

April 27, 2022  
ECT No.: 13-0685-2000

(sent via email to [kidderk1@michigan.gov](mailto:kidderk1@michigan.gov))

Mr. Keith Kidder, Senior Geologist  
Michigan Department of Environment, Great Lakes, and Energy – Oil, Gas, and Minerals Division  
Lansing Central Office  
525 West Allegan Street  
Lansing, Michigan 48909

Re: **Quarterly Project Update Report – 1<sup>st</sup> Quarter 2022**  
Hartland 36 Gas Plant  
Portion of E½ of NW ¼ of Section 36, T03N-R06E  
Hartland Township, Livingston County, Michigan

Dear Mr. Kidder:

Attached please find an electronic copy of the Quarterly Project Update Report – 1<sup>st</sup> Quarter 2022 completed by Environmental Consulting & Technology, Inc. (ECT) for the Hartland 36 Gas Plant site.

ECT sincerely appreciates the opportunity to provide our consulting services on this important project. Should you have questions or require additional information, please do not hesitate to contact me at (231) 676-3023 or [jlewandowski@ectinc.com](mailto:jlewandowski@ectinc.com).

Sincerely,  
**ENVIRONMENTAL CONSULTING & TECHNOLOGY, INC.**



Jeremy S. Lewandowski  
Senior Engineer

cc: Mr. Nick Summerland – Lambda Energy Resources, LLC

Attachments: Quarterly Project Update Report – 1<sup>st</sup> Quarter 2022

# **QUARTERLY PROJECT UPDATE REPORT 1<sup>st</sup> QUARTER 2022**

**HARLTAND 36 GAS PLANT  
PORTION OF E<sup>1</sup>/<sub>2</sub> of NW <sup>1</sup>/<sub>4</sub> of SECTION 36, T03N-R06E,  
HARTLAND TWP, LIVINGSTON COUNTY, MICHIGAN**

**LAMBDA ENERGY RESOURCES, LLC  
1510 THOMAS ROAD  
KALKASKA, MICHIGAN 49646**

**April 27, 2022**

ECT No. 13-0685-2000

## DOCUMENT REVIEW

The dual signatory process is an integral part of Environmental Consulting & Technology, Inc.'s (ECT's) Document Review Policy No. 9.03. All ECT documents undergo technical/peer review prior to dispatching these documents to any outside entity.

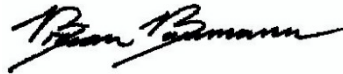
This document has been authored and reviewed by the following employees:

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Jeremy S. Lewandowski  
Author

\_\_\_\_\_  
  
Signature

\_\_\_\_\_  
April 27, 2022  
Date

\_\_\_\_\_  
Brian J. Baumann, PE  
Peer Review

\_\_\_\_\_  
  
Signature

\_\_\_\_\_  
April 27, 2022  
Date

## TABLE OF CONTENTS

<u>Section</u>		<u>Page</u>
1.0	INTRODUCTION .....	1
2.0	PROJECT LOCATION .....	1
3.0	PROJECT SUBMITTALS.....	1
4.0	PROJECT OVERVIEW .....	2
5.0	REMEDIATION SYSTEM OPERATION AND MAINTENANCE .....	3
6.0	PERFORMANCE MONITORING SUMMARY .....	3
6.1	PERFORMANCE MONITORING EVENTS.....	3
6.2	LABORATORY ANALYSIS .....	4
6.3	CLEANUP GOALS .....	4
6.4	GROUNDWATER ANALYTICAL SUMMARY & CLEANUP CRITERIA COMPARISON .....	5
7.0	CONCLUSIONS AND RECOMMENDATIONS.....	6
8.0	SCHEDULE.....	6

## LIST OF APPENDICES

### Appendix

- A FIGURES
- B TABLES
- C LABORATORY ANALYTICAL REPORTS
- D LOW-FLOW SAMPLING FIELD FORMS

## **1.0 INTRODUCTION**

This Quarterly Project Update Report was compiled by Environmental Consulting & Technology, Inc. (ECT), on behalf of Lambda Energy Resources, LLC (LER) and details remediation system operations and performance monitoring completed during the 1<sup>st</sup> Quarter 2022 at the Hartland 36 Gas Plant location, herein referenced as the “Site”.

## **2.0 PROJECT LOCATION**

The Site is a former natural gas processing plant which operated from 1999 to 2015. The property is located in a portion of the East ½ of the Northwest ¼ of Section 36, T03N-R06E, on the south side of Lone Tree Road between North Pleasant Valley Road and South Tipsico Lake Road in Hartland Township, Livingston County, Michigan. A Site Location Map and Site and Surrounding Properties Map are included as Figure 1 and Figure 2, respectively, in Appendix A.

## **3.0 PROJECT SUBMITTALS**

The following presents a chronological summary of previous documents submitted to the Michigan Department of Environment, Great Lakes, and Energy – Oil, Gas, and Minerals Division (EGLE-OGMD) by ECT for the Site:

- Soil Closure Report dated February 15, 2016
- Groundwater Characterization Work Plan dated February 23, 2016
- Groundwater Characterization Work Plan 2 dated July 8, 2016
- Project Update Report dated September 26, 2016
- Groundwater Characterization Work Plan 3 dated October 14, 2016
- Additional Groundwater Characterization Work Plan dated December 29, 2016
- Groundwater Characterization Work Plan 5 dated March 2, 2017
- Biosparging Pilot Study Work Plan dated April 5, 2017
- Groundwater Characterization Report dated July 3, 2017
- Technical Memorandum – Biosparging Pilot Study dated July 28, 2017
- Remediation System Design Plan dated August 11, 2017
- Quarterly Project Update Report – 1<sup>st</sup> Quarter 2018 dated April 24, 2018
- Quarterly Project Update Report – 2<sup>nd</sup> Quarter 2018 dated August 8, 2018
- Quarterly Project Update Report – 3<sup>rd</sup> Quarter 2018 dated October 26, 2018
- Quarterly Project Update Report – 4<sup>th</sup> Quarter 2018 dated April 8, 2019
- Quarterly Project Update Report – 1<sup>st</sup> Quarter 2019 dated April 10, 2019
- Quarterly Project Update Report – 2<sup>nd</sup> Quarter 2019 dated August 19, 2019
- Quarterly Project Update Report – 3<sup>rd</sup> Quarter 2019 dated November 25, 2019
- Quarterly Project Update Report – 4<sup>th</sup> Quarter 2020 dated May 5, 2020
- Quarterly Project Update Report – 1<sup>st</sup> Quarter 2020 dated July 17, 2020
- Quarterly Project Update Report – 2<sup>nd</sup> Quarter 2020 dated September 10, 2020

- Quarterly Project Update Report – 3<sup>rd</sup> Quarter 2020 dated December 17, 2020
- Quarterly Project Update Report – 4<sup>th</sup> Quarter 2020 dated February 2, 2021
- Quarterly Project Update Report – 1<sup>st</sup> Quarter 2021 dated April 1, 2021
- Quarterly Project Update Report – 2<sup>nd</sup> Quarter 2021 dated July 14, 2021
- Quarterly Project Update Report – 3<sup>rd</sup> Quarter 2021 dated October 28, 2021
- Quarterly Project Update Report – 4<sup>th</sup> Quarter 2022 dated March 3, 2022

#### **4.0 PROJECT OVERVIEW**

KCS Michigan Resources developed the Site in 1999 and operated the natural gas processing plant into 2006. Merit Energy Company acquired the Site in 2006 and operated the plant until August 2015, when facility decommissioning commenced. LER acquired the Site from Merit Energy Company in July 2018.

In general, operations at the Site included crude oil and brine separation and storage, natural gas compression, dehydration, sweetening (hydrogen sulfide [H<sub>2</sub>S] removal), carbon dioxide (CO<sub>2</sub>) removal (amine process), and refrigeration for natural gas liquid (NGL) extraction and storage.

Contaminated soil was discovered in September 2015 during facility decommissioning activities at the former sweetening plant/refrigeration building; sulfolane impacts are from the gas treatment chemical Sulfinol®. Remediation activities (excavation and off-Site disposal) completed from September 2015 through December 2016 resulted in disposal of 13,481.4 tons of soil at the Venice Park Landfill in Lennon, Michigan. Verification of soil remediation (VSR) samples collected from the excavations confirmed remediation of impacted soils. Refer to the Soil Closure Report dated February 15, 2016 for a detailed summary of soil remediation and sampling activities.

Groundwater investigation activities commenced on October 29, 2015 and were completed on March 7, 2017. Seven soil borings, 13 temporary monitor wells, including two vertical aquifer profile (VAP) locations, and 37 permanent monitor wells, including 20 shallow screened monitor wells and 17 deep screened monitor wells, have been installed at the Site. The lateral and vertical extents of groundwater impacted with sulfolane have been delineated to non-detectable concentrations (laboratory reporting limit of 10 micrograms per liter, µg/L). The maximum sulfolane concentration reported from a monitor well at the Site was 11,000 micrograms per liter (µg/L) from MW-20D on the June 19-21, 2017 sampling event. Refer to the Groundwater Characterization Report dated July 3, 2017 for a detailed summary of groundwater characterization and assessment activities.

A biosparging pilot study was conducted at the Site from May 1, 2017 through June 16, 2017. The pilot study included three tests to evaluate the effectiveness of biosparging to enhance bioremediation of sulfolane dissolved in groundwater at the Site. Data obtained from the pilot study indicates biosparging is an effective remedial alternative for the Site. Concentrations of sulfolane were reduced by 100% within five feet of the biosparge point and 97% to 99% at a distance of 20 feet from the biosparge point. Dissolved oxygen (DO) influence of 4.2-10 milligrams per liter (mg/L) was observed at

monitoring locations situated 40 feet from the biosparge point. Refer to the Technical Memorandum – Biosparging Pilot Study dated July 28, 2017 for a summary of pilot study activities and results. Information obtained from the pilot study was utilized to compile the Remediation System Design Plan dated August 11, 2017. The Remediation System Design Plan presented the biosparge point (BSP) array, remediation system equipment, anticipated remediation system operation and maintenance (O&M), and performance monitoring activities. Biosparge system installation activities commenced at the Site on August 21, 2017 and concluded with startup of the remediation system on November 16, 2017. Remediation system equipment and components were generally consistent with details and specifications provided in the Remediation System Design Plan and included 41 biosparge points (BSPs). Refer to the Quarterly Project Update Report – 1<sup>st</sup> Quarter 2018 dated April 24, 2018 for a summary of remediation system installation activities, O&M, and results of performance monitoring events completed through the 1<sup>st</sup> Quarter 2018.

Performance monitoring results from the 4<sup>th</sup> Quarter 2021 indicate the remediation system has significantly reduced concentrations of sulfolane in groundwater. Remediation system operations ceased on December 6, 2021, when the system was shut down to allow subsurface conditions to stabilize prior to the 4<sup>th</sup> Quarter 2021 performance monitoring event. Laboratory analytical results from the monitoring event completed on December 28-29, 2021 reported sulfolane non-detect from 13 of the 14 monitor wells that previously reported sulfolane above the cleanup goal (i.e. analytical target detection limit, 10 µg/L). MW-13D reported the concentration of sulfolane at 21 µg/L. MW-13D was the only monitor well to report a concentration of sulfate (600 mg/L) above the cleanup goal (250 mg/L). Refer to the Quarterly Project Update Report – 4<sup>th</sup> Quarter 2021 dated March 3, 2022 for a summary of results of performance monitoring events completed through the 4<sup>th</sup> Quarter 2021.

## **5.0 REMEDIATION SYSTEM OPERATION AND MAINTENANCE**

The remediation system was shut down on December 6, 2021 for the 4<sup>th</sup> Quarter 2021 performance monitoring event and did not operate during the 1<sup>st</sup> Quarter 2022. The remediation system remained shut down during the 1<sup>st</sup> Quarter 2022 to evaluate groundwater characteristics in the absence of active remediation for approximately three months.

## **6.0 PERFORMANCE MONITORING SUMMARY**

The following sections detail performance monitoring activities completed at the Site in the 1<sup>st</sup> Quarter 2022.

### **6.1 PERFORMANCE MONITORING EVENTS**

Personnel from ECT completed the following performance monitoring events at the Site in the 1<sup>st</sup> Quarter 2022:

- February 10, 2022 - Supplemental groundwater monitoring event of MW-13D
- March 31-April 1, 2022 – Quarterly groundwater monitoring event of the following 14 monitor wells:

- MW-7, MW-7D, MW-13, MW-13D, MW-14S, MW-14D, MW-15D, MW-17S, MW-17D, MW-18, MW-19S, MW-19D, MW-20S, and MW-20D

As discussed in previous project submittals, upon the commencement of closure monitoring, three quarterly monitoring events will include the 14 monitor wells with previous detections of sulfolane and one quarterly monitoring event will include all (37) monitor wells (combined for one consecutive year of quarterly monitoring).

## 6.2 LABORATORY ANALYSIS

Groundwater samples from the 1<sup>st</sup> Quarter 2022 monitoring events were collected via low-stress sampling methods in general accordance with USEPA Region 1 Low-Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells, Revision Date September 19, 2017. Groundwater samples were collected and analyzed in general accordance with currently applicable EGLE-RRD guidance documents.

The samples were collected into laboratory supplied containers, placed on ice, and shipped under chain-of-custody protocols to the ALS Environmental laboratory facility located in Holland, Michigan for analysis of the following:

- Sulfolane by USEPA Method 8270D
- Sulfate by Method A4500-SO<sub>4</sub> E-11

Copies of laboratory analytical reports are included in Appendix C. Copies of low-flow sampling field forms are included in Appendix D.

## 6.3 CLEANUP GOALS

The EGLE-OGMD established an interim drinking water criterion for sulfolane of 90 µg/L which has been considered the cleanup goal for sulfolane dissolved in groundwater at the Site. However, per the June 28, 2020 EGLE-OGMD response to the Quarterly Project Update Report – 1<sup>st</sup> Quarter 2020, the Draft EGLE Part 201 Residential Generic Cleanup Criteria and Screening Level (Part 201 Residential GCCSL) for Drinking Water for sulfolane (5.9 µg/L), published in the Comprehensive Cleanup Criteria Update 2017, is now considered the basis for final site closure. Per footnote (M) of the proposed cleanup criteria tables, since the calculated health-based criteria of 5.9 µg/L is below the analytical target detection limit of 10 µg/L, the analytical target detection limit of 10 µg/L is considered the criterion (i.e. cleanup goal).

The cleanup goal for sulfate, which is a byproduct of the biodegradation of sulfolane, was established in previous project submittals and is the EGLE Part 201 Residential GCCSL Drinking Water Criterion of 250 mg/L.



## 6.4 GROUNDWATER ANALYTICAL SUMMARY & CLEANUP CRITERIA COMPARISON

The following presents a summary and comparison of groundwater analytical results to the cleanup goal from sampling events completed in the 1<sup>st</sup> Quarter 2022. Additional discussion is provided for monitor wells that are not included as part of the quarterly performance monitoring program.

### Monitor wells located west beyond the extent of the lower clay confining layer

- Monitor well clusters MW-6/6D and MW-12S/12D reported sulfolane non-detect from all associated sampling events.

### Monitor wells screened below the lower clay confining layer

- Monitor wells MW-19DD and MW-21D reported sulfolane non-detect from all associated sampling events.
- Concentrations of sulfolane were reported above applicable cleanup criteria from MW-15DD from the pre-remediation system startup sampling event (September 11-13, 2017) and a confirmation sampling event (September 21, 2018). The concentration of sulfolane detected in MW-15DD is suspected to be the result of drilling activities completed on August 28, 2017. Sulfolane was reported non-detect from MW-15DD from all subsequent sampling events.

