pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northeast Regional Office
CLEAN WATER PROGRAM

Application Type	**New**	Application No.	**PA0276405**
Facility Type	**Industrial**	APS ID	**1035457**
Major / Minor	**Minor**	Authorization ID	**1348384**

NPDES PERMIT FACT SHEET INDIVIDUAL INDUSTRIAL WASTE (IW) AND IW STORMWATER

Applicant and Facility Information

Applicant Name	**Eureka Resources, LLC**	Facility Name	**Eureka Resources - Susquehanna Facility**
Applicant Address	315 Second Street	Facility Address	7305 State Route 29
	Williamsport, PA 17701		Dimock, PA 18801
Applicant Contact	Jerel Bogdan	Facility Contact	Bob Cooney
Applicant Phone	(570) 651-9972	Facility Phone	(570) 651-9973
Client ID	271995	Site ID	848551
SIC Code	1389	Municipality	Dimock Township
SIC Description	Mining - Oil and Gas Field Services, Nec	County	Susquehanna
Date Application Received	March 25, 2021	EPA Waived?	Yes
Date Application Accepted	March 25, 2021	If No, Reason	-

Purpose of Application: New NPDES permit to discharge industrial wastewater.

Summary of Review

The applicant is requesting a new NPDES permit to discharge 0.168 MGD of industrial wastewater to Tributary 29418 to Burdick Creek, a cold-water fishes and migratory fishes (CWF/MF) designated receiving stream in state water plan basin 4-G (Mehoopany – Bowman Creeks). As per the Department's current existing use list, the receiving stream does not have an existing use classification that is more protective than its designated use. There are no Total Maximum Daily Loads (TMDLs) on the receiving stream.

The proposed facility is for treatment of fluids generated during the drilling, fracturing, and production of conventional and unconventional natural gas and oil wells. Conventional extraction methods utilize the natural underground pressures and pressures associated with pumping to lift the product to the surface. When production decreases, an artificial lift or water/gas injection may sometimes be used to increase production. The unconventional extraction methods include horizontal drilling and hydraulic fracturing to release gas/oil from tight rock and sand formations and requires large amounts of chemically treated water.

Raw oil and gas wastewater will be unloaded into receiving tanks and pumped to primary clarifiers followed by chemical pretreatment using coagulation-flocculation. Wastewater will then flow through cartridge filters and then will be stored in pretreated water storage tanks. Wastewater will either be fed to an MVR crystallizer or a NOMAD evaporator depending on its characteristics. Distillate will be pumped to a distillate storage tank before being sent to a membrane biological reactor (MBR) unit. Wastewater will receive polishing treatment via ion exchange and reverse osmosis before being pumped to Outfall 001. Solids generated during pretreatment and in the MBR will be dewatered and disposed at a landfill.

The following treatment chemicals (and max usage rates) will be used at the facility: sodium sulfate for pretreatment (200 gpd), phosphoric acid for MBR nutrient and pH control (0.22 gpd), sodium hydroxide for pretreatment (0.04 gpd), sodium hypochlorite for MBR cleaning (2.4 gpd), anionic polymer for pretreatment (0.5 gpd), hydrated lime for pretreatment (2,200 gpd) and hydrochloric acid for pretreatment (300 gpd).

Approve	Deny	Signatures	Date
X		*Brian Burden* Brian Burden, E.I.T. / Project Manager	October 19, 2021
X		Amy M. Bellanca (signed) Amy M. Bellanca, P.E. / Environmental Engineer Manager	11-2-21

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The following chemical additives are proposed for use at the treatment facility: anti-foam for crystallizer, raw water holding tanks and pretreatment clarifier (3-4 days/week at 30-50 gpd), scale inhibitor for crystallizer boiler (continuous at 1-2 gpd), corrosion inhibitor for crystallizer boiler (continuous at 1-2 gpd).

Preliminary effluent limitations (PELs) for the proposed discharge were sent to the permittee in a letter from DEP, dated March 5, 2021 (see attached). All modeling assumptions from the PELs are carried over to this permit. Note that the PELs were developed without sampling data provided from Eureka and the sampling data provided with the application has modified some of the limitations. Additional limitations and monitoring requirements included in the permit are consistent with the requirements of other similar treatment facilities in Pennsylvania.

