Pennsylvania Department of Environmental Protection

Northwest Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0026271**
Facility Type	**Municipal**	APS ID	**1068970**
Major / Minor	**Major**	Authorization ID	**1405818**

Applicant and Facility Information

Applicant Name	**Meadville Area Sewer Authority**	Facility Name	**Meadville Area Sewer Authority Wastewater Treatment Plant**
Applicant Address	1320 Park Avenue	Facility Address	1320 Park Avenue
	Meadville, PA 16335-3114		Meadville, PA 16335-3114
Applicant Contact	Kimberly Mourer	Facility Contact	Richard Dodds
Applicant Phone	(814) 724-6058	Facility Phone	814-725-8659
Client ID	113964	Site ID	486852
Ch 94 Load Status	Existing Hydraulic Overload	Municipality	Meadville City
Connection Status	No Limitations	County	Crawford
Date Application Received	August 2, 2022	EPA Waived?	No
Date Application Accepted	August 15, 2022	If No, Reason	Major Facility, Pretreatment

Purpose of Application: Application for renewal of an NPDES Permit for treated sewage

Summary of Review

Meadville Area Sewer Authority (MASA) has applied for a renewal of NPDES Permit No. PA0026271. PA0026271 was previously issued by the Pennsylvania Department of Environmental Protection (DEP) on January 24, 2018. The permit expired on January 31, 2023. A renewal application was submitted in a timely manner, so the permit was granted an administrative extension.

Sewage at the Meadville Area Sewer Authority Wastewater Treatment Plant (WWTP) is treated by grit removal, sequencing batch reaction, phosphorus removal, and UV disinfection. The facility discharges to French Creek, which is classified as a Warm Water Fishery (WWF) in State Watershed 16-D.

Biosolids generated at this facility are treated by aerobic digestion, polymer addition, and belt filter pressing. They are hauled by Tri County and disposed of in the Seneca Landfill in Evans City, PA.

Meadville Area Sewer Authority is currently enrolled in and will continue to use eDMR.

The applicant has complied with Act 14 Notifications with letters dated May 9, 2023, and sent to Meadville City and Crawford County.

The following changes have been made since the last permit:

- Monthly *E. coli* monitoring has been added in accordance with the SOPs.
- Quarterly PFAS monitoring has been added in accordance with the SOPs.
- Monitoring has been added for total copper, total zinc, and free cyanide based on updated TMS modeling.
- The instantaneous maximum concentration limit for summer ammonia-nitrogen is changing from 18 to 12 to resolve an error from the last permit.

Approve	Deny	Signatures	Date
X		Stephanie Conrad / Project Manager	November 20, 2025
X		Adam Olesnanik Adam Olesnanik, P.E. / Environmental Engineering Manager	December 8, 2025

Summary of Review

- The weekly average concentration limit for winter $CBOD_5$ has been reduced to be consistent with Department's rounding guidance.
- Average monthly and weekly average mass loading limits for summer and winter $CBOD_5$ and TSS as well as the average monthly winter ammonia-nitrogen mass loading limit have been reduced to be consistent with Department's rounding guidance.
- Minimum measurement frequency is being increased from 5/week to 1/day for summer and winter $CBOD_5$, influent BOD_5, TSS, influent TSS, summer and winter fecal coliform, summer and winter ammonia-nitrogen, and total phosphorus to be consistent with Table 6-3, Self-Monitoring Requirements for Sewage Discharger, from DEP's *Technical Guidance for the Development and Specification of Effluent Limitations* [Doc. No. 362-0400-001]. Monitoring.
- The pretreatment requirements in Part C.II. of the permit have been updated to match EPA's current pretreatment requirements.
- Part C.I.E. has been added to the permit which requires daily reporting of UV system operation in accordance with the SOPs.

Anti-Backsliding

Section 402(o) of the Clean Water Act (CWA), enacted in the Water Quality Act of 1987, establishes anti-backsliding rules governing two situations. The first situation occurs when a permittee seeks to revise a Technology-Based effluent limitation based on BPJ to reflect a subsequently promulgated effluent guideline which is less stringent. The second situation addressed by Section 402(o) arises when a permittee seeks relaxation of an effluent limitation which is based upon a State treatment standard of water quality standard.

Previous limits can be used pursuant to EPA's anti-backsliding regulation 40 CFR 122.44 ***(l) Reissued permits. (1) Except as provided in paragraph (l)(2) of this section when a permit is renewed or reissued. Interim effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit (unless the circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued and would constitute cause for permit modification or revocation and reissuance under §122.62). (2) In the case of effluent limitations established on the basis of Section 402(a)(1)(B) of the CWA, a permit may not be renewed, reissued, or modified on the basis of effluent guidelines promulgated under section 304(b) subsequent to the original issuance of such permit, to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit.***

MASA is not seeking to revise any previously issued permit limits.

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)	7.5
Latitude	41º 37' 30.26"	Longitude	-80º 9' 27.55"
Quad Name	MEADVILLE	Quad Code	0504
Wastewater Description:	Sewage Effluent		

Receiving Waters	French Creek (WWF)	Stream Code	51591
NHD Com ID	127350470	RMI	31.04
Drainage Area	799	Yield (cfs/mi^2)	0.0697
Q_{7-10} Flow (cfs)	55.7	Q_{7-10} Basis	USGS Stream Stats
Elevation (ft)	1062	Slope (ft/ft)	
Watershed No.	16-D	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	MERCURY		
Source(s) of Impairment	SOURCE UNKNOWN		
TMDL Status		Name	

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

Nearest Downstream Public Water Supply Intake	Auqua PA Emlenton		
PWS Waters	Allegheny River	Flow at Intake (cfs)	0.292
PWS RMI	90.58	Distance from Outfall (mi)	64.27

Changes Since Last Permit Issuance: The previous permit was modeled using site specific data from an August 4, 1999 sample for pH. Because that sample is more than 10 years old, DEP has reverted to using default pH data for this renewal. The previous permit also cited an instream value for hardness that was used in a previous permit. Since no source was cited, DEP is also reverting to default instream hardness.

The previous permit cited the use of the Utica Gauge on French Creek as the source of Q_{7-10} data. No supporting documents were provided, however. Included in Attachment A is a print-out of stream flow statistics for the Utica Gauge based on monitoring data from October 1, 1988 through July 25, 2025. This data documents a Q_{7-10} flow of 55.3 cfs and a drainage area of 799 mi^2, which correlates to a low-flow yield of 0.0702 cfs/ mi^2. Extrapolating this yield to the discharge point, with a drainage area of 799 mi^2, suggest a Q_{7-10} flow of 56.1 cfs while USGS Stream Stats documents a Q_{7-10} of 55.7 cfs. Modeling was conducted using both stream flows and there was no difference between the limits generated. The modeling presented in this fact sheet used the USGS Stream Stats Q_{7-10} value for limit development.

Treatment Facility Summary

Treatment Facility Name: Meadville Area Sewer Authority Wastewater Treatment Plant

WQM Permit No.	Issuance Date	Purpose
2096407 A-1	December 22, 2021	Permit issued by PADEP to Meadville Area Sewer Authority approving plant improvements including: • Replacement of existing bar screen with two (2) 0.25 inch mechanically cleaned bar screens. • Installation of three (6) new 3,321 scfm extended aeration blowers. • Installation of four (4) new 1,263 scfm aerobic digestion blowers. • Replacement of the Ultraviolet disinfection unit • Replacement of existing grit/grease chamber with one grit pump, one (1) 165 gpm grit washer, 3 meter belt filter press, and 175 gpm cyclones.
2009404	May 6, 2011	-
2098404	April 25, 2000	-
2000403	June 6, 2000	-
2096407	January 22, 1997	-

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Sequencing Batch Reactor	Ultraviolet	7.5

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
7.5	11259	Not Overloaded	Aerobic Digestion	Landfill

Changes Since Last Permit Issuance: Since the last permit was issued, minor improvements at the plant have been made as approved in WQM Permit No. 2096407 A-1. There have been no major changes to the treatment process.

The facility name has been updated during this permit term. It was previously permitted as “Meadville Area Sewage Treatment Plant.” It will now be permitted as “Meadville Area Sewer Authority Wastewater Treatment Plant.”

Other Comments:

Compliance History

Meadville Area Municipal Authority WWTP received partial inspections in March and September of 2024. A scheduled inspection occurred in December 2024. The facility was found to be in good working order and there have been no permit limit exceedances in the last year. The facility is neither hydraulically nor organically overloaded and is not anticipated to become overloaded in the next five years.

There are currently no open violations for this facility.

Compliance History

DMR Data for Outfall 001 (from June 1, 2024 to May 31, 2025)

Parameter	SEP-25	AUG-25	JUL-25	JUN-25	MAY-25	APR-25	MAR-25	FEB-25	JAN-25	DEC-24	NOV-24	OCT-24
Flow (MGD) Average Monthly	1.57	1.75	2.24	3.58	4.92	5.17	4.16	4.70	3.65	4.04	2.43	2.21
Flow (MGD) Weekly Average	1.66	1.98	2.96	4.98	7.01	5.81	6.37	6.82	5.91	5.02	3.39	2.99
pH (S.U.) Minimum	6.7	6.7	6.8	6.6	6.5	6.4	6.5	6.5	6.6	6.8	6.9	7.0
pH (S.U.) Maximum	7.3	7.3	7.2	7.1	7.2	7.1	7.3	7.3	7.2	7.2	7.3	7.4
DO (mg/L) Minimum	6.73	6.48	7.01	7.23	7.14	7.16	6.81	7.16	7.78	7.05	4.38	4.04
$CBOD_5$ (lbs/day) Average Monthly	83	78	68	95	167	235	193	370	192	217	129	65
$CBOD_5$ (lbs/day) Weekly Average	98	131	92	117	211	302	289	468	267	346	192	91
$CBOD_5$ (mg/L) Average Monthly	6.0	5.0	4.0	4.0	4.0	6	6	9	7	6	6	3.0
$CBOD_5$ (mg/L) Weekly Average	7.0	9.0	4.0	5.0	5.0	7	7	12	9	7	10	5.0
BOD_5 (lbs/day) Raw Sewage Influent Average Monthly	2897	3027	4205	3891	4792	4628	3940	5094	3946	4044	4527	3402
BOD_5 (mg/L) Raw Sewage Influent Average Monthly	218	202	227	145	130	120	122	123	136	119	250	184
TSS (lbs/day) Average Monthly	196	291	129	154	323	416	326	638	523	393	232	102
TSS (lbs/day) Raw Sewage Influent Average Monthly	2971	8038	3750	4026	5072	3934	3217	4237	3297	4005	5316	3656
TSS (lbs/day) Weekly Average	290	597	185	204	467	524	566	1032	937	388	363	167
TSS (mg/L) Average Monthly	15	19	7	6	8	10	9	16	19	10	11	5

TSS (mg/L) Raw Sewage Influent Average Monthly	221	533	206	155	138	104	100	102	118	117	299	194
TSS (mg/L) Weekly Average	23	42	12	7	11	13	12	27	28	14	15	7
Fecal Coliform (No./100 ml) Geometric Mean	> 65	< 9	< 2	< 2	< 2	< 3	< 2	5	< 3	< 4	< 7	< 2
Fecal Coliform (No./100 ml) Instantaneous Maximum	> 2419.6	185	8.6	8.6	25.3	95.9	6.3	39.7	36.9	50.4	193.5	25.3
UV Intensity (mW/cm²) Average Monthly	5	4	6.9	11.1	27.2	30.6	36.9	33.2	37.6	39	31.5	3960
Total Nitrogen (mg/L) Average Monthly	8.336	2.534	1.669	2.27	2.317	6.108	5.658	6.03	3.944	3.699	5.611	1.976
Ammonia (lbs/day) Average Monthly	68	12	18	10	30	136	146	200	51	74	58	6
Ammonia (mg/L) Average Monthly	4.9	0.8	1.1	0.4	0.7	3.6	4.5	5.3	1.8	2.2	2.6	0.3
Ammonia (mg/L) Downstream Monitoring Average Monthly	< 0.75	0.07	0.08	0.07	0.05	0.05	0.05	0.16	0.06	0.03	0.05	< 0.03
Ammonia (mg/L) Instream Monitoring Average Monthly	< 0.75	0.06	0.12	0.07	0.11	0.11	0.07	0.04	0.07	0.04	0.16	0.07
Total Phosphorus (lbs/day) Average Monthly	24	28	33	50	62	43	24	39	38	32	33	32
Total Phosphorus (mg/L) Average Monthly	1.80	1.82	1.74	1.72	1.69	1	1	1	1	0.87	1.72	1.68
Total Nickel (mg/L) Average Quarterly	< 0.005			< 0.005			< 0.005			< 0.005		
Chloride (mg/L) Average Monthly	237	233	228	219	222	234	287	412	322	273	224	213
Chloride (mg/L) Downstream Monitoring Average Monthly	32.6	33.3	26.3	11.8	18.3	19.6	16.5	33.8	19.8	14.7	22.6	16.9

Chloride (mg/L) Instream Monitoring Average Monthly	25.1	29.9	18.4	12.8	14.6	17.6	15.8	25.3	17.1	14.3	17.9	15.5

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 7.5
Latitude 41º 37' 30.26" **Longitude** -80º 9' 27.55"
Wastewater Description: Sewage Effluent

Technology-Based Limitations (TBELs)

The following technology-based limitations apply, subject to water quality analysis and BPJ where applicable:

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
Flow (MGD)	Report	Average Monthly	-	92a.27, 92a.61
$CBOD_5$	25	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
Total Suspended Solids	3*0	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)
Total Residual Chlorine	0.5	Average Monthly	-	92a.47.(8) and 92a.48(b)(2)
Ammonia-Nitrogen	25	Average Monthly	-	BPJ
Dissolved Oxygen	4.0	Min	-	BPJ
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)
Total Nitrogen	Report	Average Monthly	-	92a.61
Total Phosphorus	Report	Average Monthly	-	92a.61
Fecal Coliform (5/1 – 9/30)	200 / 100 ml	Geo Mean	-	92a.47(a)(4)
Fecal Coliform (5/1 – 9/30)	1,000 / 100 ml	IMAX	-	92a.47(a)(4)
Fecal Coliform (10/1 – 4/30)	2,000 / 100 ml	Geo Mean	-	92a.47(a)(5)
Fecal Coliform (10/1 – 4/30)	10,000 / 100 ml	IMAX	-	92a.47(a)(5)

Best Professional Judgment (BPJ) Limitations

A Dissolved Oxygen minimum limitation of 4.0 mg/L will be imposed based on the standard in 25 PA Code §93 and best professional judgement.

Water Quality-Based Limitations (WQBELs)

WQM 7.0 Water Quality Modeling

Pursuant to EPA's approval of Pennsylvania's 2017 Triennial Review of Water Quality Standards and corresponding regulatory changes published in the *Pennsylvania Bulletin* on July 11, 2020, new water quality criteria for ammonia-nitrogen apply to waters of the commonwealth. Therefore, conventional WQBELs for outfall 001 are being re-evaluated during this renewal.

DEP's WQM 7.0 version 1.1 model is a Microsoft Access Program used for sewage dischargers to determine whether TBELs are sufficient to meet in-stream water quality criteria for ammonia-nitrogen, carbonaceous biochemical oxygen demand ($CBOD_5$), and dissolved oxygen (DO). To accomplish this, the model simultaneously simulates mixing and degradation of ammonia-nitrogen and mixing and consumption of DO through $CBOD_5$ and ammonia-nitrogen degradation. WQM 7.0 determines the highest pollutant loadings that the stream can assimilate whole still meeting water quality criteria under design conditions.

The model is a two-step process. The discharge is first modeled for the summer period (May through October) because warm temperatures are more likely to result in critical loading conditions. Reduced DO levels likely also play a role in ammonia toxicity and solubility of DO decreases at increased water temperature. If summer modeling determines that WQBELs are appropriate for the summer period, then modeling is completed for the winter period (November through April).

