

May 13, 2022

**CERTIFIED MAIL NO.** [REDACTED]

[REDACTED]  
[REDACTED]  
[REDACTED]

Re: Water Supply Request for Investigation CID 351275  
Impact to Water Supply; Operator Not Determined  
Connoquenessing Township, Butler County

[REDACTED]

This letter is regarding the Pennsylvania Department of Environmental Protection’s (Department’s) investigation of the natural gas migrating into your water supply listed in Exhibit A (“Water Supply”). The Department’s Determination is that historic oil and gas activities polluted the Water Supply. This information is summarized below.

**CASE INFORMATION:**

<b>Date of Complaint</b>	<b>Nature of Complaint (odor, taste, quantity, use, color)</b>	<b>Pollution</b>	<b>Sample Results Above Statewide Standards or Recommended Levels</b>
July 22, 2020	odd smell and effervescence	Methane (action level 7 mg/l) Manganese (0.05 mg/l) Iron (0.3 mg/l)	Methane (psi 24.8, 22.7, and 22.4 mg/l; and sink 19.1 and 27.8 mg/l) Manganese (0.162, 0.161 mg/l, and 0.123 mg/l) Iron (psi 0.394 mg/l)

**WATER SAMPLE RESULTS:**

CID 351275		Moody Predrill Raw	DEP Postdrill Raw	DEP Postdrill Raw	DEP Postdrill Raw	DEP Postdrill Raw	DEP Postdrill Treated
Parameter	MCL/SMCL	4/16/2019	7/23/2020	8/18/2020	10/29/2020	4/28/2021	4/28/2021
Alkalinity (mg/l)		ns	213	222.8	232.6	213	216.2
Barium (mg/l)	2	0.105	0.091	0.097	0.086	0.092	0.034
Calcium (mg/l)		41.5	26.4	27.34	21.81	27.7	18
Chloride (mg/l)	250	<10	28.41	46.23	25.32	35	38.85
Hardness (mg/l)		130	82	84	68	86	57
Iron (mg/l)	0.3	<0.3	0.394	0.298	0.286	0.121	0.146
Magnesium (mg/l)		6.26	3.84	3.88	3.36	4.09	2.86
Manganese (mg/l)	0.05	0.0243	0.162	0.161	0.123	0.042	0.049
pH	6.5 - 8.5	7.6	7.7	7.6	7.8	8.1	7.9
Potassium (mg/l)		1.34	1.4	1.49	1.34	1.43	1.49
Sodium (mg/l)		15.3	87.19	103.3	109.3	95.9	111
Specific Cond (µS/cm)		304	541	631	571	555	576
Strontium (mg/l)		0.317	0.203	0.211	0.196	0.232	0.128
Sulfate (mg/l)	250	39.3	26.85	28.95	29.99	34.35	34.14
TDS (mg/l)	500	188	322	366	344	348	340
Total Suspended Solids (mg/l)	<5	0.8	10	<5	6	<5	<5
Methane (mg/l)	action level >7	nd	raw 24.8	treated 19.1	treated 27.8/raw 22.7	raw 22.4	ns
Ethane (mg/l)		nd	raw 0.0932	treated 0.0929	treated 0.093/raw 0.0362	nd	ns
Propane (mg/l)		nd	nd	nd	nd	nd	ns
Lithium (mg/l)		ns	<0.025	<0.025	<0.025	<0.025	<0.025
Bromide (mg/l)	no mcl	ns	<0.2	0.317	<0.2	0.223	0.248
turbidity NTU	sfc only-1	ns	1.65	<1	1.18	1.13	<1
Aluminum (mg/l)	0.2	ns	<0.015	<0.015	<0.015	<0.015	<0.015
Zinc (mg/l)	5	ns	<0.03	<0.03	<0.03	<0.03	<0.03
Arsenic (mg/l)	0.01	<0.008	0.00439	0.0033	<0.003	<0.003	<0.003
Selenium (mg/l)	0.05	ns	<0.007	<0.007	<0.007	<0.007	<0.007
MBAS		<0.025	ns	ns	ns	ns	ns
OG	<5.05	<5.05	<5	ns	ns	<5	ns
Volatile Organic Compounds		ns	ns	ns	none above DWS	none above DWS	ns
Semivolatile Organic Compounds		ns	ns	ns	none above DWS	ns	ns

The Department has not yet determined the source of the pollution. It is likely the result of a compromised

casing on a historic oil or gas well in your local area. Although Department staff were not able to locate any abandoned oil and gas wells in your immediate area, there are locations for three historic wells shown on our maps near you. In one of those map locations, two-inch steel pipe was found. This pipe is like what would be used for oil and gas gathering line or well casing. There are multiple abandoned oil and gas wells to the west of your location which have been found and are slated for future plugging through Pennsylvania's Abandoned Well Plug Fund. The desired outcome would be that the plugging of any of these historic wells which have been found would remediate contamination issues within the fresh groundwater aquifers utilized in the area.

Your water supply is one of many in the area which could benefit from the plugging of these historic wells. Because your water well is 480 feet deep, it intercepts up to nine (9) coal seams, or the representations thereof. Ground water in coal areas has a greater occurrence of poor-quality water that is high in iron, manganese, and aluminum, and low pH. Coal beds also can cause methane migration into aquifers, and subsequently, water supplies.

Also, during this investigation it was found that there is a deep mine across the road from your home, to the southwest. It is identified by the Bureau of Abandoned Mine Reclamation Investigations Section, as an Upper Freeport deep coal mine. The Upper Freeport seam lies about 100 feet beneath the current surface location of your water well. The mine is approximately eight feet in height and is flooded. This mine was discovered and reported to the Bureau of Abandoned Mine Reclamation in February 2018 by a private party.

Please see the attached information regarding interpreting the water analyses, and important safety information regarding methane in the Water Supply. If you have any questions about any of the above, please contact Christine Miner, P.G., at 814.573.3592.

Sincerely,




Richard L. Neville  
Northwest District Oil and Gas Manager  
District Oil and Gas Operations

Enclosures: Analyses and Fact Sheets

cc: Scott Lux (elec. w/encl.)  
Brady Johnson (elec. w/encl.)  
Rick Willey (elec. w/encl.)  
Brian MacQuarrie (elec. w/encl.)  
Kayla Despenes (elec. w/encl.)  
Michael Braymer (elec. w/encl.)  
Christine Miner P.G. (elec. w/encl.)  
Jon Smoyer, LPG, Bureau of Abandoned Mine Reclamation, Cambria District Office  
File (through Joseph F. Lichtinger, P.G., Professional Geologist Manager)

**CONFIDENTIAL**

**Exhibit A**

  
Evans City, PA 16033-4504



Date of Issue: 08/13/2020 04:01:31

DEP Bureau of Laboratories - Harrisburg  
P.O. Box 1467  
2575 Interstate Drive  
Harrisburg, PA 17105-1467

Contact Phone Number: (717) 346-7200

NELAP - accredited by

NJ DEP - Laboratory Number: PA059  
PA DEP LAP - DEP Lab ID: 22-00223

Analytical Report For  
Oil And Gas Mgmt

Sample ID: 3398 012

Date Collected: 07/23/2020 02:15:00 PM

Lab Sample ID: I2020010027

Status: Completed

Name of Sample Collector: Brady Johnson

Date Received: 07/24/2020

County: Butler

State:

Municipality: Seven Fields Boro



EVANS CITY PA. 16033-4504

Sample Medium: Water

Sample Medium Type: Water

Location: NOT INDICATED

Reason: Investigation

Project: NOT INDICATED

Standard Anlysis: 946

Matrix: Water

Legal Seal:	1001969	Intact:	Yes
Legal Seal:	1001972	Intact:	Yes
Legal Seal:	1001971	Intact:	Yes
Legal Seal:	1001970	Intact:	Yes
Legal Seal:	1001968	Intact:	Yes
Legal Seal:	1001967	Intact:	Yes
Legal Seal:	1001966	Intact:	Yes

Analytical Report For  
Oil And Gas Mgmt

Sample ID: 3398 012

Date Collected: 07/23/2020 02:15:00 PM

Lab Sample ID: I2020010027

Status: Completed

Stream Condition:

