pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

March 9, 2023

CERTIFIED MAIL NO. [redacted]

[redacted]

Re: Water Supply Request for Investigation
DEP Identifier: 352647
Positive Determination -- 58 Pa. C.S § 3218
Connoquenessing Township, Butler County

[redacted]

The Department has completed its investigation of your water supply at the property listed in Exhibit A ("Water Supply"). There are four drilled water wells located at the property listed in Exhibit A. These water wells are described in the table, below:

Well Name (for identification purposes in this letter)	Approx. Well Depth	Approx. Well Location	Well Use
Well No. 1	400 feet deep	150 feet northwest of residence	Currently dry and abandoned
Well No. 2	500 feet deep	75 feet southwest of residence	Utilized until it was discovered to have crude oil on top of water column in 2020; now abandoned
Well No. 3	480 feet deep	30 feet south of residence	In use at time complaint submitted to Department; tied to inground cistern
Well No. 4	315 feet deep	200 feet northeast of residence	Drilled June 2020; currently in use; also tied to inground cistern

Based on the sample results and other information obtained to date, the Department has determined that Well No. 3 has likely been adversely affected by oil and gas activities including but not limited to the drilling, alteration, or operation of an oil or gas well. The oil and gas wells involved are likely historic abandoned oil and gas wells which have been compromised over time. It is likely, based on other complaint information in the area, that the local aquifer has been affected. This information was relayed to you within three emails dated October 10, 2021, November 15, 2021, and November 16, 2021, as well as during phone conversations. The case information is summarized below, as well as the full spreadsheet of sample analyses attached.

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

CASE INFORMATION:

Date of Complaint	**Nature of Complaint** (odor, taste, quantity, use, color)	**Sample Results Above Statewide Standards in Pretreated Water**
September 22, 2020	Well No. 3 (480' deep well)- Issues related to the well system 'plugging up' due to crude oil found in the well in June of 2020	Chloride 596.22 mg/l (250 mg/l std); Manganese 0.145 mg/l (0.05 mg/l std); Total Dissolved Solids 1,580 mg/l (500 mg/l std); and Methane 38.8 mg/l (7 mg/l action level)
	Well No. 4 (315' deep well drilled in June of 2020)-no issues noted about this well from complainant	Manganese 0.053 mg/l (0.05 mg/l std) and Volatile Organics Tetrahydrofuran 31.7 ug/l (25 ug/l std)*

* tetrahydrofuran is used in making polyvinylchloride materials such as water well casings and residential plumbing; detection of tetrahydrofuran in Well No. 4 likely due to the polyvinylchloride pipe utilized in the new well installation; the residential treatment system in place treats this effectively to <1.28 ug/l

INVESTIGATION SUMMARY:

This complaint, received by the Department by phone call on September 22, 2020, involved the water well system becoming plugged up with crude oil in June of 2020. This is a historic area of conventional and unconventional oil and gas well drilling, as well as strip and deep mining, and extensive water well drilling. This area is also known to have low yield aquifers, likely due to the increase in population density in recent years/decades. Surrounding unconventional and conventional gas wells were inspected in response to this complaint. There had been two other recent complaints (CID 351275 and CID 353804 with CID 357415 which are the same water well with different property owners filing complaints), all filed in 2020 and 2021 in the immediate vicinity of this complaint.

In the course of investigating this complaint, the Department collected raw water samples from Well No. 3 on September 29, 2020 and June 11, 2021. The June 2021 untreated sample showed a marked decline in all the elevated parameters, which were chloride, manganese, total dissolved solids, and methane. None of those parameters were above drinking water standards in the second sampling in June 2021. An Ultraviolet/Infrared ("UVIR") raw water sample that was performed on Well No. 3's water yielded a result indicating "…dithane fungicide present" (this compound is sourced from agriculture products). Most importantly, the methane was greatly reduced in the June 2021 sample as well.

The Department also collected samples from Well No. 4 during its investigation on September 29, 2020, June 11, 2021, and September 29, 2021. The initial raw water sample taken from Well No. 4 in September 2020 showed an elevation in manganese and Tetrahydrafuran (an organic compound frequently associated with new installations of polyvinylchloride, which was likely detected in Well No. 4 due to the pvc pipe that was used in plumbing Well No. 4 to the residence). This organic compound was treated by the system in place to well below the

standard and was not detected in subsequent samples. Both elevated parameters, manganese and Tetrahydrafuran, are treated to below drinking water standards, or below maximum contaminant levels by the current treatment systems in place. A very minute amount of methane (0.0351 mg/l) was detected initially in the September 2020 sample; however, no methane was detected in the June 2021 or September 2021 samples. A UVIR raw water sample performed on June 11, 2021 did not detect petroleum products in Well No. 4. In discussion with Gordon Brothers on October 6, 2021, it was determined that one portion of the treatment system on the Water Supply, the "clack" tank with peroxide feed which was being rented, was likely no longer necessary, so it would be removed.

Department personnel have reported 21 abandoned oil and gas wells in the area of the Water Supply. These abandoned wells have no known operator, and they are slated for plugging with the use of funding from the Infrastructure Investment and Jobs Act. Future plugging of the historic wells in the area of the Water Supply should partially or fully mitigate the impacts to Well No. 3 related to abandoned oil and gas wells.

Thank you for your patience in this matter. Please contact Christine Miner, P.G. at 814.573.3592 if you have any questions about the Department's determination, or if your water changes in any way.

Sincerely,

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

Enclosures:
Exhibit A, Laboratory Analyses Spreadsheet, Laboratory Analyses Specific to CID 352647, Fact Sheet-Interpreting Water Supply Results, Methane Fact Sheet

Cc: Lux (via email)
Braymer/Despenes (via email)
Lichtinger/Miner (via email)

pennsylvania
DEPARTMENT OF ENVIRONMENTAL
PROTECTION

EXHIBIT A

Water Supply Located at:

[redacted]

CID 352647		Old well, 480'	Old well, 480'	New well, 315'	New well, 315'	New well, 315'	New well, 315'
Parameter	MCL or SMCL	DEP 9-29-20 Postdrill	DEP 6-11-2021 Postdrill	DEP 9-29-20 Postdrill	DEP 6-11-2021 Postdrill	DEP 9-29-2021 Postdrill, Treated	DEP 9-29-2021 Postdrill, Treated through RO unit
Alkalinity (mg/l)		541.4	91.8	273.4	257.2	248.00	14.6
Barium (mg/l)	2	0.453	0.167	0.237	0.146	0.148	<0.01
Calcium (mg/l)		40.28	41.2	53.29	80.5	72.08	1.48
Chloride (mg/l)	250	596.22	191.52	30.83	24.6	29.44	1.2
Hardness (mg/l)		131	138	177	260	232	4
Iron (mg/l)	0.3	0.219	0.18	<0.1	<0.1	<0.1	<0.1
Magnesium (mg/l)		7.28	8.41	10.73	14.4	0.22	0.22
Manganese (mg/l)	0.05	0.145	0.022	0.053	0.036	<0.01	<0.01
pH	6.5 - 8.5	8	6.8	7.9	7	7.7	6.4
Potassium (mg/l)		3.89	2.02	2.8	2.68	<1	<1
Sodium (mg/l)		577.9	127	107.6	46.2	57.11	5.19
Specific Cond (µS/cm)		2,780	903	796	662	634	33.6
Strontium (mg/l)		0.672	0.443	1.344	1.6	1.542	0.03
Sulfate (mg/l)	250	32.4	31.6	107.6	73.84	53.17	<1
TDS (mg/l)	500	1,580	476	496	414	396	20
Total Suspended Solids (mg/l)		<5	<5	<5	<5	<5	<5
Methane (mg/l)	action level >7	38.8	1.03	0.0351	nd	nd	ns
Ethane (mg/l)		0.0302	nd	nd	nd	nd	ns
Propane (mg/l)		nd	nd	nd	nd	nd	ns
Lithium (mg/l)		0.026	<0.025	<0.025	<0.025	<0.025	<0.025
Bromide (mg/l)	no mcl	4.048	<0.2	<0.2	<0.2	<0.2	<0.2
turbidity NTU	sfc only-1	9.3	2.02	<1	1.74	<1	<1
Aluminum (mg/l)	0.2	<0.015	<0.015	<0.015	<0.015	0.0205	<0.015
Zinc (mg/l)	5	<0.03	<0.03	<0.03	<0.003	0.06	<0.03
Arsenic (mg/l)	0.01	0.00547	<0.003	<0.003	<0.003	<0.003	<0.003
Selenium (mg/l)	0.05	0.0144	<0.007	<0.007	<0.007	<0.007	<0.007
Oil & Grease	<5	<5	ns	ns	ns	ns	ns
BTEX		nd	ns (included with VOC)	ns	ns (included with VOC)	ns	ns
Volatile Organic Compounds	Tetrahydrofuran 25 ug/l	minor lab contaminants	Tetrahydrofuran 4.64 ug/l	Tetrahydrofuran 31.7 ug/l	Tetrahydrofuran 1.28 ug/l	ns	ns
UVIR		dithane fungicide present(agriculture)	nd	ns	nd	ns	ns
Total Coliform		ns	ns	7.5/100ml	ns	ns	ns
eColi		ns	ns	<1/100 ml	ns	ns	ns

ns=not sampled; nd=not detected; Tetrahydrofuran is used in pvc manufacture.