Pollutant Groups 1, 2 and 7 influent/effluent samples were analyzed from Eureka's Standing Stone facility in Bradford County, PA (NPDES Permit PA0232351).

WQM 7.0 modeling recommended effluent limitations for Ammonia-Nitrogen (1.44 mg/L average monthly, 2.88 mg/L maximum daily) and a 6.0 mg/L minimum for Dissolved Oxygen.

DEP's Toxics Management Spreadsheet recommends the limitations and monitoring requirements in the table below:

				Limitations (µg/L)		
Pollutants	**Max Application Concentration (µg/L)**	**Governing WQBEL (µg/L)**	**WQBEL Basis**	**Average Monthly**	**Daily Maximum**	**IMAX**
Total Antimony	< 20	5.83	THH	5.83	9.1	14.6
Total Arsenic	< 50	10.4	THH	10.4	16.2	26
Total Barium	10,000**	2,500	THH	2,500	3,900	6,249
Total Cadmium	< 3	0.03	CFC	0.03	0.047	0.076
Trivalent Chromium	< 10	7.65	CFC	7.65	11.9	19.1
Hexavalent Chromium	< 10	10.8	CFC	10.8	16.9	27.1
Total Cobalt	< 10	19.8	CFC	19.8	30.9	49.5
Total Copper	20	0.74	CFC	0.74	0.86	0.86
Dissolved Iron	80	312	THH	Report	Report	Report
Total Lead	< 50	0.072	CFC	0.072	0.11	0.18
Total Mercury	< 2	0.052	THH	0.052	0.081	0.13
Total Nickel	< 10	4.27	CFC	4.27	6.66	10.7
Total Selenium	< 50	5.2	CFC	5.2	8.11	13
Total Silver	< 10	0.021	AFC	0.021	0.022	0.022
Total Strontium	10,000**	4,166	THH	4,166	6,500	10,415
Total Thallium	< 50	0.25	THH	0.25	0.39	0.62
Total Zinc	100	9.38	AFC	9.38	9.77	9.77
2,4,6-Trichlorophenol	155*	2.32	CRL	2.32	3.62	5.8
Acetone	30,200*	3,645	THH	3,645	5,687	9,113
p-Cresol	698*	167	CFC	167	260	417
Osmotic Pressure (mOs/kg)	< 20	50	AFC	Report	Report	Report

* Modeling was run to determine if more stringent water quality-based limitations are required when compared to the technology-based limitations from 40 CFR 437 Subpart C (see below).

** Modeling was run to determine if more stringent water quality-based limitations are required when compared to the technology-based limitations from 25 Pa. Code § 95.10 (see below).

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Note: The permittee may resample after issuance of the draft permit at a more sensitive quantitation limit (QL) for pollutants with Max Application Concentrations reported with a "<" qualifier. If the permittee choses to resample those pollutants, a minimum of three additional sampling results are required. Samples should be taken at least one week apart. If the pollutants are analyzed using a QL that meets the Department's Target QLs (see application instructions document 3800-PM-BCW0008a) and the results are non-detect, then the pollutant is not considered present in the discharge for modeling purposes and water quality-based limitations or monitoring requirements will not be included in the final permit.

State regulations at 25 Pa. Code Chapter 95 establish technology-based limitations for all industrial wastes in addition to the above-mentioned federal regulations. Section 95.2 sets forth limitations for pH (within 6.0 S.U. – 9.0 S.U. at all times) and Oil and Grease (15.0 mg/L average monthly, 30.0 mg/L IMAX).

Section 95.10 sets forth treatment standards for new and expanding mass loadings of Total Dissolved Solids (TDS). A facility is "new" if the discharge did not exist prior to August 21, 2010. Since this is a new discharge of oil and gas wastewater, this facility will be required to comply with 25 Pa. Code § 95.10 treatment standards with average monthly limitations of 500 mg/l TDS, 250 mg/l Chlorides, 10 mg/l Barium, and 10 mg/l Strontium. The establishment of the § 95.10 treatment standards is also recommended by the *Policy and Procedure for NPDES Permitting of TDS Discharges (385-2100-002, 11/12/11)*, which classifies this facility as Non-Exempt (Natural Gas).