### Monitor wells screened within the limits of the clay confining layer (area of sulfolane impact)

- The following monitor wells reported sulfolane non-detect from all associated sampling events:
  - MW-1, MW-2, MW-2D, MW-3, MW-3D, MW-4, MW-5, MW-8, MW-9, MW-10, MW-11, MW-15, MW-16, MW-16D, MW-22D, and MW-23D
- The following monitor wells previously reported sulfolane above the cleanup goal prior to the pre-remediation system startup event and non-detect at and subsequent to the pre-remediation system startup event:
  - MW-7 and MW-13
- The following presents percent reductions to the concentration of sulfolane (relative to the highest concentration from/after the pre-remediation system startup sampling event) for monitor wells that reported sulfolane above the cleanup goal from the pre-remediation system startup sampling event:
  - MW-7, MW-7D, MW-13, MW-13D, MW-14S, MW-14D, MW-15D, MW-17S, MW-17D, MW-18, MW-19S, MW-19D, MW-20S, and MW-20D: Non-detect – 100%
- The concentration of sulfate was reported above the cleanup goal (250 mg/L) from MW-13D from the supplemental sampling event completed on February 10, 2022 (470 mg/L) and the quarterly monitoring event completed March 31-April 1, 2022 (600 mg/L). As noted in the Technical Memorandum – Biosparging Pilot Study dated July 28, 2017, and despite a slight increase to the concentration of sulfate from the 4<sup>th</sup> Quarter 2022 performance monitoring event, natural attenuation/biodegradation (i.e sulfate reduction) of sulfate is expected once biosparging has ceased.

Monitor well locations are illustrated on Figure 3 in Appendix A. Please refer to Table 1 and Table 2 in Appendix B for a summary of groundwater monitoring data for the Site.

## 7.0 CONCLUSIONS AND RECOMMENDATIONS

As supported by the data presented herein, the remediation system has been effective at reducing concentrations of sulfolane after just over four years (52 months) of operation. The concentration of sulfolane was reported non-detect from MW-13D for the supplemental monitoring event completed on February 10, 2022 and from all 14 monitor wells that were sampled for the 1<sup>st</sup> Quarter 2022 performance monitoring event.

The concentration of sulfate reported from MW-13D remains above the cleanup goal. The concentration of sulfate increased from 470 mg/L reported from the February 10, 2022 supplemental sampling event to 600 mg/L reported from the 1<sup>st</sup> Quarter 2022 monitoring event. Since the 1<sup>st</sup> Quarter 2020, the concentration of sulfate has fluctuated between 440 to 600 mg/L. In the absence of active biosparging, natural attenuation/biodegradation (i.e sulfate reduction) of sulfate is expected.

## 8.0 SCHEDULE

The following schedule of activities is proposed/anticipated for the 2<sup>nd</sup> Quarter 2022:

- The remediation system will remain shut down.
- Quarterly performance monitoring event in June 2022 to include sulfolane and sulfate analysis from the 14 monitor wells with previous detections of sulfolane.
- Remediation system operations will be evaluated following receipt of analytical results from the June 2022 monitoring event.
- A quarterly project update report will be submitted within three weeks of receipt of analytical data from the June 2022 performance monitoring event.

# **APPENDIX A**

## **FIGURES**

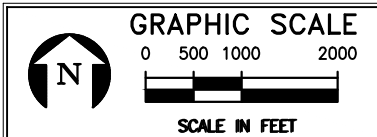


FIGURE 1  
SITE LOCATION MAP  
HARTLAND 36 GAS PLANT  
PORTION OF E 1/2 OF NE 1/4 OF SECTION 36, T03N-R06E  
HARTLAND TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN  
Source: USGS QUad: Kent Lake, 2015; West Highland, 2015; ECT, 2016.



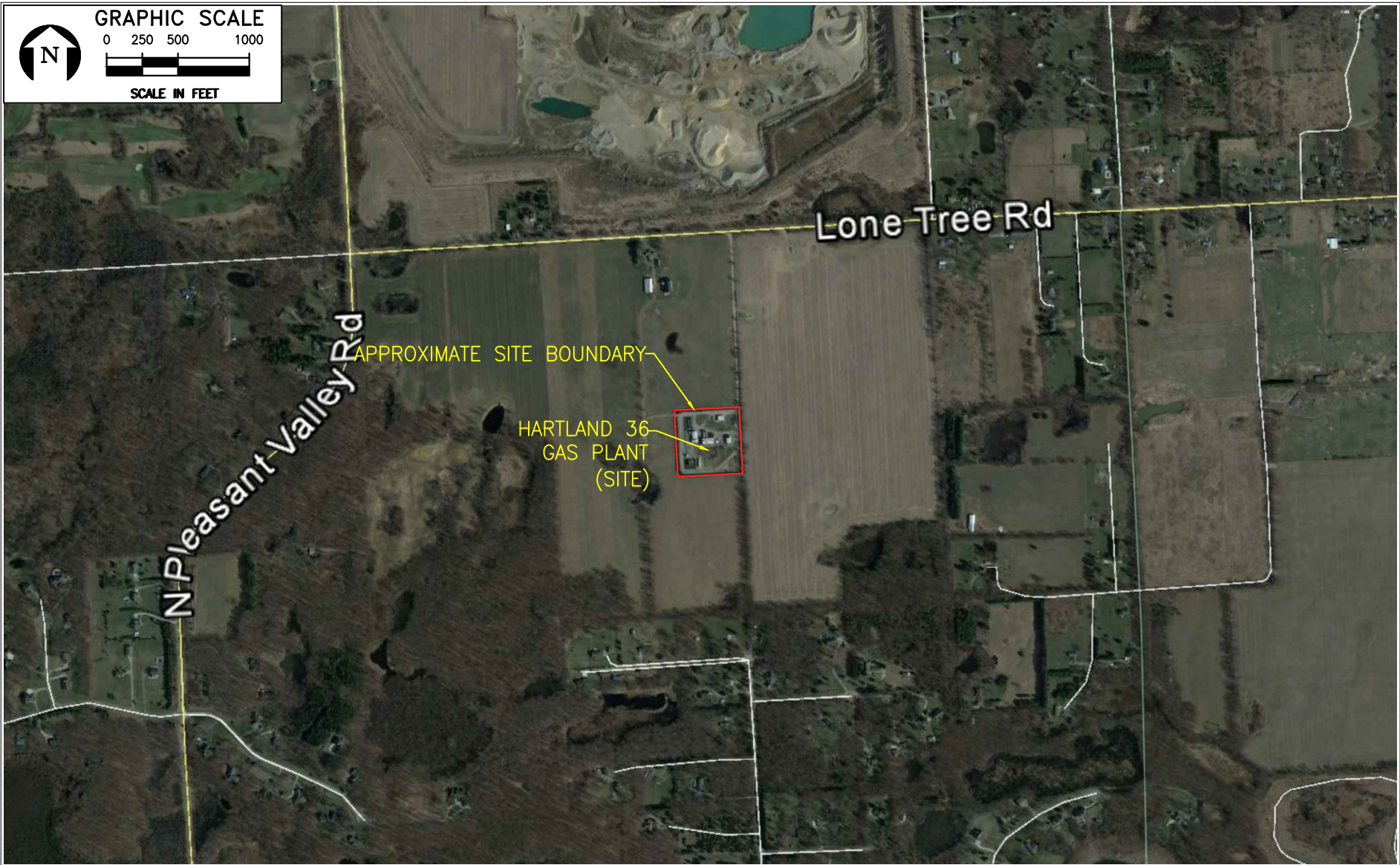


FIGURE 2  
SITE AND SURROUNDING PROPERTIES MAP  
HARTLAND 36 GAS PLANT  
PORTION OF E 1/2 OF NE 1/4 OF SECTION 36, T03N-R06E  
HARTLAND TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN  
Source: Google Earth, 2016; ECT, 2016.



### Legend

- Monitor Well
- Temporary Monitor Well
- Soil Boring
- Excavation Boundary
- Fenceline (former)
- BSP Location

**ND**  
 Not Detected at the Reporting Limit  
 Sulfolane concentrations (in ug/L) from the  
 March/April 2021 (February 2021) sampling event.

FIGURE ADAPTED FROM SURVEY PERFORMED BY:



- NOTES:**
- DRAWING BASED UPON FIELD OBSERVATIONS TAKEN 11/18/15 (FOR MW DESIGNATED WELLS), 06/06/16 (FOR TMW DESIGNATED WELLS/BORINGS) AND 08/02/16 (FOR MONITORING WELLS 8-13 & 15-16, MW-14 NOT INSTALLED).
  - ADDITIONAL FIELD OBSERVATIONS TAKEN 11/01/16 FOR LOCATIONS AND ELEVATIONS OF MW-13D, MW-14S & D, MW-17S & D, MW-18, AND MW-19S & D. NEW ELEVATIONS WERE ESTABLISHED FOR MW-9, MW-10, MW-11, MW-13, MW-15 AND MW-16. SOIL BORINGS SB-1 & SB-2 WERE ALSO LOCATED ON 11/01/16



## HARTLAND 36 GAS PLANT

130685 - 2000  
 ECT PROJECT NUMBER

DESIGNED BY	CHECKED BY
BJB DRAWN BY	JSL APPROVED BY

SHEET TITLE

### SITE PLAN

SCALE: 1" = 50' @ 11x17



FIGURE

**3**

## **APPENDIX B**

### **TABLES**

**TABLE 1**  
**GROUNDWATER ANALYTICAL SUMMARY & CLEANUP CRITERIA COMPARISON**  
 Hartland 36 Gas Plant  
 Portion of E1/2 of NW1/4 of Section 36, T03N-R06E, Hartland Township, Livingston County, Michigan  
 ECT Project #13-0685-2000

Date	MW-1			MW-2			MW-2D			MW-3			MW-3D			MW-4			MW-5			MW-6			MW-6D			MW-7		
	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate
9/11-13/17	ND	8.08	---	ND	4.14	---	ND	5.38	---	ND	6.96	---	ND	1.03	---	ND	7.75	---	ND	7.31	---	ND	5.90	---	ND	5.90	---	ND	1.55	---
9/21/17	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
12/19-20/17	ND	8.83	6.4	ND	8.76	16	ND	5.02	21	ND	9.81	41	ND	1.90	27	ND	7.10	24	ND	6.85	24	ND	2.99	42	ND	9.26	19	ND	10.07	46
1/25/18	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
2/27/18	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3/28-29/18	ND	7.87	5.0	ND	7.79	14	ND	4.05	17	ND	11.53	26	ND	1.31	30	ND	9.77	29	ND	6.31	24	ND	3.22	41	ND	6.92	20	ND	9.75	31
6/19-21/18	ND	15.96	9.3	ND	10.66	15	ND	7.87	18	ND	8.43	11	ND	1.06	28	ND	9.86	21	ND	12.49	28	ND	10.58	56	ND	10.91	10	ND	10.49	17
9/18-20/18	ND	9.98	8.5	ND	12.08	15	ND	10.21	21	ND	9.56	16	ND	1.87	34	ND	11.86	23	ND	11.26	25	ND	5.56	57	ND	8.27	22	ND	13.67	24
12/17-18/18	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3/25-26/19	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/24-26/19	ND	11.22	6.8	ND	7.00	17	ND	3.79	20	ND	11.36	15	ND	4.99	32	ND	11.47	27	ND	9.78	36	ND	6.25	61	ND	7.11	23	ND	12.22	20
9/23-24/19	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
12/3-4/19	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1/2/20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
2/13/20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3/5-6/20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/2/20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/1-2/20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
9/9-10/20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10/23/20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
12/10/20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1/11/21	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3/10/21	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/17/21	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/15/21	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
9/20/21	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
12/28-29/2021	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
2/10/22	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3/31-4/01/2022	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
% Decrease	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Sulfolane Criterion (µg/L)	Non-detect <10																													
Sulfate Criterion (mg/L)	250																													

Date	MW-7D			MW-8			MW-9			MW-10			MW-11			MW-12S			MW-12D			MW-13			MW-13D				
	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate		
9/11-13/17	1,900	0.79	---	ND	9.09	---	ND	0.73	---	ND	7.42	---	ND	3.69	---	ND	2.65	---	ND	1.36	---	ND	0.94	---	660 (730)	0.52	330		
9/21/17	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
12/19-20/17	4,100	0.89	46	ND	6.34	8	ND	0.57	21	ND	7.95	36	ND	5.04	20	ND	3.98	19	ND	4.00	32	ND	13.79	80	480	0.51	240		
1/25/18	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
2/27/18	1,200	1.47	96	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
3/28-29/18	820	0.61	81	ND	9.65	12	ND	1.32	26	ND	10.34	48	ND	5.17	16	ND	7.70	18	ND	3.45	33	ND	10.12	63	ND	8.41	220		
6/19-21/18	180 (170)	1.09	61 (57)	ND	8.58	30	ND	3.36	21	ND	9.98	39	ND	10.94	18	ND	9.09	22	ND	5.26	36	ND	8.08	93	180	2.42	480		
9/18-20/18	170	1.32	58	ND	7.88	9.4	ND	1.66	29	ND	11.83	18	ND	11.00	45	ND	3.52	55	ND	4.27	34	ND	9.36	69	ND	5.06	650		
12/17-18/18	270 (300)	12.68	37	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
3/25-26/19	1,700	0.19	53	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/24-26/19	610	0.81	84	ND	12.70	17	ND	1.20	26	ND	8.50	61	ND	11.21	40	ND	5.84	27	ND	2.96	37	ND	8.54	140	19	2.61	740		
9/23-24/19	140	2.58	57	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
12/3-4/19	1,200	4.02	48	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1/2/20	2,400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
2/13/20	1,500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3/5-6/20	ND	12.14	32	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/2/20	330	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/1-2/20	ND	15.88	30	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
9/9-10/20	ND	12.56	27	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10/23/20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
12/10/20	ND	8.80	21	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1/11/21	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3/10/21	ND	9.84	17	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/17/21	74	5.82	67	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/15/21	97	5.16	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
9/20/21	ND	2.97	90	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
12/28-29/2021	ND	5.44	86	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
2/10/22	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3/31-4/01/2022	ND	10.29	27	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
% Decrease	100%	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Sulfolane Criterion (µg/L)	Non-detect <10																												
Sulfate Criterion (mg/L)	250																												

- Notes**
- 1) Concentrations of sulfolane reported in micrograms per liter (µg/L), equivalent to parts per billion (ppb).
  - 2) DO - dissolved oxygen.
  - 3) Concentrations of dissolved oxygen and sulfate reported in milligrams per liter (mg/L), equivalent to parts per million (ppm).
  - 4) (---) - Not sampled.
  - 5) ND - Concentration not detected above reporting limit.
  - 6) Concentrations shown in parenthesis are from duplicate sample.
  - 7) % Decrease of sulfolane is the most recent sampling event relative to highest reported concentration since the pre-system startup event (9/11-13/17).
  - 8) Sulfolane criterion established by EGLE-Oil, Gas, and Minerals Division (EGLE-OGMD).
  - 9) Sulfate criterion - Part 201 Residential Generic Cleanup Criteria and Screening Levels (Part 201 Residential GCCSLs), dated January 10, 2018, per R299.44 (Table 1) of the Michigan Administrative Code.
  - 10) Concentrations that are highlighted and bold exceed cleanup criteria.