Sample Standard Comment: This is a revised report

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
00410 ALKALINITY AS CaCO3 @ pH 4.5	213.0 mg/L	07/24/2020 01:25 PM	MTUZINSKI	SM 2320B
01105H ALUMINUM, TOTAL (WATER & WASTE) ICPMS	<15.0 ug/L (U)	07/27/2020 09:43 AM	SCHOY	EPA 200.8
01002H ARSENIC, TOTAL (WATER & WASTE) BY ICPMS	4.390 ug/L	07/27/2020 09:43 AM	SCHOY	EPA 200.8
01007M BARIUM, TOTAL in MG/L (WATER & WASTE) BY ICP	0.091 mg/L	07/24/2020 01:54 PM	ATAPSOBA	EPA 200.7
71870 BROMIDE BY ION CHROMATOGRAPHY	<0.2 mg/L (U)	07/24/2020 04:26 PM	TVOROBAYCH	EPA 300.0
00916A CALCIUM, TOTAL (WATER & WASTE) BY ICP	26.400 mg/L	07/24/2020 01:54 PM	ATAPSOBA	EPA 200.7
00900 HARDNESS, TOTAL (CALCULATED)	82 mg/L	07/24/2020 01:54 PM	ATAPSOBA	SM 2340 B
** Comment ** Accredited by NJ only - accreditation not available from PA				
01045M IRON, TOTAL IN MG/L (WATER & WASTE) BY ICP	0.394 mg/L	07/24/2020 01:54 PM	ATAPSOBA	EPA 200.7
01132A LITHIUM, TOTAL (WATER & WASTE) BY ICP	<25.0 ug/L (U)	07/24/2020 01:54 PM	ATAPSOBA	EPA 200.7
00927A MAGNESIUM, TOTAL (WATER & WASTE) BY ICP	3.84 mg/L	07/24/2020 01:54 PM	ATAPSOBA	EPA 200.7
01055M MANGANESE, TOTAL in MG/L (WATER & WASTE) BY ICP	0.162 mg/L	07/24/2020 01:54 PM	ATAPSOBA	EPA 200.7
00556H Oil & Grease in water (as Hexane Extractable Material)	<5.0 mg/L (U)	08/06/2020 03:25 PM	SAGREER	EPA 1664A
00403 pH, Lab (Electrometric)	7.7 pH units	07/24/2020 01:25 PM	MTUZINSKI	SM 4500-H+ B
** Comment ** Holding Time Exceeded				
00937A POTASSIUM, TOTAL (WATER & WASTE) BY ICP	1.40 mg/L	07/24/2020 01:54 PM	ATAPSOBA	EPA 200.7
01147H SELENIUM, TOTAL (WATER & WASTE) BY ICPMS	<7.00 ug/L (U)	07/27/2020 09:43 AM	SCHOY	EPA 200.8
00929A SODIUM, TOTAL (WATER & WASTE) BY ICP	87.19 mg/L	07/24/2020 01:54 PM	ATAPSOBA	EPA 200.7
00095 SPECIFIC CONDUCTIVITY @ 25.0 C	541.00 umhos/cm	07/30/2020 02:04 PM	MTUZINSKI	SM 2510B
01082M STRONTIUM, TOTAL in MG/L (WATER & WASTE) BY ICP	0.203 mg/L	07/24/2020 01:54 PM	ATAPSOBA	EPA 200.7
00403T Temperature at which pH is measured	18.99 C	07/24/2020 01:25 PM	MTUZINSKI	SM 4500-H+ B
00940 Total Chloride-Ion Chromatograph	28.41 mg/L	07/24/2020 04:26 PM	TVOROBAYCH	EPA 300.0
70300 TOTAL DISSOLVED SOLIDS @ 180C	322 mg/L	07/24/2020 03:19 PM	LWILKINSON	SM 2540 C
00945 Total Sulfate-Ion Chromatograph	26.85 mg/L	07/24/2020 04:26 PM	TVOROBAYCH	EPA 300.0
00530 TOTAL SUSPENDED SOLIDS	10 mg/L	07/24/2020 12:16 PM	MARMANIOUS	USGS I-3765
82079 TURBIDITY, NEPHELMETRIC	1.65 NTU	07/24/2020 09:57 AM	JANBARRY	EPA 180.1
01092A ZINC, TOTAL (WATER & WASTE) BY ICP	<30.0 ug/L (U)	07/24/2020 01:54 PM	ATAPSOBA	EPA 200.7

**Analytical Report For  
Oil And Gas Mgmt**

**Sample ID:** 3398 012

**Date Collected:** 07/23/2020 02:15:00 PM

**Lab Sample ID:** I2020010027

**Status:** Completed

The results of the analyses provided in this laboratory report relate only to the sample(s) identified therein. Unless otherwise noted, the results presented on this laboratory report meet all requirements of the 2016 TNI standard. Sample was in acceptable condition when received by the Laboratory. Any exceptions are noted in the report.

\* denotes tests that the laboratory is not accredited for

U - Indicates analysis was performed for the test but it was not detected. The sample quantitation limit is reported.

J - Indicates an estimated value, reported between Reporting Limit (RL) and Minimum Detection Limit (MDL).

June Black, Technical Director, Bureau of Laboratories



Date of Issue: 03/23/2022 10:56:42

DEP Bureau of Laboratories - Harrisburg  
P.O. Box 1467  
2575 Interstate Drive  
Harrisburg, PA 17105-1467

Contact Phone Number: (717) 346-7200

NELAP - accredited by

NJ DEP - Laboratory Number: PA059  
PA DEP LAP - DEP Lab ID: 22-00223

Analytical Report For  
Oil And Gas Mgmt

Sample ID: 3398 012

Date Collected: 07/23/2020 02:15:00 PM

Lab Sample ID: O2020003008

Status: Completed

Name of Sample Collector: Brady Johnson

Date Received: 07/24/2020

County: Butler

State:

Municipality: Seven Fields Boro



EVANS CITY PA. 16033-4504

Sample Medium: Water

Sample Medium Type: Water

Location: NOT INDICATED

Reason: Investigation

Project: NOT INDICATED

Suite: METH

Matrix: Water

Legal Seal:	1001970	Intact:	Yes
Legal Seal:	1001971	Intact:	Yes
Legal Seal:	1001972	Intact:	Yes
Legal Seal:	1001968	Intact:	Yes
Legal Seal:	1001967	Intact:	Yes
Legal Seal:	1001966	Intact:	Yes
Legal Seal:	1001969	Intact:	Yes



Analytical Report For  
Oil And Gas Mgmt

Sample ID: 3398 012

Date Collected: 07/23/2020 02:15:00 PM

Lab Sample ID: O2020003008

Status: Completed

Stream Condition:

Sample Standard Comment: This is a revised report

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
74840 Ethane	93.2 ug/L (B)	07/24/2020 02:00 AM	DLY	BOL BOL6019
74828 Methane	24800 ug/L	07/24/2020 02:00 AM	DLY	BOL BOL6019
74986 Propane	14.2 ug/L (U)	07/24/2020 02:00 AM	DLY	BOL BOL6019

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Dr. Pamela Higgins, Technical Director, Bureau of Laboratories

ORGANICS LABORATORY QUALIFIERS

U - Indicates analysis was performed for the test but it was not detected. The sample quantitation limit is reported.

J - Indicates an estimated value, reported between Reporting Limit (RL) and Minimum Detection Limit (MDL).

N - Indicates presumptive evidence of a compound.

B - This flag is used when the analyte is found in the associated blank as well as in the sample.

E - This flag identifies compounds whose concentrations exceed the calibration range of the instrument for that specific analysis.

P - This flag is used with a target analyte when there is greater than a 40% difference between the results obtained from the primary and confirmation columns for dual column analysis methods (e.g. pesticides, triazines, PCBs, etc)

Q - This flag identifies the average of multiple results from multiple analyses, or the average of the averages of dual column analysis methods.

X - Non-target analytes co-elute with compound. Identification unable to be confirmed.



Date of Issue: 09/15/2020 01:06:07

DEP Bureau of Laboratories - Harrisburg  
P.O. Box 1467  
2575 Interstate Drive  
Harrisburg, PA 17105-1467

Contact Phone Number: (717) 346-7200

NELAP - accredited by

NJ DEP - Laboratory Number: PA059  
PA DEP LAP - DEP Lab ID: 22-00223

Analytical Report For  
Oil And Gas Mgmt

Sample ID: 9634 208

Date Collected: 08/18/2020

Lab Sample ID: I2020011577

Status: Completed

Name of Sample Collector: Christine Miner

Date Received: 08/19/2020

County: Butler

State:

Municipality: Connoquenessing Twp



EVANS CITY PA. 16033-4504

Sample Medium: Ground Water

Sample Medium Type: Water

Location: NOT INDICATED

Reason: Complaint

Project: NOT INDICATED

Standard Analysis: 946

Matrix: Water

Stream Condition:

Sample Comment: 12 min purge 946 inorganics taken at basement psi tank, meth/eth taken at kitchen sink for greater validity to sample. Kitchen sink bottle with headspace got 4% methane, took isotopic sample. F9634001081820201120, sent 8-18-20.

Appearance: red tint/ faint smell h2s @psi h2s smell stronger - kitche

**Analytical Report For  
Oil And Gas Mgmt**

Sample ID: 9634 208

Date Collected: 08/18/2020

Lab Sample ID: I2020011577

Status: Completed

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
00410 ALKALINITY AS CaCO3 @ pH 4.5	222.8 mg/L	08/19/2020 04:34 PM	JAHOQUE	SM 2320B
01105H ALUMINUM, TOTAL (WATER & WASTE) ICPMS	<15.0 ug/L (U)	08/24/2020 02:51 PM	SCHOY	EPA 200.8
01002H ARSENIC, TOTAL (WATER & WASTE) BY ICPMS	3.300 ug/L	08/24/2020 11:29 AM	SCHOY	EPA 200.8
01007M BARIUM, TOTAL in MG/L (WATER & WASTE) BY ICP	0.097 mg/L	08/20/2020 10:59 AM	ATAPSOBA	EPA 200.7
71870 BROMIDE BY ION CHROMATOGRAPHY	0.317 mg/L	08/19/2020 08:50 PM	TVOROBAYCH	EPA 300.0
00916A CALCIUM, TOTAL (WATER & WASTE) BY ICP	27.340 mg/L	08/20/2020 10:59 AM	ATAPSOBA	EPA 200.7
00900 HARDNESS, TOTAL (CALCULATED)	84 mg/L	08/20/2020 10:59 AM	ATAPSOBA	SM 2340 B
** Comment ** Accredited by NJ only - accreditation not available from PA				
01045M IRON, TOTAL IN MG/L (WATER & WASTE) BY ICP	0.298 mg/L	08/20/2020 10:59 AM	ATAPSOBA	EPA 200.7
01132A LITHIUM, TOTAL (WATER & WASTE) BY ICP	<25.0 ug/L (U)	08/20/2020 10:59 AM	ATAPSOBA	EPA 200.7
00927A MAGNESIUM, TOTAL (WATER & WASTE) BY ICP	3.88 mg/L	08/20/2020 10:59 AM	ATAPSOBA	EPA 200.7
01055M MANGANESE, TOTAL in MG/L (WATER & WASTE) BY ICP	0.161 mg/L	08/20/2020 10:59 AM	ATAPSOBA	EPA 200.7
00403 pH, Lab (Electrometric)	7.6 pH units	08/19/2020 04:34 PM	JAHOQUE	SM 4500-H+ B
** Comment ** Holding Time Exceeded				
00937A POTASSIUM, TOTAL (WATER & WASTE) BY ICP	1.49 mg/L	08/20/2020 10:59 AM	ATAPSOBA	EPA 200.7
01147H SELENIUM, TOTAL (WATER & WASTE) BY ICPMS	<7.00 ug/L (U)	08/24/2020 11:29 AM	SCHOY	EPA 200.8
00929A SODIUM, TOTAL (WATER & WASTE) BY ICP	103.30 mg/L	08/20/2020 12:20 PM	ATAPSOBA	EPA 200.7
00095 SPECIFIC CONDUCTIVITY @ 25.0 C	631.00 umhos/cm	08/19/2020 06:22 PM	MTUZINSKI	SM 2510B
01082M STRONTIUM, TOTAL in MG/L (WATER & WASTE) BY ICP	0.211 mg/L	08/20/2020 10:59 AM	ATAPSOBA	EPA 200.7
00403T Temperature at which pH is measured	20.18 C	08/19/2020 04:34 PM	JAHOQUE	SM 4500-H+ B
00940 Total Chloride-Ion Chromatograph	46.23 mg/L	08/19/2020 08:50 PM	TVOROBAYCH	EPA 300.0
70300 TOTAL DISSOLVED SOLIDS @ 180C	366 mg/L	08/19/2020 08:56 AM	LWILKINSON	SM 2540 C
00945 Total Sulfate-Ion Chromatograph	28.95 mg/L	08/19/2020 08:50 PM	TVOROBAYCH	EPA 300.0
00530 TOTAL SUSPENDED SOLIDS	<5 mg/L (U)	08/19/2020 09:06 AM	MARMANIOUS	USGS I-3765
82079 TURBIDITY, NEPHELMETRIC	<1 NTU (U)	08/19/2020 02:17 PM	JANJOHN	EPA 180.1
01092A ZINC, TOTAL (WATER & WASTE) BY ICP	<30.0 ug/L (U)	08/20/2020 10:59 AM	ATAPSOBA	EPA 200.7