Date of Issue: 07/02/2021 12:07:20

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: PA058
PA DEP LAP - DEP Lab ID: 22-00223

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 289 Date Collected: 06/11/2021 01:45:00 PM Lab Sample ID: 12021011891 Status: Completed

Name of Sample Collector: Christine Miner
Date Received: 06/15/2021

County: Butler State:
Municipality: Connoquenessing Twp

[redacted]

Sample Medium: Ground Water
Sample Medium Type: Water

Location: raw discharge into cistern in front yard, 480' AB ww

Reason: Complaint
Project: NOT INDICATED
Standard Analysis: 946
Matrix: Water

Stream Condition:

Appearance: organic odor, 10 min purge

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 289 Date Collected: 06/11/2021 01:45:00 PM Lab Sample ID: 12021011891 Status: Completed

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
00410 ALKALINITY AS CaCO3 @ pH 4.5	91.6 mg/L	06/15/2021 11:11 AM	JAHOGUE	SM 2320B
01109H ALUMINUM, TOTAL (WATER & WASTE) ICPMS	<15.0 ug/L (U)	06/16/2021 10:19 AM	ELEEDY	EPA 200.8
01002H ARSENIC, TOTAL (WATER & WASTE) BY ICPMS	<3.00 ug/L (U)	06/16/2021 10:19 AM	ELEEDY	EPA 200.8
01007M BARIUM, TOTAL In MG/L (WATER & WASTE) BY ICP	0.167 mg/L	06/16/2021 12:07 PM	CREITMEYER	EPA 200.7
71870 BROMIDE BY ION CHROMATOGRAPHY	<0.2 mg/L (U)	06/15/2021 04:02 PM	TVOROBEYCH	EPA 300.0
00916A CALCIUM, TOTAL (WATER & WASTE) BY ICP	41.200 mg/L	06/16/2021 12:07 PM	CREITMEYER	EPA 200.7
00900 HARDNESS, TOTAL (CALCULATED)	138 mg/L	06/16/2021 12:07 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	0.180 mg/L	06/16/2021 12:07 PM	CREITMEYER	EPA 200.7
01132A LITHIUM, TOTAL (WATER & WASTE) BY ICP	<25.0 ug/L (U)	06/16/2021 12:07 PM	CREITMEYER	EPA 200.7
00927A MAGNESIUM, TOTAL (WATER & WASTE) BY ICP	8.41 mg/L	06/16/2021 12:07 PM	CREITMEYER	EPA 200.7
01055M MANGANESE, TOTAL In MG/L (WATER & WASTE) BY ICP	0.022 mg/L	06/16/2021 12:07 PM	CREITMEYER	EPA 200.7
00403 pH, Lab (Electrometric)	6.8 pH units	06/15/2021 11:11 AM	JAHOGUE	SM 4500-H+ B
** Comment ** Holding Time Exceeded				
00937A POTASSIUM, TOTAL (WATER & WASTE) BY ICP	2.02 mg/L	06/16/2021 12:07 PM	CREITMEYER	EPA 200.7
01147H SELENIUM, TOTAL (WATER & WASTE) BY ICPMS	<7.00 ug/L (U)	06/16/2021 10:19 AM	ELEEDY	EPA 200.8
00929A SODIUM, TOTAL (WATER & WASTE) BY ICP	127.00 mg/L	06/17/2021 12:07 PM	CREITMEYER	EPA 200.7
00095 SPECIFIC CONDUCTIVITY @ 25.0 C	903.00 umhos/cm	06/17/2021 01:54 PM	MITUZINSKI	SM 2510B
01082M STRONTIUM, TOTAL In MG/L (WATER & WASTE) BY ICP	0.443 mg/L	06/16/2021 12:07 PM	CREITMEYER	EPA 200.7
00403T Temperature at which pH is measured	18.99 C	06/15/2021 11:11 AM	JAHOGUE	SM 4500-H+ B
00940 Total Chloride-Ion Chromatograph	191.52 mg/L	06/15/2021 07:36 PM	TVOROBEYCH	EPA 300.0
70300 TOTAL DISSOLVED SOLIDS @ 180C	476 mg/L	06/15/2021 12:29 PM	MOSBERCASH	SM 2540 C
00945 Total Sulfate-Ion Chromatograph	31.80 mg/L	06/15/2021 04:02 PM	TVOROBEYCH	EPA 300.0
00530 TOTAL SUSPENDED SOLIDS	<5 mg/L (U)	06/15/2021 02:32 PM	MARMANIOUS	USGS I-3765
82079 TURBIDITY, NEPHELMETRIC	2.02 NTU	06/15/2021 11:53 AM	JAHOGUE	EPA 180.1
Holding time exceeded				
01092A ZINC, TOTAL (WATER & WASTE) BY ICP	<30.0 ug/L (U)	06/16/2021 12:07 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

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

Sample ID: 9634 269 | Date Collected: 05/11/2021 01:45:00 PM | Lab Sample ID: L2021011691 | Status: Completed

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Date of Issue: 09/16/2021 11:37:57

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

290 OGM

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 291 Date Collected: 06/11/2021 01:45:00 PM Lab Sample ID: O2021003991 Status: Completed

Name of Sample Collector: Christine Miner
Date Received: 06/15/2021

County: Butler State:
Municipality: Connoquenessing Twp

[redacted]

Sample Medium: Ground Water
Sample Medium Type: Water

Location: raw discharge into ditch, 480' AB WW
Reason: Complaint
Project: NOT INDICATED
Suite: METH
Matrix: Water

Stream Condition:

Appearance: 10 min. purge, organic odor

290

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 291 Date Collected: 06/11/2021 01:45:00 PM Lab Sample ID: O2021003991 Status: Completed

Test Codes / CAS # - Description		Reported Results	Date And Time Analyzed	Approved by	Test Method
74840	Ethene	12.4 ug/L (U)	06/17/2021 02:00 AM	DACLEMENS	BOL BOL6019
74828	Methane	1030 ug/L	06/17/2021 02:00 AM	DACLEMENS	BOL BOL6019
74986	Propane	14.2 ug/L (U)	06/17/2021 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.
* 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: 07/07/2021 04:10:35

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 291 Date Collected: 06/11/2021 01:45:00 PM Lab Sample ID: O2021003967 Status: Completed

Name of Sample Collector: Christine Miner
Date Received: 06/15/2021

County: Butler State:
Municipality: Connoquenessing Twp

[redacted]

Sample Medium: Ground Water
Sample Medium Type: Water

Location: raw discharge into cistern, 480 AB WW
Reason: Complaint
Project: NOT INDICATED
Suite: VOADW
Matrix: Water

Stream Condition:

Appearance: 10 min. purge, organic odor

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 291 Date Collected: 06/11/2021 01:45:00 PM Lab Sample ID: O2021003967 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)	06/17/2021 02:00 AM	ALIU	EPA 524.3
71556	1,1,1-Trichloroethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
79345	1,1,2,2-Tetrachloroethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
79005	1,1,2-Trichloroethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
75343	1,1-Dichloroethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
75354	1,1-Dichloroethene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
563586	1,1-Dichloropropene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
87616	1,2,3-Trichlorobenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
96184	1,2,3-Trichloropropane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
120821	1,2,4-Trichlorobenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
95636	1,2,4-Trimethylbenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
95501	1,2-Dichlorobenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
107062	1,2-Dichloroethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
78875	1,2-Dichloropropane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
108678	1,3,5-Trimethylbenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
541731	1,3-Dichlorobenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
142289	1,3-Dichloropropane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
106467	1,4-Dichlorobenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
594207	2,2-Dichloropropane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
78933	2-Butanone	2.50 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
591786	2-Hexanone	2.50 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
99876	4-Isopropyltoluene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
108101	4-Methyl-2-pentanone	2.50 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
67641	Acetone	2.50 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
71432	Benzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
108861	Bromobenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
74975	Bromochloromethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
75274	Bromodichloromethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
75252	Bromoform	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
74839	Bromomethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
75150	Carbon disulfide	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
56235	Carbon tetrachloride	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
108907	Chlorobenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
75003	Chloroethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
75014	Chloroethene (vinyl chloride)	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
67663	Chloroform	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3

Sample ID: 9634 291 | Date Collected: 06/11/2021 01:45:00 PM | Lab Sample ID: O2021003987 | Status: Completed

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
74873 Chloromethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
156592 cis-1,2-Dichloroethene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
10061015 cis-1,3-Dichloropropene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
124481 Dibromochloromethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
74953 Dibromomethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
75718 Dichlorodifluoromethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
75092 Dichloromethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
100414 Ethylbenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
87683 Hexachlorobutadiene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
98828 Isopropylbenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
108383 m/p-Xylenes	1.00 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
1634044 Methyl-tert-butyl Ether	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
91203 Naphthalene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
104518 n-Butylbenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
103651 n-Propylbenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
95498 o-Chlorotoluene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
95476 o-Xylene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
106434 p-Chlorotoluene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
98566 PCTFB	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
135988 Sec-Butylbenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
100425 Styrene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
75650 t-Butyl alcohol	5.00 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
540885 tert-Butyl Acetate	10.0 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
98066 Tert-Butylbenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
127184 Tetrachloroethene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
109999 Tetrahydrofuran	4.64 ug/L	06/17/2021 02:00 AM	ALIU	EPA 524.3
108883 Toluene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
1330207 Total Xylenes	0 ug/L	06/17/2021 02:00 AM	ALIU	EPA 524.3
156605 trans-1,2-Dichloroethene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
10061026 trans-1,3-Dichloropropene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
79016 Trichloroethene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
75694 Trichlorofluoromethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
108054 Vinyl Acetate	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 291 | Date Collected: 06/11/2021 01:45:00 PM | Lab Sample ID: O2021003987 | 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: 07/07/2021 04:05:58

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

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

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 292 Date Collected: 06/11/2021 01:45:00 PM Lab Sample ID: O2021003988 Status: Completed

Name of Sample Collector: Christine Miner
Date Received: 06/15/2021

County: Butler State:
Municipality: Connoquenessing Twp

[redacted]

Sample Medium: Artificial
Sample Medium Type: Water

Location: Blank water
Reason: Complaint
Project: NOT INDICATED
Suite: VOADW
Matrix: Water

Stream Condition:

Appearance: Field Blank

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 292 Date Collected: 06/11/2021 01:45:00 PM Lab Sample ID: O2021003988 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)	06/17/2021 02:00 AM	ALIU	EPA 524.3
71556	1,1,1-Trichloroethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
79345	1,1,2,2-Tetrachloroethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
79005	1,1,2-Trichloroethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
75343	1,1-Dichloroethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
75354	1,1-Dichloroethene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
563586	1,1-Dichloropropene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
87616	1,2,3-Trichlorobenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
96184	1,2,3-Trichloropropane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
120821	1,2,4-Trichlorobenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
95636	1,2,4-Trimethylbenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
95501	1,2-Dichlorobenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
107062	1,2-Dichloroethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
78875	1,2-Dichloropropane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
108678	1,3,5-Trimethylbenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
541731	1,3-Dichlorobenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
142289	1,3-Dichloropropane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
106467	1,4-Dichlorobenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
594207	2,2-Dichloropropane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
78933	2-Butanone	2.50 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
591786	2-Hexanone	2.50 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
99876	4-Isopropyltoluene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
108101	4-Methyl-2-pentanone	2.50 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
67641	Acetone	19.5 ug/L	06/17/2021 02:00 AM	ALIU	EPA 524.3
71432	Benzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
108861	Bromobenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
74975	Bromochloromethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
75274	Bromodichloromethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
75252	Bromoform	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
74839	Bromomethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
75150	Carbon disulfide	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
56235	Carbon tetrachloride	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
108907	Chlorobenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
75003	Chloroethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
75014	Chloroethene (vinyl chloride)	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
67663	Chloroform	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3