This is in accordance with DEP's *Implementation Guidance of Section 93.7 Ammonia Criteria* [Doc. No. 391-2000-013] (Ammonia Guidance).

River Mile Index (RMI) was measured in eMAP PA as the distance between the point of discharge and the mouth of French Creek. Discharge and downstream elevations were measured in Google Earth Pro. Discharge point and downstream drainage area as well as low flow yield at the point of discharge were generated using USGS Stream Stats. USGS Stream Stats output files are provided in Attachment B. In the absence of site-specific data, discharge temperature, stream temperature, and stream pH are assumed to be 20, 25, and 7 in accordance with the Ammonia Guidance. Stream width was measured in Google Earth Pro and stream width to depth was assumed to be 10 in accordance with DEP's *Technical Reference Guide (TRG) WQM 7.0 for Windows Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen Version 1* [Doc. No. 391-2000-007]. The effluent $CBOD_5$, ammonia-nitrogen, and dissolved oxygen discharge concentrations were set equal to the previous permit limits. The DO goal was set equal to the minimum instream DO criteria defined for WWF in 25 PA Code Section 93.7 in accordance with DEP's SOP for *Establishing Effluent Limitations for Individual Sewage Permits* [SOP No. BCW-PMT-033 revised March 24, 2021, Version 1.9].

WQM 7.0 summer inputs are documented in the table below:

Discharge Characteristics		**Basin/Stream Characteristics**	
Parameter	**Value**	**Parameter**	**Value**
River Mile Index (RMI)	31.04	Drainage Area	799
Discharge Flow (MGD)	7.5	Q_{7-10} (cfs)	55.7
Discharge Temp (^oC)	20	Low-flow yield (cfs/mi^2)	0.0697
Discharge Ammonia-Nitrogen (mg/L)	6	Elevation (ft)	1062
Discharge $CBOD_5$ (mg/L)	15	Stream Width/Depth	10
Discharge Dissolved Oxygen (mg/L)	4.0	Stream Temp (^oC)	25
DO Goal	5.0	Stream pH (s.u.)	7
		Stream Width (ft)	158.40
		In-Stream Dissolved Oxygen (mg/L)	8.24

The Ammonia Guidance documents that when modeling for Winter, the in-stream temperature should be 5 ^oC and the yield is doubled. The instream dissolved oxygen concentration was also changed to 12.51 mg/L and the discharge temperature changed to 15 ^oC. Effluent concentrations for $CBOD_5$ and ammonia-nitrogen were changed to match the winter effluent limitations imposed in the previous permit.

The discharge was modeled using WQM 7.0 to evaluate water quality-based limits for ammonia-nitrogen, $CBOD_5$, and DO. Modeling confirmed that the previously imposed effluent limits were adequate to protect in-stream water quality with one exception. The previous permit imposed an instantaneous maximum summer ammonia-nitrogen limit of 18 mg/L. The updated modeling imposes a limit of 12 mg/L. A review of the modeling provided with the 2017 draft fact sheet found that the limit imposed last permit cycle should have been 12 mg/L, not 18 mg/L. A summer ammonia-nitrogen limit of 12 mg/L is therefore being imposed this permit cycle.

In accordance with DEP's SOP for *Establishing Effluent Limitations for Individual Sewage Permits* [SOP No. BCW-PMT-033 revised March 24, 2021, Version 1.9], winter ammonia-nitrogen limits are assessed by comparing winter WQM 7.0 output value with one calculated by multiplying the summer limit by a multiplier of three. The more restrictive limit is then imposed. For this facility, the model results equaled the limits generated based on summer limits and a conversion factor. WQM 7.0 output files are included in Attachment C.

Based on WQM 7.0 modeling, the following effluent limitations will be imposed.

Parameter	**Limit (mg/l)**	**SBC**	**Basis**
Ammonia-Nitrogen Summer (mg/L)	6.0	Average Monthly	WQBEL
Ammonia-Nitrogen Winter (mg/L)	18	Average Monthly	WQBEL

$CBOD_5$ Summer (mg/L)	15	Average Monthly	WQBEL
$CBOD_5$ Winter (mg/L)	25	Average Monthly	TBEL
Dissolved Oxygen	4.0	Average Monthly	BPJ

The Department's *Technical Guidance for the Development and Specification of Effluent Limitations* [Doc No.362-0400-001] stipulates that for sewage related pollutants average weekly and instantaneous maximum limits be calculated by multiplying the average monthly limit by a conversion factor of 1.5 and 2.0, respectively. Please note that the average weekly $CBOD_5$ concentration limit is being reduced to 37.0 to be consistent with this SOP and the rounding guidance.

Toxic Management Spreadsheet (TMS) Water Quality Modeling for Toxic Pollutants

DEP's Toxics Management Spreadsheet Version 1.3 (TMS) is a Microsoft Excel ® spreadsheet that facilitates the evaluation of a single discharger and performs the calculations necessary to complete a reasonable potential analysis and determine WQBELs for dischargers of toxic unconventional pollutants.

The TMS evaluates each pollutant by computing a wasteload allocation for each applicable criterion, determining the most stringent governing WQBEL, and comparing that governing WQBEL to the input discharge concentration to determine whether permit requirements should apply. That decision is made using the following reasonable potential thresholds as documented in the Department's SOP for Establishing Water Quality-Based Effluent Limitations (WQBELs) and Permit Conditions for Toxic Pollutants in NPDES Permits for Existing Dischargers [SOP No. BCW-PMT-037]:

- Establish limits in the permit where the maximum reported effluent concentration or calculated, average monthly effluent concentration exceeds 50% of the WQBEL. Use the average monthly, maximum daily, and instantaneous maximum (IMAX) limits for the permit as recommended by the TMS.

- For non-conservative pollutants, establish monitoring requirements where the maximum reported effluent concentration or calculated average monthly effluent concentration is between 25-50% of the WQBEL.

- For conservative pollutants, establish monitoring requirements where the maximum reported effluent concentration or calculated average monthly concentration is between 10-50% of the WQBEL.

TMS requires input data including stream code, RMI, elevation, drainage area, Q_{7-10} stream flow, discharge hardness and pH, and stream hardness and pH. The same discharge and basin characteristic values are used as for WQM 7.0. Discharge pH and hardness input values were taken from the effluent sample results reported in the application. In the absence of site-specific data, a stream pH default of 7.0 and hardness default of 100 were used in accordance with DEP's *DEP Toxic Management Spreadsheet (TMS) Instructions*. Application sampling data was used for pollutant effluent concentrations.

TMS model inputs are documented in the table below:

Discharge Characteristics		**Basin/Stream Characteristics**	
Parameter	**Value**	**Parameter**	**Value**
River Mile Index (RMI)	31.04	Drainage Area	799
Discharge pH	6.7	$Q_{7-10\ (cfs)}$	55.7
Discharge Hardness	189	Stream pH	7
Design Flow (MGD)	7.5	Stream Hardness	100
		Elevation (ft)	1062

A preliminary Reasonable Potential Analysis was conducted using TMS. The model suggested WQBELs for total arsenic, total cadmium, hexavalent chromium, total copper, free cyanide, total lead, total selenium, total silver, total zinc, 3,3 dichlorobenzidine, hexachlorethane, and 1,2,4-trichlorobenzine. A pre-draft letter was sent to Meadville Area Sewer Authority on May 17, 2023, and they elected to take additional samples for all 12 pollutants. The additional sampling occurred weekly between May 3 and May 24, 2023.

In accordance with *Establishing Water Quality-Based Effluent Limitations (WQBELs) and Permit Conditions for Toxic Pollutants in NPDES Permits for Existing Dischargers* [SOP No. BCW-PMT-037], when using a data set of three to nine samples, the maximum value is input into WMS. For samples sets greater than 10, the statistical mean as calculated using TOXCONC is used as the input.

The application data reported for total arsenic were all non-detect at a method detection limit (MDL) of 9 µg/L. The Department's Target Quantitation Limit (TQL) is 3.0 µg/L. Meadville Area Sewer Authority re-sampled using a MDL less than the TQL. The highest of the four re-sampling results (1 µg/L) was input into TMS. The model determined that no limit or monitoring is required for total arsenic.

The application data reported for total cadmium were all non-detect at a method detection limit (MDL) of 0.4 µg/L. The Department's TQL is 0.2 µg/L. Meadville Area Sewer Authority re-sampled using a MDL of 0.4 µg/L. Even though all of the re-sample results were non-detect, the MDL was larger than the target QL. The laboratory MDL is between 10 and 50% of the instream criteria for total cadmium (1.65), therefore monitoring is required.

The application data reported for hexavalent chromium were all non-detect at a method detection limit (MDL) of 2.0 µg/L. The Department's TQL is 1.0 µg/L. Meadville Area Sewer Authority re-sampled using a MDL less than the TQL. All four re-sampling results were non-detect at a MDL of 0.1 µg/L. The MDL result was input into TMS and the model determined that no limit or modeling is required for hexavalent chromium.

The application data for free cyanide reported a maximum result of 13 µg/L resulting from three samples. Meadville Area Sewer Authority took four additional samples resulting in one detection of 13 µg/L and three non-detect results at a MDL of 0.5 µg/L. When combined, there are seven total data points for free cyanide, therefore the maximum value of 13 µg/L was input into TMS. 13 µg/L is greater than 50% of the instream criteria for free cyanide (21.8), therefore TMS assigned limits for free cyanide.

The application data reported for total lead were all non-detect at a MDL of 4.0 µg/L. The Department's TQL is 1.0 µg/L. Meadville Area Sewer Authority re-sampled using a MDL of 4.0 µg/L. Even though all of the re-sample results were non-detect, the MDL was larger than the TQL. The laboratory MDL is between 10 and 50% of the instream criteria for total lead (21.0), therefore monitoring is required.

The application data reported for total selenium were all non-detect at a MDL of 8.0 µg/L. The Department's TQL is 5.0 µg/L. Meadville Area Sewer Authority re-sampled using a MDL of 8.0 µg/L. Even though all of the re-sample results were non-detect, the MDL was larger than the TQL. The laboratory MDL is between 10 and 50% of the instream criteria for total selenium (27.2), therefore monitoring is required.

The application data reported for total lead were all non-detect at a MDL of 0.9 µg/L. The Department's TQL is 0.4 µg/L. Meadville Area Sewer Authority re-sampled using a MDL of 1.0 µg/L. Even though all of the re-sample results were non-detect, the MDL was larger than the TQL. The laboratory MDL of 1.0 µg/L is between 10 and 50% of the instream criteria for total lead (21.0), therefore monitoring is required.

The application data for total copper reported a maximum result of 15 µg/L resulting from 8 values. Although not required by the permit, Meadville Area Sewer Authority samples for total copper quarterly. The application data reflected the 8 most recent results at the time the application was submitted. The Department agreed to re-evaluate copper based on the twelve most recent quarterly total copper sampling results. The March 2025 sampling result is suspected to be an outlier. It is postulated that the influent sample and effluent sample were inadvertently switched in the March 2025 sample.

Statistical testing is required to confirm a suspected outlier. Table 4.3 of EPA published Guidance for Data Quality Assessment (Data Quality Guidance) [EPA QA/G-9 QA00 Version] documents that when a data set is normally distributed and there are less than or equal to 25 samples, then the Extreme Value Test (Dixon's Test) can be used to confirm if a data point is an outlier.

The quarterly sampling results for copper for calendar years 2022-2025 were evaluated. This created a sample set of 15 data points. DEP's *Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and other Discharge Characteristics* [386-2000-006] documents that for a data set where all data points are detected above the reporting limit, then they can be assumed to be lognormally distributed.

The data set can be transformed to a normal distribution by converting each data point using the following equation:

$$X_{Trasnformed} = LN(X)$$

For a data set of 15 where the highest result is expected to be an outlier, the Dixon's test statistic is calculated using the following equation:

$$C = \frac{X_{15} - X_{13}}{X_{15} - X_3}$$

The test statistic is then compared to the critical value in Table A-3 of the Data Quality Guidance. If the test statist exceeds the critical value, then the data point is confirmed to be an outlier.

TABLE A-3: CRITICAL VALUES FOR THE EXTREME VALUE TEST (DIXON'S TEST)

	Level of Significance α		
n	0.10	0.05	0.01
3	0.886	0.941	0.988
4	0.679	0.765	0.889
5	0.557	0.642	0.780
6	0.482	0.560	0.698
7	0.434	0.507	0.637
8	0.479	0.554	0.683
9	0.441	0.512	0.635
10	0.409	0.477	0.597
11	0.517	0.576	0.679
12	0.490	0.546	0.642
13	0.467	0.521	0.615
14	0.492	0.546	0.641
15	0.472	0.525	0.616
16	0.454	0.507	0.595
17	0.438	0.490	0.577
18	0.424	0.475	0.561
19	0.412	0.462	0.547
20	0.401	0.450	0.535
21	0.391	0.440	0.524
22	0.382	0.430	0.514
23	0.374	0.421	0.505
24	0.367	0.413	0.497
25	0.360	0.406	0.489

The critical value for a data set of fifteen and 99% Confidence is 0.616.

The Dixon's test statistic for copper was calculated to be 0.6829, which is greater than the critical value of 0.616. The March 28, 2025 total copper result is therefore confirmed to be an outlier. The Dixon Test results are provided in Attachment D.

In accordance with DEP's SOP for *Establishing Water Quality-Based Effluent Limitations (WQBELs) and Permit Conditions for Toxic Pollutants in NPDES Permits for Existing Dischargers* [SOP No. BCW-PMT-037], when an outlier is suspected in a data set of 10 or more, the median value for the data set will be used in TMS.

A median value of 0.005 mg/L was calculated for total copper. The median value is between 10 and 50% of the instream criteria for total copper (0.022), therefore monitoring is required.

The application data for total zinc reported a maximum result of 42 µg/L resulting from 8 values. Although not required by the permit, Meadville Area Sewer Authority samples for total zinc quarterly. The application data reflected the 8 most recent results at the time the application was submitted. The Department agreed to re-evaluate zinc based on the twelve most recent quarterly total zinc sampling results. The samples were taken quarterly between December 2022 and August 2025. The March 2025 sampling result is suspected to be an outlier. It is postulated that the influent sample and effluent sample were inadvertently switched in the March 2025 sample.

The Dixon's test statistic for total zinc was calculated to be 0.4629, which is less than the critical value of 0.616. Even when considering 90% confidence, the test statistic for zinc is still less than the critical value of 0.472. The March 28, 2025 total zinc result cannot be confirmed to be an outlier. The Dixon Test results are provided in Attachment D.

TOXCONC was used to evaluate the 15 total zinc results. Although samples were taken quarterly, the lowest available input for number of samples per month is four, therefore a value of four was used. TOXCONC calculated a statistical average of 0.0493 and a coefficient of variation of 0.4438. These values were input into TMS. 0.0493 is between 10 and 50% of the governing WQBEL for total zinc (0.17), therefore monitoring is required. The TOXCONC output files are provided in Attachment E.

The application data reported for 3,3 dichlorobenzidine were all non-detect at a method detection limit (MDL) of 9.8 µg/L. The Department's TQL is 5.0 µg/L. Meadville Area Sewer Authority re-sampled using a MDL less than the TQL. All four re-sampling results were non-detect at a MDL of either 0.708 or 0.688 µg/L. The higher MDL was input into TMS and the model determined that no limit or modeling is required for 3,3 dichlorobenzidine.

The application data reported for hexachloroethane were all non-detect at a method detection limit (MDL) of 9.8 µg/L. The Department's TQL is 5.0 µg/L. Although Meadville Area Sewer Authority re-sampled for hexachloroethane, the lab reported results for Hexachlorobutadiene instead. Even though all of the re-sample results were non-detect, the MDL was larger than the target QL. The laboratory MDL of 9.8 µg/L is greater than 50% of the instream criteria for total hexachloroethane (2.25), therefore TMS assigned limits for hexachloroethane.

