



INDEPENDENT TESTING LAB

830 ROBINWOOD COURT, TRAVERSE CITY, MI 49686

PH: 231-929-0905

FAX: 231-929-0894

www.gtanalytical.com

Company: WOLVERINE GAS & OIL

Name:

ClientProj: 2023201006.02

GTA ProjNo: 081523-10

Site Addr: COOK 32 BACKGROUND

Sampled By: TSA/GCES

Date Rec: 8/15/2023

Time Rec: 3:30 PM

Sample No.	Sample ID	Date Sampled	Time Sampled	Sample Matrix
1	MW-1	8/15/2023	8:50 AM	WATER
2	MW-2	8/15/2023	11:00 AM	WATER
3	MW-3	8/15/2023	9:45 AM	WATER

ELECTRONIC SIGNATURE REPORT. This is a final report for the following pages of data for the samples specified above. All analysis was performed by the methods stated and all quality control measures required were completed. All quality control information is available upon request.

Kirk Chase

Kirk L. Chase/Chemist
Grand Traverse Analytical
830 Robinwood Court
Traverse City, MI 49686
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COMPANY: WOLVERINE GAS & OIL
PROJECT NO: 2023201006.02
LOCATION: COOK 32 BACKGROUND

GTA PROJECT NO: 081523-10
GTA SAMPLE NO: 1

DATE SAMPLED: 8/15/2023
TIME SAMPLED: 8:50 AM
DATE RECEIVED: 8/15/2023
TIME RECEIVED: 3:30 PM

MI
SAMPLE MATRIX: WATER
SAMPLE ID: MW-1

SAMPLED BY: TSA/GCES

EPA 8260B VOLATILE ORGANICS

<u>Analysis</u>	<u>Concentration</u>	<u>LOD</u>	<u>Units</u>	<u>Analyst</u>	<u>Date</u> <u>Extracted</u>	<u>Date</u> <u>Completed</u>	<u>Prep Method</u>
Benzene	ND	1.0	ug/L (PPB)	MR		8/17/2023	EPA 5030B
Toluene	ND	1.0					
Ethylbenzene	ND	1.0					
Xylene(Total)	ND	3.0					

SOIL/SOLIDS CONCENTRATIONS ARE DETERMINED ON A DRY WEIGHT BASIS.
ND = NOT DETECTED, RESULT < LOD
LOD = LIMIT OF DETECTION

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COMPANY: WOLVERINE GAS & OIL
PROJECT NO: 2023201006.02
LOCATION: COOK 32 BACKGROUND

MI

SAMPLE MATRIX: WATER
SAMPLE ID: MW-2

GTA PROJECT NO: 081523-10
GTA SAMPLE NO: 2

DATE SAMPLED: 8/15/2023
TIME SAMPLED: 11:00 AM
DATE RECEIVED: 8/15/2023
TIME RECEIVED: 3:30 PM

SAMPLED BY: TSA/GCES

EPA 8260B VOLATILE ORGANICS

<u>Analysis</u>	<u>Concentration</u>	<u>LOD</u>	<u>Units</u>	<u>Analyst</u>	<u>Date</u> <u>Extracted</u>	<u>Date</u> <u>Completed</u>	<u>Prep Method</u>
Benzene	ND	1.0	ug/L (PPB)	MR		8/17/2023	EPA 5030B
Toluene	ND	1.0					
Ethylbenzene	ND	1.0					
Xylene(Total)	ND	3.0					

SOIL/SOLIDS CONCENTRATIONS ARE DETERMINED ON A DRY WEIGHT BASIS.
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COMPANY: WOLVERINE GAS & OIL
PROJECT NO: 2023201006.02
LOCATION: COOK 32 BACKGROUND

GTA PROJECT NO: 081523-10
GTA SAMPLE NO: 3

DATE SAMPLED: 8/15/2023
TIME SAMPLED: 9:45 AM
DATE RECEIVED: 8/15/2023
TIME RECEIVED: 3:30 PM

MI
SAMPLE MATRIX: WATER
SAMPLE ID: MW-3

SAMPLED BY: TSA/GCES

EPA 8260B VOLATILE ORGANICS

<u>Analysis</u>	<u>Concentration</u>	<u>LOD</u>	<u>Units</u>	<u>Analyst</u>	<u>Date</u> <u>Extracted</u>	<u>Date</u> <u>Completed</u>	<u>Prep Method</u>
Benzene	ND	1.0	ug/L (PPB)	MR		8/17/2023	EPA 5030B
Toluene	ND	1.0					
Ethylbenzene	ND	1.0					
Xylene(Total)	ND	3.0					