Sample ID: 9634 292 | Date Collected: 06/11/2021 01:45:00 PM | Lab Sample ID: O2021003968 | Status: Completed

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
74873 Chloromethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
156592 cis-1,2-Dichloroethene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
10061015 cis-1,3-Dichloropropene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
124481 Dibromochloromethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
74953 Dibromomethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
75718 Dichlorodifluoromethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
75092 Dichloromethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
100414 Ethylbenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
87683 Hexachlorobutadiene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
98828 Isopropylbenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
108383 m/p-Xylenes	1.00 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
1634044 Methyl-tert-butyl Ether	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
91203 Naphthalene	0.554 ug/L	06/17/2021 02:00 AM	ALIU	EPA 524.3
104518 n-Butylbenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
103651 n-Propylbenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
95498 o-Chlorotoluene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
95476 o-Xylene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
106434 p-Chlorotoluene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
98566 PCTFB	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
135988 sec-Butylbenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
100425 Styrene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
75650 t-Butyl alcohol	5.00 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
540885 tert-Butyl Acetate	10.0 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
98066 Tert-Butylbenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
127184 Tetrachloroethene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
109999 Tetrahydrofuran	1.44 ug/L	06/17/2021 02:00 AM	ALIU	EPA 524.3
108883 Toluene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
1330207 Total Xylenes	0 ug/L	06/17/2021 02:00 AM	ALIU	EPA 524.3
156605 trans-1,2-Dichloroethene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
10061026 trans-1,3-Dichloropropene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
79016 Trichloroethene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
75694 Trichlorofluoromethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3
108054 Vinyl Acetate	0.500 ug/L (U)	06/17/2021 02:00 AM	ALIU	EPA 524.3

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 292 | Date Collected: 06/11/2021 01:45:00 PM | Lab Sample ID: O2021003968 | 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

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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: 07/02/2021 12:08:36

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: PA058
PA DEP LAP - DEP Lab ID: 22-00223

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9834 293 Date Collected: 06/11/2021 01:45:00 PM Lab Sample ID: O2021003994 Status: Completed

Name of Sample Collector: Christine Miner
Date Received: 06/15/2021

County: Butler State:
Municipality: Connoquenessing Twp

[redacted]

Sample Medium: Ground Water
Sample Medium Type: Water

Location: Raw from discharge into cistern, 480' AB WW
Reason: Complaint
Project: NOT INDICATED
Suite: UVIR
Matrix: Water

Stream Condition:

Sample Lab Comment: Not Covered Under NJ NELAP Accreditation
Appearance: 10 min purge, organic odor

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9834 293 Date Collected: 06/11/2021 01:45:00 PM Lab Sample ID: O2021003994 Status: Completed

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
EXTRACTED DATE	06162021 Day	06/16/2021 01:18 PM	ANFRIEDLIN	
IR IR		06/16/2021 01:18 PM	ANFRIEDLIN	
The IR analysis detected no petroleum products in this sample.				
UV UV		06/16/2021 10:01 AM	ANFRIEDLIN	
The UV analysis detected no petroleum products in this sample.				

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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)

C - 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: 07/02/2021 12:08:55

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 294 Date Collected: 06/11/2021 01:45:00 PM Lab Sample ID: O2021003995 Status: Completed

Name of Sample Collector: Christine Meier
Date Received: 06/15/2021

County: Butler State:
Municipality: Connoquenessing Twp

[redacted]

Sample Medium: Artificial
Sample Medium Type: Water

Location: Field Blank
Reason: Complaint
Project: NOT INDICATED
Suite: UVIR
Matrix: Water

Stream Condition:

Sample Lab Comment: Not Covered Under NJ NELAP Accreditation
Appearance: Field Blank

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 294 Date Collected: 06/11/2021 01:45:00 PM Lab Sample ID: O2021003995 Status: Completed

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
EXTRACTED DATE	06162021 Day	06/16/2021 01:23 PM	ANFRIEDLIN	
IR IR		06/16/2021 01:23 PM	ANFRIEDLIN	
The IR analysis detected no petroleum products in this sample.				
UV UV		06/16/2021 10:05 AM	ANFRIEDLIN	
The UV analysis detected no petroleum products in this sample.				

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

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)

O - 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: 07/02/2021 12:09:16

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: PA058
PA DEP LAP - DEP Lab ID: 22-00223

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9834 295 Date Collected: 06/11/2021 02:06:00 PM Lab Sample ID: 12021011894 Status: Completed

Name of Sample Collector: Christine Miner
Date Received: 06/15/2021

County: Butler State:
Municipality: Connoquenessing Twp

[redacted]

Sample Medium: Ground Water
Sample Medium Type: Water

Location: raw water from discharge into cistern, 315' WW in use
Reason: Complaint
Project: NOT INDICATED
Standard Analysis: 946
Matrix: Water

Stream Condition:

Appearance: no odor, no effervescence

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9834 295 Date Collected: 06/11/2021 02:06:00 PM Lab Sample ID: 12021011894 Status: Completed

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
00410 ALKALINITY AS CaCO3 @ pH 4.5	257.2 mg/L	06/15/2021 11:49 AM	JAHOGUE	SM 2320B
01105H ALUMINUM, TOTAL (WATER & WASTE) ICPMS	<15.0 ug/L (U)	06/16/2021 10:23 AM	ELEEDY	EPA 200.8
01002H ARSENIC, TOTAL (WATER & WASTE) BY ICPMS	<3.00 ug/L (U)	06/16/2021 10:23 AM	ELEEDY	EPA 200.8
01007M BARIUM, TOTAL in MG/L (WATER & WASTE) BY ICP	0.146 mg/L	06/16/2021 12:24 PM	CREITMEYER	EPA 200.7
71870 BROMIDE BY ION CHROMATOGRAPHY	<0.2 mg/L (U)	06/15/2021 04:32 PM	TVOROBEYCH	EPA 300.0
00916A CALCIUM, TOTAL (WATER & WASTE) BY ICP	80.500 mg/L	06/16/2021 12:24 PM	CREITMEYER	EPA 200.7
00900 HARDNESS, TOTAL (CALCULATED)	280 mg/L	06/16/2021 12:24 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	<0.100 mg/L (U)	06/16/2021 12:24 PM	CREITMEYER	EPA 200.7
01132A LITHIUM, TOTAL (WATER & WASTE) BY ICP	<25.0 ug/L (U)	06/16/2021 12:24 PM	CREITMEYER	EPA 200.7
00927A MAGNESIUM, TOTAL (WATER & WASTE) BY ICP	14.40 mg/L	06/16/2021 12:24 PM	CREITMEYER	EPA 200.7
01055M MANGANESE, TOTAL in MG/L (WATER & WASTE) BY ICP	0.036 mg/L	06/16/2021 12:24 PM	CREITMEYER	EPA 200.7
00403 pH, Lab (Electrometric)	7.8 pH units	06/15/2021 11:49 AM	JAHOGUE	SM 4500-H+ B
** Comment ** Holding Time Exceeded				
00937A POTASSIUM, TOTAL (WATER & WASTE) BY ICP	2.68 mg/L	06/16/2021 12:24 PM	CREITMEYER	EPA 200.7
01147H SELENIUM, TOTAL (WATER & WASTE) BY ICPMS	<7.00 ug/L (U)	06/16/2021 10:23 AM	ELEEDY	EPA 200.8
00929A SODIUM, TOTAL (WATER & WASTE) BY ICP	46.20 mg/L	06/16/2021 12:24 PM	CREITMEYER	EPA 200.7
00095 SPECIFIC CONDUCTIVITY @ 25.0 C	662.00 umhos/cm	06/17/2021 01:56 PM	MTUZINSKI	SM 2510B
01082M STRONTIUM, TOTAL in MG/L (WATER & WASTE) BY ICP	1.600 mg/L	06/16/2021 12:24 PM	CREITMEYER	EPA 200.7
00403T Temperature at which pH is measured	19.22 C	06/15/2021 11:49 AM	JAHOGUE	SM 4500-H+ B
00940 Total Chloride-Ion Chromatograph	24.60 mg/L	06/15/2021 04:32 PM	TVOROBEYCH	EPA 300.0
70300 TOTAL DISSOLVED SOLIDS @ 180C	414 mg/L	06/15/2021 07:36 AM	MOBERCASH	SM 2540 C
00945 Total Sulfate-Ion Chromatograph	73.84 mg/L	06/15/2021 04:32 PM	TVOROBEYCH	EPA 300.0
00530 TOTAL SUSPENDED SOLIDS	<5 mg/L (U)	06/15/2021 02:32 PM	MARMANIOUS	USGS I-3765
82079 TURBIDITY, NEPHELMETRIC	1.74 NTU	06/15/2021 11:54 AM	JAHOGUE	EPA 180.1
Holding time exceeded				
01092A ZINC, TOTAL (WATER & WASTE) BY ICP	<30.0 ug/L (U)	06/16/2021 12:24 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.
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Dr. Pamela Higgins, Technical Director, Bureau of Laboratories

Sample ID: 9634 285 | Date Collected: 06/11/2021 02:06:00 PM | Lab Sample ID: L2021011694 | Status: Completed

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Date of Issue: 07/02/2021 12:09:33

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 296 | Date Collected: 06/11/2021 02:06:00 PM | Lab Sample ID: O2021003992 | Status: Completed

Name of Sample Collector: Christine Miner
Date Received: 06/15/2021

County: Butler
State:
Municipality: Connoquenessing Twp

[redacted]

Sample Medium: Ground Water
Sample Medium Type: Water

Location: raw from cistern discharge, 315' WW in use
Reason: Complaint
Project: NOT INDICATED
Suite: METH
Matrix: Water

Stream Condition:

Appearance: 10 min. purge, no odor, no effervescence

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 296 | Date Collected: 06/11/2021 02:06:00 PM | Lab Sample ID: O2021003992 | Status: Completed

Test Codes / CAS # - Description		Reported Results	Date And Time Analyzed	Approved by	Test Method
74840	Ethane	12.4 ug/L (U)	06/17/2021 02:00 AM	DACLEMENS	BOL BOL6019
74828	Methane	11.8 ug/L (U)	06/17/2021 02:00 AM	DACLEMENS	BOL BOL6019
74986	Propane	14.2 ug/L (U)	06/17/2021 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.
* 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: 07/07/2021 04:06:02

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 297 Date Collected: 06/11/2021 02:06:00 PM Lab Sample ID: O2021003989 Status: Completed

Name of Sample Collector: Christine Miner
Date Received: 06/15/2021

County: Butler State:
Municipality: Connoquenessing Twp

[redacted]