The application data reported for 1,2,4 trichlorobenzene were all non-detect at a method detection limit (MDL) of 1.0 µg/L. The Department's TQL is 0.5 µg/L. Meadville Area Sewer Authority re-sampled using a MDL less than the TQL. All four re-sampling results were non-detect at a MDL of either 0.259 or 0.252 µg/L. The higher MDL was input into TMS and the model determined that no limit or modeling is required for 1,2,4 trichlorobenzene.

A second pre-draft letter was sent to Meadville Area Sewer Authority on August 2, 2025. Meadville responded on August 29, 2025 (Attachment F), electing to take four new samples for total cadmium, total selenium, total lead, total silver, and hexachloroethane using DEP's target qLs. They also elected to take three additional samples for free cyanide in order to have a cumulative data set of 10. The re-sampling data was submitted to DEP on November 13, 2025.

All four resampling results for total cadmium were non-detect with a reporting limit of 0.1 µg/L, which is less than the TQL (0.2 µg/L). While the MDL is between 10% and 50% of the governing WQBEL (1.65 µg/L, note 4 of Section I.C. of DEP's SOP for *Establishing Water Quality-Based Effluent Limitations (WQBELs) and Permit Conditions for Toxic Pollutants in NPDES Permits for Existing Dischargers* [SOP No. BCW-PMT-037] states that if the effluent concentration collected during renewal sampling is "non-detect" at or below the target quantitation limit (TQL) for the pollutant as specified in the application instructions, then the pollutant may be eliminated as a candidate for WQBELs. No monitoring or limits for total cadmium will therefore be imposed in this permit.

The four sampling results for total lead ranged from 0.3 to 0.4 µg/L. A concentration of 0.4 µg/L was input into TMS. Because the effluent concentration is less than 10% of the governing WQBEL (21 µg/L), there is no reasonable potential and no monitoring or limits for total lead will be imposed in this permit.

All four resampling results for total selenium were non-detect with a reporting limit of 0.5 µg/L, which is less than the TQL (5.0 µg/L). No monitoring or limits for total selenium will therefore be imposed in this permit.

All four resampling results for total silver were non-detect with a reporting limit of 0.2 µg/L, which is less than the TQL (0.4 µg/L). No monitoring or limits for total silver will therefore be imposed in this permit.

All four resampling results for Hexachloroethane were non-detect with reporting limits ranging from 1.98 µg/L and 4.55 µg/L, which is less than the TQL (5.0 µg/L). No monitoring or limits for Hexachloroethane will therefore be imposed in this permit.

The application data for free cyanide reported a maximum result of 13 µg/L resulting from three samples. Meadville Area Sewer Authority took four additional samples resulting in one detection of 13 µg/L and three non-detect results at a MDL of 0.5 µg/L. MASA took an additional three samples, which were all non-detect at a reporting limit of 0.5 µg/L. All the sampling combined culminates in a sample set of 10 results. TOXCONC was used to evaluate the 10 free cyanide results. The lowest available input for number of samples per month is four, therefore a value of four was used. TOXCONC

calculated a statistical average of 9.774 and a coefficient of variation of 1.4087. The TOXCONC output files are provided in Attachment E. These values were input into TMS. 9.774 is between 10 and 50% of the governing WQBEL for free cyanide (21.8), therefore monitoring is required.

Parameter	Limit (mg/l)	SBC	Basis
Total Copper	Report	Average Monthly	TMS Version 1.3
Free Cyanide	Report	Average Monthly	TMS Version 1.3
Total Zinc	Report	Average Monthly	TMS Version 1.3

TMS output files are provided in Attachment G.

The Department has been made aware that false positives for free cyanide may occur when using Method OIA 1667 due to interference caused by the preservative. While there is not adequate information to determine if the renewal sampling for this permit was similarly impacted, the Department is extending an opportunity for MASA to conduct additional sampling to determine if interference could be contributing factor in the detections. If that occurs, then DEP will reevaluate based on the updated data the monitoring requirement imposed in this permit term.

Permit Effluent Limitations

In accordance with Section III of DEP's SOP for *Establishing Effluent limitations for Individual Sewage Permits*, the limits to be imposed, which are provided below, represent the most stringent limitations between the TBELs, WQBELs, BAT, and BPJs

Parameter	Limit (mg/l)	SBC	Basis
Total Suspended Solids	30	Average Monthly	TBEL
Fecal Coliform (Recreation Season)	200 CFU/mL	Geo Mean	TBEL
Fecal Coliform (Non-Recreation Season)	2,000 CFU/mL	Geo Mean	TBEL
pH	6.0	Instantaneous Minimum	TBEL
pH	9.0	Instantaneous Maximum	TBEL
Ammonia-Nitrogen Summer (mg/L)	6.0	Average Monthly	WQM 7.0 version 1.1
Ammonia-Nitrogen Winter (mg/L)	18	Average Monthly	WQM 7.0 version 1.1
$CBOD_5$ Summer (mg/L)	15	Average Monthly	WQM 7.0 version 1.1
$CBOD_5$ Winter (mg/L)	25	Average Monthly	TBEL
Dissolved Oxygen	4.0	Average Monthly	BPJ
Total Copper	Report	Average Monthly	TMS Version 1.3
Free Cyanide	Report	Average Monthly	TMS Version 1.3
Total Zinc	Report	Average Monthly	TMS Version 1.3

Mass Loading Limitations

Section 1.A of the Department's SOP, *Establishing Effluent Limitations for Individual Sewage Permits* [SOP No. BCW-PMT-033 Version 1.9] and table 5.3 of the Department's *Technical Guidance for the Development and Specification of Effluent Limitations* [Doc. No. 362-0400-001] establish mass loading limits for Publicly Owned Treatment Works (POTWs) for ammonia-nitrogen, $CBOD_5$, and TSS. Average monthly and average weekly limits will be imposed for ammonia-nitrogen, $CBOD_5$, and TSS. Mass loading limits are calculated according to the following equation:

$$mass\ loading\ limit\ \left(\frac{lbs}{day}\right) = average\ annual\ flow\ (MGD) * concentration\ limit\ \left(\frac{mg}{L}\right) * 8.34\ (conversion\ factor)$$

The following mass loading limits are being imposed:

Parameter	Average Monthly (lbs/day)	Weekly Average (lbs/day)
Ammonia-Nitrogen Summer (mg/L)	375	-
Ammonia-Nitrogen Winter (mg/L)	1125	-
$CBOD_5$ Summer (mg/L)	935	1250
$CBOD_5$ Winter (mg/L)	1560	2314
TSS (mg/L)	1875	2810

Additional Considerations

In accordance with Section I.A. of DEP's SOP for *Establishing Effluent Limitations for Individual Sewage Permits* [SOP No. BCW-PMT-033 Version 1.9], pursuant to EPA's approval of Pennsylvania's 2017 Triennial Review of Water Quality Standards and corresponding regulatory changes published in the *Pennsylvania Bulletin* on July 11, 2020 and under the authority of 25 Pa. Code § 93.7(a) and § 92.a.61, sewage dischargers will include monitoring for *E. coli*. For new and reissued permits, a monitoring frequency of 1/month will be imposed for flows ≥ 1 MGD.

Monitoring frequency for the proposed effluent limits are based on Table 6-3, Self-Monitoring Requirements for Sewage Discharger, from DEP's *Technical Guidance for the Development and Specification of Effluent Limitations* [Doc. No. 362-0400-001]. Monitoring frequency for summer and winter $CBOD_5$ and ammonia-nitrogen, influent BOD_5 and TSS, effluent TSS, fecal coliform, and total phosphorus are all changing from 5/week to daily to be consistent with Table 6-3.

In accordance with Section I.A. of DEP's SOP for established for *Establishing Effluent Limitations for Individual Sewage Permits* [SOP No. BCW-PMT-033 Version 1.9], and under the authority of 25 Pa. Code § 92a.61(b), nutrient monitoring for total nitrogen and total phosphorus will be imposed for sewage facilities with a design flow greater than 2,000 GPD. The intent of this monitoring is to establish the nutrient load of the wastewater and evaluate the impact that load may have on the quality of the receiving stream. During the last permit cycle, total nitrogen was sampled twice per month with average monthly concentration results ranging from 1.566 to 9.766 mg/L. Total phosphorus was sampled 5 times per week with average monthly concentration results ranging from 0.62 to 2 mg/L. The SOP states that if the receiving stream is not impaired for nutrients, then discretion may be used in setting the monitoring frequency. The French Creek is not impaired for nitrogen; therefore, a monitoring frequency of 2/month will again be imposed. Total Phosphorus has an average monthly limit of 2.0 mg/L based on a Stream Enrichment Risk Analysis. This limit will again be imposed, but monitoring frequency is changing from 5/week to 1/day.

Conventional concentration and mass loading limits rounded in accordance with the guidelines in Chapter 5 Section C.2. of DEP's *Technical Guidance for the Development and Specification of Effluent Limitations* [Doc. No. 362-0400-001]. Please note that the average monthly and weekly average mass loading limits for $CBOD_5$ and TSS, the average monthly mass limit for winter ammonia-nitrogen, and the weekly average winter $CBOD_5$ have all changed to be consistent with this guidance.

Table 5.3 DEP's *Technical Guidance for the Development and Specification of Effluent Limitations* [DOC. No 362-0400-001] documents that for Publicly Owned Treatment Works (POTW)s, conventional pollutants should receive average monthly, weekly average, and instantaneous maximum concentration limits. These limits have been imposed for $CBOD_5$ and TSS.

In accordance with Section I.A. DEP's SOP for *Establishing Effluent Limitations for Individual Sewage Permits* [SOP No. BCW-PMT-033 Version 1.9], when UV disinfection is used, TRC limits are not applicable. Routine UV light intensity (mW/cm^2) monitoring is being imposed at the same monitoring frequency that would be used for TRC. Part C.I.E. has been added to the permit which requires daily reporting of UV system operation.

Influent Monitoring

Section IV.F.2 of DEP's SOP for *New and Reissuance Sewage Individual NPDES Permit Applications* [SOP No. BCW-PMT-002 Version 2.0] establishes influent BOD_5 and TSS monitoring for POTWs. The intent of influent BOD_5 and TSS

monitoring is to verify compliance with the secondary treatment requirement of 85% removal defined in 40 CFR §133.102. The influent monitoring is to be imposed at the same frequency and sample type as is used for the effluent sampling. The frequency of monitoring for BOD_5 and TSS is changing from 5/week to 1/day to be consistent with the effluent monitoring frequency.

Per-and Polyfluoroalkyl Substances (PFAS)

In February 2024, DEP implemented a new PFAS monitoring initiative consistent with EPA's memorandum that provides guidance for addressing PFAS in treated effluent discharges permitted under the NPDES program. PFAS are a family of synthetic organic chemicals containing a chain of strong carbon-fluorine bonds. PFAS are resistant to biodegradation, photooxidation, direct photolysis, and hydrolysis. Because PFAS does not readily degrade by natural processes, it accumulates over time. According to the United States Department of Health and Human Services' Agency for Toxic Substances and Disease Registry (ATSDR), the environmental persistence and mobility of PFAS, combined with decades of widespread use, have resulted in surface water, groundwater, drinking water, rainwater, solid, sediment, ice caps, outdoor and indoor air, plants, animal tissue, and human blood serum contamination across the globe. ATSDR also reports that exposure to certain PFAS can lead to adverse human health impacts. Due to their durability, toxicity, persistence, and pervasiveness, PFAS have emerged as a potentially significant pollutant of concern for sewage treatment plants.

In accordance with Section II.G. of DEP's SOP for *Establishing Effluent Limitations for Individual Sewage Permits* [BCQ-PMT-033] and under the authority of 25 Pa. Code § 92.a.61, DEP is imposing monitoring for a subset of common/well-studied PFAS to help understand the extent of PFAS contamination throughout the Commonwealth and the extent to which point source dischargers under the NPDES program contribute. These PFAS include Perfluorooctanoic Acid (PFOA), Perfluoroctanesulfonic Acid (PFOS), Perfluorobutanesulfonic acid (PFBS), and Hexafluoropropylene Oxide Dimer Acid (HFPO-DA).

Meadville Area Sewer Authority submitted their NPDES Permit renewal application prior to August 5, 2024 and DEP therefore is electing to wave the required sampling for PFOA, PFOS, PFBS, and HFPO-DA as part of the renewal sampling. Meadville Area Sewer Authority WWTP has two industrial users, Peters Heat Treating, Inc. and Ainsworth Pet Nutrition, LLC. Peters Heat Treating, Inc. is an electroplating facility, falling under the pretreatment requirements in 40 CFR Part 413. The EPA has identified this industry as one that may be a source of PFAS. Quarterly monitoring for PFOA, PFOS, PFBS, and HFPO-DA is therefore being added to this permit in accordance with 25 Pa. Code § 92a.61. In accordance with Section II.G.3. of DEP's SOP for *Establishing Effluent Limitations for Individual Sewage Permits* [BCQ-PMT-033], a footnote has been added to the permit stating "The permittee may discontinue monitoring for PFOA, PFOS, HFPO-DA, and PFBS of the results in four consecutive monitoring period indicate non-detect results at or below Quantitation Limits of 4.0 ng/L for PFOA, 3.7 ng/L PFOS, 3.5 ng/L for PFBS, and 6.4 ng/L for HFPO-DA. When monitoring is discontinued, permittees must enter a No Discharge Indicator (NODI) Code of "GG" on DMRs.

EPA Approved Pre-treatment Program

Meadville Area Sewer Authority WWTP has an EPA approved and administered Industrial Pretreatment Program. Part C.II. of the permits requires continued implementation of this program. Please note that this permit condition has been updated to match EPA's current pretreatment requirements.

Threatened and Endangered Mussel Species Concerns and Considerations

The main segment of French Creek from the Union City Reservoir to the confluence with the Allegheny River was designated by the United States Fish and Wildlife Services (USFWS) as "Critical Habitat" for the rabbitsfoot mussel, a federally listed threatened species, and is known to also contain other threatened and endangered mussel species. Meadville Area Sewer Authority WWTP discharges to this area.

The USFWS has indicated in comment letters on other NPDES permits that in order to protect threatened and endangered mussel species, wastewater discharges containing ammonia-nitrogen (NH_3-N), chloride (Cl^-), nickel, zinc, and copper where mussels or their habitat exist, can be no more than 1.9 mg/l, 78 mg/l, 7.3 µg/l, 13.18 µg/l, and 10 µg/l respectively.

A Mussel Impact Evaluation was conducted in order to determine the area of stream that will be required to assimilate the maximum reported effluent concentrations of ammonia-nitrogen, chloride, zinc, nickel, and copper to achieve pollutant concentrations at or below the USFWS criteria in the stream.

The evaluation was conducted based on the following effluent sampling results:

Parameter	Average Value (µg/L)	Source
Ammonia-Nitrogen (mg/L)	1.774	Average calculated from 3 years of reported average monthly data
Chloride (mg/L)	242	Average calculated from 3 years of reported average monthly data
Nickel, µg/L	5	All of the quarterly monitoring data for total nickel for the last three years was non-detect at a method detection level of 5 µg/L.
Zinc	29	Average value reported in the renewal application.
Copper	10	Average value reported in the renewal application.

The evaluation also used instream concentrations measured in the 2023 Aquatic Biological Investigation- Freshwater Mussel Study Norfolk Southern Meadville Yard and Meadville Area Sewer Authority WWTP. The same Q_{7-10} stream flow and plant design flow used for WQBEL modeling were used for this evaluation. A stream width of 48.28 meters was measured in eMAP PA. The Mussel Impact Evaluation is provided in Attachment H.