As in similar state-issued permits pursuant to the Clean Water Act (CWA) § 402(a)(1)(b) and 40 CFR § 122.44(a)(1) and 125.3, which authorizes DEP to develop case-by-case TBELS, the average monthly limitation of 10 mg/l for Ammonia-N is recommended as an Industrial BMP (subject to water-quality analysis). Note that WQM 7.0 modeling indicates more stringent limitations are needed for Ammonia-N (see below).

In the *Development Document for Proposed Effluent Limitations Guidelines and Standards for the Centralized Waste Treatment Industry* (EPA 821-R-98-020, December 1998), EPA defines Centralized Waste Treatment (CWT) facilities as, "any facility that treats any hazardous or nonhazardous industrial waste received from off-site by tanker truck, trailer/roll-off bins, drums, barge or other forms of shipment." Since the facility receives hauled in wastewater from the oil and gas industry, it is appropriate to classify the facility under this designation. EPA has established effluent limit guidelines (ELGs) for CWT facilities at 40 CFR § 437, and breaks down the limitations by four treatment and recovery subparts; Metals, Oils, Organics, and Multiple Wastestreams. To determine which subcategory is applicable, the flowchart on page 14-6 of the above-cited Development Document and the application's intake sampling results were used on an analysis of wastewater effluent from Eureka's Standing Stone treatment facility in Bradford County, PA. This analysis ultimately determined that the facility should be classified under the Organics Treatment and Recovery subpart (40 CFR 437, Subpart C).

EPA's 40 CFR § 437.34 identifies the New Source Performance Standards (NSPS) for 40 CFR Part 437, Subpart C – Organics Treatment and Recovery ELGs. However, § 437.34 states, "Standards for BOD_5, pH, TSS, copper, zinc, acetone, acetophenone, 2-butanone, o-cresol, p-cresol, phenol, pyridine, and 2,4,6-trichlorophenol are the same as the corresponding limitation specified in § 437.31." Consequently, best practicable control technology (BPT) limitations specified in § 437.31 are proposed, subject to water quality analysis and BPJ.

The table below lists the technology-based limitations from 40 CFR 437 Subpart C:

	Limitations (mg/L)	
Pollutant	Monthly Average	Daily Maximum
BOD_5	53	163
pH	Between 6.0 - 9.0 S.U. at all times	
TSS	61.3	216
Copper	0.757	0.865
Zinc	0.42	0.497
Acetone	7.97	30.2
Acetophenone	0.0562	0.114
2-Butanone	1.85	4.81

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o-Cresol	0.561	1.92
p-Cresol	0.205	0.698
Phenol	1.08	3.65
Pyridine	0.182	0.37
2,4,6-Trichlorophenol	0.106	0.155

As stated in an EPA recommendation dated August 28, 2013, significant concentrations of bromide can be found in SGE wastewaters which could lead to the formation of disinfection byproducts at water treatment facilities. In accordance with that letter, monitoring for bromide will be included. Elevated levels of radioactive materials and sulfate are also found in SGE wastewaters. Like other permits issued by the Department for facilities treating SGE wastewater, this permit will include monitoring of Uranium, Gross Alpha, Radium 226/228, and Sulfate.

BTEX pollutants (benzene, toluene, ethylbenzene and xylene) are parameters of concern at CWT facilities that treat oil and gas wastewaters. Standards from the Department's PAG-05 General Permit for Discharges from Petroleum Product Contaminated Groundwater Remediation Systems are applied to this permit as Best Professional Judgement (BPJ) limitations. The PAG-05 permit includes limitations for Benzene (0.001 mg/L monthly average, 0.0025 mg/L IMAX) and Total BTEX (0.1 mg/L monthly average, 0.25 mg/L IMAX). Water quality modeling indicates more stringent limitations for Benzene are needed (0.0009 mg/L, 0.0014 mg/L daily maximum, 0.00224 mg/L IMAX).

