevation: PSH assumed density of 0.8

TETRA TECH

Table 2
2023 Groundwater Field Parameters
Vacuum Glorieta
Lea County, New Mexico

Well ID	Gauging Date	PH	Temperature (°C)	Standard Conducivity (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)
VG-2	2/28/2023	NS	NS	NS	NS	NS	NS
	9/13/2023	NS	NS	NS	NS	NS	NS
VG-3	2/28/2023	NS	NS	NS	NS	NS	NS
	9/13/2023	NS	NS	NS	NS	NS	NS
VG-4	2/28/2023	NS	NS	NS	NS	NS	NS
	9/13/2023	NS	NS	NS	NS	NS	NS
VG-5	2/28/2023	7.58	20.6	1,371	2.86	91.3	NS
	9/13/2023	7.03	19.7	1,542	2.50	93.9	60
VG-6	2/28/2023	7.98	20.5	609	1.54	50.4	NS
	9/13/2023	7.20	20.2	1,610	3.10	290.7	28
VG-7	2/28/2023	7.70	20.7	1,006	1.24	233.1	NS
	9/13/2023	6.85	19.7	1,290	2.80	86.8	45

Notes:

NS: Not Sampled

BTOC: Below Top of Casing

AMSL: Above Mean Sea Level

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Table 3
Monitor Wells
Groundwater Analytical Summary
Vacuum Glorietta East Unit
Lea County, New Mexico

Well ID	Sample Date	Chloride (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylene (mg/L)
NMWQCC Groundwater Quality Standards		**250**	**0.01**	**0.75**	**0.75**	**0.62**
VG-2	2/28/2023	Not Sampled - Dry				
	9/13/2023	Not Sampled - Dry				
VG-3	2/28/2023	Not Sampled - Dry				
	9/13/2023	Not Sampled - Dry				
VG-4	2/28/2023	Not Sampled - PSH				
	9/13/2023	Not Sampled - PSH				
VG-5	2/28/2023	316	<0.0000941	<0.000278	<0.000137	<0.000174
	9/13/2023	191	<0.0000941	<0.000278	<0.000137	<0.000174
VG-6	2/28/2023	134	<0.0000941	<0.000278	<0.000137	<0.000174
	9/13/2023	257	<0.0000941	<0.000278	<0.000137	<0.000174
VG-7	2/28/2023	144	<0.0000941	<0.000278	<0.000137	<0.000174
	9/13/2023	104 J6	<0.0000941	<0.000278	<0.000137	<0.000174

Notes:

NMWQCC: New Mexico Water Quality Control Commission

Exceeds applicable regulatory standards

TDS: Total Dissolved Solids

PSH: Phase-Separated Hydrocarbons

J6: Matrix interference resulted in estimated concentration

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Table 4
Quality Assurance/Quality Control Summary
Vacuum Glorietta East Unit
Lea County, New Mexico

Well ID	Sample Date	Analyte	Primary Sample Result (mg/L)	Duplicate Sample Result (mg/L)	RPD	Within DQOs
VG-6	2/28/2023	Chloride	134	144	7.2%	Yes
		Benzene	<0.0000941	<0.0000941	N/A	Yes
		Toluene	<0.000278	<0.000278	N/A	Yes
		Ethylbenzene	<0.000137	<0.000137	N/A	Yes
		Xylene	<0.000174	<0.000174	N/A	Yes
VG-6	9/13/2023	Chloride	257	263	2.3%	Yes
		Benzene	<0.0000941	<0.0000941	N/A	Yes
		Toluene	<0.000278	<0.000278	N/A	Yes
		Ethylbenzene	<0.000137	<0.000137	N/A	Yes
		Xylene	<0.000174	<0.000174	N/A	Yes

Notes:

RPD: Relative Percent Difference calculated as = (SR-DR)*200/(SR+DR)

DQO: Data Quality Objectives

ND: Not Detected above the laboratory method detection limit

N/A: Not Applicable

TETRA TECH

Table 5
AcuVac SVE Summary
Vacuum Glorietta East Unit
Lea County, New Mexico

Event Number	Event Date	Duration (hours)	PSH Recovery (Vapor Phase gallons)	PSH Recovery (Liquid Phase gallons)	Total PSH Recovery (gallons)	Average PSH Vapor Phase Recovery (gallons per hour)
1	9/8/2014	5	2.66	0.95	6.05	0.553
	9/9/2014	3	1.76	0.68		
2	5/4/2015	5	1.48	1.24	14.51	0.340
	5/5/2015	11	3.72	2.90		
	5/6/2015	8	2.96	2.21		
3	6/11/2019	10	3.41	0	9.78	0.349
	6/12/2019	10	3.62	0		
	6/13/2019	8	2.75	0		
4	5/5/2020	10	3.21	0	11.88	0.424
	5/6/2020	10	4.49	0		
	5/7/2020	8	4.18	0		
5	2/23/2021	10	1.58	0	7.69	0.202
	2/24/2021	10	1.76	0		
	2/25/2021	10	2.25	0		
	2/26/2021	8	2.10	0		
6	5/3/2021	10	2.25	0	10.34	0.272
	5/4/2021	10	2.73	0		
	5/5/2021	10	2.73	0		
	5/6/2021	8	2.63	0		
7	7/26/2021	9	2.67	0	10.49	0.284
	7/27/2021	10	2.85	0		
	7/28/2021	10	2.63	0		
	7/29/2021	8	2.34	0		
8	11/8/2021	10	3.17	0	12.39	0.326
	11/9/2021	10	3.40	0		
	11/10/2021	10	3.19	0		
	11/11/2021	8	2.63	0		
9	2/7/2022	16	4.28	0	28.73	0.287
	2/8/2022	24	6.86	0		
	2/9/2022	24	7.02	0		
	2/10/2022	24	7.06	0		
	2/11/2022	12	3.51	0		
10	5/16/2022	24	6.72	0	29.19	0.292
	5/17/2022	24	7.35	0		
	5/18/2022	24	6.98	0		
	5/19/2022	24	6.98	0		
	5/20/2022	4	1.16	0		
11	11/7/2022	24	4.47	0	19.19	0.192
	11/8/2022	24	4.46	0		
	11/9/2022	24	5.11	0		
	11/10/2022	24	4.50	0		
	11/11/2022	4	0.65	0		
12	3/27/2023	24	5.11	0	22.18	0.222
	3/28/2023	24	5.30	0		
	3/29/2023	24	5.26	0		
	3/30/2023	24	5.65	0		
	3/31/2023	4	0.86	0		
13	12/11/2023	24	3.37	0	20.47	0.205
	12/12/2023	24	4.56	0		
	12/13/2023	24	6.13	0		
	12/14/2023	24	5.72	0		
	12/15/2023	4	0.69	0		
				Cumulative Total	**202.89 gal**	

Notes:

PSH Vapor Phase Recovery: Calculated using Texas Commission on Environmental Quality formula for emissions.

APPENDIX A: LABORATORY ANALYTICAL DATA

ANALYTICAL REPORT

March 09, 2023

Tetra Tech EMI - Houston, TX

Sample Delivery Group:	L1591760
Samples Received:	03/04/2023
Project Number:	212C-HN-02227
Description:	MNR Vacuum Glorietta 2023

Report To: Dylon Breyman
1500 CityWest Boulevard
Suite 1000
Houston, TX 77042

Entire Report Reviewed By:

Chad A Upchurch
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

VG-6 L1591760-01 GW

Collected by: Matthew C.
Collected date/time: 02/28/23 14:30
Received date/time: 03/04/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG2018192	1	03/07/23 13:41	03/07/23 13:41	GEB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2017297	1	03/05/23 10:30	03/05/23 10:30	GH	Mt. Juliet, TN

VG-7 L1591760-02 GW

Collected by: Matthew C.
Collected date/time: 03/01/23 09:30
Received date/time: 03/04/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG2018192	1	03/07/23 13:51	03/07/23 13:51	GEB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2017297	1	03/05/23 10:49	03/05/23 10:49	GH	Mt. Juliet, TN

VG-5 L1591760-03 GW

Collected by: Matthew C.
Collected date/time: 03/01/23 10:50
Received date/time: 03/04/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG2018192	5	03/07/23 14:01	03/07/23 14:01	GEB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2017297	1	03/05/23 11:08	03/05/23 11:08	GH	Mt. Juliet, TN

DUP L1591760-04 GW

Collected by: Matthew C.
Collected date/time: 03/01/23 00:00
Received date/time: 03/04/23 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG2018192	1	03/07/23 14:10	03/07/23 14:10	GEB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2017297	1	03/05/23 11:27	03/05/23 11:27	GH	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Chad A Upchurch
Project Manager

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Chloride	134		0.379	1.00	1	03/07/2023 13:41	WG2018192

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Benzene	U		0.0000941	0.00100	1	03/05/2023 10:30	WG2017297
Toluene	U		0.000278	0.00100	1	03/05/2023 10:30	WG2017297
Ethylbenzene	U		0.000137	0.00100	1	03/05/2023 10:30	WG2017297
Total Xylenes	U		0.000174	0.00300	1	03/05/2023 10:30	WG2017297
(S) Toluene-d8	*98.8*			*80.0-120*		*03/05/2023 10:30*	WG2017297
(S) 4-Bromofluorobenzene	*94.0*			*77.0-126*		*03/05/2023 10:30*	WG2017297
(S) 1,2-Dichloroethane-d4	*103*			*70.0-130*		*03/05/2023 10:30*	WG2017297

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	144		0.379	1.00	1	03/07/2023 13:51	WG2018192

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	U		0.0000941	0.00100	1	03/05/2023 10:49	WG2017297
Toluene	U		0.000278	0.00100	1	03/05/2023 10:49	WG2017297
Ethylbenzene	U		0.000137	0.00100	1	03/05/2023 10:49	WG2017297
Total Xylenes	U		0.000174	0.00300	1	03/05/2023 10:49	WG2017297
(S) Toluene-d8	*104*			*80.0-120*		*03/05/2023 10:49*	WG2017297
(S) 4-Bromofluorobenzene	*91.4*			*77.0-126*		*03/05/2023 10:49*	WG2017297
(S) 1,2-Dichloroethane-d4	*101*			*70.0-130*		*03/05/2023 10:49*	WG2017297

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Chloride	316		1.90	5.00	5	03/07/2023 14:01	WG2018192

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Benzene	U		0.0000941	0.00100	1	03/05/2023 11:08	WG2017297
Toluene	U		0.000278	0.00100	1	03/05/2023 11:08	WG2017297
Ethylbenzene	U		0.000137	0.00100	1	03/05/2023 11:08	WG2017297
Total Xylenes	U		0.000174	0.00300	1	03/05/2023 11:08	WG2017297
(S) Toluene-d8	*102*			*80.0-120*		*03/05/2023 11:08*	WG2017297
(S) 4-Bromofluorobenzene	*93.8*			*77.0-126*		*03/05/2023 11:08*	WG2017297
(S) 1,2-Dichloroethane-d4	*108*			*70.0-130*		*03/05/2023 11:08*	WG2017297

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	144		0.379	1.00	1	03/07/2023 14:10	WG2018192

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	U		0.0000941	0.00100	1	03/05/2023 11:27	WG2017297
Toluene	U		0.000278	0.00100	1	03/05/2023 11:27	WG2017297
Ethylbenzene	U		0.000137	0.00100	1	03/05/2023 11:27	WG2017297
Total Xylenes	U		0.000174	0.00300	1	03/05/2023 11:27	WG2017297
(S) Toluene-d8	*101*			*80.0-120*		*03/05/2023 11:27*	WG2017297
(S) 4-Bromofluorobenzene	*94.9*			*77.0-126*		*03/05/2023 11:27*	WG2017297
(S) 1,2-Dichloroethane-d4	*102*			*70.0-130*		*03/05/2023 11:27*	WG2017297

Method Blank (MB)

(MB) R3898511-1 03/07/23 09:45

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.379	1.00

L1591756-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1591756-01 03/07/23 11:56 • (DUP) R3898511-3 03/07/23 12:06

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	98.1	98.1	1	0.0804		15

L1591976-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1591976-01 03/07/23 15:46 • (DUP) R3898511-6 03/07/23 15:55

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	55.7	54.9	1	1.34		15

Laboratory Control Sample (LCS)

(LCS) R3898511-2 03/07/23 09:55

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	39.7	99.2	80.0-120	

L1591756-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1591756-01 03/07/23 11:56 • (MS) R3898511-4 03/07/23 12:15 • (MSD) R3898511-5 03/07/23 12:25

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50.0	98.1	142	142	88.6	88.7	1	80.0-120			0.0216	15

L1591976-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1591976-01 03/07/23 15:46 • (MS) R3898511-7 03/07/23 16:05

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50.0	55.7	103	94.6	1	80.0-120	

Method Blank (MB)

(MB) R3898687-3 03/05/23 10:11

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.0000941	0.00100
Toluene	U		0.000278	0.00100
Ethylbenzene	U		0.000137	0.00100
Xylenes, Total	U		0.000174	0.00300
(S) Toluene-d8	*99.2*			*80.0-120*
(S) 4-Bromofluorobenzene	*97.3*			*77.0-126*
(S) 1,2-Dichloroethane-d4	*100*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3898687-1 03/05/23 09:13 • (LCSD) R3898687-2 03/05/23 09:32

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.00500	0.00529	0.00564	106	113	70.0-123			6.40	20
Toluene	0.00500	0.00499	0.00526	99.8	105	79.0-120			5.27	20
Ethylbenzene	0.00500	0.00478	0.00489	95.6	97.8	79.0-123			2.28	20
Xylenes, Total	0.0150	0.0141	0.0145	94.0	96.7	79.0-123			2.80	20
(S) Toluene-d8				*97.2*	*96.4*	*80.0-120*				
(S) 4-Bromofluorobenzene				*96.9*	*95.0*	*77.0-126*				
(S) 1,2-Dichloroethane-d4				*102*	*103*	*70.0-130*				