**TABLE 1**  
**GROUNDWATER ANALYTICAL SUMMARY & CLEANUP CRITERIA COMPARISON**  
 Hartland 36 Gas Plant  
 Portion of E1/2 of NW1/4 of Section 36, T03N-R06E, Hartland Township, Livingston County, Michigan  
 ECT Project #13-0685-2000

Date	MW-14S			MW-14D			MW-15			MW-15D			MW-15DD			MW-16			MW-16D			MW-17S			MW-17D				
	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate		
9/11-13/17	120	0.85	---	7,700	0.22	---	ND	4.39	---	230	0.22	---	33	0.23	---	ND	3.31	---	ND	0.28	---	3,100	0.25	---	380	0.36	---		
9/21/17	---	---	---	---	---	---	---	---	---	---	---	---	48	0.64	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
12/19-20/17	100	2.05	91	7,100	0.45	39	ND	11.02	14	ND	4.22	46	ND	0.56	37	ND	8.42	16	ND	5.99	24	2,400	0.88	49	51	8.10	33		
1/25/18	85	3.35	56	5,400	0.43	44	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
2/27/18	ND	9.63	110	4,000	0.50	48	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
3/28-29/18	ND	8.61	120	3,600 (5,100)	0.22	50 (51)	ND	7.96	16	ND	6.86	29	ND	0.54	37	ND	8.73	19	ND	3.88	25	52 (62)	3.28	64	ND	9.68	36		
6/19-21/18	52	0.28	67	2,600 (2,800)	0.09	77 (77)	ND	7.98	39	ND	3.80	27	ND	0.53	42	ND	16.43	43	ND	8.12	24	55	8.61	68	ND (ND)	10.63	42 (41)		
9/18-20/18	ND	4.90	140	680	2.89	110	ND	8.25	32	ND	7.45	20	ND	0.60	41	ND	8.12	21	ND	2.08	22	32	3.07	65	ND	3.83	49		
12/17-18/18	ND	9.20	220	290	3.49	120	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
3/25-26/19	ND	11.08	180	ND	5.71	120	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
6/24-26/19	ND	9.88	160	110	5.82	120	ND	8.58	55	ND	5.65	28	ND	0.53	65	ND	11.24	23	ND	6.78	33	ND	1.43	69	ND	10.93	65		
9/23-24/19	ND	5.96	100	71	2.83	150	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
12/3-4/19	ND	8.66	93	71	10.21	150	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
1/2/20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
2/13/20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3/5-6/20	ND	8.44	100	ND	11.39	130	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
4/2/20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/1-2/20	ND	5.62	120	ND	7.50	110	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
9/9-10/20	ND	17.85	88	ND	10.57	100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
10/23/20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
12/10/20	ND	1.94	50	ND	1.66	110	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
1/11/21	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3/10/21	ND	12.24	67	ND	1.29	150	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
6/17/21	ND (ND)	1.41	77 (79)	ND	2.56	130	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
7/15/21	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
9/20/21	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
12/28-29/2021	ND	4.23	36	ND	3.85	83	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
2/10/22	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3/31-4/01/2022	ND	2.74	35	ND	2.08	53	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
% Decrease	100%	---	---	100%	---	---	---	---	---	100%	---	---	100%	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Sulfolane Criterion (µg/L)	Non-detect - <10																												
Sulfate Criterion (mg/L)	250																												
Date	MW-18			MW-19S			MW-19D			MW-19DD			MW-20S			MW-20D			MW-21D			MW-22D			MW-23D				
	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate	Sulfolane	DO	Sulfate		
9/11-13/17	2,200	1.16	---	29	1.64	---	5,900	0.60	---	ND	3.82	---	63	1.50	---	12,000	0.45	---	ND	6.08	---	ND	7.76	---	ND	2.87	---		
9/21/17	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
12/19-20/17	660	0.67	37	ND	10.32	44	3,200	0.38	73	ND	7.16	22	49	4.04	45	12,000	0.52	43	ND	7.58	22	ND	5.74	12	ND	2.48	20		
1/25/18	2,300	0.74	34	---	---	---	ND	0.77	74	---	---	---	---	3.76	45	10,000	1.61	41	---	---	---	---	---	---	---	---	---		
2/27/18	2,000	0.39	33	---	---	---	ND	0.57	51	---	---	---	---	---	52	9,300	0.61	46	---	---	---	---	---	---	---	---	---		
3/28-29/18	980	0.71	34	ND	9.45	43	290	0.47	54	ND	6.27	26	---	2.03	57 (58)	10,000	2.00	51	ND	4.13	22	ND	5.32	9.4	ND	3.03	19		
6/19-21/18	14	3.13	39	ND	11.14	36	750	1.08	63	ND	5.25	23	ND	4.80	56	6,600	3.99	58	ND	4.22	21	ND	12.97	8.0	ND	5.72	20		
9/18-20/18	ND (ND)	0.67	49 (49)	ND	12.84	44	170 (150)	0.86	77 (77)	ND	6.89	20	ND	9.28	63	22 (34)	5.37	80 (81)	ND	5.77	21	ND	7.65	6.8	ND	3.12	21		
12/17-18/18	ND	2.28	53	ND	8.95	47	440	3.02	83	---	---	---	---	---	9.77	48	19	5.32	90	---	---	---	---	---	---	---	---		
3/25-26/19	ND	1.09	47	ND	14.18	47	350	0.24	88	---	---	---	---	---	12.20	62	ND (ND)	10.35	89 (84)	---	---	---	---	---	---	---	---		
6/24-26/19	ND (ND)	0.97	45 (44)	ND	10.42	62	98 (73)	0.17	100 (94)	ND	7.27	23	ND	20.73	72	ND (ND)	10.86	94 (94)	ND	5.66	24	ND	9.20	8.3	ND	6.39	30		
9/23-24/19	ND	1.60	43	ND	9.79	58	ND	8.39	110	---	---	---	---	---	6.06	66	ND (ND)	6.26	84 (79)	---	---	---	---	---	---	---	---		
12/3-4/19	ND	0.93	49	ND	11.40	62	92	0.57	92	---	---	---	---	---	7.23	64	ND (ND)	6.15	84 (80)	---	---	---	---	---	---	---	---		
1/2/20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
2/13/20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
3/5-6/20	ND	7.25	71	ND	13.19	68	ND	9.24	100	---	---	---	---	---	9.74	33	ND (ND)	4.20	88 (91)	---	---	---	---	---	---	---	---		
4/2/20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
6/1-2/20	ND	6.08	61	ND	11.36	72	ND	15.02	92	---	---	---	---	---	---	11.51	36	ND (ND)	7.29	83 (85)	---	---	---	---	---	---	---		
9/9-10/20	ND	0.56	50	ND	10.46	72	ND	13.48	84	---	---	---	---	---	---	7.91	110	ND (ND)	2.79	83 (80)	---	---	---	---	---	---	---		
10/23/20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
12/10/20	ND	0.12	58	ND	9.18	74	ND	12.69	120	---	---	---	---	---	---	7.41	57	ND (ND)	1.65	80 (80)	---	---	---	---	---	---	---		
1/11/21	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
3/10/21	ND	8.42	55	ND	12.27	79	ND	7.40																					

**TABLE 2  
SULFOLANE GROUNDWATER ANALYTICAL SUMMARY & CLEANUP CRITERIA COMPARISON**

Hartland 36 Gas Plant  
Portion of E1/2 of NW1/4 of Section 36, T03N-R06E,  
Hartland Township, Livingston County, Michigan  
ECT Project #13-0685-2000

Sample Location	Screened Interval (ft bgs)	Sample Date																						
		11/4-5/15	1/27/16	6/3/2016	8/3-4/16	9/21-22/16	10/12/16	11/3/16	12/8/16	12/21-23/16	2/14/17	3/14-16/2017	4/27/17; 5/1/17	5/11/2017	5/30-31/17	6/19-21/17	9/11-13/17	9/21/2017	12/19-20/2017	1/25/2018	2/27/2018	3/28-29/2018	6/19-21/2018	9/18-20/2018
MW-1	20.1 - 25.1	ND	ND	ND	---	ND	---	---	---	---	---	ND	---	---	ND	ND	---	ND	---	---	ND	ND	ND	
MW-2	19.1 - 24.1	ND	ND	ND	---	ND	---	---	---	---	---	ND	---	---	ND	ND	---	ND	---	---	ND	ND	ND	
MW-2D	27.7 - 29.7	---	---	---	---	---	---	---	---	---	---	ND	---	---	ND	ND	---	ND	---	---	ND	ND	ND	
MW-3	22.0 - 27.0	ND	---	ND	---	ND	---	---	---	---	---	ND	---	---	ND	ND	---	ND	---	---	ND	ND	ND	
MW-3D	30.0 - 32.0	---	---	---	---	---	---	---	---	---	---	ND	---	---	ND	ND	---	ND	---	---	ND	ND	ND	
MW-4	23.1 - 28.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	---	---	---	ND	ND	---	ND	---	---	ND	ND	ND	
MW-5	18.0 - 23.0	ND	ND	ND	---	ND	---	---	---	---	---	ND	---	---	ND	ND	---	ND	---	---	ND	ND	ND	
MW-6	25.4 - 30.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	---	---	---	ND	ND	---	ND	---	---	ND	ND	ND	
MW-6D	39.4 - 44.4	---	---	---	---	ND	ND	ND	ND	ND	ND	---	---	---	ND	ND	---	ND	---	---	ND	ND	ND	
MW-7	25.2 - 30.2	<b>880</b>	<b>44</b>	<b>510</b>	ND	<b>210</b>	---	---	---	---	---	ND	---	---	---	---	<b>12</b>	ND	---	---	---	---	ND	
MW-7D	39.2 - 44.2	---	---	---	---	---	---	---	---	<b>3,100</b>	---	---	---	---	---	<b>2,600</b>	<b>1,900</b>	---	<b>4,100</b>	---	<b>1,200</b>	<b>820</b>	<b>180</b>	<b>170</b>
MW-8	24.6 - 29.6	---	---	---	ND	ND	---	---	---	---	---	ND	---	---	---	ND	ND	---	---	---	---	ND	ND	
MW-9	23.6 - 28.6	---	---	---	ND	ND	---	---	---	---	---	ND	---	---	---	ND	ND	---	---	---	---	ND	ND	
MW-10	21.2 - 26.2	---	---	---	ND	ND	---	---	---	---	---	ND	---	---	---	ND	ND	---	---	---	---	ND	ND	
MW-11	21.7 - 26.7	---	---	---	ND	ND	---	---	---	---	---	ND	---	---	---	ND	ND	---	---	---	---	ND	ND	
MW-12S	20.5 - 25.5	---	---	---	ND	ND	ND	ND	ND	ND	ND	---	---	---	ND	ND	ND	---	---	---	---	ND	ND	
MW-12D	39.7 - 44.7	---	---	---	ND	ND	ND	ND	ND	ND	ND	---	---	---	ND	ND	ND	---	---	---	---	ND	ND	
MW-13	19.1 - 24.1	---	---	---	<b>6,600</b>	<b>8,800</b>	---	---	---	---	<b>3,500</b>	---	<b>5,100</b>	<b>7,000</b>	<b>3,700</b>	<b>97</b>	ND	ND	---	---	---	---	ND	
MW-13D	27.7 - 29.7	---	---	---	---	---	---	<b>7,800</b>	---	<b>8,300</b>	---	<b>5,400</b>	<b>6,900</b>	<b>1,100</b>	<b>420</b>	<b>290</b>	<b>730</b>	---	<b>480</b>	<b>400</b>	ND	ND	<b>180</b>	
MW-14S	18.6 - 23.6	---	---	---	---	---	---	<b>46</b>	---	<b>460</b>	---	<b>540</b>	<b>490</b>	<b>160</b>	<b>520</b>	<b>94</b>	<b>120</b>	---	<b>100</b>	<b>85</b>	ND	ND	<b>52</b>	
MW-14D	36.7 - 41.7	---	---	---	---	---	---	<b>7,900</b>	---	<b>10,000</b>	---	<b>7,600</b>	<b>9,800</b>	<b>8,600</b>	<b>8,200</b>	<b>7,800</b>	<b>7,700</b>	---	<b>7,100</b>	<b>5,400</b>	<b>4,000</b>	<b>5,100</b>	<b>2,800</b>	<b>680</b>
MW-15	19.3 - 24.3	---	---	---	ND	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
MW-15D	37.9 - 42.9	---	---	---	---	---	---	---	---	---	---	<b>4,600</b>	<b>3,200</b>	---	---	---	<b>670</b>	<b>230</b>	---	---	---	---	---	
MW-15DD	50 - 55	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	<b>33</b>	<b>48</b>	---	---	---	---	
MW-16	19.5 - 24.5	---	---	---	ND	ND	---	---	---	---	---	ND	ND	ND	ND	ND	ND	---	---	---	---	---	---	
MW-16D	31.4 - 33.4	---	---	---	---	---	---	---	---	---	---	ND	ND	ND	ND	ND	ND	---	---	---	---	---	---	
MW-17S	19.9 - 24.9	---	---	---	---	---	---	<b>3,900</b>	---	<b>5,100</b>	---	<b>3,000</b>	---	---	---	<b>5,300</b>	<b>3,100</b>	---	<b>2,400</b>	<b>510</b>	<b>460</b>	<b>52</b>	<b>55</b>	<b>32</b>
MW-17D	35.4 - 37.4	---	---	---	---	---	---	<b>440</b>	---	<b>510</b>	---	<b>400</b>	---	---	---	<b>390</b>	<b>400</b>	---	<b>51</b>	ND	ND	ND	ND	
MW-18	19.9 - 24.9	---	---	---	---	---	---	<b>6,800</b>	---	<b>6,800</b>	---	<b>4,300</b>	---	<b>2,100</b>	<b>4,800</b>	<b>3,800</b>	<b>2,200</b>	---	<b>660</b>	<b>2,300</b>	<b>2,000</b>	<b>980</b>	<b>14</b>	ND
MW-19S	22.6 - 27.6	---	---	---	---	---	---	<b>2,700</b>	---	<b>1,500</b>	---	<b>1,300</b>	---	---	---	<b>24</b>	<b>33</b>	---	---	---	---	---	---	
MW-19D	43.0 - 48.0	---	---	---	---	---	---	<b>7,000</b>	---	<b>7,600</b>	---	<b>4,300</b>	---	---	---	<b>7,000</b>	<b>5,900</b>	---	<b>3,200</b>	ND	ND	<b>290</b>	<b>750</b>	<b>170</b>
MW-19DD	57 - 62	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
MW-20S	17.8 - 22.8	---	---	---	---	---	---	<b>25</b>	---	---	---	<b>97</b>	---	---	---	<b>160</b>	<b>63</b>	---	<b>49</b>	ND	ND	ND	ND	
MW-20D	31.0 - 33.0	---	---	---	---	---	---	<b>8,700</b>	---	---	---	<b>8,300</b>	---	---	---	<b>11,000</b>	<b>12,000</b>	---	<b>12,000</b>	<b>10,000</b>	<b>9,300</b>	<b>10,000</b>	<b>6,600</b>	<b>34</b>
MW-21D	52.3 - 57.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
MW-22D	36.4 - 41.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
MW-23D	28.1 - 30.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
EGLE-OGMD Cleanup Criteria																								
Collection Method		LF		Bailer/PP																				

- Notes**
- 1) ft bgs - Feet below ground surface.
  - 2) Collection method - Grab, peristaltic pump (PP), low flow (LF), Bailer.
  - 3) µg/L - Micrograms per liter, equivalent to parts per billion (ppb).
  - 4) (---) - Not sampled.
  - 5) ND - Concentration not detected above reporting limit.
  - 6) Sulfolane concentrations included on the table are for the higher concentration from samples submitted for duplicate analysis.
  - 7) Cleanup criteria for sulfolane established by EGLE-Oil, Gas, and Minerals Division (EGLE-OGMD).
  - 8) Concentrations that are highlighted and bold exceed cleanup criteria.
  - 9) MW-7 sampled on 8/11/2016 for the 8/3-4/2016 sample event.