SOIL/SOLIDS CONCENTRATIONS ARE DETERMINED ON A DRY WEIGHT BASIS.
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PROJECT NO: 2023201006.02

LOCATION: COOK 32 BACKGROUND

SAMPLED BY: MI
TSA/GCES

SAMPLE ID: MW-1

GTA PROJECT NO: 081523-10

GTA SAMPLE NO: 1

DATE SAMPLED: 8/15/2023

TIME SAMPLED: 8:50 AM

DATE RECEIVED: 8/15/2023

TIME RECEIVED: 3:30 PM

SAMPLE MATRIX: WATER

METALS

<u>Analysis</u>	<u>Concentration</u>	<u>LOD</u>	<u>Units</u>	<u>Analyst</u>	<u>Date Completed</u>	<u>Digestion Method</u>
CALCIUM TOTAL EPA 6020A	83	1.0	mg/L (PPM)	MR	8/17/2023	EPA 3005A
MAGNESIUM TOTAL EPA 6020A	14	0.10	mg/L (PPM)	MR	8/17/2023	EPA 3005A
POTASSIUM TOTAL EPA 6020A	0.73	0.10	mg/L (PPM)	MR	8/17/2023	EPA 3005A
SODIUM TOTAL EPA 6020A	2.6	0.10	mg/L (PPM)	MR	8/17/2023	EPA 3005A

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DISS = DISSOLVED



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PROJECT NO: 2023201006.02

LOCATION: COOK 32 BACKGROUND

MI

SAMPLED BY: TSA/GCES

SAMPLE ID: MW-1

GTA PROJECT NO: 081523-10

GTA SAMPLE NO: 1

DATE RECEIVED: 8/15/2023

TIME RECEIVED: 3:30 PM

DATE SAMPLED: 8/15/2023

TIME SAMPLED: 8:50 AM

SAMPLE MATRIX: WATER

SAMPLE ANALYSIS

<u>Analysis</u>	<u>Concentration</u>	<u>LOD</u>	<u>Units</u>	<u>Analyst</u>	<u>Date Completed</u>
ALKALINITY SM 4500CO2D (BICARBONATE)	280	10	mg/L (PPM)	TR	8/18/2023
ALKALINITY SM 4500CO2D (CARBONATE)	ND	10	mg/L (PPM)	TR	8/18/2023
CHLORIDE EPA 300.0	13	10	mg/L (PPM)	KC/TR	8/18/2023
SULFATE EPA 300.0	12	1.0	mg/L (PPM)	KC/TR	8/18/2023

ND = NOT DETECTED, RESULT < LOD

LOD = LIMIT OF DETECTION

s.u. = STANDARD pH UNITS REPORTED AT 25 C

DISS = DISSOLVED

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PROJECT NO: 2023201006.02

LOCATION: COOK 32 BACKGROUND

SAMPLED BY: MI

TSA/GCES

SAMPLE ID: MW-2

GTA PROJECT NO: 081523-10

GTA SAMPLE NO: 2

DATE SAMPLED: 8/15/2023

TIME SAMPLED: 11:00 AM

DATE RECEIVED: 8/15/2023

TIME RECEIVED: 3:30 PM

SAMPLE MATRIX: WATER

METALS

<u>Analysis</u>	<u>Concentration</u>	<u>LOD</u>	<u>Units</u>	<u>Analyst</u>	<u>Date Completed</u>	<u>Digestion Method</u>
CALCIUM TOTAL EPA 6020A	66	1.0	mg/L (PPM)	MR	8/17/2023	EPA 3005A
MAGNESIUM TOTAL EPA 6020A	8.8	0.10	mg/L (PPM)	MR	8/17/2023	EPA 3005A
POTASSIUM TOTAL EPA 6020A	1.5	0.10	mg/L (PPM)	MR	8/17/2023	EPA 3005A
SODIUM TOTAL EPA 6020A	8.7	0.10	mg/L (PPM)	MR	8/17/2023	EPA 3005A