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June Black, Technical Director, Bureau of Laboratories

Analytical Report For  
Oil And Gas Mgmt

Sample ID: 9634 208

Date Collected: 08/18/2020

Lab Sample ID: I2020011577

Status: Completed

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**Date of Issue:** 09/15/2020 01:06:58

**DEP Bureau of Laboratories - Harrisburg**  
P.O. Box 1467  
2575 Interstate Drive  
Harrisburg, PA 17105-1467

**Contact Phone Number:** (717) 346-7200

**NELAP - accredited by**

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**NJ DEP - Laboratory Number: PA059**  
**PA DEP LAP - DEP Lab ID: 22-00223**

**Analytical Report For**  
**Oil And Gas Mgmt**

**Sample ID:** 9634 209

**Date Collected:** 08/18/2020

**Lab Sample ID:** O2020003582

**Status:** Completed

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**Name of Sample Collector:** Christine Miner

**Date Received:** 08/19/2020

**County:** Butler

**State:**

**Municipality:** Connoquenessing Twp

██████████  
██████████

EVANS CITY PA. 16033-4504

**Sample Medium:** Ground Water

**Sample Medium Type:** Water

**Location:** NOT INDICATED

**Reason:** Complaint

**Project:** NOT INDICATED

**Suite:** METH

**Matrix:** Water

**Stream Condition:**

**Sample Comment:** 12 min purge 480'td ww

**Appearance:** red tint faint h2s smell

Analytical Report For  
Oil And Gas Mgmt

Sample ID: 9634 209

Date Collected: 08/18/2020

Lab Sample ID: O2020003582

Status: Completed

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
74840 Ethane	92.9 ug/L	08/20/2020 02:00 AM	DLY	BOL BOL6019
74828 Methane	19100 ug/L	08/20/2020 02:00 AM	DLY	BOL BOL6019
74986 Propane	14.2 ug/L (U)	08/20/2020 02:00 AM	DLY	BOL BOL6019

The results of the analyses provided in this laboratory report relate only to the sample(s) identified therein. Unless otherwise noted, the results presented on this laboratory report meet all requirements of the 2016 TNI standard. Sample was in acceptable condition when received by the Laboratory. Any exceptions are noted in the report.

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U - Indicates analysis was performed for the test but it was not detected. The sample quantitation limit is reported.

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June Black, Technical Director, Bureau of Laboratories

ORGANICS LABORATORY QUALIFIERS  
-----

U - Indicates analysis was performed for the test but it was not detected. The sample quantitation limit is reported.

J - Indicates an estimated value, reported between Reporting Limit (RL) and Minimum Detection Limit (MDL).

N - Indicates presumptive evidence of a compound.

B - This flag is used when the analyte is found in the associated blank as well as in the sample.

E - This flag identifies compounds whose concentrations exceed the calibration range of the instrument for that specific analysis.

P - This flag is used with a target analyte when there is greater than a 40% difference between the results obtained from the primary and confirmation columns for dual column analysis methods (e.g. pesticides, triazines, PCBs, etc)

Q - This flag identifies the average of multiple results from multiple analyses, or the average of the averages of dual column analysis methods.

X - Non-target analytes co-elute with compound. Identification unable to be confirmed.



Date of Issue: 02/18/2021 09:53:30

DEP Bureau of Laboratories - Harrisburg  
P.O. Box 1467  
2575 Interstate Drive  
Harrisburg, PA 17105-1467

Contact Phone Number: (717) 346-7200

NELAP - accredited by

NJ DEP - Laboratory Number: PA059  
PA DEP LAP - DEP Lab ID: 22-00223

Analytical Report For  
Oil And Gas Mgmt

Sample ID: 9634 244

Date Collected: 10/29/2020

Lab Sample ID: I2020016866

Status: Completed

Name of Sample Collector: Christine Miner

Date Received: 10/30/2020

County: Butler

State:

Municipality: Connoquenessing Twp



EVANS CITY PA. 16033-4504

Sample Medium: Ground Water

Sample Medium Type: Water

Location: psi tank, 10 min purge

Reason: Complaint

Project: NOT INDICATED

Standard Anlysis: 946

Matrix: Water

Stream Condition:

Sample Comment: This is a resample due to complainant letting me know by email that from October 24, 2020 to October 27, 2020, an "odor and taste of the water has become much worse."

Appearance: clear, effervescent at times, moderate H2S odor, no oil odor

**Analytical Report For  
Oil And Gas Mgmt**

Sample ID: 9634 244

Date Collected: 10/29/2020

Lab Sample ID: I2020016866

Status: Completed

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
00410 ALKALINITY AS CaCO3 @ pH 4.5	232.6 mg/L	10/30/2020 02:39 PM	MBOTTS	SM 2320B
01105H ALUMINUM, TOTAL (WATER & WASTE) ICPMS	<15.0 ug/L (U)	11/02/2020 04:13 PM	JOWERNER	EPA 200.8
01002H ARSENIC, TOTAL (WATER & WASTE) BY ICPMS	<3.00 ug/L (U)	11/02/2020 04:13 PM	JOWERNER	EPA 200.8
01007M BARIUM, TOTAL in MG/L (WATER & WASTE) BY ICP	0.086 mg/L	11/02/2020 03:29 PM	ATAPSOBA	EPA 200.7
71870 BROMIDE BY ION CHROMATOGRAPHY	<0.2 mg/L (U)	10/30/2020 02:53 PM	TVOROBAYCH	EPA 300.0
00916A CALCIUM, TOTAL (WATER & WASTE) BY ICP	21.810 mg/L	11/02/2020 03:29 PM	ATAPSOBA	EPA 200.7
00900 HARDNESS, TOTAL (CALCULATED)	68 mg/L	11/02/2020 03:29 PM	ATAPSOBA	SM 2340 B
** Comment ** Accredited by NJ only - accreditation not available from PA				
01045M IRON, TOTAL IN MG/L (WATER & WASTE) BY ICP	0.286 mg/L	11/02/2020 03:29 PM	ATAPSOBA	EPA 200.7
01132A LITHIUM, TOTAL (WATER & WASTE) BY ICP	<25.0 ug/L (U)	11/02/2020 03:29 PM	ATAPSOBA	EPA 200.7
00927A MAGNESIUM, TOTAL (WATER & WASTE) BY ICP	3.36 mg/L	11/02/2020 03:29 PM	ATAPSOBA	EPA 200.7
01055M MANGANESE, TOTAL in MG/L (WATER & WASTE) BY ICP	0.123 mg/L	11/02/2020 03:29 PM	ATAPSOBA	EPA 200.7
00403 pH, Lab (Electrometric)	7.8 pH units	10/30/2020 02:39 PM	MBOTTS	SM 4500-H+ B
** Comment ** Holding Time Exceeded				
00937A POTASSIUM, TOTAL (WATER & WASTE) BY ICP	1.34 mg/L	11/02/2020 03:29 PM	ATAPSOBA	EPA 200.7
01147H SELENIUM, TOTAL (WATER & WASTE) BY ICPMS	<7.00 ug/L (U)	11/02/2020 04:13 PM	JOWERNER	EPA 200.8
00929A SODIUM, TOTAL (WATER & WASTE) BY ICP	109.30 mg/L	11/03/2020 10:47 AM	ATAPSOBA	EPA 200.7
00095 SPECIFIC CONDUCTIVITY @ 25.0 C	571.00 umhos/cm	11/03/2020 03:42 PM	MTUZINSKI	SM 2510B
01082M STRONTIUM, TOTAL in MG/L (WATER & WASTE) BY ICP	0.196 mg/L	11/02/2020 03:29 PM	ATAPSOBA	EPA 200.7
00403T Temperature at which pH is measured	20.52 C	10/30/2020 02:39 PM	MBOTTS	SM 4500-H+ B
00940 Total Chloride-Ion Chromatograph	25.32 mg/L	10/30/2020 02:53 PM	TVOROBAYCH	EPA 300.0
70300 TOTAL DISSOLVED SOLIDS @ 180C	344 mg/L	10/30/2020 03:51 PM	MARMANIOUS	SM 2540 C
00945 Total Sulfate-Ion Chromatograph	29.99 mg/L	10/30/2020 02:53 PM	TVOROBAYCH	EPA 300.0
00530 TOTAL SUSPENDED SOLIDS	6 mg/L	10/30/2020 03:20 PM	MARMANIOUS	USGS I-3765
82079 TURBIDITY, NEPHELMETRIC	1.18 NTU	10/30/2020 10:04 AM	JANBARRY	EPA 180.1
01092A ZINC, TOTAL (WATER & WASTE) BY ICP	<30.0 ug/L (U)	11/02/2020 03:29 PM	ATAPSOBA	EPA 200.7

The results of the analyses provided in this laboratory report relate only to the sample(s) identified therein. Unless otherwise noted, the results presented on this laboratory report meet all requirements of the 2016 TNI standard. Sample was in acceptable condition when received by the Laboratory. Any exceptions are noted in the report.