The Mussel Impact did find that for all five pollutants of concern, the impact area was larger than 2 m^2. The French Creek Meadville 2023 Report documents that a diverse and robust mussel population was located in the reach of French Creek where Meadville Area Sewer Authority WWTP discharges. It also reports that most of the water quality samples collected downstream of Outfall 001 do not exceed known critical values for freshwater mussels. Based on this information, the Department does not anticipate this discharge to adversely impact the mussels in French Creek.

The Department will continue to monitor for the five pollutants of concern. Ammonia-nitrogen discharge sampling frequency is changing from 5/week to 1/day based on Table 6-3, Self-Monitoring Requirements for Sewage Discharger, from DEP's *Technical Guidance for the Development and Specification of Effluent Limitations* [Doc. No. 362-0400-001]. Monthly instream and downstream ammonia-nitrogen will again be imposed this permit term. Monthly instream and downstream sampling and 2/week effluent sampling for chloride will also be imposed again this permit term. Quarterly effluent monitoring for Nickel will again be imposed. Weekly copper and zinc monitoring is already being imposed based on TMS modeling, so no additional or increased limits or monitoring is proposed due to the concern of threated and endangered mussel species.

Part C.VI. of the previous permit required MASA to conduct a Mixing Study and Pollutant Reduction Evaluation due to the presence of endangered mussels in the receiving stream. The final report was submitted in May 2019. No permitting requirements will be imposed this permit term based on the results of the study.

Whole Effluent Toxicity (WET)

The 2018 Permit required Meadville Area Sewer Authority to collect discharge samples and perform WET tests to generate chronic survival and reproduction data for the cladoceran (water flea) *Cerodaphnia dubia* and chronic survival and growth data for the flathead minnow *Pimephales promelas* . The dilution series for the tests was: 4%, 8%, 16%, 58%, and 100%. The Target Instream Waste Concentration (TIWC) used to analyze the results was 16%.

Analysis of the four most recent WET tests, conducted November 2021, October 2022, November 2023, and November 2024 is included in Attachment I. Meadville Area Sewer Authority WWTP passed all four tests, therefore, there is no reasonable potential, and no WET Test based limits will be imposed this permit. An annual monitoring requirement will again be included in Part C.IV. of the permit.

Complete mixing time is calculated as a function of discharge flow rate and receiving stream characteristics (Q_{7-10} flow, velocity, width, depth, and slope). The TMS model calculated a complete mix time of 836.829 minutes. When the complete mix time is greater than 720 minutes, the Chronic Partial Mix Factor (PMF_C) is calculated using the following equation:

$$PMF_c = \left(\frac{720}{Complete\ mix\ time}\right)^{0.5}$$

The Chronic Partial Mix Factor was calculated to be 92.8%.

Chronic Instream Waste Concentration (IWCc) is calculated as a function of discharge flow, stream flow, and Chronic Partial Mix Factor according to the following equation:

$$IWC_c = \frac{Q_d * 1.547}{(Q_{7-10} * PMF_c) + (Q_d * 1.547)}$$

The Chronic Instream Waste Concentration was calculated to be 17%. Chronic Tests will again be imposed in the permit.

Target Chronic Instream Waste Concentration is calculated as a function of Chronic Instream Waste Concentration using the following equation:

$$TIWC_c = \frac{IWC_c}{1}$$

Target Chronic Instream Waste Concentration was calculated to be 17 %

The dilution series was determined using Attachment D of the Department's SOP for *Whole Effluent Toxicity (WET)* [SOP No. BPNPSM-PMT-031]. Based on a Target Chronic Instream Waste Concentration of 17%, the dilution series imposed in this permit will be 100%, 59%, 17%, 9%, and 4%. Please note that the TIWC and dilution series has changed from the last permit.

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (386-0400-001), SOPs and/or BPJ.

Outfall 001, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2)	Required
	Average Monthly	Weekly Average	Minimum	Average Monthly	Daily Maximum	Instant. Maximum	Measurement Frequency	Sample Type
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	9.0 Max	XXX	1/day	Grab
DO	XXX	XXX	4.0	XXX	XXX	XXX	1/day	Grab
$CBOD_5$ Nov 1 - Apr 30	1560	2310	XXX	25.0	37.0 Wkly Avg	50	1/day	24-Hr Composite
$CBOD_5$ May 1 - Oct 31	935	1250	XXX	15.0	20.0 Wkly Avg	30	1/day	24-Hr Composite
BOD_5 Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	1/day	24-Hr Composite
TSS Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	1/day	24-Hr Composite
TSS	1875	2810	XXX	30.0	45.0 Wkly Avg	60	1/day	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/day	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/day	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/month	Grab
UV Intensity (mW/cm^2)	XXX	XXX	XXX	Report Daily Max	Report Avg Mo	XXX	1/day	Measured
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	2/month	24-Hr Composite
Ammonia-Nitrogen Downstream Monitoring	XXX	XXX	XXX	Report	XXX	XXX	1/month	Grab

Outfall 001, Continued (from Permit Effective Date through Permit Expiration Date)

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Ammonia-Nitrogen Nov 1 - Apr 30	1125	XXX	XXX	18.0	XXX	36	1/day	24-Hr Composite
Ammonia-Nitrogen Instream Monitoring	XXX	XXX	XXX	Report	XXX	XXX	1/month	Grab
Ammonia- Nitrogen May 1 - Oct 31	375	XXX	XXX	6.0	XXX	12	1/day	24-Hr Composite
Total Phosphorus	125	XXX	XXX	2.0	XXX	4	1/day	24-Hr Composite
Total Copper	Report	Report Daily Max	XXX	Report	Report	XXX	1/week	24-Hr Composite
Free Cyanide	Report	Report Daily Max	XXX	Report	Report	XXX	1/week	24-Hr Composite
Total Nickel	XXX	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Total Zinc	Report	Report Daily Max	XXX	Report	Report	XXX	1/week	24-Hr Composite
Chloride	XXX	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Chloride Downstream Monitoring	XXX	XXX	XXX	Report	XXX	XXX	1/month	Grab
Chloride Instream Monitoring	XXX	XXX	XXX	Report	XXX	XXX	1/month	Grab
PFOA (ng/L)	XXX	XXX	XXX	XXX	Report	XXX	1/quarter	Grab
PFOS (ng/L)	XXX	XXX	XXX	XXX	Report	XXX	1/quarter	Grab
PFBS (ng/L)	XXX	XXX	XXX	XXX	Report	XXX	1/quarter	Grab
HFPO-DA (ng/L)	XXX	XXX	XXX	XXX	Report	XXX	1/quarter	Grab

Compliance Sampling Location: Outfall 001

Other Comments: None

ATTACHMENT A

Utica USGS Stream Guage Information

StreamStats Gage Page

Gage Information

Name	Value
USGS Station Number	**03023100 (https://waterdata.usgs.gov/monitoring-location/03023100)**
Station Name	French Creek at Meadville, PA
Station Type	Gaging Station, continuous record
Latitude	41.63255
Longitude	-80.15951
NWIS Latitude	41.63255476
NWIS Longitude	-80.1595043
Is regulated?	true
Agency	United States Geological Survey
NWIS Discharge Period of Record	10/01/1988 - 07/25/2025

Physical Characteristics

Filter By Statistic Group: Select ▾ Filter By Citation: Select ▾

Basin Dimensional Characteristics

Characteristic Name	Value	Units	Citation
Drainage Area	788	square miles	**49**

Streamflow Statistics

Filter By Statistic Group: 1 Checked ▾ Filter By Citation: Select ▾

Show Only Preferred ◯

Low-Flow Statistics

Statistic Name	Value	Units	Preferred?	Years of Record	Standard Error, percent	Citation	Comments
1 Day 10 Year Low Flow	50.4	cubic feet per second	✓	19		**49**	Statistic Date Range 4/1/1989 - 3/31/2008
7 Day 2 Year Low Flow	110	cubic feet per second	✓	19		**49**	Statistic Date Range 4/1/1989 - 3/31/2008
7 Day 10 Year Low Flow	55.3	cubic feet per second	✓	19		**49**	Statistic Date Range 4/1/1989 - 3/31/2008
30 Day 2 Year Low Flow	161	cubic feet per second	✓	19		**49**	Statistic Date Range 4/1/1989 - 3/31/2008
30 Day 10 Year Low Flow	67.6	cubic feet per second	✓	19		**49**	Statistic Date Range 4/1/1989 - 3/31/2008
90 Day 10 Year Low Flow	104	cubic feet per second	✓	19		**49**	Statistic Date Range 4/1/1989 - 3/31/2008
Low flow years	19	years	✓			**49**	

Citations

ID	Citation
49	**Stuckey, M.H., and Roland, M.A., 2011, Selected streamflow statistics for streamgage locations in and near Pennsylvania: U.S. Geological Survey Open-File Report 2011-1070, 88 p. (http://pubs.er.usgs.gov/publication/ofr20111070http://pubs.er.usgs.gov/publication/ofr20111070)**

ID	Citation
52	Granato G.E., Ries, K.G., III, and Steeves, P.A., 2017, Compilation of streamflow statistics calculated from daily mean streamflow data collected during water years 1901–2015 for selected U.S. Geological Survey streamgages: U.S. Geological Survey Open-File Report 2017-1108, 17 p. (https://pubs.er.usgs.gov/publication/ofr20171108)
86	Wolock, D.M., 2003, Flow characteristics at U.S. Geological Survey streamgages in the conterminous United States: U.S. Geological Survey Open-File Report 03-146, digital data set (http://water.usgs.gov/GIS/metadata/usgswrd/XML/qsitesdd.xml)
87	Wolock, D.M., 2003, Base-flow index grid for the conterminous United States: U.S. Geological Survey Open-File Report 03-263, digital data set (https://water.usgs.gov/GIS/metadata/usgswrd/XML/bfi48grd.xml)
142	Roland, M.A., and Stuckey, M.H., 2008, Regression equations for estimating flood flows at selected recurrence intervals for ungaged streams in Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2008-5102, 57p. (http://pubs.usgs.gov/sir/2008/5102/)
169	Roland, M.A., and Stuckey, M.H., 2019, Development of regression equations for the estimation of flood flows at ungaged streams in Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2019–5094, 36 p. (https://doi.org/10.3133/sir20195094)

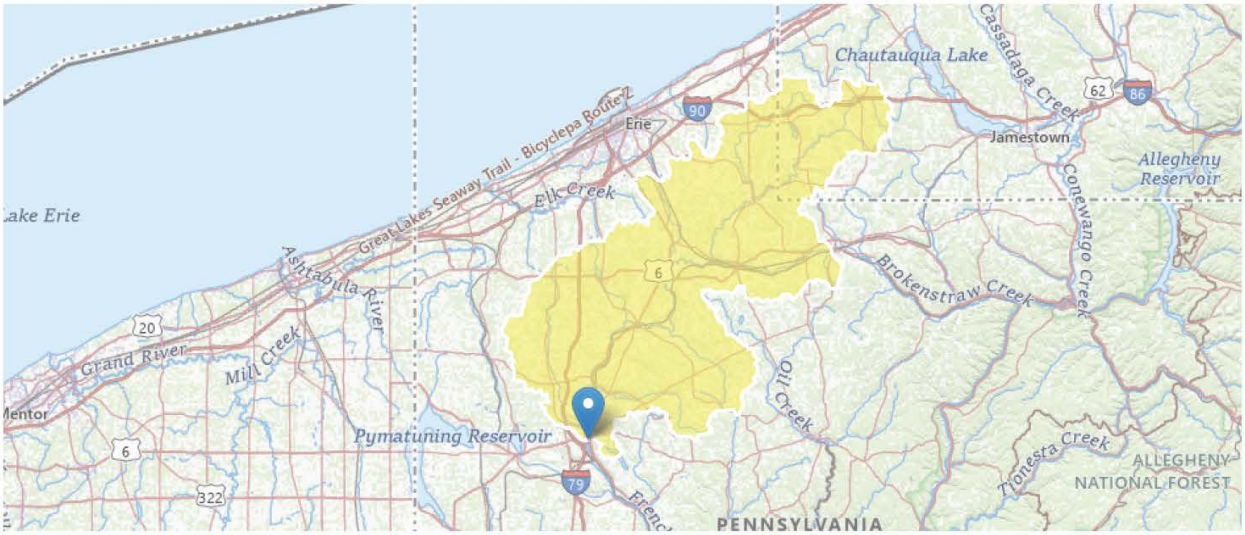
ATTACHMENT B

USGS Stream Stats Output Files

Discharge Point Outfall 001
(RMI 31.04)

StreamStats Report

Region ID: PA
Workspace ID: PA20250719162103226000
Clicked Point (Latitude, Longitude): 41.62528, -80.15779
Time: 2025-07-19 12:21:27 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	799	square miles
ELEV	Mean Basin Elevation	1398	feet
PRECIP	Mean Annual Precipitation	45	inches

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 3]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	799	square miles	2.33	1720
ELEV	Mean Basin Elevation	1398	feet	898	2700
PRECIP	Mean Annual Precipitation	45	inches	38.7	47.9

Low-Flow Statistics Flow Report [Low Flow Region 3]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	94.3	ft^3/s	43	43

Statistic	Value	Unit	SE	ASEp
30 Day 2 Year Low Flow	127	ft^3/s	38	38
7 Day 10 Year Low Flow	55.7	ft^3/s	54	54
30 Day 10 Year Low Flow	71.3	ft^3/s	49	49
90 Day 10 Year Low Flow	98.8	ft^3/s	41	41

Low-Flow Statistics Citations

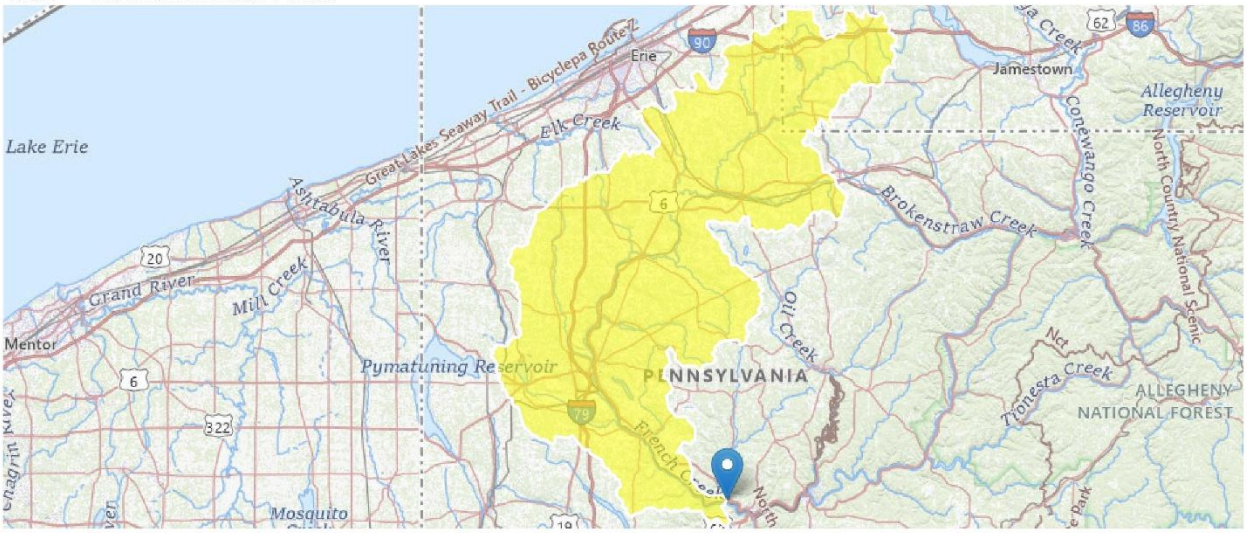
Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (http://pubs.usgs.gov/sir/2006/5130/)

Application Version: 4.29.2
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

Down Stream of Discharge Point (RMI 4.83)

StreamStats Report

Region ID: PA
Workspace ID: PA20250831134434804000
Clicked Point (Latitude, Longitude): 41.41992, -79.87872
Time: 2025-08-31 09:45:04 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	1060	square miles
ELEV	Mean Basin Elevation	998	feet
PRECIP	Mean Annual Precipitation	45	inches

General Disclaimers

Parameter values have been edited, computed flows may not apply.