Sample Medium: Ground Water
Sample Medium Type: Water

Location: raw from discharge into cistern, 315' WW in use
Reason: Complaint
Project: NOT INDICATED
Suite: VOADW
Matrix: Water

Stream Condition:

Appearance: 10 min purge, no odor, no effervescence

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 297 Date Collected: 06/11/2021 02:06:00 PM Lab Sample ID: O2021003989 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)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
71556	1,1,1-Trichloroethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
79345	1,1,2,2-Tetrachloroethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
79005	1,1,2-Trichloroethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
75343	1,1-Dichloroethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
75354	1,1-Dichloroethene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
563586	1,1-Dichloropropene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
87616	1,2,3-Trichlorobenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
96184	1,2,3-Trichloropropane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
120821	1,2,4-Trichlorobenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
95636	1,2,4-Trimethylbenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
95501	1,2-Dichlorobenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
107062	1,2-Dichloroethene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
78875	1,2-Dichloropropane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
108678	1,3,5-Trimethylbenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
541731	1,3-Dichlorobenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
142289	1,3-Dichloropropane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
106467	1,4-Dichlorobenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
594207	2,2-Dichloropropane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
78933	2-Butanone	2.50 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
591786	2-Hexanone	2.50 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
99876	4-Isopropyltoluene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
108101	4-Methyl-2-pentanone	2.50 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
67641	Acetone	2.50 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
71432	Benzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
108861	Bromobenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
74975	Bromochloromethene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
75274	Bromodichloromethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
75252	Bromoform	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
74839	Bromomethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
75150	Carbon disulfide	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
56235	Carbon tetrachloride	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
108907	Chlorobenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
75003	Chloroethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
75014	Chloroethene (vinyl chloride)	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3
67663	Chloroform	0.500 ug/L (U)	06/17/2021 02:00 AM	ALRJ	EPA 524.3

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 297 | Date Collected: 06/11/2021 02:06:00 PM | Lab Sample ID: O2021003989 | Status: Completed

Test Codes / CAS # - Description		Reported Results	Date And Time Analyzed	Approved by	Test Method
74873	Chloromethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
156592	cis-1,2-Dichloroethene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
10061015	cis-1,3-Dichloropropene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
124481	Dibromochloromethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
74953	Dibromomethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
75718	Dichlorodifluoromethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
75092	Dichloromethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
100414	Ethylbenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
87683	Hexachlorobutadiene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
98828	Isopropylbenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
108383	m/p-Xylenes	1.00 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
1634044	Methyl-tert-butyl Ether	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
91203	Naphthalene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
104518	n-Butylbenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
103651	n-Propylbenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
95498	o-Chlorotoluene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
95476	o-Xylene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
106434	p-Chlorotoluene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
98560	PCTFB	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
135988	Sec-butylbenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
100425	Styrene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
75650	t-Butyl alcohol	5.00 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
540885	tert-Butyl Acetate	10.0 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
98066	Tert-Butylbenzene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
127184	Tetrachloroethene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
109999	Tetrahydrofuran	1.28 ug/L	06/17/2021 02:00 AM	ALJU	EPA 524.3
108883	Toluene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
1330207	Total Xylenes	0 ug/L	06/17/2021 02:00 AM	ALJU	EPA 524.3
156605	trans-1,2-Dichloroethene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
10061026	trans-1,3-Dichloropropene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
79016	Trichloroethene	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
75694	Trichlorofluoromethane	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3
108054	Vinyl Acetate	0.500 ug/L (U)	06/17/2021 02:00 AM	ALJU	EPA 524.3

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 297 | Date Collected: 06/11/2021 02:06:00 PM | Lab Sample ID: O2021003989 | 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

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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: 07/02/2021 12:09:51

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 298 Date Collected: 06/11/2021 02:06:00 PM Lab Sample ID: O2021003996 Status: Completed

Name of Sample Collector: Christine Miner
Date Received: 06/15/2021

County: NOT INDICATED Butler
Municipality: NOT INDICATED Connoquenessing
State: [redacted]

Location: NOT INDICATED
Reason: Routine Sampling
Project: NOT INDICATED
Suite: UVIR
Matrix: Water

Raw from cistern discharge, 320, 315

Stream Condition: 10min purge, no odor, no effervescence

Sample Lab Comment: Refrigerator failed-Exceeded allowable temperature at labNot Covered Under NJ NELAP Accreditation

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
EXTRACTED DATE	06232021 Day	06/23/2021 02:41 PM	ANFRIEDLIN	
IR IR		06/23/2021 02:41 PM	ANFRIEDLIN	
The IR analysis detected no petroleum products in this sample.				
UV UV		06/23/2021 11:24 AM	ANFRIEDLIN	
The UV analysis detected no petroleum products in this sample.				

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 298 Date Collected: 06/11/2021 02:06:00 PM Lab Sample ID: O2021003996 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: 01/04/2021 01:35:43

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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 229 Date Collected: 09/29/2020 Lab Sample ID: 12020015089 Status: Completed

Name of Sample Collector: Christine Miner
Date Received: 10/01/2020

County: Butler State:
Municipality: Connoquenessing Twp

[redacted]

Sample Medium: Ground Water
Sample Medium Type: Water

Location: (old well, 480' supposedly crude oil found on top of well)
Reason: Complaint
Project: NOT INDICATED
Standard Anlysis: 946
Matrix: Water

Stream Condition:

Sample Comment: sampled from inlet to cistern in front yard
Appearance: clear, smelled like crude

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 229 Date Collected: 09/29/2020 Lab Sample ID: 12020015089 Status: Completed

Test Code / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
00410 ALKALINITY AS CaCO3 @ pH 4.5	541.4 mg/L	10/01/2020 05:00 PM	MBOTTS	SM 2320B
01105M ALUMINUM, TOTAL (WATER & WASTE) ICPMS	<15.0 ug/L (U)	10/07/2020 12:17 PM	SCHOY	EPA 200.8
01002M ARSENIC, TOTAL (WATER & WASTE) BY ICPMS	5.470 ug/L	10/07/2020 12:17 PM	SCHOY	EPA 200.8
01007M BARIUM, TOTAL In MGA (WATER & WASTE) BY ICP	0.453 mg/L	10/02/2020 11:38 AM	ATAPSOBA	EPA 200.7
71870 BROMIDE BY ION CHROMATOGRAPHY	4.048 mg/L	10/08/2020 04:53 PM	TVORDBEYCH	EPA 300.0
00916A CALCIUM, TOTAL (WATER & WASTE) BY ICP	40.280 mg/L	10/02/2020 11:38 AM	ATAPSOBA	EPA 200.7
00900 HARDNESS, TOTAL (CALCULATED)	131 mg/L	10/02/2020 11:38 AM	ATAPSOBA	SM 2340 B
** Comment ** Accredited by NJ only - accreditation not available from PA				
01045M IRON, TOTAL IN MGA (WATER & WASTE) BY ICP	0.219 mg/L	10/02/2020 11:38 AM	ATAPSOBA	EPA 200.7
01132A LITHIUM, TOTAL (WATER & WASTE) BY ICP	26.00 ug/L	10/02/2020 11:38 AM	ATAPSOBA	EPA 200.7
00927A MAGNESIUM, TOTAL (WATER & WASTE) BY ICP	7.28 mg/L	10/02/2020 11:38 AM	ATAPSOBA	EPA 200.7
01055M MANGANESE, TOTAL In MGA (WATER & WASTE) BY ICP	0.145 mg/L	10/02/2020 11:38 AM	ATAPSOBA	EPA 200.7
00403 pH, Lab (Electrometric)	8.0 pH units	10/01/2020 05:00 PM	MBOTTS	SM 4500-H+ B
** Comment ** Holding Time Exceeded				
00937A POTASSIUM, TOTAL (WATER & WASTE) BY ICP	3.89 mg/L	10/02/2020 11:38 AM	ATAPSOBA	EPA 200.7
01147M SELENIUM, TOTAL (WATER & WASTE) BY ICPMS	14.400 ug/L	10/07/2020 12:17 PM	SCHOY	EPA 200.8
00929A SODIUM, TOTAL (WATER & WASTE) BY ICP	577.90 mg/L	10/06/2020 02:57 PM	ATAPSOBA	EPA 200.7
00095 SPECIFIC CONDUCTIVITY @ 25.0 C	2780.00 umhos/cm	10/06/2020 04:23 PM	MTUZINSKI	SM 2510B
01082M STRONTIUM, TOTAL In MGA (WATER & WASTE) BY ICP	0.672 mg/L	10/02/2020 11:38 AM	ATAPSOBA	EPA 200.7
00403T Temperature at which pH is measured	19.10 C	10/01/2020 05:00 PM	MBOTTS	SM 4500-H+ B
00940 Total Chloride-Ion Chromatograph	596.22 mg/L	10/20/2020 04:04 PM	TVORDBEYCH	EPA 300.0
70300 TOTAL DISSOLVED SOLIDS @ 180C	1680 mg/L	10/01/2020 01:37 PM	MARMANIOUS	SM 2540 C
00945 Total Sulfate-Ion Chromatograph	32.40 mg/L	10/08/2020 04:53 PM	TVORDBEYCH	EPA 300.0
00530 TOTAL SUSPENDED SOLIDS	<5 mg/L (U)	10/01/2020 09:54 AM	MARMANIOUS	USGS I-3765
82079 TURBIDITY, NEPHELOMETRIC	9.30 NTU	10/01/2020 10:25 AM	JANBARRY	EPA 180.1
01092A ZINC, TOTAL (WATER & WASTE) BY ICP	<30.0 ug/L (U)	10/02/2020 11:38 AM	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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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).