Effluent limitations for all continuous discharges other than POTWs must be expressed as both average monthly and maximum daily effluent limits in accordance with 40 CFR 122.45(d). As per chapter 2 of 362-0400-001, a 2x daily max multiplier is to be used for all technology-based limits (unless indicated differently in ELGs or other regulation). A 2.5x IMAX multiplier is to be used. If the 2.5x multiplier calculates an IMAX limit that is below the daily maximum limitation, then the IMAX limitation will equal the daily maximum limitation.

As per table 6-4 of 362-0400-001, the sample type for volatile pollutants is a 4-grab composite. Four grab samples should be collected during actual hours of discharge over a 24-hour period and need not be flow proportioned. Pollutants listed on the National Ambient Volatile Organic Compounds Database (Acetone, 2-Butanone, Phenol, Pyridine, Benzene, Total BTEX) have the 4-grab composite sample type in the permit.

Eureka Resources will be assigned cap loads of "0 lbs/year" for Total Nitrogen and Total Phosphorus and will be required to purchase nutrient credits to meet Chesapeake Bay requirements (see Part C.II). After nutrient credit purchases, the net annual mass loadings for Total Nitrogen and Total Phosphorus shall be 0 lbs/year. Weekly monitoring and reporting requirements are added to the permit for Total Nitrogen and Total Phosphorus. Weekly monitoring and reporting requirements for TKN and NO_2+NO_3-N are added to the permit to calculate Total Nitrogen.

No stormwater outfalls are identified in the permit application. Contaminated stormwater is defined by 40 CFR 437 as, "storm water which comes in direct contact with CWT wastes, the waste handling and treatment areas, or other centralized waste treatment wastewater." Any stormwater that will come into direct contact with CWT wastes and/or CWT handling areas and is, therefore, a categorical waste under the ELG and must be conveyed to the wastewater treatment system. Stormwater BMPs are included in Part C.VI.C. of the permit. The requirement for development of a PPC plan is included in Part C.VI.A. A condition requiring all contaminated stormwater (as defined by 40 CFR 437) to be treated at the facility is included in Part C.VI.E.

As per document 385-2100-002, WET testing for CWTs or other IWs that discharge treated natural gas wastewater, where the full volume of natural gas wastewater in effluent has been treated to the pollutant concentrations contained in 95.10(b)(3)(iii), generally is not recommended. Therefore, no Whole Effluent Toxicity conditions are contained in the permit.

The Environmental Quality Board has directed DEP to collect additional data related to Sulfate, Chloride, and 1,4-Dioxane via Triennial Review 13. Limits for Chlorides and monitoring requirements for Sulfate have been established (see reasoning above). Sampling results were not submitted with the application for 1,4-Dioxane since Pollutant Group 3 sampling results were not required. A 1/quarter monitoring requirement is added to the permit for 1,4-Dioxane.

Note: On July 7, 2018 the Department rescinded the Oil and Gas Wastewater Permitting Manual (guidance doc. No. 550-2100-002) as part of its rescission of the Oil and Gas Operator's Manual (guidance doc. No. 500-0300-001) as per the PA

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Bulletin. The guidance documents were rescinded because processes have significantly changed since the documents were last revised in 2001.

All sanitary sewage flows from the facility will be conveyed to an on-lot septic system and will be separate from the industrial discharge.

The proposed discharge location for this treatment plant on Tributary 29418 to Burdick Creek has an approximate 0.13 square mile drainage area. Using the low flow yield of 0.083 cfs/mi^2, the stream contributes 0.0108 cfs (0.007 MGD) to the combined flow. When compared to the treatment facility's design capacity of 0.168 MGD and average flow of 0.072 MGD, discharge to streamflow ratios are 24:1 and 10:1 during low flow conditions. During average streamflow, treatment effluent would likely contribute a significant amount of flow as well.