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 3]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1060	square miles	2.33	1720
ELEV	Mean Basin Elevation	998	feet	898	2700
PRECIP	Mean Annual Precipitation	45	inches	38.7	47.9

Low-Flow Statistics Flow Report [Low Flow Region 3]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	97.4	ft^3/s	43	43
30 Day 2 Year Low Flow	134	ft^3/s	38	38
7 Day 10 Year Low Flow	57.2	ft^3/s	54	54
30 Day 10 Year Low Flow	77	ft^3/s	49	49
90 Day 10 Year Low Flow	107	ft^3/s	41	41

Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (http://pubs.usgs.gov/sir/2006/5130/)

Application Version: 4.29.2
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

ATTACHMENT C

WQM 7.0 Modeling Results

Summer Modeling

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
16D	51591	FRENCH CREEK	**31.040**	1062.00	799.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.070	0.00	0.00	0.000	0.000	10.0	158.40	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Meadville STP	PA0026271	0.0000	7.5000	0.0000	0.000	20.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	15.00	2.00	0.00	1.50
Dissolved Oxygen	4.00	8.24	0.00	0.00
NH3-N	6.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
16D	51591	FRENCH CREEK	**4.830**	998.00	1060.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.070	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
16D	51591	FRENCH CREEK

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
31.040	55.69	0.00	55.69	11.6025	0.00046	1.041	158.4	152.09	0.41	3.927	24.14	7.00
Q1-10 Flow												
31.040	35.64	0.00	35.64	11.6025	0.00046	NA	NA	NA	0.33	4.787	23.77	7.00
Q30-10 Flow												
31.040	75.74	0.00	75.74	11.6025	0.00046	NA	NA	NA	0.47	3.393	24.34	7.00

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
16D	51591	FRENCH CREEK

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
31.040	Meadville STP	12.26	12	12.26	12	0	0

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
31.040	Meadville STP	1.43	6	1.43	6	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
31.04	Meadville STP	15	15	6	6	4	4	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
16D	51591	FRENCH CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
31.040	7.500	24.138	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
158.400	1.041	152.094	0.408
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
4.24	0.158	1.03	0.963
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.511	0.971	Tsivoglou	5
Reach Travel Time (days)			
3.927			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.393	3.93	0.71	6.22
0.785	3.65	0.49	5.75
1.178	3.39	0.33	5.72
1.571	3.14	0.23	5.90
1.963	2.91	0.16	6.17
2.356	2.70	0.11	6.46
2.749	2.51	0.07	6.74
3.141	2.32	0.05	6.99
3.534	2.16	0.03	7.20
3.927	2.00	0.02	7.38

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
16D	51591	FRENCH CREEK

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
31.040	Meadville STP	PA0026271	0.000	CBOD5	15		
				NH3-N	6	12	
				Dissolved Oxygen			4

Winter Modeling

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
16D	51591	FRENCH CREEK	**31.040**	1062.00	799.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.139	0.00	0.00	0.000	0.000	10.0	158.40	0.00	5.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Meadville STP	PA0026271	0.0000	7.5000	0.0000	0.000	20.00	157.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	4.00	12.51	0.00	0.00
NH3-N	18.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
16D	51591	FRENCH CREEK	**4.830**	998.00	1060.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.139	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
16D	51591	FRENCH CREEK

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
31.040	111.38	0.00	111.38	11.6025	0.00046	1.358	158.4	116.65	0.57	2.801	6.42	7.04
Q1-10 Flow												
31.040	71.28	0.00	71.28	11.6025	0.00046	NA	NA	NA	0.46	3.494	7.10	7.07
Q30-10 Flow												
31.040	151.48	0.00	151.48	11.6025	0.00046	NA	NA	NA	0.67	2.392	6.07	7.03

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
16D	51591	FRENCH CREEK

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
31.040	Meadville STP	22.7	36	22.7	36	0	0

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
31.040	Meadville STP	4.31	18	4.31	18	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
31.04	Meadville STP	25	25	18	18	4	4	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
16D	51591	FRENCH CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
31.040	7.500	6.415	7.043
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
158.400	1.358	116.650	0.572
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
4.17	0.470	1.70	0.246
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
11.707	0.894	Tsivoglou	5
Reach Travel Time (days)			
2.801			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.280	3.89	1.59	11.00
0.560	3.62	1.48	10.51
0.840	3.37	1.38	10.17
1.121	3.14	1.29	9.96
1.401	2.93	1.20	9.84
1.681	2.73	1.12	9.80
1.961	2.54	1.05	9.80
2.241	2.37	0.98	9.83
2.521	2.21	0.91	9.90
2.801	2.06	0.85	9.98

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
16D	51591	FRENCH CREEK

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
31.040	Meadville STP	PA0026271	0.000	CBOD5	25		
				NH3-N	18	36	
				Dissolved Oxygen			4

ATTACHMENT D

Dixon Test Results

	Copper	Translated Value	Data Point
3/18/2022	0.008	-4.828313737	12
6/28/2022	0.005	-5.298317367	7
9/22/2022	0.005	-5.298317367	8
12/14/2022	0.01	-4.605170186	13
3/18/2023	0.007	-4.96184513	10
6/28/2023	0.004	-5.521460918	1
9/22/2023	0.004	-5.521460918	2
12/20/2023	0.004	-5.521460918	3
3/20/2024	0.01	-4.605170186	14
6/27/2024	0.004	-5.521460918	4
9/18/2024	0.004	-5.521460918	5
12/13/2024	0.007	-4.96184513	11
3/28/2025	0.072	-2.63108916	15
6/27/2025	0.004	-5.521460918	6
8/4/2025	0.006	-5.11599581	9
Median	0.005		

X_{15}	-2.63109
X_{13}	-4.60517
X_3	-5.52146

Dixon's Test Statistic
0.68298516

Suspected Outlier

$$C = \frac{X_{15} - X_{13}}{X_{15} - X_3}$$

TABLE A-3: CRITICAL VALUES FOR THE EXTREME VALUE TEST (DIXON'S TEST)

	Level of Significance α		
n	0.10	0.05	0.01
3	0.886	0.941	0.988
4	0.679	0.765	0.889
5	0.557	0.642	0.780
6	0.482	0.560	0.698
7	0.434	0.507	0.637
8	0.479	0.554	0.683
9	0.441	0.512	0.635
10	0.409	0.477	0.597
11	0.517	0.576	0.679
12	0.490	0.546	0.642
13	0.467	0.521	0.615
14	0.492	0.546	0.641
15	0.472	0.525	0.616
16	0.454	0.507	0.595
17	0.438	0.490	0.577
18	0.424	0.475	0.561
19	0.412	0.462	0.547
20	0.401	0.450	0.535
21	0.391	0.440	0.524
22	0.382	0.430	0.514
23	0.374	0.421	0.505
24	0.367	0.413	0.497
25	0.360	0.406	0.489

	Zinc	Translated Value	Data Point
3/18/2022	0.024	-3.729701449	8
6/28/2022	0.021	-3.863232841	4
9/22/2022	0.024	-3.729701449	9
12/14/2022	0.022	-3.816712826	5
3/18/2023	0.019	-3.9633163	2
6/28/2023	0.023	-3.772261063	7
9/22/2023	0.038	-3.270169119	12
12/20/2023	0.017	-4.074541935	1
3/20/2024	0.022	-3.816712826	6
6/27/2024	0.019	-3.9633163	3
9/18/2024	0.04	-3.218875825	13
12/13/2024	0.0254	-3.673006105	10
3/28/2025	0.076	-2.577021939	15
6/27/2025	0.035	-3.352407217	11
8/4/2025	0.053	-2.937463365	14

X_{15}	-2.57702
X_{13}	-3.21888
X_3	-3.96332

Dixon's Test Statistic
0.46299971

Suspected Outlier

$$C = \frac{X_{15} - X_{13}}{X_{15} - X_2}$$

TABLE A-3: CRITICAL VALUES FOR THE EXTREME VALUE T (DIXON'S TEST)

	Level of Significance α		
n	0.10	0.05	0.01
3	0.886	0.941	0.988
4	0.679	0.765	0.889
5	0.557	0.642	0.780
6	0.482	0.560	0.698
7	0.434	0.507	0.637
8	0.479	0.554	0.683
9	0.441	0.512	0.635
10	0.409	0.477	0.597
11	0.517	0.576	0.679
12	0.490	0.546	0.642
13	0.467	0.521	0.615
14	0.492	0.546	0.641
15	0.472	0.525	0.616
16	0.454	0.507	0.595
17	0.438	0.490	0.577
18	0.424	0.475	0.561
19	0.412	0.462	0.547
20	0.401	0.450	0.535
21	0.391	0.440	0.524
22	0.382	0.430	0.514
23	0.374	0.421	0.505
24	0.367	0.413	0.497
25	0.360	0.406	0.489

ATTACHMENT E

TOXCONC Output Files

Free Cyanide

Facility:	Meadville Area STP
NPDES #:	PA0026271
Outfall No:	001
n (Samples/Month):	4
Reviewer/Permit Engineer:	Conrad

Parameter Name	Free Cyanide					
Units	µg/L					
Detection Limit	0.5					
Sample Date	***When entering values below the detection limit, enter "ND" or use the < notation (eg. <0.02)***					
05/24/22	8					
05/17/22	13					
05/31/22	<0.5					
05/03/23	<0.5					
05/10/23	<0.5					
05/17/23	<0.5					
05/24/23	13					
09/17/25	<0.5					
09/23/25	<0.5					
10/10/25	<0.5					

Reviewer/Permit Engineer: Conrad

Facility: Meadville Area STP
NPDES #: PA0026271
Outfall No: 001
n (Samples/Month): 4

Parameter	Distribution Applied	Coefficient of Variation (daily)	Avg. Monthly
Free Cyanide (µg/L)	Delta-Lognormal	1.4086572	9.7738631

Total Zinc

Facility:	Meadville Area STP
NPDES #:	PA0026271
Outfall No:	001
n (Samples/Month):	4
Reviewer/Permit Engineer:	Conrad

Parameter Name	zinc					
Units	µg/L					
Detection Limit						
Sample Date	*When entering values below the detection limit, enter "ND" or use the < notation (eg. <0.02)*					
12/20/23	0.017					
03/18/23	0.019					
06/27/24	0.019					
06/28/22	0.021					
12/14/22	0.022					
03/20/24	0.022					
06/28/23	0.023					
03/18/22	0.024					
09/22/22	0.024					
12/13/24	0.0254					
06/27/25	0.035					
09/22/23	0.038					
09/18/24	0.04					
08/04/25	0.053					
03/28/25	0.076					

Reviewer/Permit Engineer: Conrad

Facility: Meadville Area STP
NPDES #: PA0026271
Outfall No: 001
n (Samples/Month): 4

Parameter	Distribution Applied	Coefficient of Variation (daily)	Avg. Monthly
zinc (µg/L)	Lognormal	0.4438944	0.0493925

ATTACHMENT F

Meadville Area Sewer Authority Pre-Draft Response

BURGESS & NIPLE

100 State Street | Suite 300 | Erie, PA 16507 | 814.636.1914

Stephanie Conrad, Project Manager
Department of Environmental Protection
South West Regional Office
400 Waterfront Drive
Pittsburgh, PA 15222

-Re- -MASA NPDES Permit No. PA0026271
Pre-Draft Survey

August 29, 2025

Dear Ms. Conrad,

To follow up on our initial letter from 8-27-25, we have revised the Authority's sampling plan and pre-draft survey.

The Authority plans to perform additional sampling for total cadmium, total selenium, total silver, and hexachlorethane once a week for the next four (4) weeks starting tentatively in the first week of September. The Authority will also sample for total cyanide once a week for the next three (3) weeks. We will provide a copy of these results to the Department after the conclusion of the sampling plan.

If you have any questions, please contact me at Emily.poach@burgessniple.com or 412-432-6141.

Sincerely,

BURGESS & NIPLE, INC.

Emily Poach

Emily A. Poach, PE

B&N
burgessniple.com

Pennsylvania
Department of
Environmental Protection

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
PRE-DRAFT PERMIT SURVEY FOR TOXIC POLLUTANTS

Permittee Name: **Meadville Area Sewer Authority Crawford County** Permit No.: **PA0026271**

Pollutant(s) identified by DEP that may require WQBELs: total cyanide, total cadmium, total lead, total selenium, total silver, and hexachlorethane

Is the permittee aware of the source(s) of the pollutant(s)? ☐ Yes ☒ No ☐ Suspected

If Yes or Suspected, describe the known or suspected source(s) of pollutant(s) in the effluent.

Has the permittee completed any studies in the past to control or treat the pollutant(s)? ☐ Yes ☒ No

If Yes, describe prior studies and results:

Does the permittee believe it can achieve the proposed WQBELs now? ☐ Yes ☐ No ☒ Uncertain

If No, describe the activities, upgrades or process changes that would be necessary to achieve the WQBELs, if known.

Estimated date by which the permittee could achieve the proposed WQBELs: _____ ☒ Uncertain

Will the permittee conduct additional sampling for the pollutant(s) to supplement the application? ☒ Yes ☐ No

Check the appropriate box(es) below to indicate site-specific data that have been collected by the permittee in the past. If any of these data have <u>not</u> been submitted to DEP, please attach to this survey.

☐	Discharge pollutant concentration coefficient(s) of variability	Year(s) Studied:
☐	Discharge and background Total Hardness concentrations (metals)	Year(s) Studied:
☐	Background / ambient pollutant concentrations	Year(s) Studied:
☐	Chemical translator(s) (metals)	Year(s) Studied:
☐	Slope and width of receiving waters	Year(s) Studied:
☐	Velocity of receiving waters at design conditions	Year(s) Studied:
☐	Acute and/or chronic partial mix factors (mixing at design conditions)	Year(s) Studied:
☐	Volatilization rates (highly volatile organics)	Year(s) Studied:
☐	Site-specific criteria (e.g., Water Effect Ratio or related study)	Year(s) Studied:

Please submit this survey to the DEP regional office that is reviewing the permit application within 30 days of receipt.