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
	The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
Tetra Tech EMI - Houston, TX
1500 CityWest Boulevard
Suite 1000
Houston. TX 77042

Billing Information:
Accounts Payable
901 West Wall
Suite 100
Midland, TX 79701

Pres Chk

Report to: **Dylon Breyman**

Email To: dylon.breyman@tetratech.com;bill.smith2@tet

Project Description: **MNR Vacuum Glorietta 2023**

City/State Collected:

Please Circle: PT MT CT ET

Phone: **832-251-5160**

Client Project # **212C-HN-02227**

Lab Project # **TETRAHTX-VACUUMGLORI**

Collected by (print): Matthew Castrejon

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	CHLORIDE 125mlHDPE-NoPres	V8260BTEX 40mlAmb-HCl	Remarks	Sample # (lab only)
VG-6	G	GW		3-28-23	1430	4	X	X		-01
VG-7	G	GW		3-1-23	0930	1	↓	↓		-02
VG-5	G	GW		3-1-23	1050	↓	↓	↓		-03
DUP	G	GW		-	-	4	✓	✓		-04
		GW								
		GW								
		GW								
		GW								
		GW								

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN
12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # 191760
F069

Acctnum: **TETRAHTX**
Template: **T219041**
Prelogin: **P983666**
PM: **3564 - Chad A Upchurch**
PB:

Shipped Via:

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Matthew Castrejon	3-3-28	0800		0
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 2 °C Bottles Received: 16
			NSA7	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 3/4/23 Time: 0800
				Hold: Condition: NCF / OK

ANALYTICAL REPORT

September 22, 2023

Tetra Tech EMI - Houston, TX

Sample Delivery Group:	L1655979
Samples Received:	09/14/2023
Project Number:	212C-HN-02227
Description:	MNR Vacuum Glorietta 2023

Report To: Dylon Breyman
1500 CityWest Boulevard
Suite 1000
Houston, TX 77042

Entire Report Reviewed By:

Chad A Upchurch
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

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VG-5 L1655979-01 GW

Collected by: Greg S | Collected date/time: 09/13/23 09:35 | Received date/time: 09/14/23 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG2134861	1	09/19/23 20:04	09/19/23 20:04	GEB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2136222	1	09/21/23 04:58	09/21/23 04:58	JCP	Mt. Juliet, TN

VG-6 L1655979-02 GW

Collected by: Greg S | Collected date/time: 09/13/23 10:50 | Received date/time: 09/14/23 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG2134880	5	09/20/23 11:33	09/20/23 11:33	GEB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2133846	1	09/17/23 12:49	09/17/23 12:49	JAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2136222	1	09/21/23 05:20	09/21/23 05:20	JCP	Mt. Juliet, TN

VG-7 L1655979-03 GW

Collected by: Greg S | Collected date/time: 09/13/23 08:40 | Received date/time: 09/14/23 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG2134880	1	09/20/23 20:47	09/20/23 20:47	GEB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2133846	1	09/17/23 13:10	09/17/23 13:10	JAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2136222	1	09/21/23 05:41	09/21/23 05:41	JCP	Mt. Juliet, TN

DUP-01 L1655979-04 GW

Collected by: Greg S | Collected date/time: 09/13/23 12:00 | Received date/time: 09/14/23 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG2134880	5	09/20/23 11:46	09/20/23 11:46	GEB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2133846	1	09/17/23 13:30	09/17/23 13:30	JAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2136222	1	09/21/23 06:03	09/21/23 06:03	JCP	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Chad A Upchurch
Project Manager

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Chloride	191		0.379	1.00	1	09/19/2023 20:04	WG2134861

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Benzene	U		0.0000941	0.00100	1	09/21/2023 04:58	WG2136222
Toluene	U		0.000278	0.00100	1	09/21/2023 04:58	WG2136222
Ethylbenzene	U		0.000137	0.00100	1	09/21/2023 04:58	WG2136222
Total Xylenes	U		0.000174	0.00300	1	09/21/2023 04:58	WG2136222
(S) Toluene-d8	*110*			*80.0-120*		*09/21/2023 04:58*	WG2136222
(S) 4-Bromofluorobenzene	*90.9*			*77.0-126*		*09/21/2023 04:58*	WG2136222
(S) 1,2-Dichloroethane-d4	*99.5*			*70.0-130*		*09/21/2023 04:58*	WG2136222

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Chloride	257		1.90	5.00	5	09/20/2023 11:33	WG2134880

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Benzene	U		0.0000941	0.00100	1	09/21/2023 05:20	WG2136222
Toluene	U		0.000278	0.00100	1	09/17/2023 12:49	WG2133846
Ethylbenzene	U		0.000137	0.00100	1	09/17/2023 12:49	WG2133846
Total Xylenes	U		0.000174	0.00300	1	09/21/2023 05:20	WG2136222
(S) Toluene-d8	*102*			*80.0-120*		*09/17/2023 12:49*	WG2133846
(S) Toluene-d8	*107*			*80.0-120*		*09/21/2023 05:20*	WG2136222
(S) 4-Bromofluorobenzene	*102*			*77.0-126*		*09/17/2023 12:49*	WG2133846
(S) 4-Bromofluorobenzene	*91.6*			*77.0-126*		*09/21/2023 05:20*	WG2136222
(S) 1,2-Dichloroethane-d4	*87.4*			*70.0-130*		*09/17/2023 12:49*	WG2133846
(S) 1,2-Dichloroethane-d4	*99.2*			*70.0-130*		*09/21/2023 05:20*	WG2136222

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	104	J6	0.379	1.00	1	09/20/2023 20:47	WG2134880

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	U		0.0000941	0.00100	1	09/21/2023 05:41	WG2136222
Toluene	U		0.000278	0.00100	1	09/17/2023 13:10	WG2133846
Ethylbenzene	U		0.000137	0.00100	1	09/17/2023 13:10	WG2133846
Total Xylenes	U		0.000174	0.00300	1	09/17/2023 13:10	WG2133846
(S) Toluene-d8	*101*			*80.0-120*		*09/17/2023 13:10*	WG2133846
(S) Toluene-d8	*108*			*80.0-120*		*09/21/2023 05:41*	WG2136222
(S) 4-Bromofluorobenzene	*103*			*77.0-126*		*09/17/2023 13:10*	WG2133846
(S) 4-Bromofluorobenzene	*91.9*			*77.0-126*		*09/21/2023 05:41*	WG2136222
(S) 1,2-Dichloroethane-d4	*86.4*			*70.0-130*		*09/17/2023 13:10*	WG2133846
(S) 1,2-Dichloroethane-d4	*103*			*70.0-130*		*09/21/2023 05:41*	WG2136222

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Chloride	263		1.90	5.00	5	09/20/2023 11:46	WG2134880

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Benzene	U		0.0000941	0.00100	1	09/21/2023 06:03	WG2136222
Toluene	U		0.000278	0.00100	1	09/17/2023 13:30	WG2133846
Ethylbenzene	U		0.000137	0.00100	1	09/17/2023 13:30	WG2133846
Total Xylenes	U		0.000174	0.00300	1	09/17/2023 13:30	WG2133846
(S) Toluene-d8	*101*			*80.0-120*		*09/17/2023 13:30*	WG2133846
(S) Toluene-d8	*109*			*80.0-120*		*09/21/2023 06:03*	WG2136222
(S) 4-Bromofluorobenzene	*102*			*77.0-126*		*09/17/2023 13:30*	WG2133846
(S) 4-Bromofluorobenzene	*90.9*			*77.0-126*		*09/21/2023 06:03*	WG2136222
(S) 1,2-Dichloroethane-d4	*86.1*			*70.0-130*		*09/17/2023 13:30*	WG2133846
(S) 1,2-Dichloroethane-d4	*98.4*			*70.0-130*		*09/21/2023 06:03*	WG2136222

Method Blank (MB)

(MB) R3975639-1 09/19/23 09:25

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.379	1.00

L1655970-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1655970-05 09/19/23 15:12 • (DUP) R3975639-3 09/19/23 15:50

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	128	128	1	0.0743		15

L1655972-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1655972-07 09/19/23 19:26 • (DUP) R3975639-6 09/19/23 19:39

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	132	132	1	0.155		15

Laboratory Control Sample (LCS)

(LCS) R3975639-2 09/19/23 09:38

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	38.7	96.8	80.0-120	

L1655970-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1655970-05 09/19/23 15:12 • (MS) R3975639-4 09/19/23 16:03 • (MSD) R3975639-5 09/19/23 16:15

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	40.0	128	142	141	35.2	33.8	1	80.0-120	J6	J6	0.415	15

L1655972-07 Original Sample (OS) • Matrix Spike (MS)

(OS) L1655972-07 09/19/23 19:26 • (MS) R3975639-7 09/19/23 19:52

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	40.0	132	144	29.3	1	80.0-120	J6

Method Blank (MB)

(MB) R3976173-1 09/20/23 09:20

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.379	1.00

L1655802-21 Original Sample (OS) • Duplicate (DUP)

(OS) L1655802-21 09/20/23 10:41 • (DUP) R3976173-3 09/20/23 10:54

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	0.643	0.654	1	1.70	J	15

L1655979-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1655979-03 09/20/23 20:47 • (DUP) R3976173-6 09/20/23 21:01

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	104	104	1	0.390		15

Laboratory Control Sample (LCS)

(LCS) R3976173-2 09/20/23 09:34

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	39.8	99.5	80.0-120	

L1655802-21 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1655802-21 09/20/23 10:41 • (MS) R3976173-4 09/20/23 11:07 • (MSD) R3976173-5 09/20/23 11:20

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	40.0	0.643	41.5	41.3	102	102	1	80.0-120			0.467	15

L1655979-03 Original Sample (OS) • Matrix Spike (MS)

(OS) L1655979-03 09/20/23 20:47 • (MS) R3976173-7 09/20/23 21:14

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	40.0	104	123	49.3	1	80.0-120	J6

Method Blank (MB)

(MB) R3975588-2 09/17/23 08:23

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Toluene	U		0.000278	0.00100
Ethylbenzene	U		0.000137	0.00100
Total Xylenes	U		0.000174	0.00300
(S) Toluene-d8	*100*			*80.0-120*
(S) 4-Bromofluorobenzene	*96.7*			*77.0-126*
(S) 1,2-Dichloroethane-d4	*86.4*			*70.0-130*

Laboratory Control Sample (LCS)

(LCS) R3975588-1 09/17/23 07:22

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Toluene	0.00500	0.00504	101	79.0-120	
Ethylbenzene	0.00500	0.00546	109	79.0-123	
Total Xylenes	0.0150	0.0166	111	79.0-123	
(S) Toluene-d8			*99.7*	*80.0-120*	
(S) 4-Bromofluorobenzene			*103*	*77.0-126*	
(S) 1,2-Dichloroethane-d4			*85.9*	*70.0-130*	

Method Blank (MB)

(MB) R3976020-3 09/20/23 22:56

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.0000941	0.00100
Toluene	U		0.000278	0.00100
Ethylbenzene	U		0.000137	0.00100
Total Xylenes	U		0.000174	0.00300
(S) Toluene-d8	*111*			*80.0-120*
(S) 4-Bromofluorobenzene	*94.1*			*77.0-126*
(S) 1,2-Dichloroethane-d4	*98.2*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3976020-1 09/20/23 21:30 • (LCSD) R3976020-2 09/20/23 21:52

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.00500	0.00494	0.00498	98.8	99.6	70.0-123			0.806	20
Toluene	0.00500	0.00498	0.00489	99.6	97.8	79.0-120			1.82	20
Ethylbenzene	0.00500	0.00483	0.00511	96.6	102	79.0-123			5.63	20
Total Xylenes	0.0150	0.0145	0.0147	96.7	98.0	79.0-123			1.37	20
(S) Toluene-d8				*105*	*108*	*80.0-120*				
(S) 4-Bromofluorobenzene				*96.6*	*97.2*	*77.0-126*				
(S) 1,2-Dichloroethane-d4				*96.6*	*100*	*70.0-130*				

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Tetra Tech EMI - Houston, TX

1500 CityWest Boulevard
Suite 1000
Houston, TX 77042

Report to: Dylon Breyman

Billing Information: Accounts Payable, 901 West Wall, Suite 100, Midland, TX 79701

Email To: dylon.breyman@tetratech.com;bill.smith2@tet

Project Description: MNR Vacuum Glorietta 2023

City/State Collected: Buckeye, NM

Please Circle: PT MT CT ET

Phone: 832-251-5160

Client Project # 212C-HN-02227

Lab Project # TETRAHTX-VACUUMGLORI

Collected by (print): Greg Scherbenske - HMI

Site/Facility ID #: TRRM

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

Pace PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1655979

Table #

Acctnum: TETRAHTX

Template: T219041

Prelogin: P1022097

PM: 3564 - Chad A Upchurch

PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	CHLORIDE 125mlHDPE-NoPres	V8260BTEX 40mlAmb-HCl		Remarks	Sample # (lab only)
~~VG-2~~	Grab	~~GW~~				4	X	X		NOT SAMPLED; DRY	
~~VG-3~~		~~GW~~				4	X	X		NOT SAMPLED; DRY	
~~VG-4~~		~~GW~~				4	X	X		NOT SAMPLED; LNAPL	
VG-5		GW		9-13-23	935	4	X	X			-01
VG-6		GW			1050	4	X	X			-02
VG-7		GW			840	4	X	X			-03
DUP-01		GW			1200	4	X	X			-04
		GW				4	X	X			
		GW				4	X	X			
		GW				4	X	X			

Matrix: S - Soil AIR - Air F - Filter GW - Groundwater B - Bioassay WW - WasteWater DW - Drinking Water OT - Other