Jennifer Fesler, Technical Director, Bureau of Laboratories

Sample ID: 9634 229 | Date Collected: 09/29/2020 | Lab Sample ID: I2020015083 | Status: Completed

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Page

Date of Issue: 01/04/2021 01:37:32

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 230 Date Collected: 09/29/2020 Lab Sample ID: O2020004825 Status: Completed

Name of Sample Collector: Chrissie Miner
Date Received: 10/01/2020

County: Butler State:
Municipality: Connoquenessing Twp

[redacted]

cistern, Raw 480' NW

Sample Medium: Ground Water
Sample Medium Type: Water

Location: NOT INDICATED
Reason: Complaint
Project: NOT INDICATED
Suite: METH
Matrix: Water

Stream Condition:

Appearance: clear, smelled like crude

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 230 Date Collected: 09/29/2020 Lab Sample ID: O2020004825 Status: Completed

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
74840 Ethane	30.2 ug/L (Q)	10/01/2020 02:00 AM	DACLEMENS	BOL BOL6019
74828 Methane	38800 ug/L (Q)	10/01/2020 02:00 AM	DACLEMENS	BOL BOL6019
74986 Propane	14.2 ug/L (U)	10/01/2020 02:00 AM	DACLEMENS	BOL BOL6019

The results of the analyses provided in the 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

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: 01/04/2021 01:38:22

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 231 Date Collected: 09/29/2020 Lab Sample ID: I2020015090 Status: Completed

Name of Sample Collector: Christine Miner
Date Received: 10/01/2020

County: Butler State:
Municipality: Connoquenessing Twp

[redacted]

cistern, raw, 480' ww

Sample Medium: Ground Water
Sample Medium Type: Water

Location: NOT INDICATED
Reason: Complaint
Project: NOT INDICATED
Standard Analysis: 100
Matrix: Water

Stream Condition:

Appearance: *clear, film on top, crude oil odor*

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 231 Date Collected: 09/29/2020 Lab Sample ID: I2020015090 Status: Completed

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)	10/07/2020 03:55 PM	SAGREER	EPA 1664A

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).

Jennifer Fesler, Technical Director, Bureau of Laboratories

Date of Issue: 01/04/2021 01:38:50

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 232 Date Collected: 09/29/2020 Lab Sample ID: O2020004820 Status: Completed

Name of Sample Collector: Christine Miner
Date Received: 10/01/2020

County: Butler State:
Municipality: Connoquenessing Twp

[redacted]

Cistern, Raw, 480' WW

Sample Medium: Ground Water
Sample Medium Type: Water

Location: NOT INDICATED
Reason: Complaint
Project: NOT INDICATED
Suite: VOADW
Matrix: Water

Stream Condition:

Sample Lab Comment: Sample bottle had headspace
Appearance: clear, odor of crude

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 232 Date Collected: 09/29/2020 Lab Sample ID: O2020004820 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)	10/01/2020 02:00 AM	ALIU	EPA 524.3
71556	1,1,1-Trichloroethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
79345	1,1,2,2-Tetrachloroethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
79005	1,1,2-Trichloroethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75343	1,1-Dichloroethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75354	1,1-Dichloroethene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
563586	1,1-Dichloropropene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
87616	1,2,3-Trichlorobenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
96184	1,2,3-Trichloropropane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
120821	1,2,4-Trichlorobenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
95636	1,2,4-Trimethylbenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
95501	1,2-Dichlorobenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
107062	1,2-Dichloroethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
78875	1,2-Dichloropropane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
108678	1,3,5-Trimethylbenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
541731	1,3-Dichlorobenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
142289	1,3-Dichloropropane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
106467	1,4-Dichlorobenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
594207	2,2-Dichloropropane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
78933	2-Butanone	2.50 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
591786	2-Hexanone	2.50 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
99876	4-Isopropyltoluene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
108101	4-Methyl-2-pentanone	2.50 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
67641	Acetone	5.00 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
71432	Benzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
108861	Bromobenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
74975	Bromochloromethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75274	Bromodichloromethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75252	Bromoform	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
74839	Bromomethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75150	Carbon disulfide	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
56235	Carbon tetrachloride	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
108907	Chlorobenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75003	Chloroethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75014	Chloroethene (vinyl chloride)	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
67663	Chloroform	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3

Sample ID: 9634 232 | Date Collected: 09/29/2020 | Lab Sample ID: O2020004820 | Status: Completed

Test Code / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
74873 Chloromethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
156592 cis-1,2-Dichloroethene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
10061015 cis-1,3-Dichloropropene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
124481 Dibromochloromethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
74953 Dibromomethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75718 Dichlorodifluoromethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75092 Dichloromethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
100414 Ethylbenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
87683 Hexachlorobutadiene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
98828 Isopropylbenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
108383 m/p-Xylenes	1.00 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
1634044 Methyl-tert-butyl Ether	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
91203 Naphthalene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
104518 n-Butylbenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
103651 n-Propylbenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
95498 o-Chlorotoluene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
95476 o-Xylene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
106434 p-Chlorotoluene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
98566 PCTFB	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
135988 Sec-butylbenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
100425 Styrene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75650 t-Butyl alcohol	5.94 ug/L	10/01/2020 02:00 AM	ALIU	EPA 524.3
540885 tert-Butyl Acetate	2.50 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
98066 Tert-Butylbenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
127184 Tetrachloroethene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
109999 Tetrahydrofuran	2.23 ug/L	10/01/2020 02:00 AM	ALIU	EPA 524.3
108883 Toluene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
1330207 Total Xylenes	0 ug/L	10/01/2020 02:00 AM	ALIU	EPA 524.3
156605 trans-1,2-Dichloroethene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
10061026 trans-1,3-Dichloropropene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
79016 Trichloroethene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75694 Trichlorofluoromethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
108054 Vinyl Acetate	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 232 | Date Collected: 09/29/2020 | Lab Sample ID: O2020004820 | 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).

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: 01/04/2021 01:39:19

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 233 Date Collected: 09/29/2020 12:05:00 PM Lab Sample ID: O2020004836 Status: Completed

Name of Sample Collector: Christine Miner
Date Received: 10/01/2020

County: NOT INDICATED
Municipality: NOT INDICATED

Baker
Connoquenessing
480' old well, cistern raw

State:

Location: NOT INDICATED
Reason: Routine Sampling
Project: NOT INDICATED
Suite: UVIR
Matrix: Water

[redacted]

Stream Condition:

Sample Lab Comment: Not Covered Under [redacted]

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
EXTRACTED DATE	10022020 Day	10/13/2020 11:52 AM	MESPECHT	
IR IR		10/13/2020 11:52 AM	MESPECHT	
The IR analysis detected no organic compounds in this sample. The IR analysis may not be suitable for detecting dichane in water samples.				
UV UV		11/06/2020 02:17 PM	MESPECHT	
The UV analysis indicates an organic compound is present in this sample, possibly dichane Holding time exceeded due to instrument failure				

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 233 Date Collected: 09/29/2020 12:05:00 PM Lab Sample ID: O2020004836 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).

Jennifer Hosler, 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: 01/04/2021 01:39:42

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: 9634 234 Date Collected: 09/29/2020 11:40:00 AM Lab Sample ID: O2020004821 Status: Completed

Name of Sample Collector: Christine Miner
Date Received: 10/01/2020

County: NOT INDICATED
Municipality: NOT INDICATED

State:

Location: NOT INDICATED
Reason: Routine Sampling
Project: NOT INDICATED
Suite: VOADW
Matrix: Water

Blank H_2O for QAQC

Stream Condition:

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)	10/01/2020 02:00 AM	ALIU	EPA 524.3
71556 1,1,1-Trichloroethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
79345 1,1,2,2-Tetrachloroethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
79005 1,1,2-Trichloroethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75343 1,1-Dichloroethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75354 1,1-Dichloroethene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
563586 1,1-Dichloropropene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
87616 1,2,3-Trichlorobenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3

1 of 4

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 234 Date Collected: 09/29/2020 11:40:00 AM Lab Sample ID: O2020004821 Status: Completed

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
96184 1,2,3-Trichloropropane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
120821 1,2,4-Trichlorobenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
95636 1,2,4-Trimethylbenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
95501 1,2-Dichlorobenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
107062 1,2-Dichloroethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
78875 1,2-Dichloropropane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
108678 1,3,5-Trimethylbenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
541731 1,3-Dichlorobenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
142289 1,3-Dichloropropane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
106467 1,4-Dichlorobenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
594207 2,2-Dichloropropane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
78933 2-Butanone	2.50 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
591786 2-Hexanone	2.50 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
99876 4-Isopropyltoluene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
108101 4-Methyl-2-pentanone	2.50 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
67641 Acetone	5.00 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
71432 Benzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
108861 Bromobenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
74975 Bromochloromethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75274 Bromodichloromethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75252 Bromoform	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
74839 Bromomethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75150 Carbon disulfide	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
56235 Carbon tetrachloride	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
108907 Chlorobenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75003 Chloroethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75014 Chloroethene (vinyl chloride)	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
67663 Chloroform	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
74873 Chloromethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
156592 cis-1,2-Dichloroethene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
10061015 cis-1,3-Dichloropropene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
124481 Dibromochloromethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
74953 Dibromomethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75718 Dichlorodifluoromethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75092 Dichloromethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
100414 Ethylbenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3

2 of 4

Sample ID: 9634 234 | Date Collected: 09/29/2020 11:40:00 AM | Lab Sample ID: O2020004821 | Status: Completed

Test Codes / CAS # - Description		Reported Results	Date And Time Analyzed	Approved by	Test Method
87683	Hexachlorobutadiene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
98828	Isopropylbenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
108383	m/p-Xylenes	1.00 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
1634044	Methyl-tert-butyl Ether	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
91203	Naphthalene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
104518	n-Butylbenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
103651	n-Propylbenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
95498	o-Chlorotoluene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
95476	o-Xylene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
106434	p-Chlorotoluene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
98566	PCTFB	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
135988	Sec-Butylbenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
100425	Styrene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75650	t-Butyl alcohol	5.00 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
540885	tert-Butyl Acetate	2.50 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
98066	Tert-Butylbenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
127184	Tetrachloroethene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
109999	Tetrahydrofuran	1.00 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
108883	Toluene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
1330207	Total Xylenes	0 ug/L	10/01/2020 02:00 AM	ALIU	EPA 524.3
156605	trans-1,2-Dichloroethene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
10061026	trans-1,3-Dichloropropene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
79016	Trichloroethene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75694	Trichlorofluoromethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
108054	Vinyl Acetate	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3

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' 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).

Jennifer Fesler, Technical Director, Bureau of Laboratories

Sample ID: 9634 234 | Date Collected: 09/29/2020 11:40:00 AM | Lab Sample ID: O2020004821 | Status: Completed

ORGANICS LABORATORY QUALIFIERS

U - Indicates analyte 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: 01/04/2021 01:40:01

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: PA859
PA DEP LAP - DEP Lab ID: 22-00223

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 235 Date Collected: 09/29/2020 Lab Sample ID: 92020005001 Status: Completed

Name of Sample Collector: Christine Miner
Date Received: 10/01/2020

County: Butler State:
Municipality: Connoquenessing Twp

[redacted]

Sample Medium: Ground Water
Sample Medium Type: Water

480' old NW, raw

Location: NOT INDICATED
Reason: Routine Sampling
Project: NOT INDICATED
Standard Anlysis: B017
Matrix: Water

Stream Condition:

Sample Standard Comment: Holding time exceeded
Appearance: clear, crude oil odor

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 235 Date Collected: 09/29/2020 Lab Sample ID: 92020005001 Status: Completed

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
MMOECT E. coli MPN	<1 /100mL	10/01/2020 09:00 AM	HEBLOSS	SM 9223B
MMO-T Total Coliform MPN	78.2 /100mL	10/01/2020 09:00 AM	HEBLOSS	SM 9223B

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* 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).