Meadville Area Sewer Authority Quarterly Effluent Sample Results

PACE Lab ID	Date	Copper		Zinc		Influent for comparison Copper	Zinc
30938	3/11/2020	0.012		0.032		0.047	0.051
62234	6/26/2020	0.005		0.014		0.058	0.085
91874	9/22/2020	0.01		0.042		0.116	0.104
121409	12/16/2020	0.013		0.028		0.06	0.066
1032313	3/26/2021	0.015		0.028		0.079	0.071
1062390	6/23/2021	0.005		0.029		0.048	0.117
1091400	9/14/2021	0.006		0.036		0.092	0.119
1112472	11/30/2021	0.007		0.02		0.046	0.054
2031694	3/18/2022	0.008		0.024		0.036	0.047
2062780	6/28/2022	0.005		0.021		0.065	0.1
22I2212	9/22/2022	0.005		0.024		0.067	0.108
22L1390	12/14/2022	0.01		0.022		0.066	0.064
23C1120	3/9/2023	0.007		0.019		0.03	0.038
23F3090	6/27/2023	0.004		0.023		0.051	0.1
23I2626	9/26/2023	0.004		0.038		0.088	0.138
23L2123	12/20/2023	0.004		0.017		0.039	0.058
24C2305	3/20/2024	0.01		0.022		0.044	0.052
24F3738	6/27/2024	0.004		0.019		0.07	0.156
24I2217	9/18/2024	0.004		0.04		0.087	0.15
24L1804	12/13/2024	0.007		0.0254		0.0285	0.0362
25C3251	3/28/2025	0.072		0.076	* Outlier result to throw out	0.005	0.034
25F3424	6/27/2025	0.004		0.035		0.027	0.086
25H0375	8/4/2025	0.006		0.053	* extra CU & Zn sample to replace thrown out	0.064	0.108

PEOPLE ADVANCING SCIENCE

August 7, 2025

Meadville Area Sewer Authority
1320 Park Avenue
Meadville, PA 16335

Dear Ms. DeWalt,

This letter is to inform you of a discrepancy that was observed between the Effluent Composite and Influent Composite samples collected on 3/28/25. A review of the results revealed that the Copper and Zinc values reported for the Effluent Composite sample were drastically higher than the historical results for this sight; the results were more in line with the historical results for the Influent Composite sample. As the samples have already been discarded, reanalysis was not possible to confirm the results; however, it is likely that the samples were switched before analysis and reported incorrectly. Resampling may be warranted in order to satisfy the monitoring requirements; please reach out to your assigned PA DEP sanitarian and let us know if you would like to schedule a resampling event.

Please accept my sincere apologies for any inconvenience this may have caused and rest assured that we will do everything possible to prevent future occurrences of this nature. We value you as a customer and appreciate your business. Thank you for continuing to use Pace Analytical Services, LLC for all your environmental testing requirements, and please do not hesitate to contact me if you have any questions or concerns.

Regards,

Krista Prosser

Krista Prosser
Quality Assurance Manager
Pace Analytical Services, LLC – Indiana

ATTACHMENT G

TMS Output File

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2025

Discharge Information

Instructions | Discharge | Stream

Facility: Meadville STP | NPDES Permit No.: PA0026271 | Outfall No.: 001

Evaluation Type: Major Sewage / Industrial Waste | Wastewater Description: Sewage

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
7.5	189	6.7						

					0 if left blank		*0.5 if left blank*		*0 if left blank*			*1 if left blank*	
	Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L		599									
	Chloride (PWS)	mg/L		441									
	Bromide	mg/L	<	0.325									
	Sulfate (PWS)	mg/L		37.9									
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L		23									
	Total Antimony	µg/L	<	0.4									
	Total Arsenic	µg/L		1									
	Total Barium	µg/L		45									
	Total Beryllium	µg/L	<	1									
	Total Boron	µg/L		123									
	Total Cadmium	µg/L	<	0.1									
	Total Chromium (III)	µg/L	<	2									
	Hexavalent Chromium	µg/L	<	0.1									
	Total Cobalt	µg/L		1									
	Total Copper	mg/L		0.005									
	Free Cyanide	µg/L		9.7738631			1.4087						
	Total Cyanide	µg/L		9									
	Dissolved Iron	µg/L		85									
	Total Iron	µg/L		62.5									
	Total Lead	µg/L		0.4									
	Total Manganese	µg/L		88									
	Total Mercury	µg/L	<	0.2									
	Total Nickel	µg/L		31									
	Total Phenols (Phenolics) (PWS)	µg/L		7									
	Total Selenium	µg/L	<	0.5									
	Total Silver	µg/L	<	0.2									
	Total Thallium	µg/L	<	1									
	Total Zinc	mg/L		0.0493925			0.4439						
	Total Molybdenum	µg/L		14									
	Acrolein	µg/L	<	1									
	Acrylamide	µg/L											
	Acrylonitrile	µg/L	<	0.5									
	Benzene	µg/L	<	0.5									
	Bromoform	µg/L	<	0.5									

Group 3	Carbon Tetrachloride	µg/L	<	0.5									
	Chlorobenzene	µg/L	<	0.5									
	Chlorodibromomethane	µg/L	<	0.5									
	Chloroethane	µg/L	<	0.5									
	2-Chloroethyl Vinyl Ether	µg/L	<	0.6									
	Chloroform	µg/L		0.9									
	Dichlorobromomethane	µg/L	<	0.5									
	1,1-Dichloroethane	µg/L	<	0.5									
	1,2-Dichloroethane	µg/L	<	0.5									
	1,1-Dichloroethylene	µg/L	<	0.5									
	1,2-Dichloropropane	µg/L	<	0.5									
	1,3-Dichloropropylene	µg/L	<	0.5									
	1,4-Dioxane	µg/L	<	0.1									
	Ethylbenzene	µg/L	<	0.5									
	Methyl Bromide	µg/L	<	0.5									
	Methyl Chloride	µg/L	<	0.5									
	Methylene Chloride	µg/L	<	0.5									
	1,1,2,2-Tetrachloroethane	µg/L	<	0.5									
	Tetrachloroethylene	µg/L	<	0.5									
	Toluene	µg/L	<	0.5									
	1,2-trans-Dichloroethylene	µg/L	<	0.5									
	1,1,1-Trichloroethane	µg/L	<	0.5									
	1,1,2-Trichloroethane	µg/L	<	0.5									
	Trichloroethylene	µg/L	<	0.5									
	Vinyl Chloride	µg/L	<	0.5									
Group 4	2-Chlorophenol	µg/L	<	1									
	2,4-Dichlorophenol	µg/L	<	1									
	2,4-Dimethylphenol	µg/L	<	1									
	4,6-Dinitro-o-Cresol	µg/L	<	2.5									
	2,4-Dinitrophenol	µg/L	<	5									
	2-Nitrophenol	µg/L	<	2.5									
	4-Nitrophenol	µg/L	<	2.5									
	p-Chloro-m-Cresol	µg/L	<	1									
	Pentachlorophenol	µg/L	<	1									
	Phenol	µg/L	<	5									
	2,4,6-Trichlorophenol	µg/L	<	1									
Group 5	Acenaphthene	µg/L	<	1									
	Acenaphthylene	µg/L	<	1									
	Anthracene	µg/L	<	1									
	Benzidine	µg/L	<	5									
	Benzo(a)Anthracene	µg/L	<	1									
	Benzo(a)Pyrene	µg/L	<	1									
	3,4-Benzofluoranthene	µg/L	<	1									
	Benzo(ghi)Perylene	µg/L	<	1									
	Benzo(k)Fluoranthene	µg/L	<	1									
	Bis(2-Chloroethoxy)Methane	µg/L	<	1									
	Bis(2-Chloroethyl)Ether	µg/L	<	1									
	Bis(2-Chloroisopropyl)Ether	µg/L	<	1									
	Bis(2-Ethylhexyl)Phthalate	µg/L	<	2.5									
	4-Bromophenyl Phenyl Ether	µg/L	<	1									
	Butyl Benzyl Phthalate	µg/L	<	1									
	2-Chloronaphthalene	µg/L	<	1									
	4-Chlorophenyl Phenyl Ether	µg/L	<	1									
	Chrysene	µg/L	<	1									
	Dibenzo(a,h)Anthrancene	µg/L											
	1,2-Dichlorobenzene	µg/L	<	0.5									
	1,3-Dichlorobenzene	µg/L	<	0.5									
	1,4-Dichlorobenzene	µg/L	<	0.5									
	3,3-Dichlorobenzidine	µg/L	<	0.708									
	Diethyl Phthalate	µg/L	<	1									
	Dimethyl Phthalate	µg/L	<	1									
	Di-n-Butyl Phthalate	µg/L	<	2.5									
	2,4-Dinitrotoluene	µg/L	<	1									

	2,6-Dinitrotoluene	µg/L	<	1									
	Di-n-Octyl Phthalate	µg/L	<	2.5									
	1,2-Diphenylhydrazine	µg/L	<	1									
	Fluoranthene	µg/L	<	1									
	Fluorene	µg/L	<	1									
	Hexachlorobenzene	µg/L	<	1									
	Hexachlorobutadiene	µg/L	<	0.5									
	Hexachlorocyclopentadiene	µg/L	<	1									
	Hexachloroethane	µg/L	<	4.55									
	Indeno(1,2,3-cd)Pyrene	µg/L	<	1									
	Isophorone	µg/L	<	1									
	Naphthalene	µg/L	<	0.5									
	Nitrobenzene	µg/L	<	1									
	n-Nitrosodimethylamine	µg/L	<	1									
	n-Nitrosodi-n-Propylamine	µg/L	<	1									
	n-Nitrosodiphenylamine	µg/L	<	1									
	Phenanthrene	µg/L	<	1									
	Pyrene	µg/L	<	1									
	1,2,4-Trichlorobenzene	µg/L	<	0.259									
Group 6	Aldrin	µg/L	<										
	alpha-BHC	µg/L	<										
	beta-BHC	µg/L	<										
	gamma-BHC	µg/L	<										
	delta BHC	µg/L	<										
	Chlordane	µg/L	<										
	4,4-DDT	µg/L	<										
	4,4-DDE	µg/L	<										
	4,4-DDD	µg/L	<										
	Dieldrin	µg/L	<										
	alpha-Endosulfan	µg/L	<										
	beta-Endosulfan	µg/L	<										
	Endosulfan Sulfate	µg/L	<										
	Endrin	µg/L	<										
	Endrin Aldehyde	µg/L	<										
	Heptachlor	µg/L	<										
	Heptachlor Epoxide	µg/L	<										
	PCB-1016	µg/L	<										
	PCB-1221	µg/L	<										
	PCB-1232	µg/L	<										
	PCB-1242	µg/L	<										
	PCB-1248	µg/L	<										
	PCB-1254	µg/L	<										
	PCB-1260	µg/L	<										
	PCBs, Total	µg/L	<										
	Toxaphene	µg/L	<										
	2,3,7,8-TCDD	ng/L	<										
Group 7	Gross Alpha	pCi/L											
	Total Beta	pCi/L	<										
	Radium 226/228	pCi/L	<										
	Total Strontium	µg/L	<										
	Total Uranium	µg/L	<										
	Osmotic Pressure	mOs/kg											

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2025

Stream / Surface Water Information

Meadville STP, NPDES Permit No. PA0026271, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **French Creek**

No. Reaches to Model: 1

- (●) Statewide Criteria
- ( ) Great Lakes Criteria
- ( ) ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi^2)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	051591	31.04	1062	799			Yes
End of Reach 1	051591	4.83	998	1060			Yes

$Q_{7\text{-}10}$

Location	RMI	LFY (cfs/mi^2)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	31.04	0.0697										100	7		
End of Reach 1	4.83	0.0697													

Q_h

Location	RMI	LFY (cfs/mi^2)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	31.04														
End of Reach 1	4.83														

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2025

Model Results

Meadville STP, NPDES Permit No. PA0026271, Outfall 001

Instructions | *Results* | RETURN TO INPUTS | SAVE AS PDF | PRINT | ◉ All ○ Inputs ○ Results ○ Limits

☑ ***Hydrodynamics***

Q_{7-10}

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
31.04	55.69		55.69	11.603	0.00046	1.105	149.252	135.034	0.408	3.927	836.829
4.83	73.88		73.882								

Q_h

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
31.04	249.34		249.34	11.603	0.00046	2.007	149.252	74.382	0.871	1.838	456.083
4.83	319.221		319.22								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.134 Analysis Hardness (mg/l): 154.18 Analysis pH: 6.79

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	750	750	1,232	
Total Antimony	0	0		0	1,100	1,100	1,807	
Total Arsenic	0	0		0	340	340	558	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	34,495	
Total Boron	0	0		0	8,100	8,100	13,305	
Total Cadmium	0	0		0	3.067	3.31	5.44	Chem Translator of 0.926 applied
Total Chromium (III)	0	0		0	812.257	2,570	4,222	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	26.8	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	156	
Total Copper	0	0		0	20.209	21.1	34.6	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	22	22.0	36.1	

Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	103.128	142	233	Chem Translator of 0.728 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	2.71	Chem Translator of 0.85 applied
Total Nickel	0	0		0	675.368	677	1,112	Chem Translator of 0.998 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	Chem Translator of 0.922 applied
Total Silver	0	0		0	6.774	7.97	13.1	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	107	
Total Zinc	0	0		0	169.112	173	284	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	4.93	
Acrylonitrile	0	0		0	650	650	1,068	
Benzene	0	0		0	640	640	1,051	
Bromoform	0	0		0	1,800	1,800	2,957	
Carbon Tetrachloride	0	0		0	2,800	2,800	4,599	
Chlorobenzene	0	0		0	1,200	1,200	1,971	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	29,567	
Chloroform	0	0		0	1,900	1,900	3,121	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	15,000	15,000	24,639	
1,1-Dichloroethylene	0	0		0	7,500	7,500	12,320	
1,2-Dichloropropane	0	0		0	11,000	11,000	18,069	
1,3-Dichloropropylene	0	0		0	310	310	509	
Ethylbenzene	0	0		0	2,900	2,900	4,764	
Methyl Bromide	0	0		0	550	550	903	
Methyl Chloride	0	0		0	28,000	28,000	45,993	
Methylene Chloride	0	0		0	12,000	12,000	19,711	
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	1,643	
Tetrachloroethylene	0	0		0	700	700	1,150	
Toluene	0	0		0	1,700	1,700	2,792	
1,2-trans-Dichloroethylene	0	0		0	6,800	6,800	11,170	
1,1,1-Trichloroethane	0	0		0	3,000	3,000	4,928	
1,1,2-Trichloroethane	0	0		0	3,400	3,400	5,585	
Trichloroethylene	0	0		0	2,300	2,300	3,778	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	560	560	920	
2,4-Dichlorophenol	0	0		0	1,700	1,700	2,792	
2,4-Dimethylphenol	0	0		0	660	660	1,084	
4,6-Dinitro-o-Cresol	0	0		0	80	80.0	131	
2,4-Dinitrophenol	0	0		0	660	660	1,084	
2-Nitrophenol	0	0		0	8,000	8,000	13,141	
4-Nitrophenol	0	0		0	2,300	2,300	3,778	
p-Chloro-m-Cresol	0	0		0	160	160	263	
Pentachlorophenol	0	0		0	7.094	7.09	11.7	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	460	460	756	

Acenaphthene	0	0		0	83	83.0	136	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	300	300	493	
Benzo(a)Anthracene	0	0		0	0.5	0.5	0.82	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	30,000	30,000	49,279	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	7,392	
4-Bromophenyl Phenyl Ether	0	0		0	270	270	444	
Butyl Benzyl Phthalate	0	0		0	140	140	230	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	820	820	1,347	
1,3-Dichlorobenzene	0	0		0	350	350	575	
1,4-Dichlorobenzene	0	0		0	730	730	1,199	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	4,000	4,000	6,570	
Dimethyl Phthalate	0	0		0	2,500	2,500	4,107	
Di-n-Butyl Phthalate	0	0		0	110	110	181	
2,4-Dinitrotoluene	0	0		0	1,600	1,600	2,628	
2,6-Dinitrotoluene	0	0		0	990	990	1,626	
1,2-Diphenylhydrazine	0	0		0	15	15.0	24.6	
Fluoranthene	0	0		0	200	200	329	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	10	10.0	16.4	
Hexachlorocyclopentadiene	0	0		0	5	5.0	8.21	
Hexachloroethane	0	0		0	60	60.0	98.6	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	10,000	10,000	16,426	
Naphthalene	0	0		0	140	140	230	
Nitrobenzene	0	0		0	4,000	4,000	6,570	
n-Nitrosodimethylamine	0	0		0	17,000	17,000	27,925	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	300	300	493	
Phenanthrene	0	0		0	5	5.0	8.21	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	130	130	214	

☑ ***CFC*** CCT (min): 720 PMF: 0.928 Analysis Hardness (mg/l): 116.32 Analysis pH: 6.93