**TABLE 2  
SULFOLANE GROUNDWATER ANALYTICAL SUMMARY & CLEANUP CRITERIA COMPARISON**

Hartland 36 Gas Plant  
SE/NE/NW Section 36, T03N-R06E,  
Hartland Township, Livingston County, Michigan  
ECT Project #13-0685-2000

Sample Location	Screened Interval (ft bgs)	Sample Date																					
		12/17-18/2018	3/25-26/19	6/24-26/2019	9/23-24/2019	12/3-4/19	1/2/2020	2/13/2020	3/5-6/2020	4/2/2020	6/1-2/2020	9/9-10/2020	10/23/2020	12/10/2020	1/11/2021	3/10/2021	6/17/2021	7/15/2021	9/20/2021	12/28-29/21	2/10/2022	3/31-4/01/2022	
MW-1	20.1 - 25.1	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-2	19.1 - 24.1	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-2D	27.7 - 29.7	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	22.0 - 27.0	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-3D	30.0 - 32.0	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-4	23.1 - 28.1	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-5	18.0 - 23.0	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-6	25.4 - 30.4	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-6D	39.4 - 44.4	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-7	25.2 - 30.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-7D	39.2 - 44.2	300	1,700	510	140	1,200	2,400	1,500	ND	330	ND	ND	---	ND	---	ND	74	97	ND	ND	---	---	---
MW-8	24.6 - 29.6	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-9	23.6 - 28.6	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-10	21.2 - 26.2	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-11	21.7 - 26.7	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-12S	20.5 - 25.5	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-12D	39.7 - 44.7	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-13	19.1 - 24.1	ND	ND	ND	ND	ND	ND	---	ND	ND	ND	ND	---	ND	---	ND	ND	---	ND	---	ND	---	ND
MW-13D	27.7 - 29.7	ND	16	19	ND	37	---	---	ND	16	ND	ND	---	99	110	ND	93	45	ND	21	ND	ND	ND
MW-14S	18.6 - 23.6	ND	ND	ND	ND	ND	---	---	ND	---	ND	ND	---	ND	---	ND	ND	---	ND	---	ND	---	ND
MW-14D	36.7 - 41.7	290	ND	110	71	71	---	---	ND	ND	ND	ND	---	ND	---	ND	ND	---	ND	---	ND	---	ND
MW-15	19.3 - 24.3	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-15D	37.9 - 42.9	ND	ND	ND	ND	ND	---	---	ND	---	ND	ND	---	ND	---	ND	ND	---	ND	---	ND	---	ND
MW-15DD	50 - 55	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-16	19.5 - 24.5	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-16D	31.4 - 33.4	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-17S	19.9 - 24.9	ND	ND	ND	ND	ND	---	---	ND	---	ND	190	91	ND	ND	ND	ND	ND	ND	ND	ND	---	ND
MW-17D	35.4 - 37.4	ND	ND	ND	ND	ND	---	---	ND	---	ND	ND	---	ND	---	ND	ND	---	ND	---	ND	---	ND
MW-18	19.9 - 24.9	ND	ND	ND	ND	ND	---	---	ND	---	ND	ND	---	ND	---	ND	ND	---	ND	---	ND	---	ND
MW-19S	22.6 - 27.6	ND	ND	ND	ND	ND	---	---	ND	---	ND	ND	---	ND	---	ND	ND	---	ND	---	ND	---	ND
MW-19D	43.0 - 48.0	440	350	98	ND	92	---	---	ND	ND	ND	ND	---	ND	---	ND	ND	---	ND	---	ND	---	ND
MW-19DD	57 - 62	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-20S	17.8 - 22.8	ND	ND	ND	ND	ND	---	---	ND	---	ND	ND	---	ND	---	ND	ND	---	ND	---	ND	---	ND
MW-20D	31.0 - 33.0	19	ND	ND	ND	ND	---	---	ND	---	ND	ND	---	ND	---	ND	ND	---	ND	---	ND	---	ND
MW-21D	52.3 - 57.3	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-22D	36.4 - 41.4	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-23D	28.1 - 30.1	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
<b>EGLE-OGMD Cleanup Criteria</b>		<b>Non-detect - &lt;10 µg/L</b>																					
<b>Collection Method</b>		LF										Bailer			LF		Bailer			LF			

- Notes**
- 1) ft bgs - Feet below ground surface.
  - 2) Collection method - Grab, peristaltic pump (PP), low flow (LF), Bailer.
  - 3) µg/L - Micrograms per liter, equivalent to parts per billion (ppb).
  - 4) (---) - Not sampled.
  - 5) ND - Concentration not detected above reporting limit.
  - 6) Sulfolane concentrations included on the table are for the higher concentration from samples submitted for duplicate analysis.
  - 7) Cleanup criteria for sulfolane established by EGLE-Oil, Gas, and Minerals Division (EGLE-OGMD).
  - 8) Concentrations that are highlighted and bold exceed cleanup criteria.
  - 9) MW-7 sampled on 8/11/2016 for the 8/3-4/2016 sample event.



**APPENDIX C**

**LABORATORY ANALYTICAL REPORTS**



17-Feb-2022

Nick Summerland  
Lambda Energy Resources  
1510 Thomas Rd  
Kalkaska, MI 49646

Re: **Lambda (Hartland 36 Gas Plant)**

Work Order: **22020766**

Dear Nick,

ALS Environmental received 1 sample on 10-Feb-2022 11:00 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 10.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA  
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

**Gary Byar**

Electronically approved by: Gary Byar

Gary Byar  
Project Manager

### Report of Laboratory Analysis

Certificate No: MI: 0022

ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

Environmental 

[www.alsglobal.com](http://www.alsglobal.com)

RIGHT SOLUTIONS RIGHT PARTNER

---

**Client:** Lambda Energy Resources  
**Project:** Lambda (Hartland 36 Gas Plant)  
**Work Order:** 22020766

**Work Order Sample Summary**

---

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
22020766-01	MW-13d	Groundwater		2/10/2022 15:05	2/10/2022 23:00	<input type="checkbox"/>

**ALS Group, USA**

Date: 17-Feb-2022

**Client:** Lambda Energy Resources  
**Project:** Lambda (Hartland 36 Gas Plant)  
**Sample ID:** MW-13d  
**Collection Date:** 2/10/2022 03:05 PM

**Work Order:** 22020766  
**Lab ID:** 22020766-01  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW846 8270D</b>	Prep: SW3510 2/16/22 15:09		Analyst: <b>EEW</b>
Sulfolane	ND		10	µg/L	1	2/16/2022 06:54 PM
Surr: 2-Fluorobiphenyl	70.4		26-79	%REC	1	2/16/2022 06:54 PM
Surr: 4-Terphenyl-d14	79.5		43-106	%REC	1	2/16/2022 06:54 PM
Surr: Nitrobenzene-d5	66.6		29-80	%REC	1	2/16/2022 06:54 PM
<b>SULFATE</b>			<b>A4500-SO4 E-11</b>			Analyst: <b>AML</b>
Sulfate	470		10	mg/L	10	2/15/2022 11:58 AM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

---

**Client:** Lambda Energy Resources  
**Project:** Lambda (Hartland 36 Gas Plant)  
**Work Order:** 22020766

---

**Case Narrative**

Batch R338227, Method A4500-SO4 E-11, Sample 22020701-01A MS: MS and MSD are for an unrelated sample

Batch R338227, Method A4500-SO4 E-11, Sample 22020861-05C MS: MS and MSD are for an unrelated sample

Batch 191814, Method SW846 8270D: The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.



**Client:** Lambda Energy Resources  
**Work Order:** 22020766  
**Project:** Lambda (Hartland 36 Gas Plant)

**QC BATCH REPORT**

Batch ID: **191814** Instrument ID **SVMS9** Method: **SW846 8270D**

MBLK		Sample ID: <b>SBLKW1-191814-191814</b>				Units: <b>µg/L</b>		Analysis Date: <b>2/16/2022 05:44 PM</b>			
Client ID:		Run ID: <b>SVMS9_220216A</b>				SeqNo: <b>8180467</b>		Prep Date: <b>2/16/2022</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Sulfolane	ND	10									
<i>Surr: 2-Fluorobiphenyl</i>	35.93	0	50	0	71.9	26-79	0				
<i>Surr: 4-Terphenyl-d14</i>	42.94	0	50	0	85.9	43-106	0				
<i>Surr: Nitrobenzene-d5</i>	36.43	0	50	0	72.9	29-80	0				

LCS		Sample ID: <b>SLCSW1-191814-191814</b>				Units: <b>µg/L</b>		Analysis Date: <b>2/16/2022 06:08 PM</b>			
Client ID:		Run ID: <b>SVMS9_220216A</b>				SeqNo: <b>8180468</b>		Prep Date: <b>2/16/2022</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Sulfolane	75.98	10	100	0	76	30-100	0				
<i>Surr: 2-Fluorobiphenyl</i>	37.29	0	50	0	74.6	26-79	0				
<i>Surr: 4-Terphenyl-d14</i>	38.96	0	50	0	77.9	43-106	0				
<i>Surr: Nitrobenzene-d5</i>	36.65	0	50	0	73.3	29-80	0				

LCSD		Sample ID: <b>SLCSDW1-191814-191814</b>				Units: <b>µg/L</b>		Analysis Date: <b>2/16/2022 06:31 PM</b>			
Client ID:		Run ID: <b>SVMS9_220216A</b>				SeqNo: <b>8180469</b>		Prep Date: <b>2/16/2022</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Sulfolane	59.64	10	100	0	59.6	30-100	75.98	24.1	30		
<i>Surr: 2-Fluorobiphenyl</i>	32.93	0	50	0	65.9	26-79	37.29	12.4	40		
<i>Surr: 4-Terphenyl-d14</i>	40.5	0	50	0	81	43-106	38.96	3.88	40		
<i>Surr: Nitrobenzene-d5</i>	31.25	0	50	0	62.5	29-80	36.65	15.9	40		

The following samples were analyzed in this batch: 22020766-01A

Client: Lambda Energy Resources  
 Work Order: 22020766  
 Project: Lambda (Hartland 36 Gas Plant)

# QC BATCH REPORT

Batch ID: **R338227** Instrument ID **GALLERY** Method: **A4500-SO4 E-11**

MBLK		Sample ID: <b>MBLK-R338227</b>				Units: <b>mg/L</b>		Analysis Date: <b>2/15/2022 11:40 AM</b>		
Client ID:		Run ID: <b>GALLERY_220215A</b>		SeqNo: <b>8175345</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Sulfate ND 1.0

MS		Sample ID: <b>22020701-01A MS</b>				Units: <b>mg/L</b>		Analysis Date: <b>2/15/2022 11:31 AM</b>		
Client ID:		Run ID: <b>GALLERY_220215A</b>		SeqNo: <b>8175314</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Sulfate 45.99 1.0 50 446.4 -801 95-118 0 SO

MS		Sample ID: <b>22020861-05C MS</b>				Units: <b>mg/L</b>		Analysis Date: <b>2/15/2022 11:49 AM</b>		
Client ID:		Run ID: <b>GALLERY_220215A</b>		SeqNo: <b>8175369</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Sulfate 49.26 1.0 50 413.2 -728 95-118 0 SO

MSD		Sample ID: <b>22020701-01A MSD</b>				Units: <b>mg/L</b>		Analysis Date: <b>2/15/2022 11:31 AM</b>		
Client ID:		Run ID: <b>GALLERY_220215A</b>		SeqNo: <b>8175315</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Sulfate 50.53 1.0 50 446.4 -792 95-118 45.99 9.41 10 SO

MSD		Sample ID: <b>22020861-05C MSD</b>				Units: <b>mg/L</b>		Analysis Date: <b>2/15/2022 11:50 AM</b>		
Client ID:		Run ID: <b>GALLERY_220215A</b>		SeqNo: <b>8175373</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Sulfate 47.99 1.0 50 413.2 -730 95-118 49.26 2.61 10 SO

LCS1		Sample ID: <b>LCS1-R338227</b>				Units: <b>mg/L</b>		Analysis Date: <b>2/15/2022 11:40 AM</b>		
Client ID:		Run ID: <b>GALLERY_220215A</b>		SeqNo: <b>8175343</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Sulfate 10.33 1.0 10 0 103 90-119 0

LCS1		Sample ID: <b>LCS1-R338227</b>				Units: <b>mg/L</b>		Analysis Date: <b>2/15/2022 01:37 PM</b>		
Client ID:		Run ID: <b>GALLERY_220215A</b>		SeqNo: <b>8175645</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Sulfate 9.967 1.0 10 0 99.7 90-119 0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Lambda Energy Resources  
**Work Order:** 22020766  
**Project:** Lambda (Hartland 36 Gas Plant)

# QC BATCH REPORT

Batch ID: **R338227**      Instrument ID **GALLERY**      Method: **A4500-SO4 E-11**

LCS2		Sample ID: <b>LCS2-R338227</b>				Units: <b>mg/L</b>		Analysis Date: <b>2/15/2022 11:29 AM</b>		
Client ID:		Run ID: <b>GALLERY_220215A</b>			SeqNo: <b>8175306</b>		Prep Date:		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	48.57	1.0	50	0	97.1	95-118	0			

LCS2		Sample ID: <b>LCS2-R338227</b>				Units: <b>mg/L</b>		Analysis Date: <b>2/15/2022 02:15 PM</b>		
Client ID:		Run ID: <b>GALLERY_220215A</b>			SeqNo: <b>8175704</b>		Prep Date:		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	50.74	1.0	50	0	101	95-118	0			

**The following samples were analyzed in this batch:**      22020766-01B

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Lambda Energy Resources  
**Project:** Lambda (Hartland 36 Gas Plant)  
**WorkOrder:** 22020766

**QUALIFIERS,  
ACRONYMS, UNITS**

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCS D	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<u>Units Reported</u>	<u>Description</u>
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter

Sample Receipt Checklist

Client Name: LAMBDA-KAL

Date/Time Received: 10-Feb-22 23:00

Work Order: 22020766

Received by: DS

Checklist completed by Diane Shaw 11-Feb-22  
eSignature Date

Reviewed by: Gary Byar 14-Feb-22  
eSignature Date

Matrices: Groundwater

Carrier name: Courier

Shipping container/cooler in good condition? Yes  No  Not Present

Custody seals intact on shipping container/cooler? Yes  No  Not Present

Custody seals intact on sample bottles? Yes  No  Not Present

Chain of custody present? Yes  No

Chain of custody signed when relinquished and received? Yes  No

Chain of custody agrees with sample labels? Yes  No

Samples in proper container/bottle? Yes  No

Sample containers intact? Yes  No

Sufficient sample volume for indicated test? Yes  No

All samples received within holding time? Yes  No

Container/Temp Blank temperature in compliance? Yes  No

Sample(s) received on ice? Yes  No

Temperature(s)/Thermometer(s): 2.7/3.7 c IR3

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage: 2/11/2022 9:37:22 AM

Water - VOA vials have zero headspace? Yes  No  No VOA vials submitted

Water - pH acceptable upon receipt? Yes  No  N/A

pH adjusted? Yes  No  N/A

pH adjusted by:

Login Notes:

-----

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:



Cincinnati, OH  
+1 513 733 5336

Fort Collins, CO  
+1 970 490 1511

Everett, WA  
+1 425 356 2600

Holland, MI  
+1 616 399 6070

# Chain of Custody Form

Houston, TX  
+1 281 530 5656

Spring City, PA  
+1 610 948 4903

South Charleston, WV  
+1 304 356 3168

Middletown, PA  
+1 717 944 5541

Salt Lake City, UT  
+1 801 266 7700

York, PA  
+1 717 505 5280

Page \_\_\_\_ of \_\_\_\_

COC ID: **051447**

ALS Project Manager:

ALS Work Order #: **22020766**

Customer Information		Project Information		Parameter/Method Request for Analysis												
Purchase Order		Project Name	Hartland 36 Gas Plant	A	Sulfolane (1) Amber Liter											
Work Order		Project Number		B	Sulfate (1) 125ml Poly											
Company Name	ECT, Inc.	Bill To Company	LAMBDA ENERGY	C												
Send Report To	Jeremy - Lewandowski	Invoice Attn	Nick Summerland	D												
Address	3399 Veterans Dr.	Address	1510 Thomas Rd.	E												
				F												
City/State/Zip	Traverse City, MI 49654	City/State/Zip	Kalkaska, MI 49646	G												
Phone	231-946-8200	Phone	231-258-6411	H												
Fax	231-946-8208	Fax		I												
e-Mail Address	jlewandowski@ectinc.com	e-Mail Address	Michigan-invoices@lambdaenergyllc.com	J												

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-13d	2/10/22	15:05	GW	-	2	X	X									
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign <i>Ty Martin</i>		Shipment Method		Turnaround Time in Business Days (BD) <input type="checkbox"/> 10 BD <input checked="" type="checkbox"/> 5 BD <input type="checkbox"/> 3 BD <input type="checkbox"/> 2 BD <input type="checkbox"/> 1 BD				Results Due Date:							
Relinquished by: <i>Ty Martin</i>	Date: 2/10/22	Time: 1530	Received by: <i>[Signature]</i>		Notes:				Cooler ID 1R3						
Relinquished by: <i>[Signature]</i>	Date: 2/10/22	Time: 1700	Received by (Laboratory): <i>[Signature]</i>		Cooler Temp. 2.7°C				QC Package: (Check One Box Below)						
Logged by (Laboratory): <i>DES</i>	Date: 2/11/22	Time: 0915	Checked by (La): <i>GRB</i>		<input checked="" type="checkbox"/> Level II Std QC <input type="checkbox"/> TRRP Checklist <input type="checkbox"/> Level III Std QC/Raw Date <input type="checkbox"/> TRRP Level IV <input type="checkbox"/> Level IV SW846/CLP <input type="checkbox"/> Other				pH31						
Preservative Key: 1-HCl 2-HNO <sub>3</sub> 3-H <sub>2</sub> SO <sub>4</sub> 4-NaOH 5-Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> 6-NaHSO <sub>4</sub> 7-Other 8-4°C 9-5035															

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.  
 2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.  
 3. The Chain of Custody is a legal document. All information must be completed accurately.