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Jennifer Fesler, Technical Director, Bureau of Laboratories



Analytical Report For  
Oil And Gas Mgmt

Sample ID: 9634 244

Date Collected: 10/29/2020

Lab Sample ID: I2020016866

Status: Completed

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**Date of Issue:** 02/18/2021 09:57:30

**DEP Bureau of Laboratories - Harrisburg**  
P.O. Box 1467  
2575 Interstate Drive  
Harrisburg, PA 17105-1467

**Contact Phone Number: (717) 346-7200**

**NELAP - accredited by**

**NJ DEP - Laboratory Number: PA059**  
**PA DEP LAP - DEP Lab ID: 22-00223**

**Analytical Report For**  
**Oil And Gas Mgmt**

**Sample ID:** 9634 250

**Date Collected:** 10/29/2020

**Lab Sample ID:** O2020005874

**Status:** Completed

**Name of Sample Collector:** Christine Miner

**Date Received:** 10/30/2020

**County:** Butler

**State:**

**Municipality:** Connoquenessing Twp



EVANS CITY PA. 16033-4504

**Sample Medium:** Ground Water

**Sample Medium Type:** Water

**Location:** 10 min purge, psi tank

**Reason:** Routine Sampling

**Project:** NOT INDICATED

**Suite:** METH

**Matrix:** Water

**Stream Condition:**

**Sample Comment:** Resample due to complainant emailing me to let me know that the odor and taste were becoming worse form October 24, 2020 to October 27, 2020.

**Appearance:** clear, effervescent at times, moderate H2S odor, no petroleu

Analytical Report For  
Oil And Gas Mgmt

Sample ID: 9634 250

Date Collected: 10/29/2020

Lab Sample ID: O2020005874

Status: Completed

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
74840 Ethane	36.2 ug/L (Q)	11/04/2020 02:00 AM	DACLEMENS	BOL BOL6019
74828 Methane	22700 ug/L (Q)	11/04/2020 02:00 AM	DACLEMENS	BOL BOL6019
74986 Propane	14.2 ug/L (U)	11/04/2020 02:00 AM	DACLEMENS	BOL BOL6019

The results of the analyses provided in this laboratory report relate only to the sample(s) identified therein. Unless otherwise noted, the results presented on this laboratory report meet all requirements of the 2016 TNI standard. Sample was in acceptable condition when received by the Laboratory. Any exceptions are noted in the report.

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J - Indicates an estimated value, reported between Reporting Limit (RL) and Minimum Detection Limit (MDL).

Jennifer Fesler, Technical Director, Bureau of Laboratories

ORGANICS LABORATORY QUALIFIERS

U - Indicates analysis was performed for the test but it was not detected. The sample quantitation limit is reported.

J - Indicates an estimated value, reported between Reporting Limit (RL) and Minimum Detection Limit (MDL).

N - Indicates presumptive evidence of a compound.

B - This flag is used when the analyte is found in the associated blank as well as in the sample.

E - This flag identifies compounds whose concentrations exceed the calibration range of the instrument for that specific analysis.

P - This flag is used with a target analyte when there is greater than a 40% difference between the results obtained from the primary and confirmation columns for dual column analysis methods (e.g. pesticides, triazines, PCBs, etc)

Q - This flag identifies the average of multiple results from multiple analyses, or the average of the averages of dual column analysis methods.

X - Non-target analytes co-elute with compound. Identification unable to be confirmed.



**Date of Issue:** 02/18/2021 09:55:32

**DEP Bureau of Laboratories - Harrisburg**  
P.O. Box 1467  
2575 Interstate Drive  
Harrisburg, PA 17105-1467

**Contact Phone Number:** (717) 346-7200

**NELAP - accredited by**

**NJ DEP - Laboratory Number: PA059**  
**PA DEP LAP - DEP Lab ID: 22-00223**

**Analytical Report For**  
**Oil And Gas Mgmt**

**Sample ID:** 9634 245

**Date Collected:** 10/29/2020

**Lab Sample ID:** O2020005873

**Status:** Completed

**Name of Sample Collector:** Christine Miner

**Date Received:** 10/30/2020

**County:** Butler

**State:**

**Municipality:** Connoquenessing Twp

██████████  
██████████

EVANS CITY PA. 16033-4504

**Sample Medium:** Ground Water

**Sample Medium Type:** Water

**Location:** 10 min. purge, kitchen sink softener treated water

**Reason:** Complaint

**Project:** NOT INDICATED

**Suite:** METH

**Matrix:** Water

**Stream Condition:**

**Sample Comment:** Resample due to complainant emailing me to let me know that the odor and taste were becoming much worse from October 24, 2020 to October 27, 2020

**Appearance:** clear, moderate HS odor, no Petroleum odor,

Analytical Report For  
Oil And Gas Mgmt

Sample ID: 9634 245

Date Collected: 10/29/2020

Lab Sample ID: O2020005873

Status: Completed

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
74840 Ethane	93.0 ug/L (Q)	11/04/2020 02:00 AM	DACLEMENS	BOL BOL6019
74828 Methane	27800 ug/L (Q)	11/04/2020 02:00 AM	DACLEMENS	BOL BOL6019
74986 Propane	14.2 ug/L (U)	11/04/2020 02:00 AM	DACLEMENS	BOL BOL6019

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Jennifer Fesler, Technical Director, Bureau of Laboratories

ORGANICS LABORATORY QUALIFIERS

U - Indicates analysis was performed for the test but it was not detected. The sample quantitation limit is reported.

J - Indicates an estimated value, reported between Reporting Limit (RL) and Minimum Detection Limit (MDL).

N - Indicates presumptive evidence of a compound.

B - This flag is used when the analyte is found in the associated blank as well as in the sample.

E - This flag identifies compounds whose concentrations exceed the calibration range of the instrument for that specific analysis.

P - This flag is used with a target analyte when there is greater than a 40% difference between the results obtained from the primary and confirmation columns for dual column analysis methods (e.g. pesticides, triazines, PCBs, etc)

Q - This flag identifies the average of multiple results from multiple analyses, or the average of the averages of dual column analysis methods.

X - Non-target analytes co-elute with compound. Identification unable to be confirmed.



Date of Issue: 03/23/2022 10:47:53

DEP Bureau of Laboratories - Harrisburg  
P.O. Box 1467  
2575 Interstate Drive  
Harrisburg, PA 17105-1467

Contact Phone Number: (717) 346-7200

NELAP - accredited by

NJ DEP - Laboratory Number: PA059  
PA DEP LAP - DEP Lab ID: 22-00223

Analytical Report For  
Oil And Gas Mgmt

Sample ID: 9634 282

Date Collected: 04/28/2021

Lab Sample ID: I2021008283

Status: Completed

Name of Sample Collector: Christine Miner

Date Received: 04/29/2021

County: Butler

State:

Municipality: Connoquenessing Twp

██████████  
██████████  
EVANS CITY PA. 16033

Sample Medium: Ground Water

Sample Medium Type: Water

Location: psi tank raw water, 37 min purge

Reason: Complaint

Project: NOT INDICATED

Standard Anlysis: 946

Matrix: Water

Legal Seal:	I010877	Intact:	Yes
Legal Seal:	I010878	Intact:	Yes

Stream Condition:

Appearance: colorless with effervescence, slight H2S odor

**Analytical Report For  
Oil And Gas Mgmt**

Sample ID: 9634 282

Date Collected: 04/28/2021

Lab Sample ID: I2021008283

Status: Completed

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
00410 ALKALINITY AS CaCO3 @ pH 4.5	213.0 mg/L	04/29/2021 05:07 PM	JAHOUE	SM 2320B
01105H ALUMINUM, TOTAL (WATER & WASTE) ICPMS	<15.0 ug/L (U)	05/03/2021 01:58 PM	SCHOY	EPA 200.8
01002H ARSENIC, TOTAL (WATER & WASTE) BY ICPMS	<3.00 ug/L (U)	05/03/2021 01:58 PM	SCHOY	EPA 200.8
38260A Automated MBAS	<0.20 mg/L (U)	04/29/2021 01:32 PM	MBOTTS	SM 5540C-M
01007M BARIUM, TOTAL in MG/L (WATER & WASTE) BY ICP	0.092 mg/L	04/30/2021 12:39 PM	CREITMEYER	EPA 200.7
71870 BROMIDE BY ION CHROMATOGRAPHY	0.223 mg/L	04/30/2021 05:49 AM	TVOROBAYCH	EPA 300.0
00916A CALCIUM, TOTAL (WATER & WASTE) BY ICP	27.700 mg/L	04/30/2021 12:39 PM	CREITMEYER	EPA 200.7
00900 HARDNESS, TOTAL (CALCULATED)	86 mg/L	04/30/2021 12:39 PM	CREITMEYER	SM 2340 B
** Comment ** Accredited by NJ only - accreditation not available from PA				
01045M IRON, TOTAL IN MG/L (WATER & WASTE) BY ICP	0.121 mg/L	04/30/2021 12:39 PM	CREITMEYER	EPA 200.7
01132A LITHIUM, TOTAL (WATER & WASTE) BY ICP	<25.0 ug/L (U)	04/30/2021 12:39 PM	CREITMEYER	EPA 200.7
00927A MAGNESIUM, TOTAL (WATER & WASTE) BY ICP	4.09 mg/L	04/30/2021 12:39 PM	CREITMEYER	EPA 200.7
01055M MANGANESE, TOTAL in MG/L (WATER & WASTE) BY ICP	0.042 mg/L	04/30/2021 12:39 PM	CREITMEYER	EPA 200.7
00403 pH, Lab (Electrometric)	8.1 pH units	04/29/2021 05:07 PM	JAHOUE	SM 4500-H+ B
** Comment ** Holding Time Exceeded				
00937A POTASSIUM, TOTAL (WATER & WASTE) BY ICP	1.43 mg/L	04/30/2021 12:39 PM	CREITMEYER	EPA 200.7
01147H SELENIUM, TOTAL (WATER & WASTE) BY ICPMS	<7.00 ug/L (U)	05/03/2021 01:58 PM	SCHOY	EPA 200.8
00929A SODIUM, TOTAL (WATER & WASTE) BY ICP	95.90 mg/L	04/30/2021 12:39 PM	CREITMEYER	EPA 200.7
00095 SPECIFIC CONDUCTIVITY @ 25.0 C	555.00 umhos/cm	05/04/2021 02:48 PM	MTUZINSKI	SM 2510B
01082M STRONTIUM, TOTAL in MG/L (WATER & WASTE) BY ICP	0.232 mg/L	04/30/2021 12:39 PM	CREITMEYER	EPA 200.7
00403T Temperature at which pH is measured	19.87 C	04/29/2021 05:07 PM	JAHOUE	SM 4500-H+ B
00940 Total Chloride-Ion Chromatograph	35.00 mg/L	04/30/2021 05:49 AM	TVOROBAYCH	EPA 300.0
70300 TOTAL DISSOLVED SOLIDS @ 180C	348 mg/L	04/29/2021 12:14 PM	MOBERCASH	SM 2540 C
00945 Total Sulfate-Ion Chromatograph	34.35 mg/L	04/30/2021 05:49 AM	TVOROBAYCH	EPA 300.0
00530 TOTAL SUSPENDED SOLIDS	<5 mg/L (U)	04/29/2021 09:19 AM	MARMANIOUS	USGS I-3765
82079 TURBIDITY, NEPHELMETRIC	1.13 NTU	04/29/2021 11:49 AM	JAHOUE	EPA 180.1
01092A ZINC, TOTAL (WATER & WASTE) BY ICP	<30.0 ug/L (U)	04/30/2021 12:39 PM	CREITMEYER	EPA 200.7

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Dr. Pamela Higgins, Technical Director, Bureau of Laboratories

Analytical Report For  
Oil And Gas Mgmt

Sample ID: 9634 282

Date Collected: 04/28/2021

Lab Sample ID: I2021008283

Status: Completed

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Date of Issue: 03/23/2022 10:47:19

DEP Bureau of Laboratories - Harrisburg  
P.O. Box 1467  
2575 Interstate Drive  
Harrisburg, PA 17105-1467

Contact Phone Number: (717) 346-7200

NELAP - accredited by

NJ DEP - Laboratory Number: PA059  
PA DEP LAP - DEP Lab ID: 22-00223

Analytical Report For  
Oil And Gas Mgmt

Sample ID: 9634 283

Date Collected: 04/28/2021 10:55:00 AM

Lab Sample ID: O2021002821

Status: Completed

Name of Sample Collector: Christine Miner

Date Received: 04/29/2021

County: NOT INDICATED

State:

Municipality: NOT INDICATED

Location: NOT INDICATED

Reason: Routine Sampling

Project: NOT INDICATED

Suite: METH

Matrix: Water

Legal Seal: I010886 Intact: Yes

Legal Seal: I010887 Intact: Yes

Stream Condition:

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
74840 Ethane	12.4 ug/L (U)	04/30/2021 02:00 AM	DLY	BOL BOL6019
74828 Methane	22400 ug/L	04/30/2021 02:00 AM	DLY	BOL BOL6019
74986 Propane	14.2 ug/L (U)	04/30/2021 02:00 AM	DLY	BOL BOL6019

Analytical Report For  
Oil And Gas Mgmt

Sample ID: 9634 283

Date Collected: 04/28/2021 10:55:00 AM

Lab Sample ID: O2021002821

Status: Completed

The results of the analyses provided in this laboratory report relate only to the sample(s) identified therein. Unless otherwise noted, the results presented on this laboratory report meet all requirements of the 2016 TNI standard. Sample was in acceptable condition when received by the Laboratory. Any exceptions are noted in the report.

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Dr. Pamela Higgins, Technical Director, Bureau of Laboratories

ORGANICS LABORATORY QUALIFIERS

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J - Indicates an estimated value, reported between Reporting Limit (RL) and Minimum Detection Limit (MDL).

N - Indicates presumptive evidence of a compound.

B - This flag is used when the analyte is found in the associated blank as well as in the sample.

E - This flag identifies compounds whose concentrations exceed the calibration range of the instrument for that specific analysis.

P - This flag is used with a target analyte when there is greater than a 40% difference between the results obtained from the primary and confirmation columns for dual column analysis methods (e.g. pesticides, triazines, PCBs, etc)

Q - This flag identifies the average of multiple results from multiple analyses, or the average of the averages of dual column analysis methods.

X - Non-target analytes co-elute with compound. Identification unable to be confirmed.



Date of Issue: 03/23/2022 10:47:27

DEP Bureau of Laboratories - Harrisburg  
P.O. Box 1467  
2575 Interstate Drive  
Harrisburg, PA 17105-1467

Contact Phone Number: (717) 346-7200

NELAP - accredited by

NJ DEP - Laboratory Number: PA059  
PA DEP LAP - DEP Lab ID: 22-00223

Analytical Report For  
Oil And Gas Mgmt

Sample ID: 9634 286

Date Collected: 04/28/2021 10:55:00 AM

Lab Sample ID: I2021008284

Status: Completed

Name of Sample Collector: Christine Miner

Date Received: 04/29/2021

County: NOT INDICATED

State:

Municipality: NOT INDICATED

Location: NOT INDICATED

Reason: Routine Sampling

Project: NOT INDICATED

Standard Analysis: 050

Matrix: Water

Legal Seal:	I010884	Intact:	Yes
Legal Seal:	I010885	Intact:	Yes

Stream Condition:

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
00556H Oil & Grease in water (as Hexane Extractable Material)	<5.0 mg/L (U)	05/10/2021 09:06 AM	SAGREER	EPA 1664A

**Analytical Report For  
Oil And Gas Mgmt**

**Sample ID:** 9634 286

**Date Collected:** 04/28/2021 10:55:00 AM

**Lab Sample ID:** I2021008284

**Status:** Completed

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Dr. Pamela Higgins, Technical Director, Bureau of Laboratories



Date of Issue: 03/23/2022 10:48:01

DEP Bureau of Laboratories - Harrisburg  
P.O. Box 1467  
2575 Interstate Drive  
Harrisburg, PA 17105-1467

Contact Phone Number: (717) 346-7200

NELAP - accredited by

NJ DEP - Laboratory Number: PA059  
PA DEP LAP - DEP Lab ID: 22-00223

Analytical Report For  
Oil And Gas Mgmt

Sample ID: 9634 284

Date Collected: 04/28/2021

Lab Sample ID: O2021002747

Status: Completed

Name of Sample Collector: Christine Miner

Date Received: 04/29/2021

County: Butler

State:

Municipality: Connoquenessing Twp

██████████  
██████████  
EVANS CITY PA. 16033

Sample Medium: Ground Water

Sample Medium Type: Water

Location: psi tank raw water after 37 min purge.

Reason: Complaint

Project: NOT INDICATED

Suite: VOADW

Matrix: Water

Legal Seal:	I010880	Intact:	Yes
Legal Seal:	I010881	Intact:	Yes

Stream Condition:

Appearance: colorless but effervescent, slight H2S odor

**Analytical Report For  
Oil And Gas Mgmt**

Sample ID: 9634 284

Date Collected: 04/28/2021

Lab Sample ID: O2021002747

Status: Completed

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
630206 1,1,1,2-Tetrachloroethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
71556 1,1,1-Trichloroethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
79345 1,1,2,2-Tetrachloroethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
79005 1,1,2-Trichloroethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
75343 1,1-Dichloroethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
75354 1,1-Dichloroethene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
563586 1,1-Dichloropropene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
87616 1,2,3-Trichlorobenzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
96184 1,2,3-Trichloropropane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
120821 1,2,4-Trichlorobenzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
95636 1,2,4-Trimethylbenzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
95501 1,2-Dichlorobenzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
107062 1,2-Dichloroethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
78875 1,2-Dichloropropane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
108678 1,3,5-Trimethy benzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
541731 1,3-Dichlorobenzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
142289 1,3-Dichloropropane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
106467 1,4-Dichlorobenzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
594207 2,2-Dichloropropane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
78933 2-Butanone	2.50 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
591786 2-Hexanone	2.50 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
99876 4-Isopropyltoluene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
108101 4-Methyl-2-pentanone	2.50 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
67641 Acetone	2.50 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
71432 Benzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
108861 Bromobenzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
74975 Bromochloromethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
75274 Bromodichloromethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
75252 Bromoform	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
74839 Bromomethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
75150 Carbon disulfide	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
56235 Carbon tetrachloride	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
108907 Chlorobenzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
75003 Chloroethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
75014 Chloroethene (vinyl chloride)	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
67663 Chloroform	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3

Analytical Report For  
Oil And Gas Mgmt

Sample ID: 9634 284

Date Collected: 04/28/2021

Lab Sample ID: O2021002747

Status: Completed

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
74873 Chloromethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
156592 cis-1,2-Dichloroethene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
10061015 cis-1,3-Dichloropropene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
124481 Dibromochloromethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
74953 D bromomethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
75718 Dichlorodifluoromethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
75092 Dichloromethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
100414 Ethylbenzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
87683 Hexachlorobutadiene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
98828 Isopropyl benzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
108383 m/p-Xylenes	1.00 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
1634044 Methyl-tert-butyl Ether	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
91203 Naphthalene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
104518 n-Butylbenzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
103651 n-Propylbenzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
95498 o-Chlorotoluene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
95476 o-Xylene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
106434 p-Chlorotoluene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
98566 PCTFB	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
135988 Sec-Butyl benzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
100425 Styrene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
75650 t-Butyl alcohol	5.00 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
540885 tert-Butyl Acetate	2.50 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
98066 Tert-Butylbenzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
127184 Tetrachloroethene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
109999 Tetrahydrofuran	15.4 ug/L	05/04/2021 02:00 AM	ALIU	EPA 524.3
108883 Toluene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
1330207 Total Xylenes	0 ug/L	05/04/2021 02:00 AM	ALIU	EPA 524.3
156605 trans-1,2-Dichloroethene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
10061026 trans-1,3-Dichloropropene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
79016 Trichloroethene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
75694 Trichlorofluoromethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
108054 Vinyl Acetate	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3

Analytical Report For  
Oil And Gas Mgmt

Sample ID: 9634 284

Date Collected: 04/28/2021

Lab Sample ID: O2021002747

Status: Completed

The results of the analyses provided in this laboratory report relate only to the sample(s) identified therein. Unless otherwise noted, the results presented on this laboratory report meet all requirements of the 2016 TNI standard. Sample was in acceptable condition when received by the Laboratory. Any exceptions are noted in the report.