Jennifer Fesler, Technical Director, Bureau of Laboratories

Date of Issue: 01/04/2021 01:40:23

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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 236 Date Collected: 09/29/2020 Lab Sample ID: I2020015101 Status: Completed

Name of Sample Collector: Christine Miner
Date Received: 10/01/2020

County: Butler State:
Municipality: Connoquenessing Twp

[redacted]

Sample Medium: Ground Water
Sample Medium Type: Water

Location: new well drld 6-30-20, Mienert drlg,approx. 315' deep
Reason: Complaint
Project: NOT INDICATED
Standard Anlysis: 946
Matrix: Water

Stream Condition:

Appearance: clear, odorless

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 236 Date Collected: 09/29/2020 Lab Sample ID: I2020015101 Status: Completed

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
00410 ALKALINITY AS CaCO3 @ pH 4.5	273.4 mg/L	10/01/2020 05:54 PM	MBOTTS	SM 2320B
01105H ALUMINUM, TOTAL (WATER & WASTE) ICPMS	<15.0 ug/L (U)	10/07/2020 12:29 PM	SCHOY	EPA 200.8
01002H ARSENIC, TOTAL (WATER & WASTE) BY ICPMS	<3.00 ug/L (U)	10/07/2020 12:29 PM	SCHOY	EPA 200.8
01007M BARIUM, TOTAL In MGL (WATER & WASTE) BY ICP	0.237 mg/L	10/02/2020 12:52 PM	ATAPSOBA	EPA 200.7
71870 BROMIDE BY ION CHROMATOGRAPHY	<0.2 mg/L (U)	10/06/2020 06:17 PM	TVOROBEYCH	EPA 300.0
00916A CALCIUM, TOTAL (WATER & WASTE) BY ICP	33.290 mg/L	10/02/2020 12:52 PM	ATAPSOBA	EPA 200.7
00900 HARDNESS, TOTAL (CALCULATED)	177 mg/L	10/02/2020 12:52 PM	ATAPSOBA	SM 2340 B
** Comment ** Accredited by NJ only - accreditation not available from PA				
01045M IRON, TOTAL IN MGL (WATER & WASTE) BY ICP	<0.100 mg/L (U)	10/02/2020 12:52 PM	ATAPSOBA	EPA 200.7
01132A LITHIUM, TOTAL (WATER & WASTE) BY ICP	<25.0 ug/L (U)	10/02/2020 12:52 PM	ATAPSOBA	EPA 200.7
00927A MAGNESIUM, TOTAL (WATER & WASTE) BY ICP	10.73 mg/L	10/02/2020 12:52 PM	ATAPSOBA	EPA 200.7
01055M MANGANESE, TOTAL In MGL (WATER & WASTE) BY ICP	0.053 mg/L	10/02/2020 12:52 PM	ATAPSOBA	EPA 200.7
00403 pH, Lab (Electrometric) ** Comment ** Holding Time Exceeded	7.9 pH units	10/01/2020 05:54 PM	MBOTTS	SM 4500-H+ B
00937A POTASSIUM, TOTAL (WATER & WASTE) BY ICP	2.60 mg/L	10/02/2020 12:52 PM	ATAPSOBA	EPA 200.7
01147H SELENIUM, TOTAL (WATER & WASTE) BY ICPMS	<7.80 ug/L (U)	10/07/2020 12:29 PM	SCHOY	EPA 200.8
00929A SODIUM, TOTAL (WATER & WASTE) BY ICP	107.60 mg/L	10/06/2020 03:05 PM	ATAPSOBA	EPA 200.7
00095 SPECIFIC CONDUCTIVITY @ 25.0 C	796.00 umhos/cm	10/06/2020 04:34 PM	MTUZINSKI	SM 2510B
01082M STRONTIUM, TOTAL In MGL (WATER & WASTE) BY ICP	1.344 mg/L	10/02/2020 12:52 PM	ATAPSOBA	EPA 200.7
00403 Temperature at which pH is measured	19.07 C	10/01/2020 05:54 PM	MBOTTS	SM 4500-H+ B
00940 Total Chloride-Ion Chromatograph	30.83 mg/L	10/20/2020 04:40 PM	TVOROBEYCH	EPA 300.0
70300 TOTAL DISSOLVED SOLIDS @ 180C	496 mg/L	10/01/2020 09:55 AM	MARMANIOUS	SM 2540 C
00945 Total Sulfate-Ion Chromatograph	107.60 mg/L	10/20/2020 04:40 PM	TVOROBEYCH	EPA 300.0
00530 TOTAL SUSPENDED SOLIDS	<5 mg/L (U)	10/01/2020 09:54 AM	MARMANIOUS	USGS I-3765
82079 TURBIDITY, NEPHELMETRIC	<1 NTU (U)	10/01/2020 10:27 AM	JANBARRY	EPA 180.1
01092A ZINC, TOTAL (WATER & WASTE) BY ICP	<30.0 ug/L (U)	10/02/2020 12:52 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

Sample ID: 9634 236 | Date Collected: 09/29/2020 | Lab Sample ID: 1202001510 | Status: Completed

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Page

Date of Issue: 01/04/2021 01:40:48

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 237 | Date Collected: 09/29/2020 11:48:00 AM | Lab Sample ID: O2020004826 | Status: Completed

Name of Sample Collector: Christine Miner
Date Received: 10/01/2020

County: NOT INDICATED
Municipality: NOT INDICATED

State:

Location: NOT INDICATED 315' WW
Reason: Routine Sampling
Project: NOT INDICATED
Suite: METH
Matrix: Water

[redacted]

Stream Condition:

Test Codes / CAS # - Description		Reported Results	Date And Time Analyzed	Approved by	Test Method
74840	Ethane	12.4 ug/L (J)	10/01/2020 02:00 AM	DACLEMENS	BOL BOL6019
74828	Methane	35.1 ug/L	10/01/2020 02:00 AM	DACLEMENS	BOL BOL6019
74986	Propane	14.2 ug/L (J)	10/01/2020 02:00 AM	DACLEMENS	BOL BOL6019

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 237 | Date Collected: 09/29/2020 11:48:00 AM | Lab Sample ID: O2020004826 | 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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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).

Jennifer Hesler, 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: 01/04/2021 01:41:42

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

Contact Phone Number: (717) 348-7200

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 239 Date Collected: 09/29/2020 Lab Sample ID: O2020004822 Status: Completed

Name of Sample Collector: Christine Miner
Date Received: 10/01/2020

County: Butler State:
Municipality: Connoquenessing Twp

[redacted]

Sample Medium: Ground Water
Sample Medium Type: Water
Location: 315' new well
Reason: Complaint
Project: NOT INDICATED
Suite: VOADW
Matrix: Water

Stream Condition:

Appearance: clear, odorless

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 239 Date Collected: 09/29/2020 Lab Sample ID: O2020004822 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)	10/01/2020 02:00 AM	ALIU	EPA 524.3
71556 1,1,1-Trichloroethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
79345 1,1,2,2-Tetrachloroethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
79005 1,1,2-Trichloroethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75343 1,1-Dichloroethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75354 1,1-Dichloroethene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
563586 1,1-Dichloropropene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
87616 1,2,3-Trichlorobenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
96184 1,2,3-Trichloropropane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
120821 1,2,4-Trichlorobenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
95636 1,2,4-Trimethylbenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
95501 1,2-Dichlorobenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
107062 1,2-Dichloroethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
78875 1,2-Dichloropropane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
108678 1,3,5-Trimethylbenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
541731 1,3-Dichlorobenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
142289 1,3-Dichloropropane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
106467 1,4-Dichlorobenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
594207 2,2-Dichloropropane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
78933 2-Butanone	2.50 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
591786 2-Hexanone	2.50 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
99876 4-Isopropyltoluene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
108101 4-Methyl-2-pentanone	2.50 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
67641 Acetone	5.00 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
71432 Benzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
108861 Bromobenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
74975 Bromochloromethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75274 Bromodichloromethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75252 Bromoform	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
74839 Bromomethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75150 Carbon disulfide	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
56235 Carbon tetrachloride	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
108907 Chlorobenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75003 Chloroethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75014 Chloroethene (vinyl chloride)	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
67663 Chloroform	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3

Sample ID: 9634 239 Date Collected: 09/29/2020 Lab Sample ID: O2020004822 Status: Completed

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
74873 Chloromethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
156592 cis-1,2-Dichloroethene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
10061015 cis-1,3-Dichloropropene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
124481 Dibromochloromethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
74953 Dibromomethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75718 Dichlorodifluoromethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75092 Dichloromethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
100414 Ethylbenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
87683 Hexachlorobutadiene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
98828 Isopropylbenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
108383 m/p-Xylenes	1.00 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
1634044 Methyl-tert-butyl Ether	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
91203 Naphthalene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
104518 n-Butylbenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
103651 n-Propylbenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
95498 o-Chlorotoluene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
95476 o-Xylene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
106434 p-Chlorotoluene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
98566 PCTFB	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
135988 sec-Butylbenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
100425 Styrene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75650 t-Butyl alcohol	5.00 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
540885 tert-Butyl Acetate	2.50 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
98066 Tert-Butylbenzene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
127184 Tetrachloroethene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
109999 Tetrahydrofuran	31.7 ug/L	10/01/2020 02:00 AM	ALIU	EPA 524.3
108883 Toluene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
1330207 Total Xylenes	0 ug/L	10/01/2020 02:00 AM	ALIU	EPA 524.3
156605 trans-1,2-Dichloroethene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
10061026 trans-1,3-Dichloropropene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
79016 Trichloroethene	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
75694 Trichlorofluoromethane	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3
108054 Vinyl Acetate	0.500 ug/L (U)	10/01/2020 02:00 AM	ALIU	EPA 524.3

Sample ID: 9634 239 Date Collected: 09/29/2020 Lab Sample ID: O2020004822 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).

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).