Remarks:

pH ___ Temp ___

Flow ___ Other ___

Samples returned via: __ UPS ✓ FedEx __ Courier ___

Tracking # 6941 8348 9151

Sample Receipt Checklist

COC Seal Present/Intact:	NP	Y N
COC Signed/Accurate:		Y N
Bottles arrive intact:		Y N
Correct bottles used:		Y N
Sufficient volume sent:		Y N
If Applicable		
VOA Zero Headspace:		Y N
Preservation Correct/Checked:		Y N
RAD Screen <0.5 mR/hr:		Y N

	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
Relinquished by : (Signature)	9/13/23	1500			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 3.0 °C (Dual)	Bottles Received: 16
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) Christopher Galleri (14)	Date: 9/14/23	Time: 0845

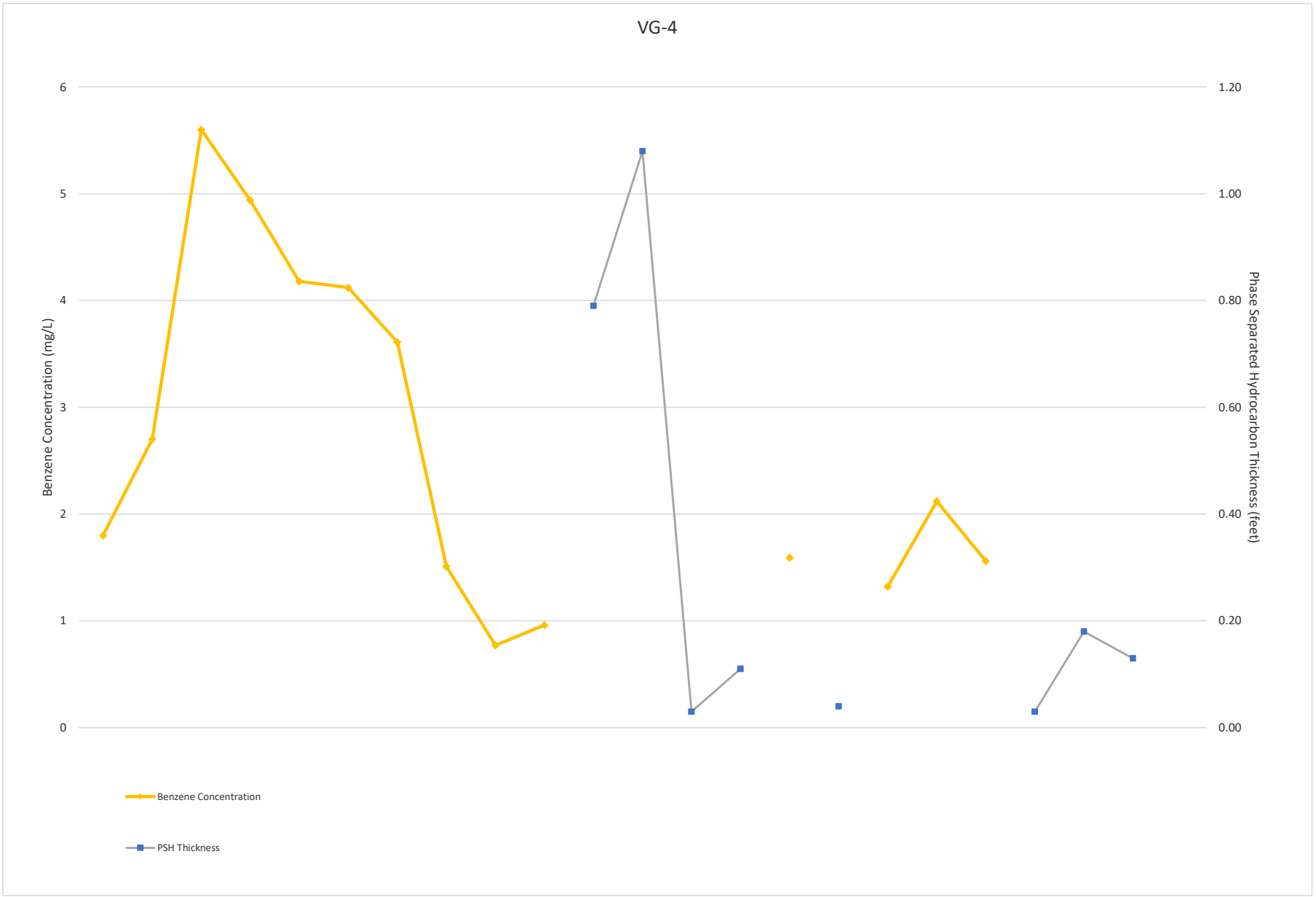
If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

APPENDIX B: BENZENE CONCENTRATION GRAPHS

Benzene Concentration Graph
Maverick Natural Resources - Vacuum Glorietta
Lea County, New Mexico



APPENDIX C: HISTORICAL GROUNDWATER GAUGING DATA

APPENDIX C
Historical Groundwater Gauging Data
VG-2
Vacuum Glorietta
Lea County, New Mexico

Gauging Date	Well Total Depth (feet BTOC)	PSH (feet BTOC)	Water level (feet BTOC)	PSH Thickness (feet)	PSH Elevation (feet AMSL)	TOC Elevation (feet AMSL)	Groundwater Elevation (feet AMSL)
1/27/2014	70.00	-	65.41	-	-	3,930.56	**3,865.15**
4/16/2014	70.00	-	65.38	-	-	3,930.56	**3,865.18**
7/22/2014	70.00	-	65.32	-	-	3,930.56	**3,865.24**
10/9/2014	70.00	-	64.03	-	-	3,930.56	**3,866.53**
1/14/2015	70.00	-	64.30	-	-	3,930.56	**3,866.26**
4/16/2015	70.00	-	64.37	-	-	3,930.56	**3,866.19**
7/8/2015	70.00	-	64.85	-	-	3,930.56	**3,865.71**
10/9/2015	70.00	-	65.15	-	-	3,930.56	**3,865.41**
1/7/2016	70.00	-	65.25	-	-	3,930.56	**3,865.31**
4/6/2016	70.00	-	65.29	-	-	3,930.56	**3,865.27**
6/10/2016	70.00	-	65.35	-	-	3,930.56	**3,865.21**
8/16/2017	70.00	-	65.58	-	-	3,930.56	**3,864.98**
11/30/2017	70.00	-	65.57	-	-	3,930.56	**3,864.99**
7/24/2018	-	-	65.79	-	-	3,930.56	**3,864.77**
11/14/2018	67.70	-	65.90	-	-	3,930.56	**3,864.66**
6/17/2019	67.89	-	66.44	-	-	3,930.56	**3,864.12**
11/20/2019	67.89	-	66.42	-	-	3,930.56	**3,864.14**
5/13/2020	67.7	-	66.51	-	-	3,930.56	**3,864.05**
11/19/2020	67.7	-	66.74	-	-	3,930.56	**3,863.82**
5/11/2021	67.7	-	Dry	-	-	3,930.56	**Dry**
11/17/2021	67.7	-	Dry	-	-	3,930.56	**Dry**
5/23/2022	67.7	-	Dry	-	-	3,930.56	**Dry**
11/14/2022	67.7	-	Dry	-	-	3,930.56	**Dry**
2/28/2023	67.7	-	Dry	-	-	3,930.56	**Dry**
9/13/2023	67.7	-	Dry	-	-	3,930.56	**Dry**

APPENDIX C
Historical Groundwater Gauging Data
VG-2
Vacuum Glorietta
Lea County, New Mexico

Gauging Date	Well Total Depth (feet BTOC)	PSH (feet BTOC)	Water level (feet BTOC)	PSH Thickness (feet)	PSH Elevation (feet AMSL)	TOC Elevation (feet AMSL)	Groundwater Elevation (feet AMSL)

Notes:

TOC	Top of Casing
AMSL	Above Mean Sea Level
BTOC	Below Top of Casing

APPENDIX C
Historical Groundwater Gauging Data
VG-3
Vacuum Glorietta
Lea County, New Mexico

Gauging Date	Well Total Depth (feet BTOC)	PSH (feet BTOC)	Water level (feet BTOC)	PSH Thickness (feet)	PSH Elevation (feet AMSL)	TOC Elevation (feet AMSL)	Groundwater Elevation (feet AMSL)
1/27/2014	70.00	-	64.71	-	-	3,931.15	**3,866.44**
4/16/2014	70.00	-	64.66	-	-	3,931.15	**3,866.49**
7/22/2014	70.00	-	64.59	-	-	3,931.15	**3,866.56**
9/10/2014	70.00	-	63.30	-	-	3,931.15	**3,867.85**
1/14/2015	70.00	-	63.58	-	-	3,931.15	**3,867.57**
4/16/2015	70.00	-	63.63	-	-	3,931.15	**3,867.52**
8/7/2015	70.00	-	64.11	-	-	3,931.15	**3,867.04**
9/10/2015	70.00	-	64.38	-	-	3,931.15	**3,866.77**
7/1/2016	70.00	-	64.48	-	-	3,931.15	**3,866.67**
6/4/2016	70.00	-	64.54	-	-	3,931.15	**3,866.61**
6/10/2016	70.00	-	64.61	-	-	3,931.15	**3,866.54**
8/16/2017	70.00	-	64.86	-	-	3,931.15	**3,866.29**
11/30/2017	70.00	-	64.87	-	-	3,931.15	**3,866.28**
7/24/2018	-	-	65.02	-	-	3,931.15	**3,866.13**
11/14/2018	68.48	-	65.21	-	-	3,931.15	**3,865.94**
6/17/2019	68.61	-	65.56	-	-	3,931.15	**3,865.59**
11/19/2019	68.61	-	65.66	-	-	3,931.15	**3,865.49**
5/12/2020	68.3	-	65.78	-	-	3,931.15	**3,865.37**
11/19/2020	68.3	-	65.98	-	-	3,931.15	**3,865.17**
5/11/2021	68.41	-	66.59	-	-	3,931.15	**3,864.56**
11/17/2021	68.41	-	67.23	-	-	3,931.15	**3,863.92**
5/23/2022	68.41	-	67.06	-	-	3,931.15	**3,864.09**
11/14/2022	68.41	-	67.13	-	-	3,931.15	**3,864.02**
2/28/2023	68.6	-	67.62	-	-	3,931.15	**3,863.53**
9/13/2023	68.6	-	68.41	-	-	3,931.15	**3,862.74**

APPENDIX C
Historical Groundwater Gauging Data
VG-3
Vacuum Glorietta
Lea County, New Mexico

Gauging Date	Well Total Depth (feet BTOC)	PSH (feet BTOC)	Water level (feet BTOC)	PSH Thickness (feet)	PSH Elevation (feet AMSL)	TOC Elevation (feet AMSL)	Groundwater Elevation (feet AMSL)

Notes:

TOC	Top of Casing
AMSL	Above Mean Sea Level
BTOC	Below Top of Casing

APPENDIX C
Historical Groundwater Gauging Data
VG-4
Vacuum Glorietta
Lea County, New Mexico

Gauging Date	Well Total Depth (feet BTOC)	PSH (feet BTOC)	Water level (feet BTOC)	PSH Thickness (feet)	PSH Elevation (feet AMSL)	TOC Elevation (feet AMSL)	Corrected Groundwater Elevation (feet AMSL)
1/27/2014	78.00	65.52	65.56	0.04	3,865.63	3,931.15	**3,865.62**
4/16/2014	78.00	65.48	65.49	0.01	3,865.67	3,931.15	**3,865.66**
7/22/2014	78.00	65.44	65.45	0.01	3,865.71	3,931.15	**3,865.70**
10/9/2014	78.00	-	63.93	0	-	3,931.15	**3,867.22**
1/14/2015	78.00	-	64.48	0	-	3,931.15	**3,866.67**
4/16/2015	78.00	-	64.53	0	-	3,931.15	**3,866.62**
7/8/2015	78.00	-	65.02	0	-	3,931.15	**3,866.13**
10/9/2015	78.00	-	65.25	0	-	3,931.15	**3,865.90**
1/7/2016	78.00	-	65.33	0	-	3,931.15	**3,865.82**
4/6/2016	78.00	65.35	65.36	0.01	3,865.80	3,931.15	**3,865.79**
10/6/2016	78.00	-	65.46	0	-	3,931.15	**3,865.69**
8/16/2017	78.00	-	65.75	0	-	3,931.15	**3,865.40**
11/30/2017	78.00	-	68.42	0	-	3,931.15	**3,862.73**
7/24/2018	-	65.13	65.92	0.79	3,866.02	3,931.15	**3,865.23**
11/14/2018	-	66.06	67.14	1.08	3,865.09	3,931.15	**3,864.01**
6/17/2019	-	66.35	66.38	0.03	3,864.80	3,931.15	**3,864.77**
11/19/2019	-	66.57	66.68	0.11	3,864.58	3,931.15	**3,864.47**
5/13/2020	72.1	-	66.65	0	-	3,931.15	**3,864.50**
11/18/2020	-	67.89	67.93	0.04	3,863.26	3,931.15	**3,863.22**
5/12/2021	70.7	-	67.54	0	-	3,931.15	**3,863.61**
11/17/2021	70.7	-	67.86	0	-	3,931.15	**3,863.29**
5/23/2022	70.7	-	67.89	0	-	3,931.15	**3,863.26**
11/14/2022	70.7	67.93	67.96	0.03	3,863.22	3,931.15	**3,863.19**
2/28/2023	70.7	67.56	67.74	0.18	3,863.59	3,931.15	**3,863.41**
9/13/2023	70.7	69.48	69.61	0.13	3,861.67	3,931.15	**3,861.54**

APPENDIX C
Historical Groundwater Gauging Data
VG-4
Vacuum Glorietta
Lea County, New Mexico