18-Apr-2022

Nick Summerland  
Lambda Energy Resources  
1510 Thomas Rd  
Kalkaska, MI 49646

Re: **Lambda (Hartland 36 Gas Plant)**

Work Order: **22040216**

Dear Nick,

ALS Environmental received 14 samples on 04-Apr-2022 10:30 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 26.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA  
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

A handwritten signature in black ink, appearing to read "G. Byar".

Electronically approved by: Gary Byar

Gary Byar  
Project Manager

## Report of Laboratory Analysis

Certificate No: MI: 0022

ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

Environmental 

[www.alsglobal.com](http://www.alsglobal.com)

RIGHT SOLUTIONS RIGHT PARTNER

**Client:** Lambda Energy Resources  
**Project:** Lambda (Hartland 36 Gas Plant)  
**Work Order:** 22040216

**Work Order Sample Summary**

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
22040216-01	MW-13s	Groundwater		3/31/2022 08:40	4/4/2022 22:30	<input type="checkbox"/>
22040216-02	MW-13d	Groundwater		3/31/2022 09:50	4/4/2022 22:30	<input type="checkbox"/>
22040216-03	MW-17s	Groundwater		3/31/2022 10:50	4/4/2022 22:30	<input type="checkbox"/>
22040216-04	MW-17d	Groundwater		3/31/2022 11:45	4/4/2022 22:30	<input type="checkbox"/>
22040216-05	MW-14d	Groundwater		3/31/2022 12:40	4/4/2022 22:30	<input type="checkbox"/>
22040216-06	MW-14s	Groundwater		3/31/2022 13:30	4/4/2022 22:30	<input type="checkbox"/>
22040216-07	MW-20s	Groundwater		3/31/2022 14:20	4/4/2022 22:30	<input type="checkbox"/>
22040216-08	MW-20d	Groundwater		3/31/2022 15:15	4/4/2022 22:30	<input type="checkbox"/>
22040216-09	MW-15d	Groundwater		4/1/2022 10:15	4/4/2022 22:30	<input type="checkbox"/>
22040216-10	MW-18	Groundwater		4/1/2022 09:05	4/4/2022 22:30	<input type="checkbox"/>
22040216-11	MW-19s	Groundwater		4/1/2022 11:20	4/4/2022 22:30	<input type="checkbox"/>
22040216-12	MW-19d	Groundwater		4/1/2022 12:15	4/4/2022 22:30	<input type="checkbox"/>
22040216-13	MW-7s	Groundwater		4/1/2022 13:20	4/4/2022 22:30	<input type="checkbox"/>
22040216-14	MW-7d	Groundwater		4/1/2022 14:15	4/4/2022 22:30	<input type="checkbox"/>



**ALS Group, USA**

Date: 18-Apr-2022

**Client:** Lambda Energy Resources  
**Project:** Lambda (Hartland 36 Gas Plant)  
**Sample ID:** MW-13s  
**Collection Date:** 3/31/2022 08:40 AM

**Work Order:** 22040216  
**Lab ID:** 22040216-01  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW846 8270D</b>	Prep: SW3510 4/8/22 16:31		Analyst: <b>EEW</b>
Sulfolane	ND		10	µg/L	1	4/15/2022 06:23 PM
Surr: 2-Fluorobiphenyl	79.3	S	26-79	%REC	1	4/15/2022 06:23 PM
Surr: 4-Terphenyl-d14	88.2		43-106	%REC	1	4/15/2022 06:23 PM
Surr: Nitrobenzene-d5	78.7		29-80	%REC	1	4/15/2022 06:23 PM
<b>SULFATE</b>			<b>A4500-SO4 E-11</b>			Analyst: <b>AML</b>
Sulfate	190		4.0	mg/L	4	4/6/2022 12:26 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group, USA**

Date: 18-Apr-2022

**Client:** Lambda Energy Resources  
**Project:** Lambda (Hartland 36 Gas Plant)  
**Sample ID:** MW-13d  
**Collection Date:** 3/31/2022 09:50 AM

**Work Order:** 22040216  
**Lab ID:** 22040216-02  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW846 8270D</b>	Prep: SW3510 4/8/22 16:31		Analyst: <b>EEW</b>
Sulfolane	ND		10	µg/L	1	4/15/2022 06:46 PM
Surr: 2-Fluorobiphenyl	82.4	S	26-79	%REC	1	4/15/2022 06:46 PM
Surr: 4-Terphenyl-d14	98.8		43-106	%REC	1	4/15/2022 06:46 PM
Surr: Nitrobenzene-d5	75.3		29-80	%REC	1	4/15/2022 06:46 PM
<b>SULFATE</b>			<b>A4500-SO4 E-11</b>			Analyst: <b>AML</b>
Sulfate	600		10	mg/L	10	4/6/2022 12:34 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group, USA**

Date: 18-Apr-2022

**Client:** Lambda Energy Resources  
**Project:** Lambda (Hartland 36 Gas Plant)  
**Sample ID:** MW-17s  
**Collection Date:** 3/31/2022 10:50 AM

**Work Order:** 22040216  
**Lab ID:** 22040216-03  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW846 8270D</b>	Prep: SW3510 4/8/22 16:31		Analyst: <b>EEW</b>
Sulfolane	ND		10	µg/L	1	4/15/2022 07:09 PM
Surr: 2-Fluorobiphenyl	83.3	S	26-79	%REC	1	4/15/2022 07:09 PM
Surr: 4-Terphenyl-d14	101		43-106	%REC	1	4/15/2022 07:09 PM
Surr: Nitrobenzene-d5	79.0		29-80	%REC	1	4/15/2022 07:09 PM
<b>SULFATE</b>			<b>A4500-SO4 E-11</b>			Analyst: <b>AML</b>
Sulfate	40		1.0	mg/L	1	4/6/2022 12:17 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group, USA**

Date: 18-Apr-2022

**Client:** Lambda Energy Resources  
**Project:** Lambda (Hartland 36 Gas Plant)  
**Sample ID:** MW-17d  
**Collection Date:** 3/31/2022 11:45 AM

**Work Order:** 22040216  
**Lab ID:** 22040216-04  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW846 8270D</b>	Prep: SW3510 4/8/22 16:31		Analyst: <b>EEW</b>
Sulfolane	ND		9.9	µg/L	1	4/15/2022 07:31 PM
Surr: 2-Fluorobiphenyl	86.4	S	26-79	%REC	1	4/15/2022 07:31 PM
Surr: 4-Terphenyl-d14	98.3		43-106	%REC	1	4/15/2022 07:31 PM
Surr: Nitrobenzene-d5	81.4	S	29-80	%REC	1	4/15/2022 07:31 PM
<b>SULFATE</b>			<b>A4500-SO4 E-11</b>			Analyst: <b>AML</b>
Sulfate	200		4.0	mg/L	4	4/6/2022 12:28 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**Client:** Lambda Energy Resources  
**Project:** Lambda (Hartland 36 Gas Plant)  
**Sample ID:** MW-14d  
**Collection Date:** 3/31/2022 12:40 PM

**Work Order:** 22040216  
**Lab ID:** 22040216-05  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW846 8270D</b>	Prep: SW3510 4/8/22 16:31		Analyst: <b>EEW</b>
Sulfolane	ND		10	µg/L	1	4/15/2022 07:54 PM
Surr: 2-Fluorobiphenyl	81.3	S	26-79	%REC	1	4/15/2022 07:54 PM
Surr: 4-Terphenyl-d14	95.8		43-106	%REC	1	4/15/2022 07:54 PM
Surr: Nitrobenzene-d5	74.6		29-80	%REC	1	4/15/2022 07:54 PM
<b>SULFATE</b>			<b>A4500-SO4 E-11</b>			Analyst: <b>AML</b>
Sulfate	53		1.0	mg/L	1	4/6/2022 12:17 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group, USA**

Date: 18-Apr-2022

**Client:** Lambda Energy Resources  
**Project:** Lambda (Hartland 36 Gas Plant)  
**Sample ID:** MW-14s  
**Collection Date:** 3/31/2022 01:30 PM

**Work Order:** 22040216  
**Lab ID:** 22040216-06  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW846 8270D</b>	Prep: SW3510 4/8/22 16:31		Analyst: <b>EEW</b>
Sulfolane	ND		9.8	µg/L	1	4/15/2022 08:17 PM
Surr: 2-Fluorobiphenyl	88.9	S	26-79	%REC	1	4/15/2022 08:17 PM
Surr: 4-Terphenyl-d14	98.9		43-106	%REC	1	4/15/2022 08:17 PM
Surr: Nitrobenzene-d5	82.4	S	29-80	%REC	1	4/15/2022 08:17 PM
<b>SULFATE</b>			<b>A4500-SO4 E-11</b>			Analyst: <b>AML</b>
Sulfate	35		1.0	mg/L	1	4/6/2022 12:18 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**Client:** Lambda Energy Resources  
**Project:** Lambda (Hartland 36 Gas Plant)  
**Sample ID:** MW-20s  
**Collection Date:** 3/31/2022 02:20 PM

**Work Order:** 22040216  
**Lab ID:** 22040216-07  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW846 8270D</b>	Prep: SW3510 4/8/22 16:31		Analyst: <b>EEW</b>
Sulfolane	ND		10	µg/L	1	4/15/2022 08:40 PM
Surr: 2-Fluorobiphenyl	74.1		26-79	%REC	1	4/15/2022 08:40 PM
Surr: 4-Terphenyl-d14	84.0		43-106	%REC	1	4/15/2022 08:40 PM
Surr: Nitrobenzene-d5	69.7		29-80	%REC	1	4/15/2022 08:40 PM
<b>SULFATE</b>			<b>A4500-SO4 E-11</b>			Analyst: <b>AML</b>
Sulfate	100		4.0	mg/L	4	4/6/2022 12:30 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group, USA**

Date: 18-Apr-2022

**Client:** Lambda Energy Resources  
**Project:** Lambda (Hartland 36 Gas Plant)  
**Sample ID:** MW-20d  
**Collection Date:** 3/31/2022 03:15 PM

**Work Order:** 22040216  
**Lab ID:** 22040216-08  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW846 8270D</b>	Prep: SW3510 4/8/22 16:31		Analyst: <b>EEW</b>
Sulfolane	ND		9.9	µg/L	1	4/15/2022 09:03 PM
Surr: 2-Fluorobiphenyl	87.3	S	26-79	%REC	1	4/15/2022 09:03 PM
Surr: 4-Terphenyl-d14	101		43-106	%REC	1	4/15/2022 09:03 PM
Surr: Nitrobenzene-d5	80.8	S	29-80	%REC	1	4/15/2022 09:03 PM
<b>SULFATE</b>			<b>A4500-SO4 E-11</b>			Analyst: <b>AML</b>
Sulfate	72		1.0	mg/L	1	4/6/2022 12:19 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.



**Client:** Lambda Energy Resources  
**Project:** Lambda (Hartland 36 Gas Plant)  
**Sample ID:** MW-15d  
**Collection Date:** 4/1/2022 10:15 AM

**Work Order:** 22040216  
**Lab ID:** 22040216-09  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW846 8270D</b>	Prep: SW3510 4/8/22 16:31		Analyst: <b>EEW</b>
Sulfolane	ND		9.9	µg/L	1	4/15/2022 09:25 PM
Surr: 2-Fluorobiphenyl	84.2	S	26-79	%REC	1	4/15/2022 09:25 PM
Surr: 4-Terphenyl-d14	96.1		43-106	%REC	1	4/15/2022 09:25 PM
Surr: Nitrobenzene-d5	80.9	S	29-80	%REC	1	4/15/2022 09:25 PM
<b>SULFATE</b>			<b>A4500-SO4 E-11</b>			Analyst: <b>AML</b>
Sulfate	34		1.0	mg/L	1	4/6/2022 12:20 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group, USA**

Date: 18-Apr-2022

**Client:** Lambda Energy Resources  
**Project:** Lambda (Hartland 36 Gas Plant)  
**Sample ID:** MW-18  
**Collection Date:** 4/1/2022 09:05 AM

**Work Order:** 22040216  
**Lab ID:** 22040216-10  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW846 8270D</b>	Prep: SW3510 4/8/22 16:31		Analyst: <b>EEW</b>
Sulfolane	ND		9.7	µg/L	1	4/15/2022 09:49 PM
Surr: 2-Fluorobiphenyl	88.6	S	26-79	%REC	1	4/15/2022 09:49 PM
Surr: 4-Terphenyl-d14	95.2		43-106	%REC	1	4/15/2022 09:49 PM
Surr: Nitrobenzene-d5	81.7	S	29-80	%REC	1	4/15/2022 09:49 PM
<b>SULFATE</b>			<b>A4500-SO4 E-11</b>			Analyst: <b>AML</b>
Sulfate	55		1.0	mg/L	1	4/6/2022 12:20 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**Client:** Lambda Energy Resources  
**Project:** Lambda (Hartland 36 Gas Plant)  
**Sample ID:** MW-19s  
**Collection Date:** 4/1/2022 11:20 AM

**Work Order:** 22040216  
**Lab ID:** 22040216-11  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW846 8270D</b>	Prep: SW3510 4/8/22 16:31		Analyst: <b>EEW</b>
Sulfolane	ND		10	µg/L	1	4/15/2022 10:11 PM
Surr: 2-Fluorobiphenyl	86.2	S	26-79	%REC	1	4/15/2022 10:11 PM
Surr: 4-Terphenyl-d14	97.3		43-106	%REC	1	4/15/2022 10:11 PM
Surr: Nitrobenzene-d5	80.0	S	29-80	%REC	1	4/15/2022 10:11 PM
<b>SULFATE</b>			<b>A4500-SO4 E-11</b>			Analyst: <b>AML</b>
Sulfate	89		1.0	mg/L	1	4/6/2022 12:20 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group, USA**