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PROJECT NO: 2023201006.02

LOCATION: COOK 32 BACKGROUND

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SAMPLED BY: TSA/GCES

SAMPLE ID: MW-2

GTA PROJECT NO: 081523-10

GTA SAMPLE NO: 2

DATE RECEIVED: 8/15/2023

TIME RECEIVED: 3:30 PM

DATE SAMPLED: 8/15/2023

TIME SAMPLED: 11:00 AM

SAMPLE MATRIX: WATER

SAMPLE ANALYSIS

<u>Analysis</u>	<u>Concentration</u>	<u>LOD</u>	<u>Units</u>	<u>Analyst</u>	<u>Date Completed</u>
ALKALINITY SM 4500CO2D (BICARBONATE)	620	10	mg/L (PPM)	TR	8/18/2023
ALKALINITY SM 4500CO2D (CARBONATE)	ND	10	mg/L (PPM)	TR	8/18/2023
CHLORIDE EPA 300.0	31	10	mg/L (PPM)	KC/TR	8/18/2023
SULFATE EPA 300.0	15	1.0	mg/L (PPM)	KC/TR	8/18/2023

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PROJECT NO: 2023201006.02

LOCATION: COOK 32 BACKGROUND

SAMPLED BY: MI

TSA/GCES

SAMPLE ID: MW-3

GTA PROJECT NO: 081523-10

GTA SAMPLE NO: 3

DATE SAMPLED: 8/15/2023

TIME SAMPLED: 9:45 AM

DATE RECEIVED: 8/15/2023

TIME RECEIVED: 3:30 PM

SAMPLE MATRIX: WATER

METALS

<u>Analysis</u>	<u>Concentration</u>	<u>LOD</u>	<u>Units</u>	<u>Analyst</u>	<u>Date Completed</u>	<u>Digestion Method</u>
CALCIUM TOTAL EPA 6020A	86	1.0	mg/L (PPM)	MR	8/17/2023	EPA 3005A
MAGNESIUM TOTAL EPA 6020A	13	0.10	mg/L (PPM)	MR	8/17/2023	EPA 3005A
POTASSIUM TOTAL EPA 6020A	0.37	0.10	mg/L (PPM)	MR	8/17/2023	EPA 3005A
SODIUM TOTAL EPA 6020A	2.7	0.10	mg/L (PPM)	MR	8/17/2023	EPA 3005A

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LOCATION: COOK 32 BACKGROUND

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SAMPLED BY: TSA/GCES

SAMPLE ID: MW-3

GTA PROJECT NO: 081523-10

GTA SAMPLE NO: 3

DATE RECEIVED: 8/15/2023

TIME RECEIVED: 3:30 PM

DATE SAMPLED: 8/15/2023

TIME SAMPLED: 9:45 AM

SAMPLE MATRIX: WATER

SAMPLE ANALYSIS

<u>Analysis</u>	<u>Concentration</u>	<u>LOD</u>	<u>Units</u>	<u>Analyst</u>	<u>Date Completed</u>
ALKALINITY SM 4500CO2D (BICARBONATE)	780	10	mg/L (PPM)	TR	8/18/2023
ALKALINITY SM 4500CO2D (CARBONATE)	ND	10	mg/L (PPM)	TR	8/18/2023
CHLORIDE EPA 300.0	ND	10	mg/L (PPM)	KC/TR	8/18/2023
SULFATE EPA 300.0	8.2	1.0	mg/L (PPM)	KC/TR	8/18/2023

ND = NOT DETECTED, RESULT < LOD

LOD = LIMIT OF DETECTION

s.u. = STANDARD pH UNITS REPORTED AT 25 C

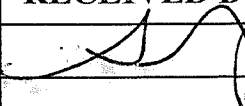
DISS = DISSOLVED

CHAIN OF CUSTODY

PROJECT NUMBER 2023201006.02	SITE NAME/ADDRESS Cook 32 Background	COMPANY/NAME Wolverine Gas and Oil
SAMPLED BY TSA	COMPANY GCES	GTA PROJECT # 081523-10

SAMPLE INFORMATION

#	SAMPLE ID	DATE SAMPLED	TIME	MATRIX	ANALYSIS
	MW-1	8-15-23	8:50	GW	BTEX, Calcium, Magnesium, Potassium, Sodium chloride, sulfate, Alkalinity (Bi Carb)
	MW-2	I	11:00	I	I
	MW-3	I	9:45	I	I

BILL TO: GCES	TempRec: ☐ 1.00	On Ice? ☒ Y ☐ N	REPORT TO: E. Vlacke
RELEASED BY Trevor A. Miller / J. M. W. M.	DATE/TIME 8-15-23 15:30	RECEIVED BY 	DATE/TIME 8/15/23 1530
REQUESTED TAT ☒ STANDARD ☐ 1 BUSINESS DAY ☐ 2 BUSINESS DAYS ☐ 3 BUSINESS DAYS			