Gauging Date	Well Total Depth (feet BTOC)	PSH (feet BTOC)	Water level (feet BTOC)	PSH Thickness (feet)	PSH Elevation (feet AMSL)	TOC Elevation (feet AMSL)	Corrected Groundwater Elevation (feet AMSL)

Notes:

TOC	Top of Casing
AMSL	Above Mean Sea Level
BTOC	Below Top of Casing

APPENDIX C
Historical Groundwater Gauging Data
VG-5
Vacuum Glorietta
Lea County, New Mexico

Gauging Date	Well Total Depth (feet BTOC)	PSH (feet BTOC)	Water level (feet BTOC)	PSH Thickness (feet)	PSH Elevation (feet AMSL)	TOC Elevation (feet AMSL)	Groundwater Elevation (feet AMSL)
1/27/2014	74.00	-	64.51	-	-	3,930.52	**3,866.01**
4/16/2014	74.00	-	64.80	-	-	3,930.52	**3,865.72**
7/22/2014	74.00	-	64.38	-	-	3,930.52	**3,866.14**
10/9/2014	74.00	-	63.16	-	-	3,930.52	**3,867.36**
1/14/2015	74.00	-	63.42	-	-	3,930.52	**3,867.10**
4/16/2015	74.00	-	63.46	-	-	3,930.52	**3,867.06**
7/8/2015	74.00	-	63.99	-	-	3,930.52	**3,866.53**
10/9/2015	74.00	-	64.25	-	-	3,930.52	**3,866.27**
1/7/2016	74.00	-	64.32	-	-	3,930.52	**3,866.20**
4/6/2016	74.00	-	64.36	-	-	3,930.52	**3,866.16**
10/6/2016	74.00	-	64.43	-	-	3,930.52	**3,866.09**
8/16/2017	74.00	-	64.68	-	-	3,930.52	**3,865.84**
11/30/2017	74.00	-	64.77	-	-	3,930.52	**3,865.75**
7/24/2018	-	-	64.84	-	-	3,930.52	**3,865.68**
11/14/2018	75.30	-	64.98	-	-	3,930.52	**3,865.54**
6/17/2019	75.31	-	65.46	-	-	3,930.52	**3,865.06**
11/20/2019	75.31	-	65.49	-	-	3,930.52	**3,865.03**
5/13/2020	75.15	-	65.57	-	-	3,930.52	**3,864.95**
11/19/2020	75.15	-	65.80	-	-	3,930.52	**3,864.72**
5/11/2021	75.15	-	66.49	-	-	3,930.52	**3,864.03**
11/17/2021	75.15	-	66.81	-	-	3,930.52	**3,863.71**
5/23/2022	75.15	-	66.90	-	-	3,930.52	**3,863.62**
11/14/2022	75.15	-	66.97	-	-	3,930.52	**3,863.55**
2/28/2023	75.15	-	67.46	-	-	3,930.52	**3,863.06**
9/13/2023	75.15	-	68.33	-	-	3,930.52	**3,862.19**

APPENDIX C
Historical Groundwater Gauging Data
VG-5
Vacuum Glorietta
Lea County, New Mexico

Gauging Date	Well Total Depth (feet BTOC)	PSH (feet BTOC)	Water level (feet BTOC)	PSH Thickness (feet)	PSH Elevation (feet AMSL)	TOC Elevation (feet AMSL)	Groundwater Elevation (feet AMSL)

Notes:

TOC	Top of Casing
AMSL	Above Mean Sea Level
BTOC	Below Top of Casing

APPENDIX C
Historical Groundwater Gauging Data
VG-6
Vacuum Glorietta
Lea County, New Mexico

Gauging Date	Well Total Depth (feet BTOC)	PSH (feet BTOC)	Water level (feet BTOC)	PSH Thickness (feet)	PSH Elevation (feet AMSL)	TOC Elevation (feet AMSL)	Groundwater Elevation (feet AMSL)
1/27/2014	80.00	-	68.38	-	-	3,935.16	**3,866.78**
4/16/2014	80.00	-	68.32	-	-	3,935.16	**3,866.84**
7/22/2014	80.00	-	68.26	-	-	3,935.16	**3,866.90**
10/9/2014	80.00	-	67.06	-	-	3,935.16	**3,868.10**
1/14/2015	80.00	-	67.27	-	-	3,935.16	**3,867.89**
4/16/2015	80.00	-	67.30	-	-	3,935.16	**3,867.86**
7/8/2015	80.00	-	67.86	-	-	3,935.16	**3,867.30**
10/9/2015	80.00	-	68.12	-	-	3,935.16	**3,867.04**
1/7/2016	80.00	-	68.16	-	-	3,935.16	**3,867.00**
4/6/2016	80.00	-	68.21	-	-	3,935.16	**3,866.95**
10/6/2016	80.00	-	68.27	-	-	3,935.16	**3,866.89**
8/16/2017	80.00	-	68.53	-	-	3,935.16	**3,866.63**
11/30/2017	80.00	-	68.57	-	-	3,935.16	**3,866.59**
7/24/2018	-	-	68.69	-	-	3,935.16	**3,866.47**
11/14/2018	80.00	-	68.86	-	-	3,935.16	**3,866.30**
6/17/2019	80.16	-	69.35	-	-	3,935.16	**3,865.81**
11/19/2019	80.16	-	69.31	-	-	3,935.16	**3,865.85**
5/12/2020	79.72	-	69.41	-	-	3,935.16	**3,865.75**
11/18/2020	79.72	-	69.64	-	-	3,935.16	**3,865.52**
5/12/2021	79.72	-	70.48	-	-	3,935.16	**3,864.68**
11/17/2021	79.72	-	70.73	-	-	3,935.16	**3,864.43**
5/23/2022	79.72	-	70.80	-	-	3,935.16	**3,864.36**
11/14/2022	79.72	-	70.65	-	-	3,935.16	**3,864.51**
2/28/2023	79.72	-	71.46	-	-	3,935.16	**3,863.70**
9/13/2023	79.72	-	72.48	-	-	3,935.16	**3,862.68**

APPENDIX C
Historical Groundwater Gauging Data
VG-6
Vacuum Glorietta
Lea County, New Mexico

Gauging Date	Well Total Depth (feet BTOC)	PSH (feet BTOC)	Water level (feet BTOC)	PSH Thickness (feet)	PSH Elevation (feet AMSL)	TOC Elevation (feet AMSL)	Groundwater Elevation (feet AMSL)

Notes:

TOC	Top of Casing
AMSL	Above Mean Sea Level
BTOC	Below Top of Casing

APPENDIX C
Historical Groundwater Gauging Data
VG-7
Vacuum Glorietta
Lea County, New Mexico

Gauging Date	Well Total Depth (feet BTOC)	PSH (feet BTOC)	Water level (feet BTOC)	PSH Thickness (feet)	PSH Elevation (feet AMSL)	TOC Elevation (feet AMSL)	Groundwater Elevation (feet AMSL)
1/27/2014	80.00	-	68.23	-	-	3,934.78	**3,866.55**
4/16/2014	80.00	-	68.19	-	-	3,934.78	**3,866.59**
7/22/2014	80.00	-	68.10	-	-	3,934.78	**3,866.68**
10/9/2014	80.00	-	66.93	-	-	3,934.78	**3,867.85**
1/14/2015	80.00	-	67.12	-	-	3,934.78	**3,867.66**
4/16/2015	80.00	-	67.16	-	-	3,934.78	**3,867.62**
7/8/2015	80.00	-	67.70	-	-	3,934.78	**3,867.08**
10/9/2015	80.00	-	67.98	-	-	3,934.78	**3,866.80**
1/7/2016	80.00	-	68.01	-	-	3,934.78	**3,866.77**
4/6/2016	80.00	-	68.07	-	-	3,934.78	**3,866.71**
10/6/2016	80.00	-	68.13	-	-	3,934.78	**3,866.65**
8/16/2017	80.00	-	68.38	-	-	3,934.78	**3,866.40**
11/30/2017	80.00	-	68.36	-	-	3,934.78	**3,866.42**
7/24/2018	-	-	68.58	-	-	3,934.78	**3,866.20**
11/14/2018	79.80	-	68.65	-	-	3,934.78	**3,866.13**
6/17/2019	80.09	-	69.15	-	-	3,934.78	**3,865.63**
11/19/2019	80.09	-	69.17	-	-	3,934.78	**3,865.61**
5/12/2020	79.87	-	69.30	-	-	3,934.78	**3,865.48**
11/18/2020	79.86	-	69.48	-	-	3,934.78	**3,865.30**
5/12/2021	79.86	-	70.36	-	-	3,934.78	**3,864.42**
11/17/2021	79.86	-	70.77	-	-	3,934.78	**3,864.01**
5/23/2022	79.86	-	70.52	-	-	3,934.78	**3,864.26**
11/14/2022	79.86	-	70.60	-	-	3,934.78	**3,864.18**
2/28/2023	79.86	-	71.31	-	-	3,934.78	**3,863.47**
9/13/2023	79.86	-	72.38	-	-	3,934.78	**3,862.40**

APPENDIX C
Historical Groundwater Gauging Data
VG-7
Vacuum Glorietta
Lea County, New Mexico

Gauging Date	Well Total Depth (feet BTOC)	PSH (feet BTOC)	Water level (feet BTOC)	PSH Thickness (feet)	PSH Elevation (feet AMSL)	TOC Elevation (feet AMSL)	Groundwater Elevation (feet AMSL)

Notes:

TOC	Top of Casing
AMSL	Above Mean Sea Level
BTOC	Below Top of Casing

APPENDIX D: HISTORICAL GROUNDWATER ANALYTICAL DATA

APPENDIX D
Historical Groundwater Analytical Data
VG-2
Vacuum Glorietta
Lea County, New Mexico

Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	Chloride (mg/L)
NMWQCC GQS	**0.01**	**0.75**	**0.75**	**0.62**	**250**
1/28/2014	<0.001	<0.001	<0.001	<0.003	125
4/16/2014	<0.001	<0.001	<0.001	<0.003	134
7/22/2014	<0.001	<0.001	<0.001	<0.003	146
10/9/2014	<0.001	<0.001	<0.001	<0.003	111
1/14/2015	<0.001	<0.001	<0.001	<0.003	106
4/16/2015	<0.001	<0.001	<0.001	<0.003	88.4
7/8/2015	<0.001	<0.001	<0.001	<0.003	73.8
10/9/2015	<0.001	<0.001	<0.001	<0.003	106
1/7/2016	<0.001	<0.001	<0.001	<0.003	183
4/6/2016	<0.001	<0.001	<0.001	<0.003	174
10/6/2016	<0.001	<0.001	<0.001	<0.003	200
8/16/2017	<0.0020	<0.0050	<0.0020	<0.0060	200
11/30/2017	<0.0020	<0.0050	<0.0020	<0.0060	195
7/25/2018	<0.00100	<0.00100	<0.00100	<0.00300	173
11/14/2018	<0.00100	<0.00100	<0.00100	<0.00300	175
6/17/2019	<0.00100	<0.00100	<0.00100	<0.00300	193
11/20/2019	<0.00100	<0.00100	<0.00100	<0.00300	192
5/13/2020	<0.00100	<0.00100	<0.00100	<0.00300	176
11/19/2020	<0.00100	<0.00100	<0.00100	<0.00300	117
5/11/2021	Not Sampled - Dry				
11/17/2021	Not Sampled - Dry				
5/23/2022	Not Sampled - Dry				
11/14/2022	Not Sampled - Dry				
2/28/2023	Not Sampled - Dry				
9/13/2023	Not Sampled - Dry				

Notes:

NMWQCC	New Mexico Water Quality Control Commission
GQS	Groundwater Quality Standards
J	The identification of the analyte is acceptable; the reported value is an estimate
-	Not Analyzed
	Result exceeds NMWQCC Groundwater Quality Standards

APPENDIX D
Historical Groundwater Analytical Data
VG-3
Vacuum Glorietta
Lea County, New Mexico

Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	Chloride (mg/L)
NMWQCC GQS	**0.01**	**0.75**	**0.75**	**0.62**	**250**
1/18/2014	<0.001	<0.001	<0.001	<0.003	45.2
4/16/2014	<0.001	<0.001	<0.001	<0.003	46.7
7/22/2014	<0.001	<0.001	<0.001	<0.003	44.4
9/10/2014	<0.001	<0.001	<0.001	<0.003	38.2
1/14/2015	<0.001	<0.001	<0.001	<0.003	50
4/16/2015	<0.001	<0.001	<0.001	<0.003	45.7
7/8/2015	<0.001	<0.001	<0.001	<0.003	44.2
10/9/2015	<0.001	<0.001	<0.001	<0.003	41.6
1/7/2016	<0.001	<0.001	<0.001	<0.003	40.4
4/6/2016	<0.001	<0.001	<0.001	<0.003	40.9
10/6/2016	<0.001	<0.001	<0.001	<0.003	40.3
8/16/2017	<0.0020	<0.0050	<0.0020	<0.0060	40.4
11/30/2017	<0.0020	<0.0050	<0.0020	<0.0060	38.1
7/25/2018	<0.00100	<0.00100	<0.00100	<0.00300	44.8
11/14/2018	<0.00100	<0.00100	<0.00100	<0.00300	46.6
6/17/2019	<0.00100	<0.00100	<0.00100	<0.00300	49.6
11/19/2019	<0.00100	<0.00100	<0.00100	<0.00300	55.1
5/12/2020	<0.00100	<0.00100	<0.00100	<0.00300	56.8
11/19/2020	<0.00100	<0.00100	<0.00100	<0.00300	59.8
5/11/2021	0.000254 J	<0.00100	0.000335 J	0.000705 J	58.9
11/17/2021	<0.0020	<0.0050	<0.0020	<0.0060	51.7
5/23/2022	<0.0020	<0.0050	<0.0020	<0.0060	76.2
11/15/2022	<0.00100	<0.00100	<0.00100	<0.00300	59.7
2/28/2023	Not Sampled - Dry				
9/13/2023	Not Sampled - Dry				