Date: 18-Apr-2022

**Client:** Lambda Energy Resources  
**Project:** Lambda (Hartland 36 Gas Plant)  
**Sample ID:** MW-19d  
**Collection Date:** 4/1/2022 12:15 PM

**Work Order:** 22040216  
**Lab ID:** 22040216-12  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW846 8270D</b>	Prep: SW3510 4/8/22 16:31		Analyst: <b>EEW</b>
Sulfolane	ND		10	µg/L	1	4/15/2022 10:34 PM
Surr: 2-Fluorobiphenyl	84.1	S	26-79	%REC	1	4/15/2022 10:34 PM
Surr: 4-Terphenyl-d14	102		43-106	%REC	1	4/15/2022 10:34 PM
Surr: Nitrobenzene-d5	81.0	S	29-80	%REC	1	4/15/2022 10:34 PM
<b>SULFATE</b>			<b>A4500-SO4 E-11</b>			Analyst: <b>AML</b>
Sulfate	110		4.0	mg/L	4	4/6/2022 12:32 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**Client:** Lambda Energy Resources  
**Project:** Lambda (Hartland 36 Gas Plant)  
**Sample ID:** MW-7s  
**Collection Date:** 4/1/2022 01:20 PM

**Work Order:** 22040216  
**Lab ID:** 22040216-13  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW846 8270D</b>	Prep: SW3510 4/8/22 16:31		Analyst: <b>EEW</b>
Sulfolane	ND		10	µg/L	1	4/15/2022 10:57 PM
Surr: 2-Fluorobiphenyl	87.2	S	26-79	%REC	1	4/15/2022 10:57 PM
Surr: 4-Terphenyl-d14	104		43-106	%REC	1	4/15/2022 10:57 PM
Surr: Nitrobenzene-d5	83.7	S	29-80	%REC	1	4/15/2022 10:57 PM
<b>SULFATE</b>			<b>A4500-SO4 E-11</b>			Analyst: <b>AML</b>
Sulfate	23		1.0	mg/L	1	4/6/2022 12:23 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**Client:** Lambda Energy Resources  
**Project:** Lambda (Hartland 36 Gas Plant)  
**Sample ID:** MW-7d  
**Collection Date:** 4/1/2022 02:15 PM

**Work Order:** 22040216  
**Lab ID:** 22040216-14  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW846 8270D</b>	Prep: SW3510 4/8/22 16:31		Analyst: <b>EEW</b>
Sulfolane	ND		10	µg/L	1	4/15/2022 11:20 PM
Surr: 2-Fluorobiphenyl	82.9	S	26-79	%REC	1	4/15/2022 11:20 PM
Surr: 4-Terphenyl-d14	95.4		43-106	%REC	1	4/15/2022 11:20 PM
Surr: Nitrobenzene-d5	76.3		29-80	%REC	1	4/15/2022 11:20 PM
<b>SULFATE</b>			<b>A4500-SO4 E-11</b>			Analyst: <b>AML</b>
Sulfate	27		1.0	mg/L	1	4/6/2022 12:23 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

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**Client:** Lambda Energy Resources  
**Project:** Lambda (Hartland 36 Gas Plant)  
**Work Order:** 22040216

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**Case Narrative**

Batch 194365, Method SW846 8270D, Sample MW-13s (22040216-01B): One or more surrogate recoveries were above the upper control limits. The sample was non-detect, therefore, no qualification is needed. 2-Fluorobiphenyl

Batch 194365, Method SW846 8270D, Sample MW-13d (22040216-02B): One or more surrogate recoveries were above the upper control limits. The sample was non-detect, therefore, no qualification is needed. 2-Fluorobiphenyl

Batch 194365, Method SW846 8270D, Sample MW-17s (22040216-03B): One or more surrogate recoveries were above the upper control limits. The sample was non-detect, therefore, no qualification is needed. 2-Fluorobiphenyl

Batch 194365, Method SW846 8270D, Sample MW-17d (22040216-04B): One or more surrogate recoveries were above the upper control limits. The sample was non-detect, therefore, no qualification is needed. 2-Fluorobiphenyl; Nitrobenzne-d5

Batch 194365, Method SW846 8270D, Sample MW-14d (22040216-05B): One or more surrogate recoveries were above the upper control limits. The sample was non-detect, therefore, no qualification is needed. 2-Fluorobiphenyl

Batch 194365, Method SW846 8270D, Sample MW-14s (22040216-06B): One or more surrogate recoveries were above the upper control limits. The sample was non-detect, therefore, no qualification is needed. 2-Fluorobiphenyl; Nitrobenzne-d5

Batch 194365, Method SW846 8270D, Sample MW-20d (22040216-08B): One or more surrogate recoveries were above the upper control limits. The sample was non-detect, therefore, no qualification is needed. 2-Fluorobiphenyl; Nitrobenzne-d5

Batch 194365, Method SW846 8270D, Sample MW-15d (22040216-09B): One or more surrogate recoveries were above the upper control limits. The sample was non-detect, therefore, no qualification is needed. 2-Fluorobiphenyl; Nitrobenzne-d5

Batch 194365, Method SW846 8270D, Sample MW-18 (22040216-10B): One or more surrogate recoveries were above the upper control limits. The sample was non-detect, therefore, no qualification is needed. 2-Fluorobiphenyl; Nitrobenzne-d5

Batch 194365, Method SW846 8270D, Sample MW-19s (22040216-11B): One or more

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**Client:** Lambda Energy Resources  
**Project:** Lambda (Hartland 36 Gas Plant)  
**Work Order:** 22040216

**Case Narrative**

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surrogate recoveries were above the upper control limits. The sample was non-detect, therefore, no qualification is needed. 2-Fluorobiphenyl; Nitrobenzne-d5

Batch 194365, Method SW846 8270D, Sample MW-19d (22040216-12B): One or more surrogate recoveries were above the upper control limits. The sample was non-detect, therefore, no qualification is needed. 2-Fluorobiphenyl; Nitrobenzne-d5

Batch 194365, Method SW846 8270D, Sample MW-7s (22040216-13B): One or more surrogate recoveries were above the upper control limits. The sample was non-detect, therefore, no qualification is needed. 2-Fluorobiphenyl; Nitrobenzne-d5

Batch 194365, Method SW846 8270D, Sample MW-7d (22040216-14B): One or more surrogate recoveries were above the upper control limits. The sample was non-detect, therefore, no qualification is needed. 2-Fluorobiphenyl

Batch R341503, Method A4500-SO4 E-11, Sample 22040244-02A MSD: MSD is for an unrelated sample

Batch R341503, Method A4500-SO4 E-11, Sample 22040216-14A MSD: The MS recovery was below the lower control limit. The corresponding result in the parent sample may be biased low for this analyte:



**Client:** Lambda Energy Resources  
**Work Order:** 22040216  
**Project:** Lambda (Hartland 36 Gas Plant)

**QC BATCH REPORT**

Batch ID: **194365** Instrument ID **SVMS9** Method: **SW846 8270D**

MBLK		Sample ID: <b>SBLKW1-194365-194365</b>				Units: <b>µg/L</b>		Analysis Date: <b>4/15/2022 05:14 PM</b>			
Client ID:		Run ID: <b>SVMS9_220415A</b>				SeqNo: <b>8334860</b>		Prep Date: <b>4/8/2022</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Sulfolane	ND	10									
<i>Surr: 2-Fluorobiphenyl</i>	37.9	0	50	0	75.8	26-79	0				
<i>Surr: 4-Terphenyl-d14</i>	46.93	0	50	0	93.9	43-106	0				
<i>Surr: Nitrobenzene-d5</i>	38.34	0	50	0	76.7	29-80	0				

LCS		Sample ID: <b>SLCSW1-194365-194365</b>				Units: <b>µg/L</b>		Analysis Date: <b>4/15/2022 05:37 PM</b>			
Client ID:		Run ID: <b>SVMS9_220415A</b>				SeqNo: <b>8334861</b>		Prep Date: <b>4/8/2022</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Sulfolane	65.7	10	100	0	65.7	30-100	0				
<i>Surr: 2-Fluorobiphenyl</i>	39.69	0	50	0	79.4	26-79	0			S	
<i>Surr: 4-Terphenyl-d14</i>	46.84	0	50	0	93.7	43-106	0				
<i>Surr: Nitrobenzene-d5</i>	38.97	0	50	0	77.9	29-80	0				

LCSD		Sample ID: <b>SLCSDW1-194365-194365</b>				Units: <b>µg/L</b>		Analysis Date: <b>4/15/2022 06:00 PM</b>			
Client ID:		Run ID: <b>SVMS9_220415A</b>				SeqNo: <b>8334862</b>		Prep Date: <b>4/8/2022</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Sulfolane	66.51	10	100	0	66.5	30-100	65.7	1.23	30		
<i>Surr: 2-Fluorobiphenyl</i>	37.91	0	50	0	75.8	26-79	39.69	4.59	40		
<i>Surr: 4-Terphenyl-d14</i>	47.43	0	50	0	94.9	43-106	46.84	1.25	40		
<i>Surr: Nitrobenzene-d5</i>	38.31	0	50	0	76.6	29-80	38.97	1.71	40		

The following samples were analyzed in this batch:

22040216-01B	22040216-02B	22040216-03B
22040216-04B	22040216-05B	22040216-06B
22040216-07B	22040216-08B	22040216-09B
22040216-10B	22040216-11B	22040216-12B
22040216-13B	22040216-14B	

Client: Lambda Energy Resources  
 Work Order: 22040216  
 Project: Lambda (Hartland 36 Gas Plant)

# QC BATCH REPORT

Batch ID: **R341503** Instrument ID **GALLERY** Method: **A4500-SO4 E-11**

MBLK		Sample ID: <b>MBLK-R341503</b>				Units: <b>mg/L</b>		Analysis Date: <b>4/6/2022 12:23 PM</b>		
Client ID:		Run ID: <b>GALLERY_220406A</b>				SeqNo: <b>8301554</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	ND	1.0								

MS		Sample ID: <b>22040244-02A MS</b>				Units: <b>mg/L</b>		Analysis Date: <b>4/6/2022 12:14 PM</b>		
Client ID:		Run ID: <b>GALLERY_220406A</b>				SeqNo: <b>8301525</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	71.73	1.0	50	23.06	97.3	95-118	0			

MS		Sample ID: <b>22040216-14A MS</b>				Units: <b>mg/L</b>		Analysis Date: <b>4/6/2022 12:24 PM</b>		
Client ID: <b>MW-7d</b>		Run ID: <b>GALLERY_220406A</b>				SeqNo: <b>8301558</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	74.67	1.0	50	26.57	96.2	95-118	0			

MSD		Sample ID: <b>22040244-02A MSD</b>				Units: <b>mg/L</b>		Analysis Date: <b>4/6/2022 12:15 PM</b>		
Client ID:		Run ID: <b>GALLERY_220406A</b>				SeqNo: <b>8301528</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	68.67	1.0	50	23.06	91.2	95-118	71.73	4.36	10	S

MSD		Sample ID: <b>22040216-14A MSD</b>				Units: <b>mg/L</b>		Analysis Date: <b>4/6/2022 12:25 PM</b>		
Client ID: <b>MW-7d</b>		Run ID: <b>GALLERY_220406A</b>				SeqNo: <b>8301559</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	73.44	1.0	50	26.57	93.7	95-118	74.67	1.66	10	S

LCS1		Sample ID: <b>LCS1-R341503</b>				Units: <b>mg/L</b>		Analysis Date: <b>4/6/2022 12:22 PM</b>		
Client ID:		Run ID: <b>GALLERY_220406A</b>				SeqNo: <b>8301552</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	10.22	1.0	10	0	102	90-119	0			

LCS2		Sample ID: <b>LCS2-R341503</b>				Units: <b>mg/L</b>		Analysis Date: <b>4/6/2022 12:11 PM</b>		
Client ID:		Run ID: <b>GALLERY_220406A</b>				SeqNo: <b>8301515</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	50.77	1.0	50	0	102	95-118	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Lambda Energy Resources  
**Work Order:** 22040216  
**Project:** Lambda (Hartland 36 Gas Plant)

## QC BATCH REPORT

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Batch ID: **R341503**      Instrument ID **GALLERY**      Method: **A4500-SO4 E-11**

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**The following samples were analyzed in this batch:**

22040216-01A	22040216-02A	22040216-03A
22040216-04A	22040216-05A	22040216-06A
22040216-07A	22040216-08A	22040216-09A
22040216-10A	22040216-11A	22040216-12A
22040216-13A	22040216-14A	

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**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

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**Client:** Lambda Energy Resources  
**Project:** Lambda (Hartland 36 Gas Plant)  
**WorkOrder:** 22040216

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**QUALIFIERS,  
ACRONYMS, UNITS**

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Analyte accreditation is not offered
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<u>Units Reported</u>	<u>Description</u>
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter

Sample Receipt Checklist

Client Name: LAMBDA-KAL

Date/Time Received: 04-Apr-22 22:30

Work Order: 22040216

Received by: LYS

Checklist completed by Lydia Sweet 05-Apr-22  
eSignature Date

Reviewed by: Gary Byar 06-Apr-22  
eSignature Date

Matrices: Water

Carrier name: Courier

Shipping container/cooler in good condition? Yes  No  Not Present

Custody seals intact on shipping container/cooler? Yes  No  Not Present

Custody seals intact on sample bottles? Yes  No  Not Present

Chain of custody present? Yes  No

Chain of custody signed when relinquished and received? Yes  No

Chain of custody agrees with sample labels? Yes  No

Samples in proper container/bottle? Yes  No

Sample containers intact? Yes  No

Sufficient sample volume for indicated test? Yes  No

All samples received within holding time? Yes  No

Container/Temp Blank temperature in compliance? Yes  No

Sample(s) received on ice? Yes  No

Temperature(s)/Thermometer(s): 2.3/3.3, 4.0/5.0, 4.1/5.1c IR3

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage: 4/5/2022 9:17:46 AM

Water - VOA vials have zero headspace? Yes  No  No VOA vials submitted

Water - pH acceptable upon receipt? Yes  No  N/A

pH adjusted? Yes  No  N/A

pH adjusted by:

Login Notes:

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Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:



# Chain of Custody Form

Page 1 of 2

22040216

ECT - TC: ECT Inc.  
Project: ECT - Hartland 36 Gas Plant



ALS Project Manager: Bill Carey

Customer Information		Project Information				Parameter/Method Request for Analysis										
Purchase Order		Project Name	Hartland 36 Gas Plant			A	Sulfolane									
Work Order		Project Number				B	Sulfate									
Company Name	ECT Inc.	Bill To Company	LAMBDA Energy			C										
Send Report To	Jeremy Lewandowski	Invoice Attn.	Nick Summerland			D										
Address	3399 Veterans Dr.	Address	1510 Thomas Rd.			E										
							F									
City/State/Zip	Traverse City, MI 49684	City/State/Zip	Kalkaska, MI 49646			G										
Phone	231-946-8200	Phone	231-258-6411			H										
Fax	231-946-8208	Fax	michigan-invoices@lambdaenergyllc.com			J										
e-Mail Address	j.lewandowski@ectinc.com															

No.	Sample Description	Date	Time	Matrix	Pres. Key Numbers	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-13s	3-31-22	8:40	GW	-	2	X	X									
2	MW-13d	3-31-22	9:50	GW	-	2	X	X									
3	MW-17s	3-31-22	10:50	GW	-	2	X	X									
4	MW-17d	3-31-22	11:45	GW	-	2	X	X									
5	MW-14d	3-31-22	12:40	GW	-	2	X	X									
6	MW-14s	3-31-22	13:30	GW	-	2	X	X									
7	MW-20s	3-31-22	14:20	GW	-	2	X	X									
8	MW-20d	3-31-22	15:15	GW	-	2	X	X									
9	MW-15d	4-1-22	10:15	GW	-	2	X	X									
10	MW-18	4-1-22	9:05	GW	-	2	X	X									

Sampler(s): Please Print & Sign Ty Martin Ty Martin Shipment Method: ECT to Lab Turnaround Time: (Business Days)  10 BD  5 BD  3 BD  2 BD  1 BD  Other \_\_\_\_\_ Results Due Date: \_\_\_\_\_

Relinquished by: Ty Martin (ECT) Date: 4/4/22 Time: 1429 Received by: [Signature] Date: 4/4/22 Time: 1429 Notes: \_\_\_\_\_

Relinquished by: [Signature] Date: 4/4/22 Time: 1700 Received by (Laboratory): [Signature] Date: 4/4/22 Time: 2230 ALS Cooler ID: 1R3 Cooler Temp: 2.3 QC Package: (Check Box Below)  Level II: Standard QC  Level III: Raw Data

Logged by (Laboratory): [Signature] Date: 4/5/22 Time: 0854 Checked by (Laboratory): [Signature] ALS Cooler ID: pt32 Cooler Temp: 4.0 4.1  TRRP LRC  TRRP Level IV  Level IV: SW846 Methods/CLP like  Other: \_\_\_\_\_

Preservative Key: 1-HCl 2-HNO<sub>3</sub> 3-H<sub>2</sub>SO<sub>4</sub> 4-NaOH 5-Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> 6-NaHSO<sub>4</sub> 7-Other 8-4°C Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS.