\* denotes tests that the laboratory is not accredited for

U - Indicates analysis was performed for the test but it was not detected. The sample quantitation limit is reported.

J - Indicates an estimated value, reported between Reporting Limit (RL) and Minimum Detection Limit (MDL).

Dr. Pamela Higgins, Technical Director, Bureau of Laboratories

ORGANICS LABORATORY QUALIFIERS

U - Indicates analysis was performed for the test but it was not detected. The sample quantitation limit is reported.

J - Indicates an estimated value, reported between Reporting Limit (RL) and Minimum Detection Limit (MDL).

N - Indicates presumptive evidence of a compound.

B - This flag is used when the analyte is found in the associated blank as well as in the sample.

E - This flag identifies compounds whose concentrations exceed the calibration range of the instrument for that specific analysis.

P - This flag is used with a target analyte when there is greater than a 40% difference between the results obtained from the primary and confirmation columns for dual column analysis methods (e.g. pesticides, triazines, PCBs, etc)

Q - This flag identifies the average of multiple results from multiple analyses, or the average of the averages of dual column analysis methods.

X - Non-target analytes co-elute with compound. Identification unable to be confirmed.





Date of Issue: 03/23/2022 10:48:08

DEP Bureau of Laboratories - Harrisburg  
P.O. Box 1467  
2575 Interstate Drive  
Harrisburg, PA 17105-1467

Contact Phone Number: (717) 346-7200

NELAP - accredited by

NJ DEP - Laboratory Number: PA059  
PA DEP LAP - DEP Lab ID: 22-00223

Analytical Report For  
Oil And Gas Mgmt

Sample ID: 9634 285

Date Collected: 04/28/2021

Lab Sample ID: O2021002748

Status: Completed

Name of Sample Collector: Christine Miner

Date Received: 04/29/2021

County: Butler

State:

Municipality: Connoquenessing Twp

██████████  
██████████  
EVANS CITY PA. 16033

Sample Medium: Artificial

Sample Medium Type: Water

Location: Field blank for QAQC

Reason: Complaint

Project: NOT INDICATED

Suite: VOADW

Matrix: Water

Legal Seal:	I010883	Intact:	Yes
Legal Seal:	I010882	Intact:	Yes

Stream Condition:

Sample Lab Comment: This sample contained the following Tentatively Identified Compounds:ethanol

Appearance: blank water for QAQC

Analytical Report For  
Oil And Gas Mgmt

Sample ID: 9634 285

Date Collected: 04/28/2021

Lab Sample ID: O2021002748

Status: Completed

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
630206 1,1,1,2-Tetrachloroethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
71556 1,1,1-Trichloroethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
79345 1,1,2,2-Tetrachloroethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
79005 1,1,2-Trichloroethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
75343 1,1-Dichloroethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
75354 1,1-Dichloroethene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
563586 1,1-Dichloropropene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
87616 1,2,3-Trichlorobenzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
96184 1,2,3-Trichloropropane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
120821 1,2,4-Trichlorobenzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
95636 1,2,4-Trimethylbenzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
95501 1,2-Dichlorobenzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
107062 1,2-Dichloroethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
78875 1,2-Dichloropropane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
108678 1,3,5-Trimethy benzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
541731 1,3-Dichlorobenzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
142289 1,3-Dichloropropane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
106467 1,4-Dichlorobenzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
594207 2,2-Dichloropropane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
78933 2-Butanone	2.50 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
591786 2-Hexanone	2.50 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
99876 4-Isopropyltoluene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
108101 4-Methyl-2-pentanone	2.50 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
67641 Acetone	16.2 ug/L	05/04/2021 02:00 AM	ALIU	EPA 524.3
71432 Benzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
108861 Bromobenzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
74975 Bromochloromethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
75274 Bromodichloromethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
75252 Bromoform	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
74839 Bromomethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
75150 Carbon disulfide	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
56235 Carbon tetrachloride	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
108907 Chlorobenzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
75003 Chloroethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
75014 Chloroethene (vinyl chloride)	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3

Analytical Report For  
Oil And Gas Mgmt

Sample ID: 9634 285

Date Collected: 04/28/2021

Lab Sample ID: O2021002748

Status: Completed

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
67663 Chloroform	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
74873 Chloromethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
156592 cis-1,2-Dichloroethene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
10061015 cis-1,3-Dichloropropene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
124481 Dibromochloromethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
74953 D bromomethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
75718 Dichlorodifluoromethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
75092 Dichloromethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
100414 Ethylbenzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
87683 Hexachlorobutadiene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
98828 Isopropyl benzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
108383 m/p-Xylenes	1.00 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
1634044 Methyl-tert-butyl Ether	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
91203 Naphthalene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
104518 n-Butylbenzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
103651 n-Propylbenzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
95498 o-Chlorotoluene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
95476 o-Xylene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
106434 p-Chlorotoluene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
98566 PCTFB	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
135988 Sec-Butyl benzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
100425 Styrene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
75650 t-Butyl alcohol	5.00 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
540885 tert-Butyl Acetate	2.50 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
98066 Tert-Butylbenzene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
127184 Tetrachloroethene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
109999 Tetrahydrofuran	1.00 ug/L (B)	05/04/2021 02:00 AM	ALIU	EPA 524.3
108883 Toluene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
1330207 Total Xylenes	0 ug/L	05/04/2021 02:00 AM	ALIU	EPA 524.3
156605 trans-1,2-Dichloroethene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
10061026 trans-1,3-Dichloropropene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
79016 Trichloroethene	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
75694 Trichlorofluoromethane	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3
108054 Vinyl Acetate	0.500 ug/L (U)	05/04/2021 02:00 AM	ALIU	EPA 524.3

Analytical Report For  
Oil And Gas Mgmt

Sample ID: 9634 285

Date Collected: 04/28/2021

Lab Sample ID: O2021002748

Status: Completed

The results of the analyses provided in this laboratory report relate only to the sample(s) identified therein. Unless otherwise noted, the results presented on this laboratory report meet all requirements of the 2016 TNI standard. Sample was in acceptable condition when received by the Laboratory. Any exceptions are noted in the report.

\* denotes tests that the laboratory is not accredited for

U - Indicates analysis was performed for the test but it was not detected. The sample quantitation limit is reported.

J - Indicates an estimated value, reported between Reporting Limit (RL) and Minimum Detection Limit (MDL).

Dr. Pamela Higgins, Technical Director, Bureau of Laboratories

ORGANICS LABORATORY QUALIFIERS

U - Indicates analysis was performed for the test but it was not detected. The sample quantitation limit is reported.

J - Indicates an estimated value, reported between Reporting Limit (RL) and Minimum Detection Limit (MDL).

N - Indicates presumptive evidence of a compound.

B - This flag is used when the analyte is found in the associated blank as well as in the sample.

E - This flag identifies compounds whose concentrations exceed the calibration range of the instrument for that specific analysis.

P - This flag is used with a target analyte when there is greater than a 40% difference between the results obtained from the primary and confirmation columns for dual column analysis methods (e.g. pesticides, triazines, PCBs, etc)

Q - This flag identifies the average of multiple results from multiple analyses, or the average of the averages of dual column analysis methods.

X - Non-target analytes co-elute with compound. Identification unable to be confirmed.