NI - 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)

C - 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: 01/04/2021 01:42:37

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 241 Date Collected: 09/29/2020 11:45:00 AM Lab Sample ID: B2020005002 Status: Completed

Name of Sample Collector: Christine Miner
Date Received: 10/01/2020
County: NOT INDICATED Butler
Municipality: NOT INDICATED Connoquenessing
State:
Location: NOT INDICATED 315' new well, cistern, raw
Reason: Complaint
Project: NOT INDICATED
Standard Anlysis: 9017
Matrix: Water

Stream Condition:

Sample Standard Comment: Holding time exceeded

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
MMOECT E. coli MPN	<1 /100mL	10/01/2020 09:00 AM	HEBLOSS	SM 9223B
MMO-T Total Coliform MPN	7.5 /100mL	10/01/2020 09:00 AM	HEBLOSS	SM 9223B

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 241 Date Collected: 09/29/2020 11:45:00 AM Lab Sample ID: B2020005002 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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U - Indicates analysis was performed for the test but it was not detected. The sample quantitation limit is reported.

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Jennifer Fesler, Technical Director, Bureau of Laboratories

Date of Issue: 02/06/2023 12:16:43

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 334 Date Collected: 09/29/2021 11:26:00 AM Lab Sample ID: I2021018631 Status: Completed

Name of Sample Collector: Christine Miner
Date Received: 09/30/2021

County: NOT INDICATED
Municipality: NOT INDICATED

Location: NOT INDICATED
Reason: Routine Sampling
Project: NOT INDICATE
Standard Anlysis: 946
Matrix: Water

Stream Condition:

State:

Butler
Conneaueness
315' new WW, Kitchen sink, Heated but not through RO

[redacted]

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
00410 ALKALINITY AS CaCO3 @ pH 4.5	248.0 mg/L	10/01/2021 10:29 AM	JAHOGUE	SM 2320B
01105M ALUMINUM, TOTAL (WATER & WASTE) ICPMS	20.500 ug/L	10/01/2021 11:26 AM	ELEEDY	EPA 200.8
01002H ARSENIC, TOTAL (WATER & WASTE) BY ICPMS	<3.00 ug/L (U)	10/01/2021 11:26 AM	ELEEDY	EPA 200.8
01007M BARIUM, TOTAL in MG/L (WATER & WASTE) BY ICP	0.148 mg/L	10/04/2021 12:02 PM	ATAPSOBA	EPA 200.7
71870 BROMIDE BY ION CHROMATOGRAPHY	<0.2 mg/L (U)	09/30/2021 02:09 PM	TVOROBEYCH	EPA 300.0
00916A CALCIUM, TOTAL (WATER & WASTE) BY ICP	72.080 mg/L	10/04/2021 12:02 PM	ATAPSOBA	EPA 200.7
00900 HARDNESS, TOTAL (CALCULATED)	232 mg/L	10/04/2021 12:02 PM	ATAPSOBA	SM 2340 B

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 334 Date Collected: 09/29/2021 11:26:00 AM Lab Sample ID: I2021018631 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	<0.100 mg/L (U)	10/04/2021 12:02 PM	ATAPSOBA	EPA 200.7
01132A LITHIUM, TOTAL (WATER & WASTE) BY ICP	<25.0 ug/L (U)	10/04/2021 12:02 PM	ATAPSOBA	EPA 200.7
00927A MAGNESIUM, TOTAL (WATER & WASTE) BY ICP	12.56 mg/L	10/04/2021 12:02 PM	ATAPSOBA	EPA 200.7
01055M MANGANESE, TOTAL in MG/L (WATER & WASTE) BY ICP	<0.010 mg/L (U)	10/04/2021 12:02 PM	ATAPSOBA	EPA 200.7
00403 pH, Lab (Electrometric)	7.7 pH units	10/01/2021 10:29 AM	JAHOGUE	SM 4500-H+ B
** Comment ** Holding Time Exceeded				
00937A POTASSIUM, TOTAL (WATER & WASTE) BY ICP	2.84 mg/L	10/04/2021 12:02 PM	ATAPSOBA	EPA 200.7
01147H SELENIUM, TOTAL (WATER & WASTE) BY ICPMS	<7.00 ug/L (U)	10/01/2021 11:26 AM	ELEEDY	EPA 200.8
00929A SODIUM, TOTAL (WATER & WASTE) BY ICP	57.11 mg/L	10/04/2021 12:02 PM	ATAPSOBA	EPA 200.7
00095 SPECIFIC CONDUCTIVITY @ 25.0 C	634.00 umhos/cm	10/01/2021 11:26 AM	MTUZINSKI	SM 2510B
01082M STRONTIUM, TOTAL in MG/L (WATER & WASTE) BY ICP	1.542 mg/L	10/04/2021 12:02 PM	ATAPSOBA	EPA 200.7
00403T Temperature at which pH is measured	17.34 C	10/01/2021 10:29 AM	JAHOGUE	SM 4500-H+ B
00940 Total Chloride-Ion Chromatograph	29.44 mg/L	09/30/2021 02:09 PM	TVOROBEYCH	EPA 300.0
70300 TOTAL DISSOLVED SOLIDS @ 180C	396 mg/L	09/30/2021 07:39 AM	MOBERCASH	SM 2540C-15
00945 Total Sulfate-Ion Chromatograph	53.17 mg/L	09/30/2021 02:09 PM	TVOROBEYCH	EPA 300.0
00530 TOTAL SUSPENDED SOLIDS	<5 mg/L (U)	09/30/2021 01:55 PM	MARMANIOUS	USGS I-3765-85
82079 TURBIDITY, NEPHELMETRIC	<1 NTU (U)	09/30/2021 11:32 AM	JAHOGUE	EPA 180.1
01092A ZINC, TOTAL (WATER & WASTE) BY ICP	60.00 ug/L	10/07/2021 10:57 AM	ATAPSOBA	EPA 200.7
Duplicate values are not within acceptable range				

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).

Jennifer Fesler, Technical Director, Bureau of Laboratories

Date of Issue: 02/06/2023 12:19:05

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 335 Date Collected: 09/29/2021 11:26:00 AM Lab Sample ID: O2021006499 Status: Completed

Name of Sample Collector: Christine Miner
Date Received: 09/30/2021

County: NOT INDICATED
Municipality: NOT INDICATED
State:

Butler
Conroy Jeressing
315' new WD, Kitchen Sink, treated but not through RO

Location: NOT INDICATED
Reason: Routine Sampling
Project: NOT INDICATED
Suite: METH
Matrix: Water

[redacted]

Stream Condition:

Sample Standard Comment: This is a revised rep
Sample Lab Comment: This is a revised report

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
74840 Ethane	12.4 ug/L (U)	09/30/2021 02:00 AM	DLY	BOL BOL6019
Ethane result was from replicate bottle run 9 days after collection				
74828 Methane	11.6 ug/L (U)	09/30/2021 02:00 AM	DLY	BOL BOL6019
74986 Propane	14.2 ug/L (U)	09/30/2021 02:00 AM	DLY	BOL BOL6019

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9634 335 Date Collected: 09/29/2021 11:26:00 AM Lab Sample ID: O2021006499 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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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: 02/06/2023 12:19:25

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: 9834 336 Date Collected: 09/29/2021 11:30:00 AM Lab Sample ID: I2021018632 Status: Completed

Name of Sample Collector: Christine Miner
Date Received: 09/30/2021
County: NOT INDICATED Butler
Municipality: NOT INDICATED Connoquenessing
State:
Location: NOT INDICATED 315' new WW. Reverse Osmosis Treated at small Kitchen sink
Reason: Routine Sampling
Project: NOT INDICATED
Standard Anlysis: 946
Matrix: Water
[redacted]
Stream Condition:

Test Codes / CAS # - Description	Reported Results	Date And Time Analyzed	Approved by	Test Method
00410 ALKALINITY AS CaCO3 @ pH 4.5	14.6 mg/L	10/01/2021 10:34 AM	JAHOGUE	SM 2320B
01105H ALUMINUM, TOTAL (WATER & WASTE) ICPMS	<15.0 ug/L (U)	10/01/2021 11:29 AM	ELEEDY	EPA 200.8
01002H ARSENIC, TOTAL (WATER & WASTE) BY ICPMS	<3.00 ug/L (U)	10/01/2021 11:29 AM	ELEEDY	EPA 200.8
01007M BARIUM, TOTAL in MG/L (WATER & WASTE) BY ICP	<0.010 mg/L (U)	10/04/2021 12:11 PM	ATAPSOBA	EPA 200.7
71870 BROMIDE BY ION CHROMATOGRAPHY	<0.2 mg/L (U)	09/30/2021 06:35 PM	TVOROBEYCH	EPA 300.0
00916A CALCIUM, TOTAL (WATER & WASTE) BY ICP	1.480 mg/L	10/04/2021 12:11 PM	ATAPSOBA	EPA 200.7
00900 HARDNESS, TOTAL (CALCULATED)	4 mg/L	10/04/2021 12:11 PM	ATAPSOBA	SM 2340 B

Analytical Report For
Oil And Gas Mgmt

Sample ID: 9834 336 Date Collected: 09/29/2021 11:30:00 AM Lab Sample ID: I2021018632 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	<0.100 mg/L (U)	10/04/2021 12:11 PM	ATAPSOBA	EPA 200.7
01132A LITHIUM, TOTAL (WATER & WASTE) BY ICP	<25.0 ug/L (U)	10/04/2021 12:11 PM	ATAPSOBA	EPA 200.7
00927A MAGNESIUM, TOTAL (WATER & WASTE) BY ICP	0.22 mg/L	10/04/2021 12:11 PM	ATAPSOBA	EPA 200.7
01055M MANGANESE, TOTAL in MG/L (WATER & WASTE) BY ICP	<0.010 mg/L (U)	10/04/2021 12:11 PM	ATAPSOBA	EPA 200.7
00403 pH, Lab (Electrometric)	6.4 pH units	10/01/2021 10:34 AM	JAHOGUE	SM 4500-H+ B
** Comment ** Holding Time Exceeded				
00937A POTASSIUM, TOTAL (WATER & WASTE) BY ICP	<1.00 mg/L (U)	10/04/2021 12:11 PM	ATAPSOBA	EPA 200.7
01147H SELENIUM, TOTAL (WATER & WASTE) BY ICPMS	<7.00 ug/L (U)	10/01/2021 11:29 AM	ELEEDY	EPA 200.8
00929A SODIUM, TOTAL (WATER & WASTE) BY ICP	5.19 mg/L	10/04/2021 12:11 PM	ATAPSOBA	EPA 200.7
00095 SPECIFIC CONDUCTIVITY @ 25.0 C	33.60 umhos/cm	10/01/2021 11:29 AM	MTUZINSKI	SM 2510B
01082M STRONTIUM, TOTAL in MG/L (WATER & WASTE) BY ICP	0.030 mg/L	10/04/2021 12:11 PM	ATAPSOBA	EPA 200.7
00403T Temperature at which pH is measured	17.38 C	10/01/2021 10:34 AM	JAHOGUE	SM 4500-H+ B
00940 Total Chloride-Ion Chromatograph	1.20 mg/L	09/30/2021 06:35 PM	TVOROBEYCH	EPA 300.0
70300 TOTAL DISSOLVED SOLIDS @ 180C	20 mg/L	09/30/2021 07:39 AM	MOBERCASH	SM 2540C-15
00945 Total Sulfate-Ion Chromatograph	<1.00 mg/L (U)	09/30/2021 06:35 PM	TVOROBEYCH	EPA 300.0
00530 TOTAL SUSPENDED SOLIDS	<5 mg/L (U)	09/30/2021 01:55 PM	MARMANIOUS	USGS I-3765-85
82079 TURBIDITY, NEPHELMETRIC	<1 NTU	09/30/2021 11:34 AM	JAHOGUE	EPA 180.1
01092A ZINC, TOTAL (WATER & WASTE) BY ICP	<30.0 ug/L (U)	10/04/2021 12:11 PM	ATAPSOBA	EPA 200.7

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Jennifer Fesler, 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 CaCo3	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 commons ones that have known health effects. The table lists acceptable limits, potential health effects, and possible uses and sources of the contaminant.