Eureka has not conducted any studies or analyses regarding the assimilative capacity of the receiving stream. Part C.III is added to the permit requiring the permittee to conduct a study on the assimilative capacity on the receiving stream and submit the study to the Department within 6 months of the permit effective date. Within 1 year of the permit effective date the permittee shall develop and submit to DEP a plan for ensuring the protection of the water quality and stream bed/banks of Tributary 29418 until its confluence with Burdick Creek. If the effluent creates a health hazard or nuisance, the permittee shall, upon notice from DEP, provide such additional treatment or additional measures to protect the water quality of Tributary 29418 to Burdick Creek as may be required by DEP (see Part C.I.D.).

A temperature increase IMAX limitation of 2.0°F is included using the standard template Part C condition stating: "This discharge shall not cause a change in the stream temperature of more than 2.0°F during any one hour." The condition is included to protect the CWF stream designation of the receiving stream. Temperature measurements shall be taken at representative upstream and downstream locations of Outfall 001 and the treatment plant flow shall be recorded at the time of measurements.

Several parameters listed in Part C.IV are subject to WQBELs that are necessary to comply with state water quality standards, but may be less than QLs, as defined in 25 Pa. Code § 252.1, that are generally achievable by conventional analytical technology. The permittee shall analyze the parameters using methods that will achieve the QLs listed in Part C.IV. For the purpose of compliance, a statistical value reported on the DMR that is less than the QLs (i.e., "non-detect") will be considered to be in compliance.

There no open violations for the client that would warrant withholding issuance of this permit. The permittee shall obtain a Water Quality Management (WQM) permit from DEP for construction of treatment facilities and complete construction in accordance with the WQM permit application prior to commencing discharges authorized by this permit.


Burdick Trib 29418 Creek PEL Letter.pdf


Toxics Management Spreadsheet.pdf


StreamStats Outfall 001.pdf

Comments Received

From Bard Haven Farm in Dimock, PA:

"We are writing to you firstly to express our concerns for your intended direct discharge of treated wastewater into the Burdick Creek Tributary, and secondly to request information about the work that you do in the process.

Our two families raise Angus beef for market on Bard Haven Farm, directly across the road from your site at 7305 SR 29 in Dimock. The cattle are pastured, and watered, from this tributary, and we are concerned about the wellbeing of the herd, and ultimately the ability to offer wholesome safe meat to the public market. During summer months this tributary sometimes carries very little water and therefore any contaminants would likely be highly concentrated as it passes though the Bard Haven pastures and on to the next farm where a producing dairy herd grazes, and beyond to other producing farmland and recreation areas.

We also produce quality hay on the land immediately adjacent to the 7305 property, which we would hope might be protected from any risk of contamination. Our beef and hay customers, some local and some as far away as North Carolina,

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may be less inclined to buy our produce when they know of any potential risk from the wastewater discharge business next door.

We have been, and continue to be, supportive of the natural gas industry and the function of the Department of Environmental Protection in regards to that industry. However, we have serious concerns about the possible impact to our livelihoods if your permit request is granted.

Please forward any and all information that you can provide to help us understand the work intended with this endeavor, along with supportive documentation of similar work that has been proven to be safe for the neighboring community.

Thank you, in advance, for your consideration."

Comment Response:

Thank you for the comment and DEP understands the concerns of a community when a new stream discharge is proposed for the area. NPDES discharge permits issued by DEP are intended to protect the receiving stream by ensuring PA Chapter 93 water quality standards are met under low flow conditions. The Q_{7-10} stream flow used to model the discharge is a statistical estimate of the lowest average flow that would be experienced during a consecutive 7-day period with an average recurrence interval of ten years. The discharge flow entered into DEP's models is the highest discharge flow expected from the facility. A conservative set of permit limitations is then obtained by combining the highest expected discharge flow with the 10-year low stream flow into DEP's models.

As explained in the fact sheet above, there are many limitations and other measures included in the draft permit with the overall goal of protecting Tributary 29418 to Burdick Creek. Other comments or suggestions for the permit are welcome to be submitted from the public for consideration during the draft permit public notice period.