Notes:

NMWQCC	New Mexico Water Quality Control Commission
GQS	Groundwater Quality Standards
J	The identification of the analyte is acceptable; the reported value is an estimate
-	Not Analyzed
	Result exceeds NMWQCC Groundwater Quality Standards

APPENDIX D
Historical Groundwater Analytical Data
VG-4
Vacuum Glorietta
Lea County, New Mexico

Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	Chloride (mg/L)
NMWQCC GQS	**0.01**	**0.75**	**0.75**	**0.62**	**250**
10/28/2014	1.8	<0.05	0.82	0.2	4,140
1/14/2015	2.7	0.03	1.1	0.78	5,640
4/16/2015	5.6	0.037	1.7	0.8	3,080
7/8/2015	4.94	<0.05	1.57	<0.15	2,240
10/9/2015	4.18	<0.05	1.5	0.305	1,480
1/7/2016	4.12	<0.05	2.1	0.272	1,360
4/6/2016	3.61	<0.05	5.47	2.13	1,190
10/6/2016	1.51	<0.05	0.54	0.256	1,490
8/16/2017	0.77	<0.0050	0.12	0.035	1,180
11/30/2017	0.96	0.0065	0.25	0.11	1,060
7/25/2018	Not Sampled - PSH Present				
11/14/2018	Not Sampled - PSH Present				
6/17/2019	Not Sampled - PSH Present				
11/19/2019	Not Sampled - PSH Present				
5/13/2020	1.59	0.0837	0.551	0.826	581
11/18/2020	Not Sampled - PSH Present				
5/12/2021	1.32	0.0246 J	0.296	0.111 J	532
11/18/2021	2.12	0.0463	0.0911	0.952	461
5/23/2022	1.56	0.0135	0.671	0.397	376
11/15/2022	Not Sampled - PSH Present				
2/28/2023	Not Sampled - PSH Present				
9/13/2023	Not Sampled - PSH Present				

Notes:

NMWQCC	New Mexico Water Quality Control Commission
GQS	Groundwater Quality Standards
J	The identification of the analyte is acceptable; the reported value is an estimate
-	Not Analyzed
	Result exceeds NMWQCC Groundwater Quality Standards

APPENDIX D

Historical Groundwater Analytical Data
VG-5
Vacuum Glorietta
Lea County, New Mexico

Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	Chloride (mg/L)
NMWQCC GQS	**0.01**	**0.75**	**0.75**	**0.62**	**250**
1/28/2014	<0.001	<0.001	<0.001	<0.003	304
4/16/2014	<0.001	<0.001	<0.001	<0.003	342
7/22/2014	<0.001	<0.001	<0.001	<0.003	140
10/9/2014	<0.001	<0.001	<0.001	<0.003	278
1/14/2015	<0.001	<0.001	<0.001	<0.003	228
4/16/2015	<0.001	<0.001	<0.001	<0.003	200
7/8/2015	<0.001	<0.001	<0.001	<0.003	232
10/9/2015	<0.001	<0.001	<0.001	<0.003	204
1/7/2016	<0.001	<0.001	<0.001	<0.003	158
4/6/2016	<0.001	<0.001	<0.001	<0.003	224
10/6/2016	<0.001	<0.001	<0.001	<0.003	283
8/16/2017	<0.0020	<0.0050	<0.0020	<0.0060	298
11/30/2017	<0.0020	<0.0050	<0.0020	<0.0060	417
7/25/2018	<0.00100	<0.00100	<0.00100	<0.00300	225
11/14/2018	<0.00100	<0.00100	<0.00100	<0.00300	180
6/17/2019	0.000862 J	0.00439	0.000526 J	0.00244 J	188
11/20/2019	<0.00100	<0.00100	<0.00100	<0.00300	176
5/13/2020	<0.00100	<0.00100	<0.00100	<0.00300	295
11/19/2020	<0.00100	<0.00100	<0.00100	<0.00300	368
5/11/2021	0.000166 J	<0.00100	<0.00100	<0.00300	154
11/18/2021	<0.00200	<0.00500	<.00200	<0.00600	331
5/23/2022	<0.00200	<0.00500	<.00200	<0.00600	204
11/16/2022	<0.00100	<0.00100	<0.00100	<0.00300	248
2/28/2023	<0.0000941	<0.000278	<0.000137	<0.000174	316
9/13/2023	<0.0000941	<0.000278	<0.000137	<0.000174	191

Notes:

U	Not detected at the Reporting Limit (or MDL where applicable)
NMWQCC	New Mexico Water Quality Control Commission
GQS	Groundwater Quality Standards
J	The identification of the analyte is acceptable; the reported value is an estimate
-	Not Analyzed
	Result exceeds NMWQCC Groundwater Quality Standards

APPENDIX D
Historical Groundwater Analytical Data
VG-6
Vacuum Glorietta
Lea County, New Mexico

Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	Chloride (mg/L)
NMWQCC GQS	**0.01**	**0.75**	**0.75**	**0.62**	**250**
1/28/2014	<0.001	<0.001	<0.001	<0.003	88.3
4/16/2014	<0.001	<0.001	<0.001	<0.003	78.1
7/22/2014	<0.001	<0.001	<0.001	<0.003	95.3
10/9/2014	<0.001	<0.001	<0.001	<0.003	113
1/14/2015	<0.001	<0.001	<0.001	<0.003	88.4
4/16/2015	<0.001	<0.001	<0.001	<0.003	82.3
7/8/2015	<0.001	<0.001	<0.001	<0.003	99.9
10/9/2015	<0.001	<0.001	<0.001	<0.003	134
1/7/2016	<0.001	<0.001	<0.001	<0.003	111
4/6/2016	<0.001	<0.001	<0.001	<0.003	86
10/6/2016	<0.001	<0.001	<0.001	<0.003	139
8/16/2017	<0.0020	<0.0050	<0.0020	<0.0060	140
11/30/2017	<0.0020	<0.0050	<0.0020	<0.0060	84.4
7/25/2018	<0.00100	<0.00100	<0.00100	<0.00300	117
11/14/2018	<0.00100	<0.00100	<0.00100	<0.00300	134
6/17/2019	<0.00100	0.00105	<0.00100	<0.00300	138
11/19/2019	<0.00100	<0.00100	<0.00100	<0.00300	143
5/12/2020	<0.00100	<0.00100	<0.00100	<0.00300	135
11/18/2020	<0.00100	<0.00100	<0.00100	<0.00300	115
5/12/2021	<0.00100	<0.00100	<0.00100	<0.00300	88.8
11/17/2021	<0.0020	<0.0050	<0.0020	<0.0060	75.1
5/23/2022	<0.0020	<0.0050	<0.0020	<0.0060	64.1
11/15/2022	<0.00100	<0.00100	<0.00100	<0.00300	126
2/28/2023	<0.0000941	<0.000278	<0.000137	<0.000174	134
9/13/2023	<0.0000941	<0.000278	<0.000137	<0.000174	257

Notes:

U	Not detected at the Reporting Limit (or MDL where applicable)
NMWQCC	New Mexico Water Quality Control Commission
GQS	Groundwater Quality Standards
J	The identification of the analyte is acceptable; the reported value is an estimate
-	Not Analyzed
	Result exceeds NMWQCC Groundwater Quality Standards

APPENDIX D
Historical Groundwater Analytical Data
VG-7
Vacuum Glorietta
Lea County, New Mexico

Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	Chloride (mg/L)
NMWQCC GQS	**0.01**	**0.75**	**0.75**	**0.62**	**250**
1/28/2014	<0.001	<0.001	<0.001	<0.003	191
4/16/2014	<0.001	<0.001	<0.001	<0.003	211
7/22/2014	<0.001	<0.001	<0.001	<0.003	201
10/9/2014	<0.001	<0.001	<0.001	<0.003	189
1/14/2015	<0.001	<0.001	<0.001	<0.003	246
4/16/2015	<0.001	<0.001	<0.001	<0.003	270
7/8/2015	<0.001	<0.001	<0.001	<0.003	203
10/9/2015	<0.001	<0.001	<0.001	<0.003	154
1/7/2016	<0.001	<0.001	<0.001	<0.003	121
4/6/2016	<0.001	<0.001	<0.001	<0.003	148
10/6/2016	<0.001	<0.001	<0.001	<0.003	172
8/16/2017	<0.0020	<0.0050	<0.0020	<0.0060	134
11/30/2017	<0.0020	<0.0050	<0.0020	<0.0060	164
7/25/2018	<0.00100	<0.00100	<0.00100	<0.00300	254
11/14/2018	<0.00100	<0.00100	<0.00100	<0.00300	229
6/17/2019	<0.00100	<0.00100	<0.00100	<0.00300	207
11/19/2019	<0.00100	<0.00100	<0.00100	<0.00300	149
5/12/2020	<0.00100	<0.00100	<0.00100	<0.00300	129
11/18/2020	<0.00100	<0.00100	<0.00100	<0.00300	122
5/12/2021	<0.00100	<0.00100	<0.00100	<0.00300	127
11/17/2021	<0.0020	<0.0050	<0.0020	<0.0060	137
5/23/2022	<0.0020	<0.0050	<0.0020	<0.0060	124
11/15/2022	<0.00100	<0.00100	<0.00100	<0.00300	137
2/28/2023	<0.0000941	<0.000278	<0.000137	<0.000174	144
9/13/2023	<0.0000941	<0.000278	<0.000137	<0.000174	104

Notes:

U	Not detected at the Reporting Limit (or MDL where applicable)
NMWQCC	New Mexico Water Quality Control Commission
GQS	Groundwater Quality Standards
J	The identification of the analyte is acceptable; the reported value is an estimate
-	Not Analyzed
	Result exceeds NMWQCC Groundwater Quality Standards

APPENDIX E: ACUVAC REMEDIATION REPORTS

AcuVac Remediation

April 10, 2022

Mr. Dylon Breyman
Environmental Scientist, III
Project Manager
Tetra Tech
2500 City West Blvd, Suite 1000
Houston, TX 77042

Dear Dylon:

Re: Vacuum Glorietta Site, Lea County, NM, (Event #12)

At your request, AcuVac Remediation, LLC (AcuVac) performed) performed a single continuous one hundred (100.0) hour Soil Vapor Extraction (SVE) Event; recorded as #12A, #12B, #12C, #12D and #12E at the above referenced site as outlined in the table below. The following is the report and a copy of the operating data collected during Event #12. Additionally, the attached Table #1 contains the Summary Well Data, and Table #2 contains the Summary Recovery Data.

Event Number	Well Number	Event Type	Event Duration (hrs)	Date
#12A	VG-4	SVE	24.0	03/27/2023
#12B	VG-4	SVE	24.0	03/28/2023
#12C	VG-4	SVE	24.0	03/29/2023
#12D	VG-4	SVE	24.0	03/30/2023
#12E	VG-4	SVE	4.0	03/31/2023

The event hours for each day are based on the start time of the event 0800 hrs. and ending at 0800 hrs. on the following day.

The purpose of the events was to enhance recovery of phase separated hydrocarbons (PSH) present at the Site through the removal of petroleum hydrocarbons in both liquid and vapor phases. PSH refers to both petroleum hydrocarbons and Non-Aqueous Phase Liquids (NAPL). The source of the PSH is a historical pipeline release.

OBJECTIVES

The objectives of the SVE Events:

- Maximize liquid and vapor phase petroleum hydrocarbon removal from groundwater and soils in the subsurface formations within the influence of the extraction well.
- Expose the capillary fringe area and below to the extraction well induced vacuums.
- Increase the liquid and vapor phase petroleum hydrocarbon specific yields with high induced vacuums.

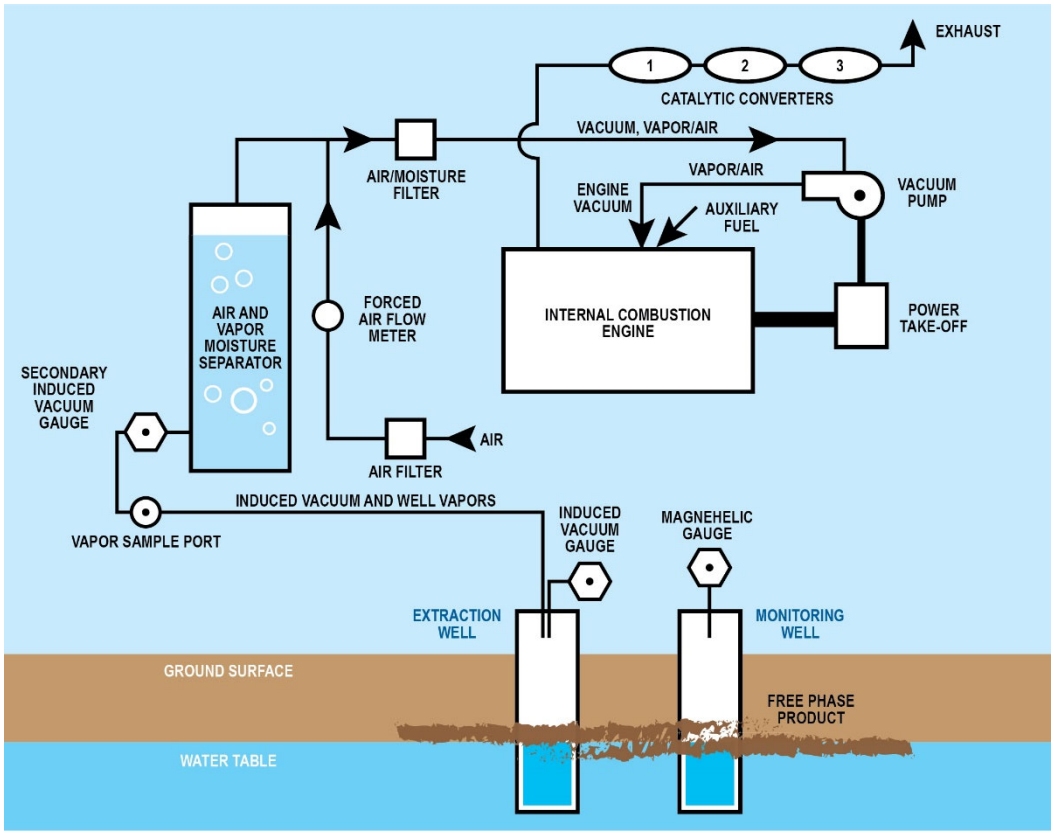
METHODS AND EQUIPMENT

AcuVac owns and maintains an inventory of equipment to perform SVE events and uses no third-party equipment. The events at the Site were conducted using the AcuVac I-6 System (System) with a Roots RAI-33 blower, used as a vacuum pump, and a Roots RAI-22 positive displacement blower. The table below lists additional equipment and instrumentation employed, and the data element captured by each.