Date of Issue: 03/23/2022 10:47:44

DEP Bureau of Laboratories - Harrisburg  
P.O. Box 1467  
2575 Interstate Drive  
Harrisburg, PA 17105-1467

Contact Phone Number: (717) 346-7200

NELAP - accredited by

NJ DEP - Laboratory Number: PA059  
PA DEP LAP - DEP Lab ID: 22-00223

Analytical Report For  
Oil And Gas Mgmt

Sample ID: 9634 288

Date Collected: 04/28/2021 10:28:00 AM

Lab Sample ID: I2021008286

Status: Completed

Name of Sample Collector: Christine Miner

Date Received: 04/29/2021

County: NOT INDICATED

State:

Municipality: NOT INDICATED

Location: NOT INDICATED

Reason: Routine Sampling

Project: NOT INDICATED

Standard Analysis: 946

Matrix: Water

Legal Seal:	I010857	Intact:	Yes
Legal Seal:	I010858	Intact:	Yes

Stream Condition:

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
00410 ALKALINITY AS CaCO3 @ pH 4.5	216.2 mg/L	04/29/2021 05:15 PM	JAHOUE	SM 2320B
01105H ALUMINUM, TOTAL (WATER & WASTE) ICPMS	<15.0 ug/L (U)	05/03/2021 02:01 PM	SCHOY	EPA 200.8
01002H ARSENIC, TOTAL (WATER & WASTE) BY ICPMS	<3.00 ug/L (U)	05/03/2021 02:01 PM	SCHOY	EPA 200.8
01007M BARIUM, TOTAL in MG/L (WATER & WASTE) BY ICP	0.034 mg/L	04/30/2021 12:42 PM	CREITMEYER	EPA 200.7
71870 BROMIDE BY ION CHROMATOGRAPHY	0.248 mg/L	04/30/2021 06:39 AM	TVOROBAYCH	EPA 300.0
00916A CALCIUM, TOTAL (WATER & WASTE) BY ICP	18.000 mg/L	04/30/2021 12:42 PM	CREITMEYER	EPA 200.7
00900 HARDNESS, TOTAL (CALCULATED)	57 mg/L	04/30/2021 12:42 PM	CREITMEYER	SM 2340 B

**Analytical Report For  
Oil And Gas Mgmt**

Sample ID: 9634 288

Date Collected: 04/28/2021 10:28:00 AM

Lab Sample ID: I2021008286

Status: Completed

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
** Comment ** Accredited by NJ only - accreditation not available from PA				
01045M IRON, TOTAL IN MG/L (WATER & WASTE) BY ICP	0.146 mg/L	04/30/2021 12:42 PM	CREITMEYER	EPA 200.7
01132A LITHIUM, TOTAL (WATER & WASTE) BY ICP	<25.0 ug/L (U)	04/30/2021 12:42 PM	CREITMEYER	EPA 200.7
00927A MAGNESIUM, TOTAL (WATER & WASTE) BY ICP	2.86 mg/L	04/30/2021 12:42 PM	CREITMEYER	EPA 200.7
01055M MANGANESE, TOTAL in MG/L (WATER & WASTE) BY ICP	0.049 mg/L	04/30/2021 12:42 PM	CREITMEYER	EPA 200.7
00403 pH, Lab (Electrometric)	7.9 pH units	04/29/2021 05:15 PM	JAHOUE	SM 4500-H+ B
** Comment ** Holding Time Exceeded				
00937A POTASSIUM, TOTAL (WATER & WASTE) BY ICP	1.49 mg/L	04/30/2021 12:42 PM	CREITMEYER	EPA 200.7
01147H SELENIUM, TOTAL (WATER & WASTE) BY ICPMS	<7.00 ug/L (U)	05/03/2021 02:01 PM	SCHOY	EPA 200.8
00929A SODIUM, TOTAL (WATER & WASTE) BY ICP	111.00 mg/L	04/30/2021 12:42 PM	CREITMEYER	EPA 200.7
00095 SPECIFIC CONDUCTIVITY @ 25.0 C	576.00 umhos/cm	05/04/2021 02:56 PM	MTUZINSKI	SM 2510B
01082M STRONTIUM, TOTAL in MG/L (WATER & WASTE) BY ICP	0.128 mg/L	04/30/2021 12:42 PM	CREITMEYER	EPA 200.7
00403T Temperature at which pH is measured	19.23 C	04/29/2021 05:15 PM	JAHOUE	SM 4500-H+ B
00940 Total Chloride-Ion Chromatograph	38.85 mg/L	04/30/2021 06:39 AM	TVOROBAYCH	EPA 300.0
70300 TOTAL DISSOLVED SOLIDS @ 180C	340 mg/L	04/29/2021 12:15 PM	MOBERCASH	SM 2540 C
00945 Total Sulfate-Ion Chromatograph	34.14 mg/L	04/30/2021 06:39 AM	TVOROBAYCH	EPA 300.0
00530 TOTAL SUSPENDED SOLIDS	<5 mg/L (U)	04/29/2021 09:19 AM	MARMANIOUS	USGS I-3765
82079 TURBIDITY, NEPHELMETRIC	<1 NTU	04/29/2021 11:50 AM	JAHOUE	EPA 180.1
01092A ZINC, TOTAL (WATER & WASTE) BY ICP	<30.0 ug/L (U)	04/30/2021 12:42 PM	CREITMEYER	EPA 200.7

The results of the analyses provided in this laboratory report relate only to the sample(s) identified therein. Unless otherwise noted, the results presented on this laboratory report meet all requirements of the 2016 TNI standard. Sample was in acceptable condition when received by the Laboratory. Any exceptions are noted in the report.

\* denotes tests that the laboratory is not accredited for

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J - Indicates an estimated value, reported between Reporting Limit (RL) and Minimum Detection Limit (MDL).

Dr. Pamela Higgins, Technical Director, Bureau of Laboratories

# How to Interpret a Water Analysis Report

This article outlines some of the major parameters you may see on the analysis and assists you in understanding the numbers on a water test report.



Whether your water causes illness, stains on plumbing, scaly deposits, or a bad taste, a water analysis identifies the problem and enables you to make knowledgeable decisions about water treatment.

## Features of a Sample Report

Once the lab has completed testing your water, you will receive a report that looks similar to Figure 1. It will contain a list of contaminants tested, the concentrations, and, in some cases, highlight any problem contaminants. An important feature of the report is the units used to measure the contaminant level in your water. Milligrams per liter (mg/l) of water are used for substances like metals and nitrates. A milligram per liter is also equal to one part per million (ppm)--that is one part contaminant to one million parts water. About 0.03 of a teaspoon of sugar dissolved in a bathtub of water is an approximation of one ppm. For extremely toxic substances like pesticides, the units used are even smaller. In these cases, parts per billion (ppb) are used. Another unit found on some test reports is that used to measure radon--picocuries per liter. Some values like pH, hardness, conductance, and turbidity are reported in units specific to the test.

In addition to the test results, a lab may make notes on any contaminants that exceeded the PA DEP drinking water

standards. For example, in Figure 1 the lab noted that total coliform bacteria and iron both exceeded the standards.

Retain your copy of the report in a safe place as a record of the quality of your water supply. If polluting activities such as mining occur in your area, you may need a record of past water quality to prove that your supply has been damaged.

\*\*\* ANALYTICAL LABORATORY REPORT \*\*\*

Client: Client's name	Collected by: KM
Project: Analytical Laboratory Services	Project Number: CL000001
Date Collected: 08/28/90	Time Collected: 7:35 am
Sample Identification: Kitchen Tap	Lab Number: 01000

Analysis	Results	Units
Total Coliform Bacteria	50	# /100ml
Nitrate-Nitrogen	4.55	mg/l
pH	7.50	units
Iron	0.55	mg/l
Hardness as CaCO <sub>3</sub>	280	mg/l
Sulfate Sulfur	32.0	mg/l
Chloride	25.4	mg/l
Specific Conductance	344	umhos/cc

On the basis of the above test result(s), this water sample DOES NOT MEET PaDER drinking water standards

The following notes apply to this sample:

The Total Coliform Bacteria exceeded the max. lev. of 1 colony/100ml.  
The Iron level exceeded the limit of 0.3 mg/l.

Submitted by: \_\_\_\_\_  
Laboratory Manager

Figure 1. A sample water analysis report.

## Water test parameters

The following tables provide a general guideline to common water quality parameters that may appear on your water analysis report. The parameters are divided into three categories: health risk parameters, general indicators, and nuisance parameters. These guidelines are by no means exhaustive. However, they will provide you with acceptable limits and some information about symptoms, sources of the problem and effects.

### Health Risk Parameters

The parameters in Table 1 are some common ones that have known health effects. The table lists acceptable limits, potential health effects, and possible uses and sources of the contaminant.



**PennState Extension**

Contaminant	Acceptable Limit	Sources/Uses	Potential Health Effects at High Concentrations
* Recommended level in water at which remedial action should be taken. No mandatory standards have been set.			
Atrazine	3 ppb or 003 ppm	used as a herbicide; surface or ground water contamination from agricultural runoff or leaching	heart and liver damage
Benzene	5 ppb or 005 ppm	gasoline additive; usually from accidental oil spills, industrial uses, or landfills	blood disorders like aplastic anemia; immune system depression; acute exposure affects central nervous system causing dizziness, headaches; long term exposure increases cancer risks
Lead at tap	0.015 ppm or 15 ppb	used in batteries; lead gasolines and pipe solder; may be leached from brass faucets, lead caulking, lead pipes, and lead soldered joints	nervous disorders and mental impairment, especially in fetuses and infants; kidney damage; blood disorders and hypertension; low birth weights
Nitrates (NO <sub>3</sub> )	10 mg/l (nitrate-N) 45 mg/l (nitrate)	soil by-product of agricultural fertilization; human and animal waste leaching to groundwater	methemoglobinemia (blue baby disease) in infants (birth to 6 months); low health threat to children and adults
Total Coliform	<1 coliform/100 ml	possible bacterial or viral contamination from human sewage or animal manure	diarrheal diseases, constant high level exposure can lead to cholera and hepatitis
			Radon
			300 pCi/l*
			naturally occurring gas formed from uranium decay; can seep into well water from surrounding rocks and be released in the air as it leaves the faucet
			breathing gas increases chances of lung cancer; may increase risk of stomach, colon and bladder cancers

Table 1: Standards, symptoms, and potential health effects of regulated contaminants.

### General Water Quality Indicators

General Water Quality Indicators are parameters used to indicate the presence of harmful contaminants. Testing for indicators can eliminate costly tests for specific contaminants. Generally, if the indicator is present, the supply may contain the contaminant as well. For example, turbidity or the lack of clarity in a water sample usually indicates that bacteria may be present. The pH value is also considered a general water quality indicator. High or low pHs can indicate how corrosive water is. Corrosive water may further indicate that metals like lead or copper are being dissolved in the water as it passes through distribution pipes. Table 2 shows some of the common general indicators.



Indicator	Acceptable Limit	Indication
pH value	6.5 to 8.5	An important overall measure of water quality, pH can alter corrosivity and solubility of contaminants. Low pH will cause pitting of pipes and fixtures or a metallic taste. This may indicate that metals are being dissolved. At high pH, the water will have a slippery feel or a soda taste.
Turbidity	<5 NTU	Clarity of sample can indicate contamination.
Total Dissolved Solids (TDS)	500 mg/l	Dissolved minerals like iron or manganese. High TDS also can indicate hardness (scaly deposits) or cause staining, or a salty, bitter taste.