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 aplasticaremia; 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_3)	10 mg/l (nitrate-N) 45 mg/l (nitrate)	soil by-product of agricultural fertilization; human and animal waste leaching to groundwater	methemoglobinemaia (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 unpallatable 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_4)	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 ti 10.5*	hard
10.5 and above	very hard

Table 4. Hardness classifications.

Additional Resources

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.

Prepared by Paul D. Robillard, Assistant Professor of Agricultural Engineering, William E. Sharpe, Professor of Forest Hydrology and Bryan R. Swistock, Senior Extension Associate, Department of Ecosystem Science and Management

Authors

Bryan Swistock
Senior Extension Associate; Water Resources Coordinator
brs@psu.edu
814-863-0194

extension.psu.edu

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Code: ART-2161

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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_4) 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.

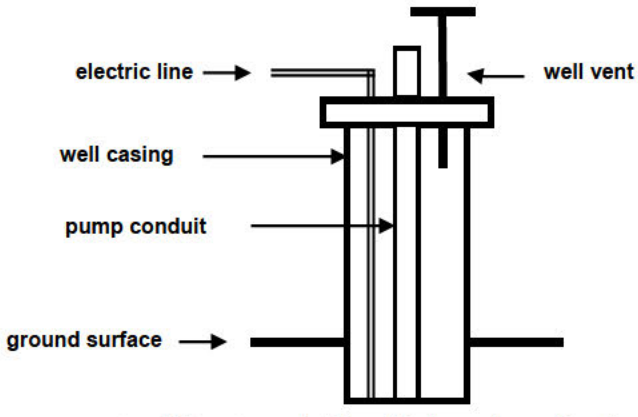
Methane can migrate into water wells in a gaseous phase or dissolved in the groundwater. At atmospheric pressure, methane is soluble in water between 26-35 milligrams per liter. It is sometimes recognizable as effervescent gas bubbles in water drawn from a faucet. In some cases, the release of methane 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-arrresting 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

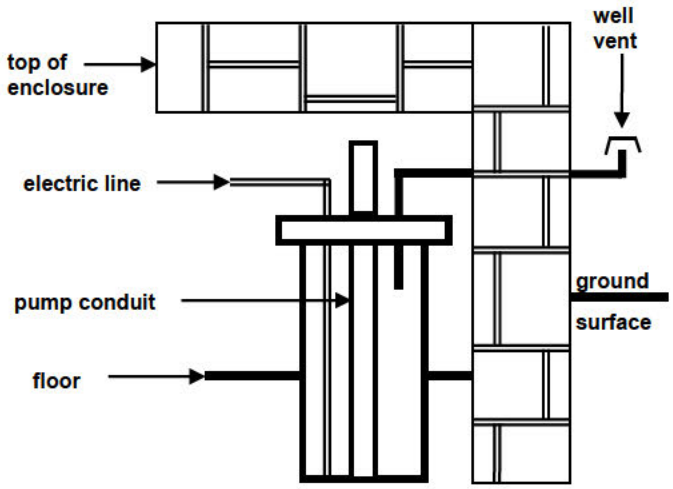
does not vent into the building. Venting of wells will not adequately remove methane dissolved in the groundwater, but properly designed water aeration systems are one effective way to lower the concentration of methane dissolved in the water.

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

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

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

North-central Regional Office

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

Counties Served: Bradford, Cameron, Centre, Clearfield, Clinton, Columbia, Lycoming, Montour, Northumberland, Potter, Snyder, Sullivan, Tioga and Union

Southeast Regional Office

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

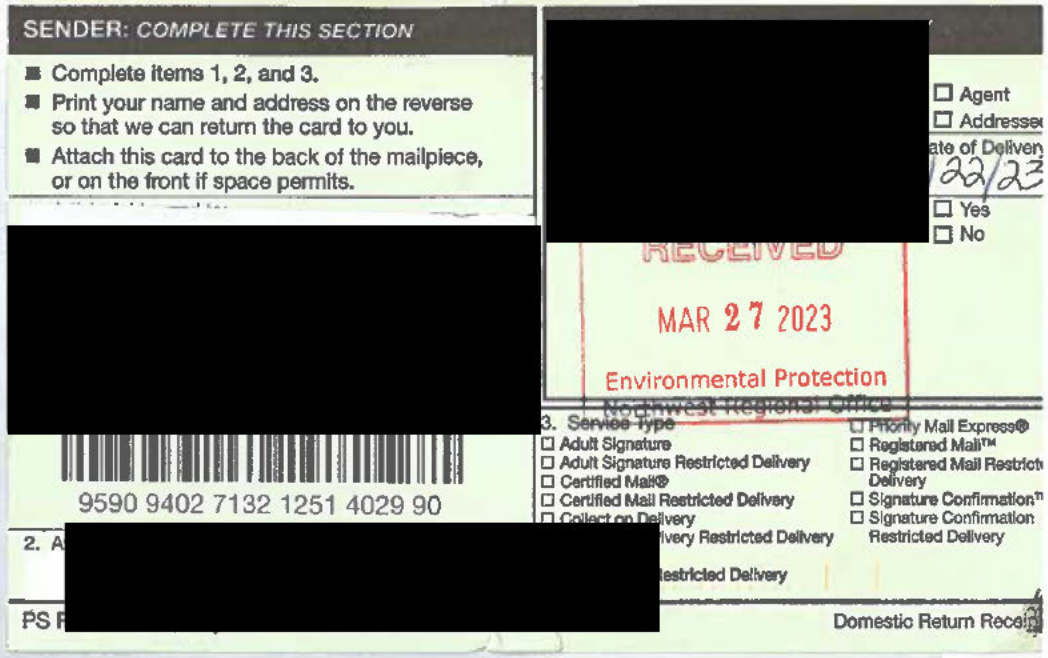
Counties Served: Bucks, Chester, Delaware, Montgomery and Philadelphia

Northeast Regional Office

2 Public Square
Wilkes-Barre, PA 18701-1915
Telephone: 570-826-2511

Counties Served: Carbon, Lackawanna, Lehigh, Luzerne, Monroe, Northampton, Pike, Schuylkill, Susquehanna, Wayne and Wyoming

For more information, visit www.dep.state.pa.us, keyword: Wells.



SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

[redacted]

[redacted]

9590 9402 7132 1251 4029 90

2. A[redacted]

PS F[redacted]

RECEIVED

MAR 27 2023

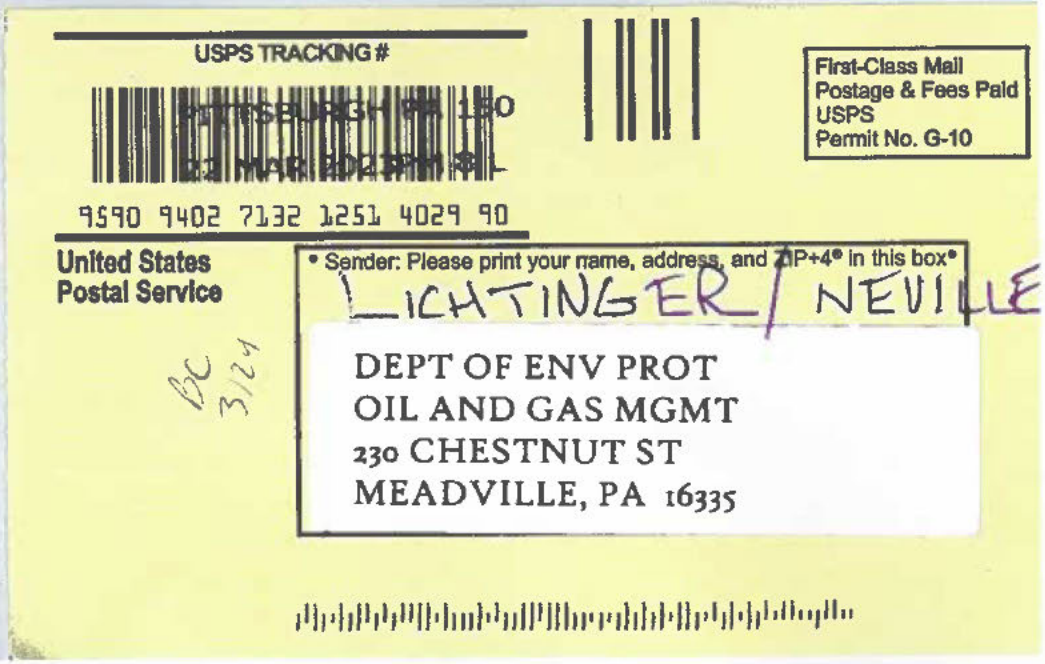
Environmental Protection

Northwest Regional Office

☐ Agent
☐ Addressee
ate of Deliver
22/23
☐ Yes
☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
[illegible]ivery Restricted Delivery
[illegible]estricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

Domestic Return Rece[illegible]



USPS TRACKING #

[redacted]

9590 9402 7132 1251 4029 90

First-Class Mail
Postage & Fees Paid
USPS
Permit No. G-10

United States Postal Service

* Sender: Please print your name, address, and ZIP+4® in this box*

LICHTINGER / NEVILLE

DEPT OF ENV PROT
OIL AND GAS MGMT
230 CHESTNUT ST
MEADVILLE, PA 16335

BC 3/24