Equipment and Instrumentation Employed by AcuVac

Measurement Equipment	Data Element
Extraction Well Induced Vacuum and Flow	
Dwyer Magnehelic Gauges	Extraction Well Vacuum
Dwyer Averaging Pitot Tubes / Magnehelic Gauges	Extraction Well Vapor Flow
Observation Wells	
Dwyer Digital Manometer	Vacuum / Pressure Influence
Extraction Well Vapor Monitoring	
AcuVac V-1 Vacuum Box	Extraction Well Non-Diluted Vapor Sample Collection
HORIBA® Analyzer	Extraction Well Vapor TPH Concentration
RKI 1200 O_2 Monitor	Extraction Well Vapor Oxygen Content
NAPL Thickness (if present)	
Solinst Interface Probes Model 122	Depth to LNAPL and Depth to Groundwater
Atmospheric Conditions	
Testo Model 511	Relative and Absolute Barometric Pressure

ACUVAC SOIL VAPOR EXTRACTION SYSTEM



The vacuum extraction portion of the System consists of a vacuum pump driven by an internal combustion engine (IC engine). The vacuum pump connects to the extraction well, and the vacuum created on the extraction well causes light hydrocarbons in the soil and in the groundwater to volatilize and flow through a moisture knockout tank to the vacuum pump and the IC engine where they burn as part of the normal combustion process. Auxiliary propane powers the engine if the well vapors do not provide the required energy.

The IC engine provides the power necessary to achieve and maintain high induced vacuums and/or high well vapor flows needed to maximize the vacuum radius of influence.

Emissions from the engine pass through three catalytic converters to maximize destruction of effluent hydrocarbon vapors. The engine's fuel-to-air ratio is adjusted to maintain efficient combustion. Because the engine powers all equipment, the System stops when the engine stops preventing an uncontrolled release of hydrocarbons. Since the System operates entirely under vacuum, any leaks in the seals or connections leak into the System and not the atmosphere. Vacuum loss, low oil pressure, over-speed, or overheating automatically shut down the engine.

The design of the AcuVac System enables independent control of both the induced well vacuum and the groundwater pumping functions such that the AcuVac team controls the induced hydraulic gradient to increase exposure of the formation to soil vapor extraction (SVE). The ability to separate the vapor and liquid flows within the extraction well improve the LNAPL recovery rates and enabled the AcuVac team to record data specific to each media.

RECOVERY SUMMARY FOR SVE EVENT #12

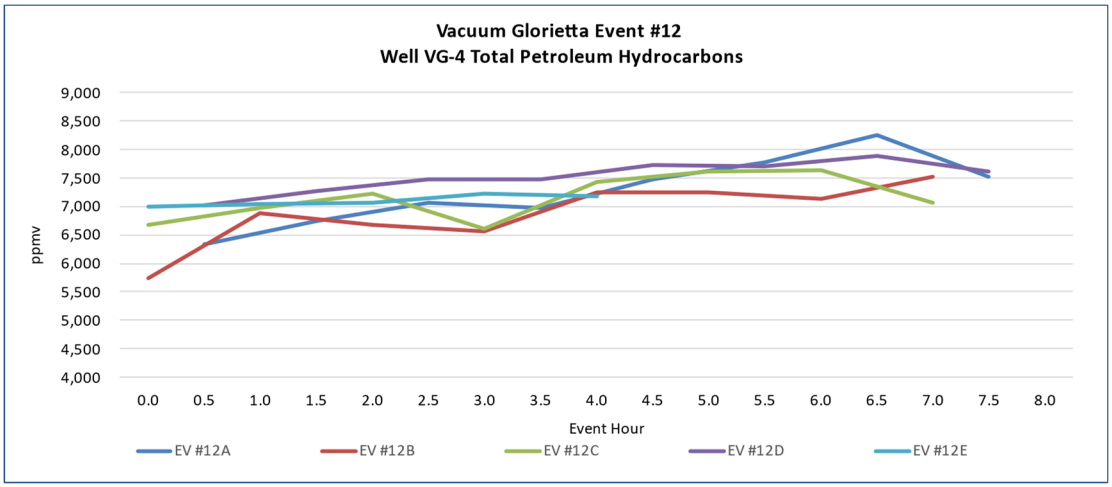
The Recovery Summary Table below lists the groundwater, liquid LNAPL, and PSH vapor recovery data for Event #12, on the dates shown.

Recovery Summary Well VG-4							
Event Number		**Event #12A**	**Event #12B**	**Event #12C**	**Event #12D**	**Event #12E**	**Event #12**
Event Date		**03/27/2023**	**03/28/2023**	**03/29/2023**	**03/30/2023**	**03/31/2023**	**Total**
Event Hours		**24.0**	**24.0**	**24.0**	**24.0**	**4.0**	**100.0**
Data Element							
Groundwater Recovery	gals	0	0	0	0	0	0
LNAPL Recovery							
Liquid	gals	0	0	0	0	0	0
Vapor	gals	5.11	5.30	5.26	5.65	0.86	22.17
Total	gals	5.11	5.30	5.26	5.65	0.86	22.17
Gallons/Hour	gph	**0.21**	**0.22**	**0.22**	**0.24**	**0.21**	**0.22**

- Total vapor hydrocarbons burned as IC engine fuel in the Recovery Summary Table above are based on the HORIBA® data recorded in the Influent Vapor Data Table shown below.

Influent Vapor Data Well VG-4						
Event Number		**Event #12A**	**Event #12B**	**Event #12C**	**Event #12D**	**Event #12E**
Event Date		**03/27/2023**	**03/28/2023**	**03/29/2023**	**03/30/2023**	**03/31/2023**
Event Hours		**24.0**	**24.0**	**24.0**	**24.0**	**4.0**
Data Element						
TPH- Maximum	ppmv	8,250	7,520	7,630	7,880	7,230
TPH- Average	ppmv	7,269	6,878	7,153	7,521	7,104
TPH- Minimum	ppmv	6,340	5,740	6,600	7,010	7,000
TPH- Initial	ppmv	6,340	5,740	6,670	7,010	7,040
TPH- Ending	ppmv	7,520	7,520	7,070	7,620	7,230
PID - Average	ppm	1,096	1,133	1,429	1,312	1,365
CO_2.- Average	%	12.83	12.58	12.38	12.99	12.66
O_2.- Average	%	2.7	2.9	2.2	1.8	1.9

- The TPH vapor concentrations from the influent vapor samples for Event #11 are presented in the following graph.



- The extraction well induced vacuum and well vapor flow for Event #12 are presented in the following table.

Well Vacuum and Well Vapor Flow Well VG-4						
Event Number		**Event #12A**	**Event #12B**	**Event #12C**	**Event #12D**	**Event #12E**
Event Date		**03/27/2023**	**03/28/2023**	**03/29/2023**	**03/30/2023**	**03/31/2023**
Event Hours		**24.0**	**24.0**	**24.0**	**24.0**	**4.0**
Data Element						
Well Vacuum- Maximum	InH_2O	46.00	47.00	47.00	48.00	48.00
Well Vacuum- Average	InH_2O	45.12	47.00	46.82	47.41	47.78
Well Vacuum- Minimum	InH_2O	45.00	47.00	45.00	47.00	47.00
Well Vapor Flow- Maximum	scfm	15.19	14.98	14.95	15.63	14.00
Well Vapor Flow- Average	scfm	14.24	14.75	14.21	14.63	13.99
Well Vapor Flow- Minimum	scfm	13.94	13.99	13.87	13.99	13.97

- The LNAPL thickness recorded at the start and conclusion of Event #12 is contained in the following table.

LNAPL Thickness Data Well VG-4			
Event Number		**Event #12A**	**Event #12E**
Event Date		**03/27/2023**	**03/31/2023**
Event Hours		**24.0**	**4.0**
Event Start			
Depth to LNAPL	Ft BTOC	68.74	NM
Depth to Groundwater	Ft BTOC	69.09	-
LNAPL Thickness	ft	0.35	-
Hydro Equivalent	Ft BTOC	68.83	NM
Event Conclusion			
Depth to LNAPL	Ft BTOC	NM	67.95
Depth to Groundwater	Ft BTOC	-	69.08
LNAPL Thickness	ft	-	0.14
Hydro Equivalent	Ft BTOC	NM	67.99

NM- Not Measured

ADDITIONAL INFORMATION

- All LNAPL volume recovered, 22.17 gals, was burned as IC engine fuel. The LNAPL weighted recovery rate for Event #12 was 0.22 gals/hour.

METHOD OF CALIBRATION AND CALCULATIONS

The HORIBA® Analytical instrument is calibrated with Hexane and CO_2 in accordance with the manufacturer's specifications.

The formula used to calculate the emission rate is:

$$ER = HC\ (ppmv) \times MW\ (Hexane) \times Flow\ Rate\ (scfm) \times 1.58E^{-7} \frac{(min)(lb\ mole)}{(hr)(ppmv)(ft^3)} = lbs/hr$$

INFORMATION INCLUDED WITH REPORT

- Table #1 Summary Well Data
- Table #2 Summary Recovery Data
- Recorded Data

After you have reviewed the report and if you have any questions, please contact me. We appreciate you selecting AcuVac to provide these services.

Sincerely,
ACUVAC REMEDIATION, LLC

Paul D. Faucher
President

Summary Well Data
Table #1

Event		12A	12B	12C	12D	12E
WELL NO.		**VG-4**	**VG-4**	**VG-4**	**VG-4**	**VG-4**
Current Event Hours		24.0	24.0	24.0	24.0	4.0
Total Event Hours		463.0	487.0	511.0	535.0	539.0
TD (estimated)	ft BGS	73.8	73.8	73.8	73.8	73.8
Well Screen	ft BGS	unknown	unknown	unknown	unknown	unknown
Well Size	in	4.0	4.0	4.0	4..0	4.0
Well Data						
Depth to LNAPL - Static - Start Event	ft BTOC	68.74	NM	NM	NM	NM
Depth to Groundwater - Static - Start Event	ft BTOC	69.09	NM	NM	NM	NM
LNAPL Thickness	ft	0.35	-		-	-
Hydro-Equivalent- Beginning	ft BTOC	68.83	-		-	-
Depth to LNAPL - End Event	ft BTOC	NM	NM	NM	NM	67.95
Depth to Groundwater - End Event	ft BTOC	NM	NM	NM	NM	69.08
LNAPL Thickness	ft	-	-		-	0.14
Hydro-Equivalent- Ending	ft BTOC	-	-		-	67.99
Extraction Data						
Maximum Extraction Well Vacuum	InH_2O	46.00	47.00	47.00	48.00	48.00
Average Extraction Well Vacuum	InH_2O	45.12	47.00	46.82	47.41	47.78
Minimum Extraction Well Vacuum	InH_2O	45.00	47.00	45.00	47.00	47.00
Maximum Extraction Well Vapor Flow	scfm	15.19	14.98	14.95	15.63	14.00
Average Extraction Well Vapor Flow	scfm	14.24	14.75	14.21	14.63	13.99
Minimum Extraction Well Vapor Flow	scfm	13.94	13.99	13.87	13.99	13.97
Influent Data						
Maximum TPH	ppmv	8,250	7,520	7,630	7,880	7,230
Average TPH	ppmv	7,269	6,878	7,153	7,521	7,104
Maximum TPH	ppmv	6,340	5,740	6,600	7,010	7,000
Initial TPH	ppmv	6,340	5,740	6,670	7,010	7,040
Final TPH	ppmv	7,520	7,520	7,070	7,620	7,230
Average PID	ppm	1,096	1,133	1,429	1,312	1,365
Average CO_2	%	12.83	12.58	12.38	12.99	12.66
Average O_2	%	2.7	2.9	2.2	1.8	1.9

Summary Recovery Data
Table #2

Event		12A	12B	12C	12D	12E
WELL NO.		VG-4	VG-4	VG-4	VG-4	VG-4
Recovery Data- Current Event						
Total Liquid Volume Recovered	gals	-	-	-	-	-
Total Liquid LNAPL Recovered	gals	-	-	-	-	-
Total Liquid LNAPL Recovered / Total Liquid	%	-	-	-	-	-
Total Liquid LNAPL Recovered / Total LNAPL	%	-	-	-	-	-
Total Vapor LNAPL Recovered	gals	5.11	5.30	5.26	5.65	0.86
Total Vapor LNAPL Recovered / Total LNAPL	%	100.00	100.00	100.00	100.00	100.00
Total Vapor and Liquid LNAPL Recovered	gals	5.11	5.30	5.26	5.65	0.86
Average LNAPL Recovery	gals/hr	0.21	0.22	0.22	0.24	0.21
Total LNAPL Recovered	lbs	36	37	37	40	6
Total Volume of Well Vapors	cu. ft	6,835	7,080	6,821	7,022	3,358
Recovery Data- Cumulative						
Total Liquid Volume Recovered	gals	27,394	27,394	27,394	27,394	27,394
Total Liquid LNAPL Recovered	gals	7.99	7.99	7.99	7.99	7.99
Total Vapor LNAPL Recovered	gals	62.90	68.20	73.46	79.11	79.96
Total Vapor and Liquid LNAPL Recovered	gals	70.88	76.19	81.44	87.09	87.95
Average LNAPL Recovery	gals/hr	0.13	0.13	0.13	0.14	0.14
Total LNAPL Recovered	lbs	1,996	2,034	2,070	2,110	2,116
Total Volume of Well Vapors	cu. ft	586,191	593,271	600,092	607,114	610,475

AcuVac Remediation

December 27, 2023

Mr. Chuck Terhune, P.G.
Program Manager
Tetra Tech
2500 City West Blvd, Suite 1000
Houston, TX 77042

Dear Chuck:

Re: Vacuum Glorietta Site, Lea County, NM, (Site)

At your request, AcuVac Remediation, LLC (AcuVac) performed) performed a single continuous one hundred (100.0) hour Soil Vapor Extraction (SVE) Event; recorded as #13A, #13B, #13C, #13D and #13E at the above referenced Site as outlined in the table below. The following is the report and a copy of the operating data collected during Event #13. Additionally, the attached Table #1 contains the Summary Well Data, and Table #2 contains the Summary Recovery Data.