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	

Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	220	220	1,199	
Total Arsenic	0	0		0	150	150	818	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	22,354	
Total Boron	0	0		0	1,600	1,600	8,724	
Total Cadmium	0	0		0	0.273	0.3	1.65	Chem Translator of 0.903 applied
Total Chromium (III)	0	0		0	83.885	97.5	532	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	56.7	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	104	
Total Copper	0	0		0	10.191	10.6	57.9	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	5.2	5.2	28.4	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	8,700	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2.966	3.86	21.0	Chem Translator of 0.769 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	4.94	Chem Translator of 0.85 applied
Total Nickel	0	0		0	59.103	59.3	323	Chem Translator of 0.997 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	4.600	4.99	27.2	Chem Translator of 0.922 applied
Total Silver	0	0		0	N/A	N/A	N/A	Chem Translator of 1 applied
Total Thallium	0	0		0	13	13.0	70.9	
Total Zinc	0	0		0	134.287	136	743	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	16.4	
Acrylonitrile	0	0		0	130	130	709	
Benzene	0	0		0	130	130	709	
Bromoform	0	0		0	370	370	2,017	
Carbon Tetrachloride	0	0		0	560	560	3,053	
Chlorobenzene	0	0		0	240	240	1,309	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	19,083	
Chloroform	0	0		0	390	390	2,126	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	3,100	3,100	16,902	
1,1-Dichloroethylene	0	0		0	1,500	1,500	8,178	
1,2-Dichloropropane	0	0		0	2,200	2,200	11,995	
1,3-Dichloropropylene	0	0		0	61	61.0	333	
Ethylbenzene	0	0		0	580	580	3,162	
Methyl Bromide	0	0		0	110	110	600	
Methyl Chloride	0	0		0	5,500	5,500	29,987	
Methylene Chloride	0	0		0	2,400	2,400	13,085	
1,1,2,2-Tetrachloroethane	0	0		0	210	210	1,145	
Tetrachloroethylene	0	0		0	140	140	763	
Toluene	0	0		0	330	330	1,799	

1,2-trans-Dichloroethylene	0	0		0	1,400	1,400	7,633	
1,1,1-Trichloroethane	0	0		0	610	610	3,326	
1,1,2-Trichloroethane	0	0		0	680	680	3,708	
Trichloroethylene	0	0		0	450	450	2,453	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	110	110	600	
2,4-Dichlorophenol	0	0		0	340	340	1,854	
2,4-Dimethylphenol	0	0		0	130	130	709	
4,6-Dinitro-o-Cresol	0	0		0	16	16.0	87.2	
2,4-Dinitrophenol	0	0		0	130	130	709	
2-Nitrophenol	0	0		0	1,600	1,600	8,724	
4-Nitrophenol	0	0		0	470	470	2,563	
p-Chloro-m-Cresol	0	0		0	500	500	2,726	
Pentachlorophenol	0	0		0	5.443	5.44	29.7	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	91	91.0	496	
Acenaphthene	0	0		0	17	17.0	92.7	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	59	59.0	322	
Benzo(a)Anthracene	0	0		0	0.1	0.1	0.55	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	6,000	6,000	32,713	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	910	910	4,962	
4-Bromophenyl Phenyl Ether	0	0		0	54	54.0	294	
Butyl Benzyl Phthalate	0	0		0	35	35.0	191	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	160	160	872	
1,3-Dichlorobenzene	0	0		0	69	69.0	376	
1,4-Dichlorobenzene	0	0		0	150	150	818	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	800	800	4,362	
Dimethyl Phthalate	0	0		0	500	500	2,726	
Di-n-Butyl Phthalate	0	0		0	21	21.0	114	
2,4-Dinitrotoluene	0	0		0	320	320	1,745	
2,6-Dinitrotoluene	0	0		0	200	200	1,090	
1,2-Diphenylhydrazine	0	0		0	3	3.0	16.4	
Fluoranthene	0	0		0	40	40.0	218	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	2	2.0	10.9	
Hexachlorocyclopentadiene	0	0		0	1	1.0	5.45	

Hexachloroethane	0	0		0	12	12.0	65.4	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	2,100	2,100	11,450	
Naphthalene	0	0		0	43	43.0	234	
Nitrobenzene	0	0		0	810	810	4,416	
n-Nitrosodimethylamine	0	0		0	3,400	3,400	18,538	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	59	59.0	322	
Phenanthrene	0	0		0	1	1.0	5.45	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	26	26.0	142	

☑ ***THH*** CCT (min): 720 PMF: 0.928 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	N/A	
Chloride (PWS)	0	0		0	250,000	250,000	N/A	
Sulfate (PWS)	0	0		0	250,000	250,000	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	5.6	5.6	30.5	
Total Arsenic	0	0		0	10	10.0	54.5	
Total Barium	0	0		0	2,400	2,400	13,085	
Total Boron	0	0		0	3,100	3,100	16,902	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Free Cyanide	0	0		0	4	4.0	21.8	
Dissolved Iron	0	0		0	300	300	1,636	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	1,000	1,000	5,452	
Total Mercury	0	0		0	0.050	0.05	0.27	
Total Nickel	0	0		0	610	610	3,326	
Total Phenols (Phenolics) (PWS)	0	0		0	5	5.0	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	0.24	0.24	1.31	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	3	3.0	16.4	
Acrylonitrile	0	0		0	N/A	N/A	N/A	

Benzene	0	0		0	N/A	N/A	N/A	
Bromoform	0	0		0	N/A	N/A	N/A	
Carbon Tetrachloride	0	0		0	N/A	N/A	N/A	
Chlorobenzene	0	0		0	100	100.0	545	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	5.7	5.7	31.1	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	N/A	N/A	N/A	
1,1-Dichloroethylene	0	0		0	33	33.0	180	
1,2-Dichloropropane	0	0		0	N/A	N/A	N/A	
1,3-Dichloropropylene	0	0		0	N/A	N/A	N/A	
Ethylbenzene	0	0		0	68	68.0	371	
Methyl Bromide	0	0		0	100	100.0	545	
Methyl Chloride	0	0		0	N/A	N/A	N/A	
Methylene Chloride	0	0		0	N/A	N/A	N/A	
1,1,2,2-Tetrachloroethane	0	0		0	N/A	N/A	N/A	
Tetrachloroethylene	0	0		0	N/A	N/A	N/A	
Toluene	0	0		0	57	57.0	311	
1,2-trans-Dichloroethylene	0	0		0	100	100.0	545	
1,1,1-Trichloroethane	0	0		0	10,000	10,000	54,522	
1,1,2-Trichloroethane	0	0		0	N/A	N/A	N/A	
Trichloroethylene	0	0		0	N/A	N/A	N/A	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	30	30.0	164	
2,4-Dichlorophenol	0	0		0	10	10.0	54.5	
2,4-Dimethylphenol	0	0		0	100	100.0	545	
4,6-Dinitro-o-Cresol	0	0		0	2	2.0	10.9	
2,4-Dinitrophenol	0	0		0	10	10.0	54.5	
2-Nitrophenol	0	0		0	N/A	N/A	N/A	
4-Nitrophenol	0	0		0	N/A	N/A	N/A	
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A	
Pentachlorophenol	0	0		0	N/A	N/A	N/A	
Phenol	0	0		0	4,000	4,000	21,809	
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A	
Acenaphthene	0	0		0	70	70.0	382	
Anthracene	0	0		0	300	300	1,636	
Benzidine	0	0		0	N/A	N/A	N/A	
Benzo(a)Anthracene	0	0		0	N/A	N/A	N/A	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroisopropyl)Ether	0	0		0	200	200	1,090	
Bis(2-Ethylhexyl)Phthalate	0	0		0	N/A	N/A	N/A	

4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0		0	0.1	0.1	0.55	
2-Chloronaphthalene	0	0		0	800	800	4,362	
Chrysene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	1,000	1,000	5,452	
1,3-Dichlorobenzene	0	0		0	7	7.0	38.2	
1,4-Dichlorobenzene	0	0		0	300	300	1,636	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	600	600	3,271	
Dimethyl Phthalate	0	0		0	2,000	2,000	10,904	
Di-n-Butyl Phthalate	0	0		0	20	20.0	109	
2,4-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
2,6-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
1,2-Diphenylhydrazine	0	0		0	N/A	N/A	N/A	
Fluoranthene	0	0		0	20	20.0	109	
Fluorene	0	0		0	50	50.0	273	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	N/A	N/A	N/A	
Hexachlorocyclopentadiene	0	0		0	4	4.0	21.8	
Hexachloroethane	0	0		0	N/A	N/A	N/A	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	34	34.0	185	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	54.5	
n-Nitrosodimethylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	N/A	N/A	N/A	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	20	20.0	109	
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	0.38	

☑ ***CRL*** CCT (min): ###### PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	N/A	N/A	N/A	
Total Arsenic	0	0		0	N/A	N/A	N/A	
Total Barium	0	0		0	N/A	N/A	N/A	
Total Boron	0	0		0	N/A	N/A	N/A	

Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Free Cyanide	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	N/A	N/A	N/A	
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	N/A	N/A	N/A	
Acrylonitrile	0	0		0	0.06	0.06	1.35	
Benzene	0	0		0	0.58	0.58	13.0	
Bromoform	0	0		0	7	7.0	157	
Carbon Tetrachloride	0	0		0	0.4	0.4	9.0	
Chlorobenzene	0	0		0	N/A	N/A	N/A	
Chlorodibromomethane	0	0		0	0.8	0.8	18.0	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	N/A	N/A	N/A	
Dichlorobromomethane	0	0		0	0.95	0.95	21.4	
1,2-Dichloroethane	0	0		0	9.9	9.9	223	
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,2-Dichloropropane	0	0		0	0.9	0.9	20.2	
1,3-Dichloropropylene	0	0		0	0.27	0.27	6.07	
Ethylbenzene	0	0		0	N/A	N/A	N/A	
Methyl Bromide	0	0		0	N/A	N/A	N/A	
Methyl Chloride	0	0		0	N/A	N/A	N/A	
Methylene Chloride	0	0		0	20	20.0	450	
1,1,2,2-Tetrachloroethane	0	0		0	0.2	0.2	4.5	
Tetrachloroethylene	0	0		0	10	10.0	225	
Toluene	0	0		0	N/A	N/A	N/A	
1,2-trans-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,1,1-Trichloroethane	0	0		0	N/A	N/A	N/A	
1,1,2-Trichloroethane	0	0		0	0.55	0.55	12.4	
Trichloroethylene	0	0		0	0.6	0.6	13.5	
Vinyl Chloride	0	0		0	0.02	0.02	0.45	
2-Chlorophenol	0	0		0	N/A	N/A	N/A	
2,4-Dichlorophenol	0	0		0	N/A	N/A	N/A	

2,4-Dimethylphenol	0	0		0	N/A	N/A	N/A	
4,6-Dinitro-o-Cresol	0	0		0	N/A	N/A	N/A	
2,4-Dinitrophenol	0	0		0	N/A	N/A	N/A	
2-Nitrophenol	0	0		0	N/A	N/A	N/A	
4-Nitrophenol	0	0		0	N/A	N/A	N/A	
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A	
Pentachlorophenol	0	0		0	0.030	0.03	0.67	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	1.5	1.5	33.7	
Acenaphthene	0	0		0	N/A	N/A	N/A	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	0.0001	0.0001	0.002	
Benzo(a)Anthracene	0	0		0	0.001	0.001	0.022	
Benzo(a)Pyrene	0	0		0	0.0001	0.0001	0.002	
3,4-Benzofluoranthene	0	0		0	0.001	0.001	0.022	
Benzo(k)Fluoranthene	0	0		0	0.01	0.01	0.22	
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	0.67	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	7.2	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0		0	N/A	N/A	N/A	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	0.12	0.12	2.7	
1,2-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,3-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,4-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
3,3-Dichlorobenzidine	0	0		0	0.05	0.05	1.12	
Diethyl Phthalate	0	0		0	N/A	N/A	N/A	
Dimethyl Phthalate	0	0		0	N/A	N/A	N/A	
Di-n-Butyl Phthalate	0	0		0	N/A	N/A	N/A	
2,4-Dinitrotoluene	0	0		0	0.05	0.05	1.12	
2,6-Dinitrotoluene	0	0		0	0.05	0.05	1.12	
1,2-Diphenylhydrazine	0	0		0	0.03	0.03	0.67	
Fluoranthene	0	0		0	N/A	N/A	N/A	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	0.00008	0.00008	0.002	
Hexachlorobutadiene	0	0		0	0.01	0.01	0.22	
Hexachlorocyclopentadiene	0	0		0	N/A	N/A	N/A	
Hexachloroethane	0	0		0	0.1	0.1	2.25	
Indeno(1,2,3-cd)Pyrene	0	0		0	0.001	0.001	0.022	
Isophorone	0	0		0	N/A	N/A	N/A	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	N/A	N/A	N/A	
n-Nitrosodimethylamine	0	0		0	0.0007	0.0007	0.016	
n-Nitrosodi-n-Propylamine	0	0		0	0.005	0.005	0.11	

n-Nitrosodiphenylamine	0	0		0	3.3	3.3	74.2	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	N/A	N/A	N/A	

☑ ***Recommended WQBELs & Monitoring Requirements***

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Copper	Report	Report	Report	Report	Report	mg/L	0.022	AFC	Discharge Conc > 10% WQBEL (no RP)
Free Cyanide	Report	Report	Report	Report	Report	µg/L	21.8	THH	Discharge Conc > 25% WQBEL (no RP)
Total Zinc	Report	Report	Report	Report	Report	mg/L	0.17	AFC	Discharge Conc > 10% WQBEL (no RP)

☑ ***Other Pollutants without Limits or Monitoring***

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments
Total Dissolved Solids (PWS)	N/A	N/A	PWS Not Applicable
Chloride (PWS)	N/A	N/A	PWS Not Applicable
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	N/A	N/A	PWS Not Applicable
Total Aluminum	790	µg/L	Discharge Conc ≤ 10% WQBEL
Total Antimony	N/A	N/A	Discharge Conc < TQL
Total Arsenic	54.5	µg/L	Discharge Conc ≤ 10% WQBEL
Total Barium	13,085	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	8,528	µg/L	Discharge Conc ≤ 10% WQBEL

Total Cadmium	1.65	µg/L	Discharge Conc < TQL
Total Chromium (III)	532	µg/L	Discharge Conc < TQL
Hexavalent Chromium	17.2	µg/L	Discharge Conc < TQL
Total Cobalt	100	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	1,636	µg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	8,700	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	21.0	µg/L	Discharge Conc ≤ 10% WQBEL
Total Manganese	5,452	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	0.27	µg/L	Discharge Conc < TQL
Total Nickel	323	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	PWS Not Applicable
Total Selenium	27.2	µg/L	Discharge Conc < TQL
Total Silver	8.39	µg/L	Discharge Conc < TQL
Total Thallium	1.31	µg/L	Discharge Conc < TQL
Total Molybdenum	N/A	N/A	No WQS
Acrolein	3.16	µg/L	Discharge Conc < TQL
Acrylonitrile	1.35	µg/L	Discharge Conc < TQL
Benzene	13.0	µg/L	Discharge Conc < TQL
Bromoform	157	µg/L	Discharge Conc < TQL
Carbon Tetrachloride	9.0	µg/L	Discharge Conc < TQL
Chlorobenzene	545	µg/L	Discharge Conc < TQL
Chlorodibromomethane	18.0	µg/L	Discharge Conc < TQL
Chloroethane	N/A	N/A	No WQS
2-Chloroethyl Vinyl Ether	18,951	µg/L	Discharge Conc < TQL
Chloroform	31.1	µg/L	Discharge Conc ≤ 25% WQBEL
Dichlorobromomethane	21.4	µg/L	Discharge Conc < TQL
1,1-Dichloroethane	N/A	N/A	No WQS
1,2-Dichloroethane	223	µg/L	Discharge Conc < TQL
1,1-Dichloroethylene	180	µg/L	Discharge Conc < TQL
1,2-Dichloropropane	20.2	µg/L	Discharge Conc < TQL
1,3-Dichloropropylene	6.07	µg/L	Discharge Conc < TQL
1,4-Dioxane	N/A	N/A	No WQS
Ethylbenzene	371	µg/L	Discharge Conc < TQL
Methyl Bromide	545	µg/L	Discharge Conc < TQL
Methyl Chloride	29,480	µg/L	Discharge Conc < TQL
Methylene Chloride	450	µg/L	Discharge Conc < TQL
1,1,2,2-Tetrachloroethane	4.5	µg/L	Discharge Conc < TQL
Tetrachloroethylene	225	µg/L	Discharge Conc < TQL
Toluene	311	µg/L	Discharge Conc < TQL
1,2-trans-Dichloroethylene	545	µg/L	Discharge Conc < TQL
1,1,1-Trichloroethane	3,159	µg/L	Discharge Conc < TQL
1,1,2-Trichloroethane	12.4	µg/L	Discharge Conc < TQL
Trichloroethylene	13.5	µg/L	Discharge Conc < TQL
Vinyl Chloride	0.45	µg/L	Discharge Conc < TQL