# Chain of Custody Form

Page 2 of 2

22040216

ECT - TC: ECT, Inc.  
Project: ECT - Hartland 36 Gas Plant



ALS Project Manager: Bill Carey

Customer Information		Project Information				Parameter/Method Request for Analysis										
Purchase Order		Project Name	Hartland 36 Gas Plant			A	Sulfolane									
Work Order		Project Number				B	Sulfate									
Company Name	ECT Inc.	Bill To Company	LAMBDA ENERGY			C										
Send Report To	Jeremy Lewandowski	Invoice Attn.	Nick Summerland			D										
Address	3399 Veterans Dr.	Address	1510 Thomas Rd			E										
City/State/Zip	Traverse City, MI 49654	City/State/Zip	Kalkaska, MI 49646			F										
Phone	231-946-8200	Phone	231-258-6411			G										
Fax	231-946-8208	Fax	michigan-invoices@lambdaenergyllc.com			H										
e-Mail Address	jlewandowski@ectinc.com				J											

No.	Sample Description	Date	Time	Matrix	Pres. Key Numbers	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
11	MW-19s	4-1-22	11:20	GW	-	2	X	X									
12	MW-19d	4-1-22	12:15	GW	-	2	X	X									
13	MW-7s	4-1-22	13:20	GW	-	2	X	X									
14	MW-7d	4-1-22	14:15	GW	-	2	X	X									

Sampler(s): Please Print & Sign Ty Martin Ty Martin
 Shipment Method: ECT to lab
 Turnaround Time: (Business Days)  10 BD  5 BD  3 BD  2 BD  1 BD
  Other \_\_\_\_\_
 Results Due Date: \_\_\_\_\_

Relinquished by:	Date:	Time:	Received by:	Date:	Time:	Notes:			
<u>Ty Martin (ECT)</u>	<u>4/4/22</u>	<u>1429</u>	<u>[Signature]</u>	<u>4/4/22</u>	<u>1429</u>				
Relinquished by:	Date:	Time:	Received by (Laboratory):	Date:	Time:	ALS Cooler ID	Cooler Temp	QC Package: (Check Box Below)	
<u>[Signature]</u>	<u>4/4/22</u>	<u>1700</u>	<u>QS</u>	<u>4/4/22</u>	<u>2030</u>	<u>1R3</u>	<u>2.3</u>	<input checked="" type="checkbox"/> Level II: Standard QC	<input type="checkbox"/> Level III: Raw Data
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):						
<u>[Signature]</u>	<u>4/5/22</u>	<u>0854</u>	<u>GRB</u>						
						<u>pt32</u>	<u>4.0</u>	<input type="checkbox"/> TRRP LRC	<input type="checkbox"/> TRRP Level IV
							<u>4.1</u>	<input type="checkbox"/> Level IV: SW846 Methods/CLP like	<input type="checkbox"/> Other:

Preservative Key: 1-HCl 2-HNO<sub>3</sub> 3-H<sub>2</sub>SO<sub>4</sub> 4-NaOH 5-Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> 6-NaHSO<sub>4</sub> 7-Other 8-4°C
 Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS.



## APPENDIX D

# LOW-FLOW SAMPLING FIELD FORMS

CLIENT: **Lambda Energy**  
 LOCATION: **13390 Lone Tree Road**  
**Hartland Township, Michigan**  
 PROJECT: **130685.2000**

Monitoring Location: **Hartland #36**  
 Sample ID: **MW-13d**  
 Well Type: **2" PVC**

**INSPECTION**

Label on well? YES NO REMEDIED  
 Is reference mark visible? YES NO REMEDIED  
 Standing water present? YES NO REMEDIED  
 Indication of surface runoff in well? YES NO REMEDIED  
 Repair Notes:  
 Is cement pad in good repair? YES NO REMEDIED  
 Is protective casing locked and in good repair? YES NO REMEDIED  
 Is inner cap in place and properly sealing well? YES NO REMEDIED  
 Is well casing in visibly good repair? YES NO REMEDIED

**STATIC WATER LEVEL**

Date: 2/10/22 Time: 14:30  
 Top of Casing Elevation:  
 Depth to Water: 20.42 Measured with: ELECTRONIC TAPE CHALKED TAPE OTHER  
 Elevation of Water: \_\_\_\_\_ Well depth verified? YES NO

**WELL PURGING**

Purge Method: PERISTALTIC BLADDER OTHER \_\_\_\_\_ Date: 2/10/22 Start Time: 14:31  
 Measured Well Depth: 32.20 Screen Length: \_\_\_\_\_ Depth to Screen Midpoint: \_\_\_\_\_

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Cond. (umho/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
14:50	20.66	-.24	250	8.4	1.329	4.58	7.14	92.7	4.63
14:55	20.66	-.24	250	8.1	1.321	4.57	7.17	96.4	4.51
15:00	20.66	-.24	250	8.0	1.316	4.56	7.19	98.6	4.33
						7m			

Total Volume Purged (gal): 2 Stabilization Criteria: +/- 3% +/- 3% +/- 10% +/- 0.1 Units +/- 10 mV +/- 10% (if > 0.5 mg/l) (if > 5 NTU)

Stabilization Criteria Reference Doc. USEPA EQASOP-GW 001 Rev #3, January 19, 2010

**FIELD ANALYSIS**

Time: 15:00  
 Temperature: 8.0 deg. C  
 Specific Conductance: 1.316 umhos/cm  
 Dissolved Oxygen: 4.56 mg/L  
 pH: 7.19 S.U.  
 ORP: 98.6 mV  
 Turbidity: 4.33 NTU  
 CALIBRATION CHECK  
 Standard (conc.) Reading Mark if Recalibrated  
 Specific Cond.: \_\_\_\_\_ umhos/cm  
 Dissolved Oxygen: \_\_\_\_\_ mg/L  
 pH: \_\_\_\_\_ S.U.  
 Eh: \_\_\_\_\_ mV  
 Turbidity: \_\_\_\_\_ NTU

**SAMPLE COLLECTION**

Time: 15:05 Sample Duplicate?: NO  
 Appearance of Sample: clear, no odor, no sheen Sample Method: LF

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
1	1000 ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	Sulfolane
1	125 ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	Sulfate
		glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
		glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
		glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
		glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
		glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
		glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
		glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
		glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	

**SAMPLING PERSONNEL**

Name (SIGNATURE): \_\_\_\_\_ Chain of Custody No. \_\_\_\_\_  
 Name (SIGNATURE): \_\_\_\_\_

CLIENT: Merit Energy Co.  
 LOCATION: 13390 Lone Tree Road  
 Hartland Township, Michigan  
 PROJECT: 130685.2000

Monitoring Location: \_\_\_\_\_  
 Sample ID: MW- 7s  
 Well Type: 2" PVC

**INSPECTION**

Label on well?	YES NO REMEDIED	Is cement pad in good repair?	YES NO REMEDIED
Is reference mark visible?	YES NO REMEDIED	Is protective casing locked and in good repair?	YES NO REMEDIED
Standing water present?	YES NO REMEDIED	Is inner cap in place and properly sealing well?	YES NO REMEDIED
Indication of surface runoff in well?	YES NO REMEDIED	Is well casing in visibly good repair?	YES NO REMEDIED

**STATIC WATER LEVEL**

Date: 4-1-22 Time: 12:49  
 Top of Casing Elevation: \_\_\_\_\_  
 Depth to Water: 23.35'  
 Elevation of Water: \_\_\_\_\_  
 Measured with: ELECTRONIC TAPE CHALKED TAPE OTHER  
 Well depth verified? YES NO

**WELL PURGING**

Purge Method: PERISTALTIC BLADDER OTHER \_\_\_\_\_ Date: 4-1-22 Start Time: 12:50  
 Measured Well Depth: 33.00' Screen Length: \_\_\_\_\_ Depth to Screen Midpoint: \_\_\_\_\_

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Cond. (umho/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
13:05	23.40	-0.05	250	8.4	.426	11.74	7.16	87.6	1.62
13:10	23.40	-0.05	250	8.5	.431	11.80	7.17	89.4	1.46
13:15	23.40	-0.05	250	8.4	.434	11.84	7.17	91.2	1.43
Total Volume Purged (gal): 1.75 Stabilization Criteria: +/- 3% +/- 3% +/- 10% +/- 0.1 Units +/- 10 mV +/- 10% (if > 5 mg/l) (if > 5 NTU)									

Stabilization Criteria Reference Doc. USEPA EQASOP-GW 001 Rev #3, January 19, 2010

**FIELD ANALYSIS**

Time: 13:15	Temperature: 8.4 deg. C	Specific Conductance: .434 umhos/cm	Dissolved Oxygen: 11.84 mg/L	pH: 7.17 S.U.	ORP: 91.2 mV	Turbidity: 1.43 NTU
CALIBRATION CHECK		Standard (conc.)	Reading	Mark if Recalibrated		
Specific Cond.:			umhos/cm			
Dissolved Oxygen:			mg/L			
pH:			S.U.			
Eh:			mV			
Turbidity:			NTU			

**SAMPLE COLLECTION**

Time: 13:20 Sample Duplicate?: No  
 Appearance of Sample: Clear, no odor Sample Method: LF

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
1	1000 ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	Sulfolane
1	125 ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	Sulfate
		glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
		glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
		glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
		glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
		glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
		glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
		glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
		glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
		glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
		glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	

**SAMPLING PERSONNEL**

Name (SIGNATURE): [Signature] Chain of Custody No. \_\_\_\_\_  
 Name (SIGNATURE): \_\_\_\_\_

**CLIENT:** Merit Energy Co. **Monitoring Location:** \_\_\_\_\_  
**LOCATION:** 13390 Lone Tree Road **Sample ID:** MW- 7d  
**Hartland Township, Michigan** **Well Type:** 2" PVC  
**PROJECT:** 130685.2000

INSPECTION		
Label on well?	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/> REMEDIATED <input type="checkbox"/>
Is reference mark visible?	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/> REMEDIATED <input type="checkbox"/>
Standing water present?	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/> REMEDIATED <input type="checkbox"/>
Indication of surface runoff in well?	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/> REMEDIATED <input type="checkbox"/>
Repair Notes:		
Is cement pad in good repair?	YES <input type="checkbox"/>	NO <input type="checkbox"/> REMEDIATED <input type="checkbox"/>
Is protective casing locked and in good repair?	YES <input type="checkbox"/>	NO <input type="checkbox"/> REMEDIATED <input type="checkbox"/>
Is inner cap in place and properly sealing well?	YES <input type="checkbox"/>	NO <input type="checkbox"/> REMEDIATED <input type="checkbox"/>
Is well casing in visibly good repair?	YES <input type="checkbox"/>	NO <input type="checkbox"/> REMEDIATED <input type="checkbox"/>

**STATIC WATER LEVEL**  
 Date: 4-1-22 Time: 13:44  
 Top of Casing Elevation: \_\_\_\_\_  
 Depth to Water: 23.95  
 Measured with: ELECTRONIC TAPE CHALKED TAPE OTHER  
 Elevation of Water: \_\_\_\_\_ Well depth verified? YES  NO

**WELL PURGING**  
 Purge Method: PERISTALTIC BLADDER OTHER \_\_\_\_\_ Date: 4-1-22 Start Time: 13:45  
 Measured Well Depth: 48.50 Screen Length: \_\_\_\_\_ Depth to Screen Midpoint: \_\_\_\_\_

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Cond. (umho/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
14:00	23.96	0.01	250	8.6	507	10.39	7.98	196.2	6.84
14:05	23.96	0.01	250	8.4	508	10.33	7.99	199.6	6.76
14:10	23.96	0.01	250	8.4	510	10.29	7.99	203.4	6.24
Total Volume Purged (gal):	1.75		Stabilization Criteria:	+/- 3%	+/- 3%	+/- 10% (if > 0.5 mg/l)	+/- 0.1 Units	+/- 10 mV	+/- 10% (if > 5 NTU)

Stabilization Criteria Reference Doc. USEPA EQASOP-GW 001 Rev #3, January 19, 2010

**FIELD ANALYSIS**  
 Time: 14:10  
 Temperature: 8.4 deg. C  
 Specific Conductance: 510 umhos/cm  
 Dissolved Oxygen: 10.29 mg/L  
 pH: 7.99 S.U.  
 ORP: 203.4 mV  
 Turbidity: 6.24 NTU

CALIBRATION CHECK		Mark if
Standard (conc.)	Reading	Recalibrated
Specific Cond.: _____	umhos/cm	_____
Dissolved Oxygen: _____	mg/L	_____
pH: _____	S.U.	_____
Eh: _____	mV	_____
Turbidity: _____	NTU	_____

**SAMPLE COLLECTION**  
 Time: 14:15 Sample Duplicate?: NO  
 Appearance of Sample: Clear, no odor Sample Method: LF

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
1	1000 ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	Sulfolane
1	125 ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	Sulfate

**SAMPLING PERSONNEL**  
 Chain of Custody No. \_\_\_\_\_  
 Name (SIGNATURE): [Signature] Name (SIGNATURE): \_\_\_\_\_

**CLIENT:** Merit Energy Co. **Monitoring Location:** Hartland  
**LOCATION:** 13390 Lone Tree Road **Sample ID:** MW-135  
**Hartland Township, Michigan** **Well Type:** 2" PVC  
**PROJECT:** 130685.2000

**INSPECTION**

Label on well?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> REMEDIED <input type="checkbox"/>	Is cement pad in good repair?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> REMEDIED <input type="checkbox"/>
Is reference mark visible?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> REMEDIED <input type="checkbox"/>	Is protective casing locked and in good repair?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> REMEDIED <input type="checkbox"/>
Standing water present?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> REMEDIED <input type="checkbox"/>	Is inner cap in place and properly sealing well?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> REMEDIED <input type="checkbox"/>
Indication of surface runoff in well?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> REMEDIED <input type="checkbox"/>	Is well casing in visibly good repair?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> REMEDIED <input type="checkbox"/>

**STATIC WATER LEVEL**

Date: 3-31-22 Time: 8:09  
 Top of Casing Elevation: \_\_\_\_\_  
 Depth to Water: 20.20' Measured with: ELECTRONIC TAPE CHALKED TAPE OTHER \_\_\_\_\_  
 Elevation of Water: \_\_\_\_\_ Well depth verified? YES  NO