Table 2. General water quality indicators.

*Nuisance contaminants* are a third category of contaminants. While these have no adverse health effects, they may make water unpalatable or reduce the effectiveness of soaps and detergents. Some nuisance contaminants also cause staining. Nuisance contaminants may include **iron bacteria, hydrogen sulfide, and hardness**. Table 3 shows some typical nuisance contaminants you may see on your water analysis report.

Contaminant	Acceptable Limit	Effects
Chlorides	250 mg/l	salty or brackish taste; corrosive; blackens and pits stainless steel
Copper (Cu)	1.3 mg/l	blue-green stains on plumbing fixtures; bitter metallic taste
Iron (Fe)	0.3 mg/l	metallic taste; discolored beverages; yellowish stains, stains laundry
Manganese (Mn)	0.05 mg/l or 5 ppb	black stains on fixtures and laundry; bitter taste
Sulfates (SO <sub>4</sub> )	250 mg/l	greasy feel, laxative effect
Iron Bacteria	present	orangeish to brownish slime in water

Table 3. Common nuisance contaminants and their effects.

Hardness is one contaminant you will also commonly see on the report. Hard water is a purely aesthetic problem that causes soap and scaly deposits in plumbing and decreased cleaning action of soaps and detergents. Hard water can also cause scale buildup in hot water heaters and reduce their effective lifetime. Table 4 will help you interpret the hardness parameters cited on your analysis. Note that the units used in this table differ from those indicated in Figure 1. Hardness can be expressed by either mg/l or a grains per gallon (gpg). A gpg is used exclusively as a hardness unit and equals approximately 17 mg/l or ppm. Most people object to water falling in the "hard" or "very hard" categories in Table 4. However, as with all water treatment, you should carefully consider the advantages and disadvantages to softening before making a purchasing a water softener.

Concentration of hardness minerals in grains per gallon (GPG)	Hardness Level
* level at which most people find hardness objectionable	
below 1.0	soft
1.0 to 3.5	slightly hard
3.5 to 7.5	moderately hard
7.5 to 10.5*	hard
10.5 and above	very hard

Table 4. Hardness classifications.

## Additional Resources

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For more detailed information about water testing ask for publication *Water Tests: What Do the Numbers Mean?* at your local extension office or from this website.

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## **extension.psu.edu**

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## Methane Gas and Water Wells

Residents of the coal and natural gas-producing regions of Pennsylvania need to be aware of the potential dangers resulting from the accumulation of microbial gas, coal bed methane or natural gas in their water wells.

***High concentrations of methane in water wells, water well enclosures and other confined spaces could cause an explosion.***

### What is Methane?

Methane (CH<sub>4</sub>) is a naturally occurring hydrocarbon gas found underground. It is present in shallow and deep coal beds as well as in other rock units, and it is the main hydrocarbon found in natural gas and coal beds. Methane can occur as a gas or dissolved in the groundwater, or as a gas in the soil and rock zones below the surface.

Methane migrates from areas of high pressure to areas of low pressure. Mining and well drilling operations can affect the pressure in the subsurface and cause the migration of methane to areas of lower pressure, such as shallow aquifers and water wells used as water supplies. Gas migration in the subsurface can also be influenced by an increase or decrease in the water level of an aquifer, atmospheric pressure changes and other natural processes.

Active underground mining operations can lower groundwater levels, reducing pressure in aquifers occurring above and adjacent to the area of coal extraction. This reduction in pressure can allow gases within the overlying rock layers to migrate into nearby water wells. Methane can also be released from abandoned deep mines and from active and/or abandoned gas wells that are prone to leakage. Additionally, improperly constructed operating gas wells may mobilize methane in the subsurface. Releases from these and other sources can also migrate into nearby water wells.

Methane can migrate into water wells in a gaseous phase or dissolved in the groundwater. At atmospheric pressure, methane is soluble in water between 26-35 milligrams per liter. It is sometimes recognizable as effervescent gas bubbles in water drawn from a faucet. In some cases, the release of methane in a water well may be recognized by a sound similar to that of boiling water. However, methane is a colorless and odorless gas, and it may accumulate undetected in water wellbores and water well enclosures that are not properly vented. Methane may also move into basements of homes and other structures through plumbing and piping containing electrical connections. These conditions could lead to an explosion.

### What to Do?

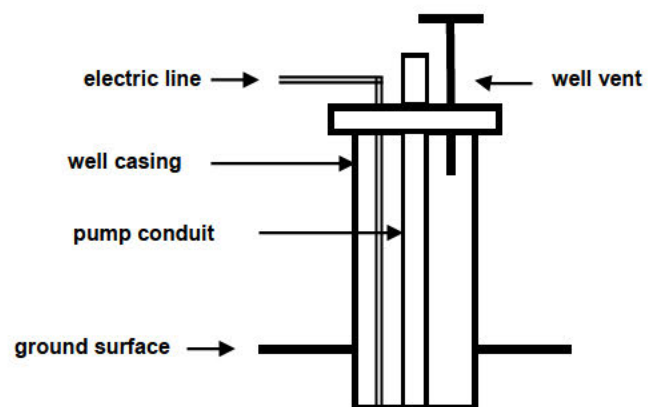
Methane gas is lighter than air with a specific gravity of 0.555, so it will not accumulate in the water wellbore if the water well is adequately vented to the atmosphere. Venting is an inexpensive and effective way to mitigate methane accumulation in water wells, water well enclosures and other confined spaces, such as basements. Proper venting reduces the potential for methane gas to seep into homes or structures from water wells.

### Recommended Venting Procedures

Proper design is extremely important. Water well vents should be installed by a qualified water well driller or plumber.

The vent should extend above any possible flood level, potential ignition sources and areas of exposure (above the roof line for water wells adjacent to buildings), and it should have watertight connections to prevent surface water from entering. The well vent should be at least one (1) inch diameter or larger to facilitate gas flow. The end of the vent pipe should have a down-turned "gooseneck" or "T" and be capped with corrosion-resistant screening. If the vent is not screened, it can become a potential entry point for debris and small animals.

If concentrations in a vent pipe happen to exceed the lower explosive limit for methane (5 percent methane in air), installation of a spark-arresting cap at the end of the pipe should be considered. In addition, conduits from the water well that carry electrical lines or waterlines into the building should be sealed so that the air in the conduit





does not vent into the building. Venting of wells will not adequately remove methane dissolved in the groundwater, but properly designed water aeration systems are one effective way to lower the concentration of methane dissolved in the water.

### Enclosed Wells

When the top of the water well is buried in a covered pit or enclosed in a basement, the vent pipe must vent gas to the outside air, as shown in the diagram at right.

The vent pipe should be screened and extend above any possible flood level, roof line, potential ignition sources and areas of exposure.

In cases where the water well is located in an enclosure, it should have a tight-fitting well cap, and all openings through the cap should be properly sealed to prevent methane from escaping into the water well enclosure.

### Play It Safe

When a water well is no longer in service, the plumbing connections should be disconnected and sealed to prevent methane from entering the home or building.

**NOTE:** Water wells may differ considerably from the wells depicted in the diagrams. Also, well-venting requirements may vary from place to place because of differences in local plumbing codes. Therefore, water well owners are encouraged to contact a professional water well specialist or a local building code enforcement officer to determine the proper venting procedures required under the local plumbing code.

**For more information on methane and water wells, please contact the local DEP office:**

#### Southwest Regional Office

400 Waterfront Drive  
Pittsburgh, PA 15222-4745  
Telephone: 412-442-4000

*Counties Served: Allegheny, Armstrong, Beaver, Cambria, Fayette, Greene, Indiana, Somerset, Washington and Westmoreland*

#### South-central Regional Office

909 Elmerton Ave.  
Harrisburg, PA 17110-8200  
Telephone: 877-333-1904

*Counties Served: Adams, Bedford, Berks, Blair, Cumberland, Dauphin, Franklin, Fulton, Huntingdon, Juniata, Lancaster, Lebanon, Mifflin, Perry and York*

#### Southeast Regional Office

2 E. Main St.  
Norristown, PA 19401-4915  
Telephone: 484-250-5900

*Counties Served: Bucks, Chester, Delaware, Montgomery and Philadelphia*

#### Northwest Regional Office

230 Chestnut St.  
Meadville, PA 16335-3481  
Telephone: 814-332-6945

*Counties Served: Butler, Clarion, Crawford, Elk, Erie, Forest, Jefferson, Lawrence, McKean, Mercer, Venango and Warren*

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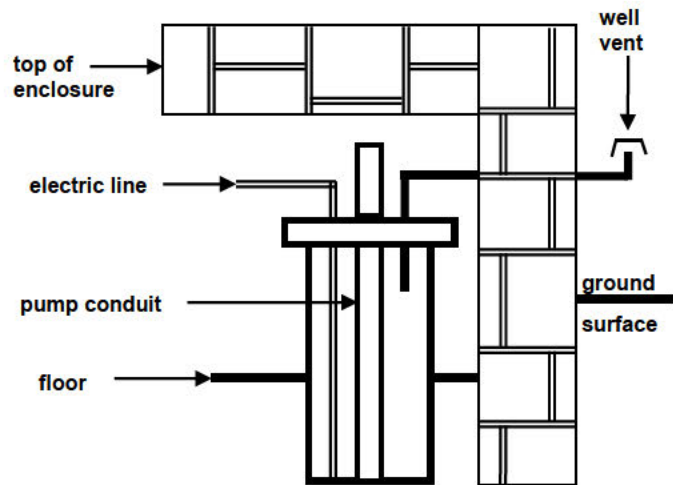
208 W. Third St., Suite 101  
Williamsport, PA 17701-6448  
Telephone: 570-327-3636

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#### Northeast Regional Office

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Telephone: 570-826-2511

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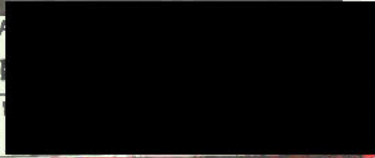


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