The proposed discharger must also obtain a Water Quality Management (WQM) permit from DEP for the construction of the treatment facility. The WQM permit application must demonstrate that the treatment facility can discharge wastewater meeting the conditions of the NPDES permit.

A copy of the draft permit documents will be mailed to the two addresses on the submitted comment letter. Please note that records of the performance of similar facilities can be found by requesting a file review from the appropriate DEP regional office.

Public Comment via Email:

"It is unacceptable to allow a continuous discharge from Eureka's plant, into the small tributary that leads into Burdick Creek in Dimock. This creek is frequently very low. Most importantly, it passes through farms, pastures with cows that drink the water. It also passes through a number of yards. I am concerned that future ground water contamination may occur and we all know how that gets treated! Please do not allow this plant to be constructed. Yes, the creek passes through my yard."

Comment Response:

Thank you for the comment and please refer to the response above as well as the reasoning provided throughout this fact sheet. Please also refer to the draft permit Part C.III condition regarding the assimilative capacity study/plan of Tributary 29418 to Burdick Creek.

Other technical comments or suggestions for the draft permit are welcome to be submitted from the public for consideration during the draft permit public notice period. A copy of the draft permit documents will be emailed to the address provided.

Public Comment via Phone Call:

Caller indicated this shouldn't be allowed to happen and DEP doesn't do their job and probably will not do anything to prevent problems. DEP will just let them slide and continue to pollute the environment.

Comment Response:

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This comment has been noted.

Public Comments via Phone Calls:

Callers inquired after an ad that was in our local newspaper or last week about a pending permit from a company called Eureka Resources.

Comment Response:

Public notice will appear in the PA Bulletin after draft permit issuance. Public notice will also be posted at the site during the draft permit comment period.

Public Comment via Email

"Regarding Eureka Permit application for Dimock Township PA. Dimock Township PA has been burdened with more than our share of natural gas industrial development. Another frack wastewater facility will have negative impacts on our rural community. Thank you."

Comment Response:

Thank you for the comment and please refer to the response above as well as the reasoning provided throughout this fact sheet. Other comments or suggestions for the draft permit are welcome to be submitted from the public for consideration during the draft permit public notice period. A copy of the draft permit documents will be emailed to the address provided.

Public Participation

DEP will publish notice of the receipt of the NPDES permit application and a tentative decision to issue the individual NPDES permit in the *Pennsylvania Bulletin* in accordance with 25 Pa. Code § 92a.82. Upon publication in the *Pennsylvania Bulletin*, DEP will accept written comments from interested persons for a 30-day period (which may be extended for one additional 15-day period at DEP's discretion), which will be considered in making a final decision on the application. Any person may request or petition for a public hearing with respect to the application. A public hearing may be held if DEP determines that there is significant public interest in holding a hearing. If a hearing is held, notice of the hearing will be published in the *Pennsylvania Bulletin* at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge.

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.168
Latitude	41º 44' 39.12"	Longitude	-75º 53' 57.48"
Quad Name	Springville	Quad Code	0538
Wastewater Description:	IW Process Effluent with ELG		
Receiving Waters	Tributary 29418 to Burdick Creek (CWF/MF)	Stream Code	29418
NHD Com ID	66397499	RMI	0.9
Drainage Area	0.13 mi^2	Yield (cfs/mi^2)	0.083
Q_{7-10} Flow (cfs)	0.01	Q_{7-10} Basis	Gage 01533400
Elevation (ft)	1455	Slope (ft/ft)	0.038
Watershed No.	4-G	Chapter 93 Class.	CWF/MF
Existing Use	-	Existing Use Qualifier	-
Exceptions to Use	-	Exceptions to Criteria	-
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment	-		
Source(s) of Impairment	-		
TMDL Status	-	Name	-

Background/Ambient Data		Data Source
pH (SU)	-	-
Temperature (°F)	-	-
Hardness (mg/L)	-	-
Other:	-	-

Nearest Downstream Public Water Supply Intake		Danville Municipal Water Authority	
PWS Waters	Susquehanna River	Flow at Intake (cfs)	1123
PWS RMI	122.5	Distance from Outfall (mi)	~116