**WELL PURGING**

Purge Method: PERISTALTIC BLADDER OTHER \_\_\_\_\_ Date: 3-31-22 Start Time: 8:10  
 Measured Well Depth: 20.20 Screen Length: \_\_\_\_\_ Depth to Screen Midpoint: \_\_\_\_\_

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Cond. (umho/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
8:25	20.31	.11	250	8.3	1.251	7.13	7.80	114.1	2.84
8:30	20.31	.11	250	8.4	1.248	7.08	7.82	112.8	2.73
8:35	20.31	.11	250	8.3	1.245	7.05	7.82	111.4	2.71

Total Volume Purged (gal): 2 Stabilization Criteria: +/- 3% +/- 3% +/- 10% +/- 0.1 Units +/- 10 mV +/- 10% (if > 0.5 mg/l) (if > 5 NTU)  
 Stabilization Criteria Reference Doc. USEPA EQASOP-GW 001 Rev #3, January 19, 2010

**FIELD ANALYSIS**

Time: 8:35  
 Temperature: 8.3 deg. C  
 Specific Conductance: 1.245 umhos/cm  
 Dissolved Oxygen: 7.05 mg/L  
 pH: 7.82 S.U.  
 ORP: 111.4 mV  
 Turbidity: 2.71 NTU

CALIBRATION CHECK		Mark if Recalibrated
Standard (conc.)	Reading	
Specific Cond.: _____	_____ umhos/cm	_____
Dissolved Oxygen: _____	_____ mg/L	_____
pH: _____	_____ S.U.	_____
Eh: _____	_____ mV	_____
Turbidity: _____	_____ NTU	_____

**SAMPLE COLLECTION**

Time: 8:40 Sample Duplicate?: NO  
 Appearance of Sample: Clear, no odor Sample Method: LF

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
1	1000 ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	Sulfolane
1	125 ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	Sulfate

**SAMPLING PERSONNEL**

Chain of Custody No. \_\_\_\_\_  
 Name (SIGNATURE): [Signature] Name (SIGNATURE): \_\_\_\_\_

CLIENT: Merit Energy Co. Monitoring Location: Hartland  
LOCATION: 13390 Lone Tree Road Sample ID: MW-13d  
Hartland Township, Michigan Well Type: 2" PVC  
PROJECT: 130685.2000

INSPECTION	
Label on well?	YES NO REMEDIED
Is reference mark visible?	YES NO REMEDIED
Standing water present?	YES NO REMEDIED
Indication of surface runoff in well?	YES NO REMEDIED
Repair Notes:	
Is cement pad in good repair?	YES NO REMEDIED
Is protective casing locked and in good repair?	YES NO REMEDIED
Is inner cap in place and properly sealing well?	YES NO REMEDIED
Is well casing in visibly good repair?	YES NO REMEDIED

**STATIC WATER LEVEL**  
Date: 3-31-22 Time: 9:14  
Top of Casing Elevation: \_\_\_\_\_  
Depth to Water: 19.04' Measured with: ELECTRONIC TAPE CHALKED TAPE OTHER  
Elevation of Water: \_\_\_\_\_ Well depth verified? YES NO

WELL PURGING									
Purge Method: <u>PERISTALTIC</u>	BLADDER OTHER _____								
Date: <u>3-31-22</u>	Start Time: <u>9:15</u>								
Measured Well Depth: <u>32.20'</u>	Screen Length: _____ Depth to Screen Midpoint: _____								
Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Cond. (umho/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
<u>9:30</u>	<u>19.84</u>	<u>-.20</u>	<u>250</u>	<u>8.0</u>	<u>1.423</u>	<u>9.67</u>	<u>7.16</u>	<u>156.7</u>	<u>4.19</u>
<u>9:35</u>	<u>19.84</u>	<u>-.20</u>	<u>250</u>	<u>8.0</u>	<u>1.493</u>	<u>8.27</u>	<u>7.29</u>	<u>181.3</u>	<u>4.14</u>
<u>9:40</u>	<u>19.84</u>	<u>-.20</u>	<u>250</u>	<u>7.9</u>	<u>1.540</u>	<u>8.01</u>	<u>7.34</u>	<u>178.3</u>	<u>4.09</u>
<u>9:45</u>	<u>19.84</u>	<u>-.20</u>	<u>250</u>	<u>7.9</u>	<u>1.581</u>	<u>7.79</u>	<u>7.37</u>	<u>174.9</u>	<u>4.03</u>
Stabilization Criteria:				+/- 3%	+/- 3%	+/- 10% (if > 0.5 mg/l)	+/- 0.1 Units	+/- 10 mV	+/- 10 % (if > 5 NTU)
Total Volume Purged (gal): <u>2</u>		Stabilization Criteria Reference Doc. USEPA EQASOP-GW 001 Rev #3, January 19, 2010							

FIELD ANALYSIS		
Time: <u>9:45</u>	CALIBRATION CHECK	Mark if
Temperature: <u>7.9</u> deg. C	Standard (conc.) Reading	Recalibrated
Specific Conductance: <u>1.581</u> umhos/cm	Specific Cond.: _____ umhos/cm	_____
Dissolved Oxygen: <u>7.79</u> mg/L	Dissolved Oxygen: _____ mg/L	_____
pH: <u>7.37</u> S.U.	pH: _____ S.U.	_____
ORP: <u>174.9</u> mV	Eh: _____ mV	_____
Turbidity: <u>4.03</u> NTU	Turbidity: _____ NTU	_____

SAMPLE COLLECTION					
Time: <u>9:50</u>	Sample Duplicate?: <u>NO</u>				
Appearance of Sample: <u>Clear, no odor</u>	Sample Method: <u>LF</u>				
NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
<u>1</u>	<u>1000</u> ml	<u>glass plastic</u>	yes <u>no</u>	<u>None</u> , HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	<u>Sulfolane</u>
<u>1</u>	<u>125</u> ml	<u>glass plastic</u>	yes <u>no</u>	<u>None</u> , HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	<u>Sulfate</u>
_____	_____ ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	_____
_____	_____ ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	_____
_____	_____ ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	_____
_____	_____ ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	_____
_____	_____ ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	_____
_____	_____ ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	_____
_____	_____ ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	_____
_____	_____ ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	_____

**SAMPLING PERSONNEL**  
Name (SIGNATURE): \_\_\_\_\_ Chain of Custody No. \_\_\_\_\_  
Name (SIGNATURE): \_\_\_\_\_

CLIENT: Merit Energy Co. Monitoring Location: \_\_\_\_\_  
 LOCATION: 13390 Lone Tree Road Sample ID: MW-145  
 Hartland Township, Michigan Well Type: 2" PVC  
 PROJECT: 130685.2000

**INSPECTION**

Label on well? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> REMEDIED	Is cement pad in good repair? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> REMEDIED
Is reference mark visible? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> REMEDIED	Is protective casing locked and in good repair? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> REMEDIED
Standing water present? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> REMEDIED	Is inner cap in place and properly sealing well? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> REMEDIED
Indication of surface runoff in well? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> REMEDIED	Is well casing in visibly good repair? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> REMEDIED

Repair Notes: \_\_\_\_\_

**STATIC WATER LEVEL**

Date: 3-31-22 Time: 12:59

Top of Casing Elevation: \_\_\_\_\_  
 Depth to Water: 19.26 Measured with: ELECTRONIC TAPE CHALKED TAPE OTHER  
 Elevation of Water: \_\_\_\_\_ Well depth verified? YES NO

**WELL PURGING**

Purge Method: PERISTALTIC BLADDER OTHER \_\_\_\_\_ Date: 3-31-22 Start Time: 13:00

Measured Well Depth: 26.52 Screen Length: \_\_\_\_\_ Depth to Screen Midpoint: \_\_\_\_\_

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Cond. (umho/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
13:15	19.30	-.04	180	8.9	1.028	2.83	6.74	210.0	3.81
13:20	19.30	-.04	180	8.8	1.024	2.78	6.75	206.4	3.71
13:25	19.30	-.04	180	8.9	1.020	2.74	6.76	202.9	3.68

Total Volume Purged (gal): 1.25 Stabilization Criteria: +/- 3% +/- 3% +/- 10% +/- 0.1 Units +/- 10 mV +/- 10 %  
 (if > 0.5 mg/l) (if > 5 NTU)

Stabilization Criteria Reference Doc. USEPA EQASOP-GW 001 Rev #3, January 19, 2010

**FIELD ANALYSIS**

Time: 13:25	CALIBRATION CHECK	Mark if
Temperature: 8.9 deg. C	Standard (conc.)	Recalibrated
Specific Conductance: 1.020 umhos/cm	Specific Cond.: _____ umhos/cm	_____
Dissolved Oxygen: 2.74 mg/L	Dissolved Oxygen: _____ mg/L	_____
pH: 6.76 S.U.	pH: _____ S.U.	_____
ORP: 202.9 mV	Eh: _____ mV	_____
Turbidity: 3.68 NTU	Turbidity: _____ NTU	_____

**SAMPLE COLLECTION**

Time: 13:30 Sample Duplicate?: NO  
 Appearance of Sample: Clear, no odor Sample Method: LF

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
1	1000 ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	Sulfolane
1	125 ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	Sulfate

**SAMPLING PERSONNEL**

Chain of Custody No. \_\_\_\_\_  
 Name (SIGNATURE): [Signature] Name (SIGNATURE): [Signature]

**CLIENT:** Merit Energy Co.  
**LOCATION:** 13390 Lone Tree Road  
 Hartland Township, Michigan  
**PROJECT:** 130685.2000

**Monitoring Location:** \_\_\_\_\_  
**Sample ID:** MW-14d  
**Well Type:** 2" PVC

**INSPECTION**

Label on well?	YES NO REMEDIED	Is cement pad in good repair?	YES NO REMEDIED
Is reference mark visible?	YES NO REMEDIED	Is protective casing locked and in good repair?	YES NO REMEDIED
Standing water present?	YES NO REMEDIED	Is inner cap in place and properly sealing well?	YES NO REMEDIED
Indication of surface runoff in well?	YES NO REMEDIED	Is well casing in visibly good repair?	YES NO REMEDIED

**STATIC WATER LEVEL**

Date: 3-31-22 Time: 12:09  
 Top of Casing Elevation: \_\_\_\_\_  
 Depth to Water: 19.17 Measured with: ELECTRONIC TAPE CHALKED TAPE OTHER  
 Elevation of Water: \_\_\_\_\_ Well depth verified? YES NO

**WELL PURGING**

Purge Method: PERISTALTIC BLADDER OTHER \_\_\_\_\_ Date: 3-31-22 Start Time: 12:10  
 Measured Well Depth: 45.11 Screen Length: \_\_\_\_\_ Depth to Screen Midpoint: \_\_\_\_\_

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Cond. (umho/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
12:25	19.18	-.01	220	8.7	.764	2.19	7.11	174.3	3.24
12:30	19.18	-.01	220	8.6	.760	2.13	7.09	171.5	3.17
12:35	19.18	-.01	220	8.6	.756	2.08	7.09	169.3	3.09

Total Volume Purged (gal): 1.25 Stabilization Criteria: +/- 3% +/- 3% +/- 10% +/- 0.1 Units +/- 10 mV +/- 10 % (if > 0.5 mg/l) (if > 5 NTU)

Stabilization Criteria Reference Doc. USEPA EQASOP-GW 001 Rev #3, January 19, 2010

**FIELD ANALYSIS**

Time: 12:35  
 Temperature: 8.6 deg. C  
 Specific Conductance: .756 umhos/cm  
 Dissolved Oxygen: 2.08 mg/L  
 pH: 7.09 S.U.  
 ORP: 169.3 mV  
 Turbidity: 3.09 NTU

CALIBRATION CHECK		Mark if Recalibrated
Standard (conc.)	Reading	
Specific Cond.:	_____ umhos/cm	_____
Dissolved Oxygen:	_____ mg/L	_____
pH:	_____ S.U.	_____
Eh:	_____ mV	_____
Turbidity:	_____ NTU	_____

**SAMPLE COLLECTION**

Time: 12:40 Sample Duplicate?: NO  
 Appearance of Sample: Clear, no odor Sample Method: LF

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
1	1000 ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	Sulfolane
1	125 ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	Sulfate
	ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
	ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
	ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
	ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
	ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
	ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
	ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
	ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	

**SAMPLING PERSONNEL**

Name (SIGNATURE):  Chain of Custody No. \_\_\_\_\_ Name (SIGNATURE): \_\_\_\_\_









CLIENT: Merit Energy Co.  
 LOCATION: 13390 Lone Tree Road  
 Hartland Township, Michigan  
 PROJECT: 130685.2000

Monitoring Location: \_\_\_\_\_  
 Sample ID: MW-18  
 Well Type: 2" PVC

**INSPECTION**

Label on well?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> REMEDIED	Is cement pad in good repair?	YES <input type="checkbox"/> NO <input type="checkbox"/> REMEDIED
Is reference mark visible?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> REMEDIED	Is protective casing locked and in good repair?	YES <input type="checkbox"/> NO <input type="checkbox"/> REMEDIED
Standing water present?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> REMEDIED	Is inner cap in place and properly sealing well?	YES <input type="checkbox"/> NO <input type="checkbox"/> REMEDIED
Indication of surface runoff in well?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> REMEDIED	Is well casing in visibly good repair?	YES <input type="checkbox"/> NO <input type="checkbox"/> REMEDIED

**STATIC WATER LEVEL**

Date: 4-1-22 Time: 8:29  
 Top of Casing Elevation: \_\_\_\_\_  
 Depth to Water: 20.30'  
 Elevation of Water: \_\_\_\_\_  
 Measured with: ELECTRONIC TAPE CHALKED TAPE OTHER  
 Well depth verified? YES  NO

**WELL PURGING**

Purge Method: PERISTALTIC BLADDER OTHER \_\_\_\_\_ Date: 4-1-22 Start Time: 8:30  
 Measured Well Depth: 27.50 Screen Length: \_\_\_\_\_ Depth to Screen Midpoint: \_\_\_\_\_

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Cond. (umho/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
8:45	20.33	-.03	250	8.1	.486	5.17	7.31	116.8	9.91
8:50	20.33	-.03	250	8.0	.479	5.14	7.30	115.1	8.94
8:55	20.33	-.03	250	8.1	.475	5.12	7.30	114.6	8.22
9:00	20.33	-.03	250	8.1	.471	5.10	7.29	113.8	8.06

Total Volume Purged (gal): 2 Stabilization Criteria: +/- 3% +/- 3% +/- 10% (if > 0.5 mg/l) +/- 0.1 Units +/- 10 mV +/- 10 % (if > 5 NTU)

Stabilization Criteria Reference Doc. USEPA EQASOP-GW 001 Rev #3, January 19, 2010

**FIELD ANALYSIS**

Time: 9:00	Temperature: 8.1 deg. C	Specific Conductance: .471 umhos/cm	Dissolved Oxygen: 5.10 mg/L	pH: 7.29 S.U.	ORP: 113.8 mV	Turbidity: 8.06 NTU
CALIBRATION CHECK		Standard (conc.)		Reading		Mark if Recalibrated
Specific Cond.:					umhos/cm	
Dissolved Oxygen:					mg/L	
pH:					S.U.	
Eh:					mV	
Turbidity:					NTU	

**SAMPLE COLLECTION**

Time: 9:05 Sample Duplicate?: NO  
 Appearance of Sample: Clear, no odor Sample Method: LF

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
1	1000 ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	Sulfolane
1	125 ml	glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	Sulfate
		glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
		glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
		glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
		glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
		glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
		glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
		glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	
		glass plastic	yes no	None, HCl, HNO <sub>3</sub> , NaOH, H <sub>2</sub> SO <sub>4</sub> , ZnAc, TSP, BAK	

**SAMPLING PERSONNEL**

Name (SIGNATURE): [Signature] Chain of Custody No. \_\_\_\_\_  
 Name (SIGNATURE): \_\_\_\_\_