Event Number	Well Number	Event Type	Event Duration (hrs)	Date
#13A	VG-4	SVE	24.0	12/11/2023
#13B	VG-4	SVE	24.0	12/12/2023
#13C	VG-4	SVE	24.0	12/13/2023
#13D	VG-4	SVE	24.0	12/14/2023
#13E	VG-4	SVE	4.0	12/15/2023

The event hours for each day are based on the start time of the event 0800 hrs. and ending at 0800 hrs. on the following day.

The purpose of the events was to enhance recovery of phase separated hydrocarbons (PSH) present at the Site through the removal of petroleum hydrocarbons in both liquid and vapor phases. PSH refers to both petroleum hydrocarbons and Non-Aqueous Phase Liquids (NAPL). The source of the PSH is a historical pipeline release.

OBJECTIVES

The objectives of the SVE Events:

- Maximize liquid and vapor phase petroleum hydrocarbon removal from groundwater and soils in the subsurface formations within the influence of the extraction well.
- Expose the capillary fringe area and below to the extraction well induced vacuums.
- Increase the liquid and vapor phase petroleum hydrocarbon specific yields with high induced vacuums.

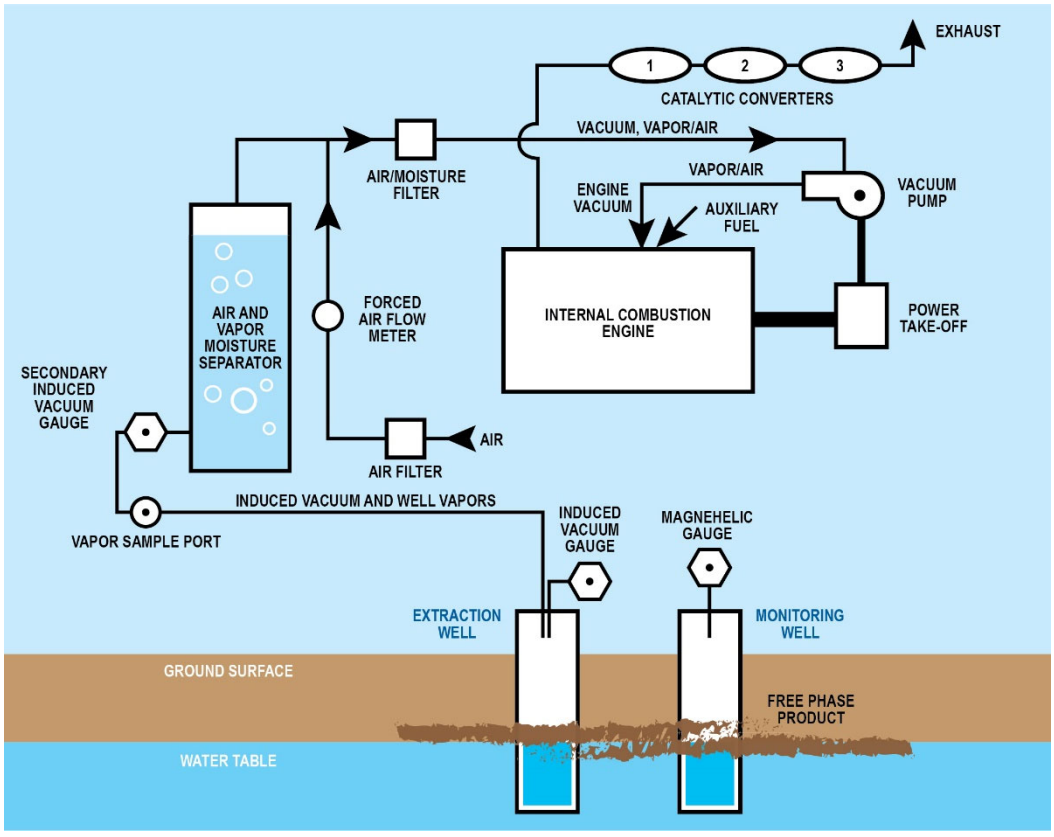
METHODS AND EQUIPMENT

AcuVac owns and maintains an inventory of equipment to perform SVE events and uses no third-party equipment. The events at the Site were conducted using the AcuVac I-6 System (System) with a Roots RAI-33 blower, used as a vacuum pump, and a Roots RAI-22 positive displacement blower. The table below lists additional equipment and instrumentation employed, and the data element captured by each.

Equipment and Instrumentation Employed by AcuVac

Measurement Equipment	Data Element
Extraction Well Induced Vacuum and Flow	
Dwyer Magnehelic Gauges	Extraction Well Vacuum
Dwyer Averaging Pitot Tubes / Magnehelic Gauges	Extraction Well Vapor Flow
Observation Wells	
Dwyer Digital Manometer	Vacuum / Pressure Influence
Extraction Well Vapor Monitoring	
AcuVac V-1 Vacuum Box	Extraction Well Non-Diluted Vapor Sample Collection
HORIBA® Analyzer	Extraction Well Vapor TPH Concentration
RKI 1200 O_2 Monitor	Extraction Well Vapor Oxygen Content
NAPL Thickness (if present)	
Solinst Interface Probes Model 122	Depth to LNAPL and Depth to Groundwater
Atmospheric Conditions	
Testo Model 511	Relative and Absolute Barometric Pressure

THE ACUVAC SYSTEM



The vacuum extraction portion of the System consists of a vacuum pump driven by an internal combustion engine (IC engine). The vacuum pump connects to the extraction well, and the vacuum created on the extraction well causes light hydrocarbons in the soil and in the groundwater to volatilize and flow through a moisture knockout tank to the vacuum pump and the IC engine where they burn as part of the normal combustion process. Auxiliary propane powers the engine if the well vapors do not provide the required energy. The IC engine provides the power necessary to achieve and maintain high induced vacuums and/or high well vapor flows needed to maximize the vacuum radius of influence.

Emissions from the engine pass through three catalytic converters to maximize destruction of effluent hydrocarbon vapors. The engine's fuel-to-air ratio is adjusted to maintain efficient combustion. Since the System operates entirely under vacuum, any leaks in the seals or connections leak into the System and not the atmosphere. Vacuum loss, low oil pressure, over-speed, or overheating automatically shut down the engine. Because the engine powers all equipment, the System stops when the engine stops preventing an uncontrolled release of hydrocarbons.

The design of the AcuVac System enables independent control of both the induced well vacuum and the groundwater pumping functions such that the AcuVac team controls the induced hydraulic gradient to increase exposure of the formation to soil vapor extraction (SVE). The ability to separate the vapor and liquid flows within the extraction well improve the LNAPL recovery rates and enabled the AcuVac team to record data specific to each media.

RECOVERY SUMMARY FOR SVE EVENT #13

The Recovery Summary Table below lists the groundwater, liquid LNAPL, and PSH vapor recovery data for Event #13 on the dates shown.

Recovery Summary
Well VG-4

Event Number		Event #13A	Event #13B	Event #13C	Event #13D	Event #13E	Event #13
Event Date		**12/11/2023**	**12/12/2023**	**12/13/2023**	**12/14/2023**	**12/15/2023**	**Total**
Event Hours		**24.0**	**24.0**	**24.0**	**24.0**	**4.0**	**100.0**
Data Element							
Groundwater Recovery	gals	0	0	0	0	0	0
LNAPL Recovery							
Liquid	gals	0	0	0	0	0	0
Vapor	gals	3.37	4.56	6.13	5.72	0.69	20.47
Total	gals	3.37	4.56	6.13	5.72	0.69	20.47
Gallons/Hour	gph	**0.14**	**0.19**	**0.26**	**0.24**	**0.17**	**0.20**

- Total vapor hydrocarbons burned as IC engine fuel in the Recovery Summary Table above are based on the HORIBA® data recorded in the Influent Vapor Data Table shown below.

Influent Vapor Data Well VG-4						
Event Number		**Event #13A**	**Event #13B**	**Event #13C**	**Event #13D**	**Event #13E**
Event Date		**12/11/2023**	**12/12/2023**	**12/13/2023**	**12/14/2023**	**12/15/2023**
Event Hours		**24.0**	**24.0**	**24.0**	**24.0**	**4.0**
Data Element						
TPH- Maximum	ppmv	6,460	5,360	6,430	6,020	5,840
TPH- Average	ppmv	5,911	4,998	6,151	5,713	5,703
TPH- Minimum	ppmv	5,610	3,850	5,610	4,580	5,530
TPH- Initial	ppmv	5,660	3,850	5,840	4,580	5,830
TPH- Ending	ppmv	5,610	5,310	6,270	5,810	5,840
PID - Average	ppm	1,027	1,093	1,221	1,268	1,427
CO_2.- Average	%	9.39	8.12	10.01	9.66	9.36
O_2.- Average	%	6.4	7.3	4.0	4.2	4.4

- The extraction well induced vacuum and well vapor flow for Event #13 are presented in the following table.

Well Vacuum and Well Vapor Flow Well VG-4						
Event Number		**Event #13A**	**Event #13B**	**Event #13C**	**Event #13D**	**Event #13E**
Event Date		**12/11/2023**	**12/12/2023**	**12/13/2023**	**12/14/2023**	**12/15/2023**
Event Hours		**24.0**	**24.0**	**24.0**	**24.0**	**4.0**
Data Element						
Well Vacuum- Maximum	InH_2O	92.00	84.00	60.00	70.00	84.00
Well Vacuum- Average	InH_2O	83.00	76.59	60.00	64.65	76.59
Well Vacuum- Minimum	InH_2O	70.00	73.00	60.00	60.00	73.00
Well Vapor Flow- Maximum	scfm	12.26	14.19	21.40	21.37	14.19
Well Vapor Flow- Average	scfm	12.12	13.96	21.40	20.42	13.96
Well Vapor Flow- Minimum	scfm	11.78	13.36	21.40	13.68	13.36

- The LNAPL thickness recorded at the start and conclusion of Event #13 is contained in the following table.

LNAPL Thickness Data Well VG-4			
Event Number		**Event #13A**	**Event #13E**
Event Date		**12/11/2023**	**12/15/2023**
Event Hours		**24.0**	**4.0**
Event Start			
Depth to LNAPL	Ft BTOC	-	NM
Depth to Groundwater	Ft BTOC	69.16	-
LNAPL Thickness	ft	-	-
Hydro Equivalent	Ft BTOC	69.16	NM
Event Conclusion			
Depth to LNAPL	Ft BTOC	NM	NM
Depth to Groundwater	Ft BTOC	-	-
LNAPL Thickness	ft	-	-
Hydro Equivalent	Ft BTOC	NM	NM

NM- Not Measured

METHOD OF CALIBRATION AND CALCULATIONS

The HORIBA® Analytical instrument is calibrated with Hexane and CO_2 in accordance with the manufacturer's specifications.

The formula used to calculate the emission rate is:

$$ER = HC\ (ppmv) \times MW\ (Hexane) \times Flow\ Rate\ (scfm) \times 1.58E^{-7} \frac{(min)(lb\ mole)}{(hr)(ppmv)(ft^3)} = lbs/hr$$

INFORMATION INCLUDED WITH REPORT

- Table #1 Summary Well Data
- Table #2 Summary Recovery Data

After you have reviewed the report and if you have any questions, please contact me. We appreciate you selecting AcuVac to provide these services.

Sincerely,
ACUVAC REMEDIATION, LLC

Paul D. Faucher
President

Table #1
Summary Well Data

Event		13A	13B	13C	13D	13E
WELL NO.		**VG-4**	**VG-4**	**VG-4**	**VG-4**	**VG-4**
Current Event Hours		24.0	24.0	24.0	24.0	4.0
Total Event Hours		663.0	687.0	711.0	735.0	739.0
TD (estimated)	ft BGS	73.8	73.8	73.8	73.8	73.8
Well Screen	ft BGS	unknown	unknown	unknown	unknown	unknown
Well Size	in	4.0	4.0	4.0	4..0	4.0
Well Data						
Depth to LNAPL - Static - Start Event	ft BTOC	-	NM	NM	NM	NM
Depth to Groundwater - Static - Start Event	ft BTOC	69.16	NM	NM	NM	NM
LNAPL Thickness	ft	-	-		-	-
Hydro-Equivalent- Beginning	ft BTOC	69.16	-		-	-
Depth to LNAPL - End Event	ft BTOC	NM	NM	NM	NM	NM
Depth to Groundwater - End Event	ft BTOC	NM	NM	NM	NM	NM
LNAPL Thickness	ft	-	-		-	-
Hydro-Equivalent- Ending	ft BTOC	-	-		-	-
Extraction Data						
Maximum Extraction Well Vacuum	InH_2O	92.00	84.00	60.00	70.00	84.00
Average Extraction Well Vacuum	InH_2O	83.00	76.59	60.00	64.65	76.59
Minimum Extraction Well Vacuum	InH_2O	70.00	73.00	60.00	60.00	73.00
Maximum Extraction Well Vapor Flow	scfm	12.26	14.19	21.40	21.37	14.19
Average Extraction Well Vapor Flow	scfm	12.12	13.96	21.40	20.42	13.96
Minimum Extraction Well Vapor Flow	scfm	11.78	13.36	21.40	13.68	13.36
Influent Data						
Maximum TPH	ppmv	6,460	5,360	6,430	6,020	5,840
Average TPH	ppmv	5,911	4,998	6,151	5,713	5,703
Maximum TPH	ppmv	5,610	3,850	5,610	4,580	5,530
Initial TPH	ppmv	5,660	3,850	5,840	4,580	5,830
Final TPH	ppmv	5,610	5,310	6,270	5,810	5,840
Average PID	ppm	1,027	1,093	1,221	1,268	1,427
Average CO_2	%	9.39	8.12	10.01	9.66	9.36
Average O_2	%	6.4	7.3	4.0	4.2	4.4

Table #2
Summary Recovery Data

Event		13A	13B	13C	13D	13E
WELL NO.		VG-4	VG-4	VG-4	VG-4	VG-4
Recovery Data- Current Event						
Total Liquid Volume Recovered	gals	-	-	-	-	-
Total Liquid LNAPL Recovered	gals	-	-	-	-	-
Total Liquid LNAPL Recovered / Total Liquid	%	-	-	-	-	-
Total Liquid LNAPL Recovered / Total LNAPL	%	-	-	-	-	-
Total Vapor LNAPL Recovered	gals	3.37	4.56	6.13	5.72	0.69
Total Vapor LNAPL Recovered / Total LNAPL	%	100.00	100.00	100.00	100.00	100.00
Total Vapor and Liquid LNAPL Recovered	gals	3.37	4.56	6.13	5.72	0.69
Average LNAPL Recovery	gals/hr	0.14	0.19	0.26	0.24	0.17
Total LNAPL Recovered	lbs	24	32	43	40	5
Total Volume of Well Vapors	cu. ft	5,818	6,701	10,272	9,802	3,350
Recovery Data- Cumulative						
Total Liquid Volume Recovered	gals	27,394	27,394	27,394	27,394	27,394
Total Liquid LNAPL Recovered	gals	7.99	7.99	7.99	7.99	7.99
Total Vapor LNAPL Recovered	gals	83.34	87.89	94.03	99.74	100.43
Total Vapor and Liquid LNAPL Recovered	gals	91.32	95.88	102.01	107.73	108.42
Average LNAPL Recovery	gals/hr	0.14	0.14	0.14	0.15	0.15
Total LNAPL Recovered	lbs	2,140	2,171	2,214	2,254	2,259
Total Volume of Well Vapors	cu. ft	616,289	622,990	633,262	643,064	646,414

APPENDIX F: MONITOR WELL CONSTUCTION AND LOCATIONS

Apppendix
2023 Montior Well Construction and Locations
Vaccum Glorieta
Lea County, New Mexico

Well ID	Date Installed	Latitude	Longitude	Screened Interval (ft bgs)	Total Depth (ft bgs)
VG-2	2/4/2004	32.798202	-103.444707	55 - 70	70
VG-3	2/5/2004	32.799435	-103.445218	55 - 70	70
VG-4	Unknown	32.798968	-103.446186	55 - 70	70
VG-5	12/10/2013	32.798493	-103.446157	60 - 75	75
VG-6	12/5/2013	32.799362	-103.446288	65 - 80	80
VG-7	12/4/2023	32.798988	-103.446540	65 - 80	80

Notes:

BTOC: Below Top of Casing

AMSL: Above Mean Sea Level

APPENDIX G: COOL-OX SAFETY DATA SHEET

Cool-Ox®

Safety Data Sheet

1. Chemical Product and Supplier Identification

Product Name: *Cool-Ox®*
Chemical Name: Oxidizer
Chemical Family: Peroxygens
Trade Names: *Cool-Ox®*

Formulator: DeepEarth Technologies, Inc.
8201 W. 183rd St., Suite C
Tinley Park, IL 60487

Toll free: **1-877-Cool-Ox-1**
Emergency: **1-312-909-3667**
1-800-695-4398

SDS Number: PB-01
Issue Date: January 2020
Patented Product: Formulation and use of this product is protected under:

USPTO Patent # 6,843,618	USPTO Patent # 8,231,305
USPTO Patent # 9,475,106	USPTO Patent # 9,616,473
USPTO Patent # 10,040,105	USPTO Patent # 10,369,604
CAN Patent # 2684856	CAN Patent # 2776666
AUS Patent # 20122253381	AUS Patent # 20155271845
EP Patent # 2707154	EP Patent # 3192591

2. Composition/Information on Ingredients

Components: (as blended)	Compound	CAS Number
	Calcium Peroxide	1305-79-9
	EDTA	60-00-4
	DTPA	67-43-6
	EDDHA	1170-02-1

3. Hazards Identification

Emergency Overview: Oxidizer - Contact with combustibles may under extreme circumstances, cause fire. In fire, material decomposes, releasing oxygen that may intensify the fire.

Potential Health Effects: Irritating to the mucous membrane and eyes. If product contacts eyes and face, treat eyes first. Submerge contaminated clothing in water prior to drying. Do not dry near open flame or heat source.

Inhalation: At high concentrations, slight nose and throat irritation with cough. In case of repeated or prolonged exposure, there is a risk of sore throat and nose bleeds.

Eye contact: Severe eye irritation with watering and redness. Risk of serious or permanent eye lesions.

Skin contact: In case of prolonged contact; irritation.

Ingestion: Irritation of the mouth and throat with nausea and vomiting.

4. First-Aid Measures

Inhalation: Remove the subject from dusty environment. Consult with a physician in case of respiratory symptoms.

Eye contact:	Flush eyes with running water for 15 minutes, while keeping the eyelids wide open. Consult with ophthalmologist in all cases.
Skin contact:	Wash the affected skin with running water. Remove and clean clothing. Consult with a physician in case of persistent pain or redness.
Ingestion:	If the victim is conscious, rinse mouth and administer fresh water. **DO NOT induce vomiting.** Consult a physician in all cases.

5. Fire-Fighting Measures

Flash point:	Not applicable
Flammability:	Not applicable
Auto-flammability:	Not applicable
Danger of explosion:	Non-explosive
Common extinguishing methods:	Large quantities of water, water spray. In case of fire in close proximity, all means of extinguishing are acceptable.
Inappropriate extinguishing methods:	No restriction.
Special precautions:	Evacuate all non-essential personnel. Intervention only by capable personnel who are trained and aware of the hazards of the product. If safe to do so, remove unaffected product to a safe area.
Specific hazards:	Oxidizing substance. Oxygen released on exothermic decomposition may support combustion in case of surrounding fire. Pressure burst may occur due to decomposition in confined spaces/containers. Contact with flammables may cause fire or explosion.
Firefighting instructions:	Personnel should wear full bunker gear and positive-pressure, self-contained breathing apparatus. Apply cooling water to sides of transport or storage vessels that are exposed to flames until fire is out. Do not approach hot vessels containing product.

6. Accidental Release Measures

Precautions:	Observe the protection measures given in Sections 5 and 8. Avoid materials and products which are incompatible with the product (see Section 10). Avoid direct contact of the product with water. Immediately notify the appropriate authorities in case of reportable discharge.
Cleanup methods:	Collect the product with a means suitable to avoid dust formation. All the receiving equipment should be clean, vented, dry, labeled and made of material that is compatible with the product. Because of the contamination risk, the collected material should be isolated in a safe place. Clean the area with large quantities of water. For disposal methods, refer to Section 13.

7. Handling and Storage

Handling: Clean and dry process piping and equipment before any operation. Never return unused product to storage container. Keep away from incompatible products.
Containers and equipment used to handle this product should be used exclusively for this material. Avoid any contact with water or humidity.

Storage: Store in a dry area, protected from heat sources and direct sunlight.

Other precautions: Warn personnel about the dangers of the product.

8. Exposure Controls/Personal Protection

Engineering controls: Provide ventilation in work areas to keep dust below the following applicable limits:

ACGIH™ TLV™ (1996)	OSHA PEL	NIOSH REL (1994)
5 mg/m^3 TWA	Total dust - 15 mg/m^3 TWA Respirable fraction - 5 mg/m^3 TWA	5 mg/m^3 TWA

ACGIH™ and TLV™ are registered trademarks of the American Conference of Governmental Industrial Hygienists.

Eye/face protection: Dust proof chemical goggles.

Hand protection: Impervious protective gloves made of nitrile, natural rubber, or neoprene.

Skin protection: For brief contact, few precautions other than clean body-covering, clothing should be needed. When prolonged or frequently repeated contact could occur, use protective, full body clothing impervious to this material.

Respiratory protection: For many conditions, no respiratory protection may be needed; however, in dusty or unknown atmospheres use a NIOSH approved dust respirator.

Other precautions: Safety shower and eyewash stations. Consult your industrial hygienist or safety manager for the selection of personal protective equipment suitable for the working conditions.

9. Physical and Chemical Properties

Appearance: White to pale amber powder
Odor: Odorless
pH: 7 - 9 (saturated solution)
Melting Point: 527 °F (275 °C) - Decomposes
Vapor Pressure: Not applicable
Vapor Density: Not applicable
Boiling point: Not applicable
Bulk Density: 0.5 - 0.65 g/mL (Loose Method)
Solubility in Water: Moderate

10. Stability and Reactivity

Chemical Stability: Stable under certain conditions (see below).

Conditions to avoid:	Heat and moisture
Materials to avoid:	Water, Acids, Bases, Salts of heavy metals, Reducing agents, Organic materials, Flammable substances
Hazardous decomposition products:	Oxygen, hydrogen peroxide, steam and heat.
Hazardous polymerization:	Does not occur.

11. Toxicological Information

Acute toxicity:	Oral route, LD_{50}, rat, 7340 mg/kg
Chronic toxicity:	No data
Irritation:	Rabbit (eyes), severe irritant
Sensitization:	No data
Target Organ Effects:	Eyes and respiratory passages.

12. Ecological Information

Acute ecotoxicity:	Fish, Cyprinus carpio, 48 hours, LC_{50}, 25.6 mg/L
Chronic ecotoxicity:	No data
Mobility:	Low solubility and mobility.
Abiotic degradation:	Air - Not applicable Water - Slow hydrolysis Water/Soil - Complexation/precipitation Carbonates/phosphates present at environmental concentrations. Degradation products: carbonates/phosphates sparingly soluble.
Biotic degradation:	Not applicable
Potential for bioaccumulation:	Not applicable
Comments:	Observed effects are related to alkaline properties of the product. Hazard to the environment is limited due to the product properties a) No bioaccumulation. b) Weak solubility and precipitation as carbonate or phosphate in aquatic environment. c) rapid neutralization at environmental pH.

13. Disposal Considerations

Waste Disposal Method:	Consult current federal, state and local regulations regarding the proper disposal of this material and its emptied containers.

14. Transport Information

D.O.T. Proper Shipping Name:	Oxidizing substances, solid, n.o.s.		
UN Number:	UN 1479		
Hazard Class:	5.1		
Label(s):	5.1 (Oxidizer)		
Packing Group:	III		
STCC Number:	4918717	**Emergency Response Guide #:**	140

Cool-Ox®

15. Regulatory Information

TSCA Inventory List: Not Listed

CERCLA Hazardous Substance (40 CFR Part 302)

Listed substance: No
Unlisted substance: Yes
Reportable Quantity (RQ): Not Listed
Characteristic(s): Ignitability
RCRA Waste Number: D001

Sara, Title III, Sections 302/303 (40 CFR Part 355- Emergency Planning and Notification)

Hazard category: Eye and skin irritant
Threshold planning quantity: Not Listed

Sara, Title III, Sections 311/312 (40 CFR Part 370- Hazardous Chemical Reporting: Community Right-To-Know)

Extremely hazardous substance: No
WHMIS Classification: C Oxidizing Material
Material Causing Other Toxic Effects - Eye and skin irritant

Canadian Domestic Substances List: Listed, DSL/NDSL Record number - 3929

This product has been classified in accordance with the hazard criteria of the CPR and the SDS contains all of the information required by the CPR.

16. Other Information

HMIS™ Rating:

Health - 2 Flammability - 0 Reactivity - 1 PPE - Required

HMIS™ is a registered trademark of the National Paint and Coating Association.

NFPA™ Rating:

Health - 2 Flammability - 0 Reactivity - 1 OX

NFPA™ is a registered trademark of the National Fire Protection Association.

Disclaimer

The information contained in this document is believed to be true and correct. However, the formulator makes no warranty, either expressed or implied, as to its authenticity, accuracy or to the use of this product and this document is subject to change or revision without prior notice.

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District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

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

CONDITIONS

Action 316693

CONDITIONS

Operator:	OGRID:
Maverick Permian LLC 1000 Main Street, Suite 2900 Houston, TX 77002	331199
	Action Number: 316693
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
michael.buchanan	Review of the 2023 Annual Report for Vacuum Glorietta East Unit, 1RP-744: content satisfactory 1. Continue gauging and groundwater monitoring events on a semi-annual schedule as planned. 2. Introduce a gravity fed Cool-Ox injection (ISCO) into BG-4 in order to expedite degradation of PSH. 3. Maverick may discontinue SVE remediation in replacement for the ISCO Cool-Ox injections. 4. Submit the 2024 Annual Report to OCD via the online portal by April 1, 2025.	7/16/2024