2-Chlorophenol	164	µg/L	Discharge Conc < TQL
2,4-Dichlorophenol	54.5	µg/L	Discharge Conc < TQL
2,4-Dimethylphenol	545	µg/L	Discharge Conc < TQL
4,6-Dinitro-o-Cresol	10.9	µg/L	Discharge Conc < TQL
2,4-Dinitrophenol	54.5	µg/L	Discharge Conc < TQL
2-Nitrophenol	8,423	µg/L	Discharge Conc < TQL
4-Nitrophenol	2,422	µg/L	Discharge Conc < TQL
p-Chloro-m-Cresol	168	µg/L	Discharge Conc < TQL
Pentachlorophenol	0.67	µg/L	Discharge Conc < TQL
Phenol	21,809	µg/L	Discharge Conc < TQL
2,4,6-Trichlorophenol	33.7	µg/L	Discharge Conc < TQL
Acenaphthene	87.4	µg/L	Discharge Conc < TQL
Acenaphthylene	N/A	N/A	No WQS
Anthracene	1,636	µg/L	Discharge Conc < TQL
Benzidine	0.002	µg/L	Discharge Conc < TQL
Benzo(a)Anthracene	0.022	µg/L	Discharge Conc < TQL
Benzo(a)Pyrene	0.002	µg/L	Discharge Conc < TQL
3,4-Benzofluoranthene	0.022	µg/L	Discharge Conc < TQL
Benzo(ghi)Perylene	N/A	N/A	No WQS
Benzo(k)Fluoranthene	0.22	µg/L	Discharge Conc < TQL
Bis(2-Chloroethoxy)Methane	N/A	N/A	No WQS
Bis(2-Chloroethyl)Ether	0.67	µg/L	Discharge Conc < TQL
Bis(2-Chloroisopropyl)Ether	1,090	µg/L	Discharge Conc < TQL
Bis(2-Ethylhexyl)Phthalate	7.2	µg/L	Discharge Conc < TQL
4-Bromophenyl Phenyl Ether	284	µg/L	Discharge Conc < TQL
Butyl Benzyl Phthalate	0.55	µg/L	Discharge Conc < TQL
2-Chloronaphthalene	4,362	µg/L	Discharge Conc < TQL
4-Chlorophenyl Phenyl Ether	N/A	N/A	No WQS
Chrysene	2.7	µg/L	Discharge Conc < TQL
1,2-Dichlorobenzene	863	µg/L	Discharge Conc < TQL
1,3-Dichlorobenzene	38.2	µg/L	Discharge Conc < TQL
1,4-Dichlorobenzene	769	µg/L	Discharge Conc < TQL
3,3-Dichlorobenzidine	1.12	µg/L	Discharge Conc < TQL
Diethyl Phthalate	3,271	µg/L	Discharge Conc < TQL
Dimethyl Phthalate	2,632	µg/L	Discharge Conc < TQL
Di-n-Butyl Phthalate	109	µg/L	Discharge Conc < TQL
2,4-Dinitrotoluene	1.12	µg/L	Discharge Conc < TQL
2,6-Dinitrotoluene	1.12	µg/L	Discharge Conc < TQL
Di-n-Octyl Phthalate	N/A	N/A	No WQS
1,2-Diphenylhydrazine	0.67	µg/L	Discharge Conc < TQL
Fluoranthene	109	µg/L	Discharge Conc < TQL
Fluorene	273	µg/L	Discharge Conc < TQL
Hexachlorobenzene	0.002	µg/L	Discharge Conc < TQL
Hexachlorobutadiene	0.22	µg/L	Discharge Conc < TQL
Hexachlorocyclopentadiene	5.26	µg/L	Discharge Conc < TQL

Hexachloroethane	2.25	µg/L	Discharge Conc < TQL
Indeno(1,2,3-cd)Pyrene	0.022	µg/L	Discharge Conc < TQL
Isophorone	185	µg/L	Discharge Conc < TQL
Naphthalene	147	µg/L	Discharge Conc < TQL
Nitrobenzene	54.5	µg/L	Discharge Conc < TQL
n-Nitrosodimethylamine	0.016	µg/L	Discharge Conc < TQL
n-Nitrosodi-n-Propylamine	0.11	µg/L	Discharge Conc < TQL
n-Nitrosodiphenylamine	74.2	µg/L	Discharge Conc < TQL
Phenanthrene	5.26	µg/L	Discharge Conc < TQL
Pyrene	109	µg/L	Discharge Conc < TQL
1,2,4-Trichlorobenzene	0.38	µg/L	Discharge Conc < TQL

ATTACHMENT H

Muscle Impact Evaluation

Muscle Impact Spreadsheet

9/7/2025

Outfall 001

Facility:	Meadville					
Permit Number:	PA0026271	**Effective:**	2/1/2018	**Expiration:**	1/31/2023	
Outfall No:	001					
Location:	Meadville City, Crawford County					
Discharge to:	French Creek					
Site Specific Mussel Survey Completed:	August 8 and 9, 2023					

Discharge and Stream Characteristics			Comments
Q_S	Stream Flow	36 MGD / 55.7 cfs	US Stream Stats Q7-10 Flow
Q_D	Discharge Flow	7.5 MGD / 11.6059 cfs	
$C_{S(Cl^-)}$	Instream chloride Concentration	19 mg/L	From August 2023 Mussel Study Upstream Station (3F)
$C_{E(Cl^-)}$	Discharge chloride (existing)	242 mg/L	Average calculated from 3 years of reported average monthly data
$C_{P(Cl^-)}$	Discharge chloride (proposed)	mg/L	
$C_{S(Ni)}$	Instream nickel Concentration	0 µg/L	From August 2023 Mussel Study Upstream Station (3F)
$C_{E(Ni)}$	Discharge nickel (existing)	5 µg/L	All of the quarterly monitoring data for the last three years was ND@ MDL=5
$C_{P(Ni)}$	Discharge nickel (proposed)	µg/L	
$C_{S(Zn)}$	Instream zinc Concentration	0 µg/L	From August 2023 Mussel Study Upstream Station (3F)
$C_{E(Zn)}$	Discharge zinc (existing)	29 µg/L	Average value reported in Application
$Zn_{P(Zn)}$	Discharge zinc (proposed)	µg/L	
$C_{S(Cu)}$	Instream copper Concentration	2.14 µg/L	From August 2023 Mussel Study Upstream Station (3F)
$C_{E(Cu)}$	Discharge copper (existing)	10 µg/L	Average value reported in Application
$Zn_{P(Cu)}$	Discharge copper (proposed)	µg/L	
$C_{S(NH3-N)}$	Instream NH^3-N	0 mg/L	From August 2023 Mussel Study Upstream Station (3F)
$C_{E(NH3-N)}$	Discharge NH^3-N (existing)	1.74 mg/L	Average calculated from 3 years of reported average monthly data
$C_{P(NH3-N)}$	Discharge NH^3-N (proposed)	mg/L	
pH_S	Instream pH	7 S.U.	
T_S	Instream Temp.	25 °C	Default value for a WWF
$C_{C(NH3-N)}$	Ammonia criteria	1.367 mg/L	From ammonia criteria comparison spreadsheet -using instream pH and Temp
$C_{C(Cl^-)}$	Chloride criteria	78 mg/L	USFWS criteria
$C_{C(Ni)}$	Nickel criteria	7.3 µg/L	USFWS criteria
$C_{C(Zn)}$	Zinc criteria	13.18 µg/L	USFWS criteria
$C_{C(Cu)}$	Copper criteria	10 µg/L	USFWS criteria
W_S	Stream width	48.28 meters	

Ammonia Criteria Calculations:

	pH_S	7	S.U.	*(Default value is 7.0)*
	T_S	25	°C	*(Default value is 20° for a CWF and 25° for a WWF)*

Acute Criteria

	METHOD and UNITS	CRITERIA	Comments	
	Old CMC (mg TAN/L) =	6.764		
	EPA 2013 CMC (mg TAN/L) =	11.073	Oncorhynchus present	* formula on pg. 41 (plateaus at 15.7 C)
		11.073	Oncorhynchus absent	* formula on pg. 42 (plateaus at 10.2 C)

Chronic Criteria

	METHOD and UNITS	CRITERIA	COMMENTS
	Old CMC (mg TAN/L) =	1.341	
$C_{C(NH3-N)}$	EPA 2013 CMC (mg TAN/L) =	1.367	* formula on pg. 46 (plateaus at 7 C)

Endangered Mussel Species Impact Area Calculations:

Existing Area of Impact

☑ N/A - No Site Specific Mussel Survey Completed for this Discharger

Approximate Area of Impact Determined from Survey =	N/A m^2	(Enter N/A if no site specific survey has been completed)
Existing Mussel Density within Area of Impact =		
Rabbitsfoot *(Quadrula cylindrical)*	per m^2	
Northern Riffleshell *(Epioblasma torulosa rangiana)*	per m^2	
Rayed Bean *(Villosa fabalis)*	per m^2	
Clubshell *(Pleurobema clava)*	per m^2	
Sheepnose *(Plethobasus cyphyus)*	per m^2	
Snuffbox *(Epioblasma triquetra)*	per m^2	
TOTAL	0 per m^2	

Method 1 - Utilizing Site Specific Mussel Survey Information

☑ N/A - No Site Specific Mussel Survey Completed for this Discharger

This method utilizes a simple comparison of the size of the existing area of impact as determined from a site specific mussel survey and the chlorides in the existing discharge compared to the chlorides in the proposed discharge after the facility upgrades treatment technologies. This method is only applicable to where the stream impairment is caused by TDS and/or chlorides as the plume has been delineated through conductivity measurements.

A.	Area of Impact Determined from Survey:	N/A	m^2
B.	Chlorides in Existing Discharge:	242	mg/L
C.	Chlorides in Proposed Discharge after Treatment Facility Upgrades:	0	mg/L
D.	Approximate Area of Impact after Treatment Facility Upgrades:	N/A	m^2

A/B = D/C Therefore, D = (A*C)/B

9/7/2025

Outfall 001

Facility:	Meadville				
Permit Number:	PA0026271	**Effective:**	2/1/2018	**Expiration:**	1/31/2023
Outfall No:	001				
Location:	Meadville City, Crawford County				
Discharge to:	French Creek				
Site Specific Mussel Survey Completed:	August 8 and 9, 2023				

Endangered Mussel Species Impact Area Calculations: (continued...)

Method 2 - Mass Balance Relationship of Loading and Assimilative Capacity of Stream

Chloride (Cl^-)	$L_{S(Cl^-)}$ = Available Chloride Loading in Stream = $C_{C(Cl^-)} - C_{S(Cl^-)}$ X Q_S(MGD) X 8.34 =	17,714 lbs/Day
	$L_{D\text{-}MAX(Cl^-)}$ = Current Maximum Discharge Chloride Loading exceeding criteria = ($C_{E(Cl^-)} - C_{E(Cl^-)}$) X Q_D(MGD) X 8.34 =	10,258 lbs/Day
	$\%_{E(Cl^-)}$ = Percent of Stream Capacity for Current Loading = $L_{D\text{-}MAX(Cl^-)}$ / $L_{S(Cl^-)}$ =	58% of Stream Capacity
	$L_{D(Cl^-)}$ = Proposed Discharge Cl^- Loading exceeding criteria after Treatment Facility Upgrades = ($C_{P(Cl^-)} - C_{P(Cl^-)}$) X Q_D(MGD) X 8.34 =	-4878.9 lbs/Day
	$\%_{P(Cl^-)}$ = Percent of Stream Capacity for Proposed Loading = $L_{D(Cl^-)}$ / $L_{S(Cl^-)}$ =	-27.54% of Stream Capacity
	Proposed Area of Impact due to Chloride * = ($\%_{P(Cl^-)}$ X W_S)^2 X 0.5 = * assuming equal flow across transect and 90° spread at discharge	88.41 m^2
Nickel (Ni)	$L_{S(Ni)}$ = Available Nickel Loading in Stream = $C_{C(Ni)} - C_{S(Ni)}$ X Q_S(MGD) X 8.34 =	2,192 lbs/Day
	$L_{D\text{-}MAX(Ni)}$ = Current Maximum Discharge Nickel Loading exceeding criteria = ($C_{E(Ni)} - C_{E(Ni)}$) X Q_D(MGD) X 8.34 =	-144 lbs/Day
	$\%_{E(Ni)}$ = Percent of Stream Capacity for Current Loading = $L_{D\text{-}MAX(Ni)}$ / $L_{S(Ni)}$ =	0% of Stream Capacity
	$L_{D(Ni)}$ = Proposed Discharge Ni Loading exceeding criteria after Treatment Facility Upgrades = ($C_{P(Ni)} - C_{P(Ni)}$) X Q_D(MGD) X 8.34 =	-456.615 lbs/Day
	$\%_{P(Ni)}$ = Percent of Stream Capacity for Proposed Loading = $L_{D(Ni)}$ / $L_{S(Ni)}$ =	-20.83% of Stream Capacity
	Proposed Area of Impact due to Nickel * = ($\%_{P(Ni)}$ X W_S)^2 X 0.5 = * assuming equal flow across transect and 90° spread at discharge	50.57 m^2
Zinc (Zn)	$L_{S(Zn)}$ = Available Zinc Loading in Stream = $C_{C(Zn)} - C_{S(Zn)}$ X Q_S(MGD) X 8.34 =	3,957 lbs/Day
	$L_{D\text{-}MAX(Zn)}$ = Current Maximum Discharge Zinc Loading exceeding criteria = ($C_{E(Zn)} - C_{E(Zn)}$) X Q_D(MGD) X 8.34 =	990 lbs/Day
	$\%_{E(Zn)}$ = Percent of Stream Capacity for Current Loading = $L_{D\text{-}MAX(Zn)}$ / $L_{S(Zn)}$ =	25% of Stream Capacity
	$L_{D(Zn)}$ = Proposed Discharge Zn Loading exceeding criteria after Treatment Facility Upgrades = ($C_{P(Zn)} - C_{P(Zn)}$) X Q_D(MGD) X 8.34 =	-824.409 lbs/Day
	$\%_{P(Zn)}$ = Percent of Stream Capacity for Proposed Loading = $L_{D(Zn)}$ / $L_{S(Zn)}$ =	-20.83% of Stream Capacity
	Proposed Area of Impact due to Zinc * = ($\%_{P(Zn)}$ X W_S)^2 X 0.5 = * assuming equal flow across transect and 90° spread at discharge	50.59 m^2
Copper (Cu)	$L_{S(Cu)}$ = Available Copper Loading in Stream = $C_{C(Cu)} - C_{S(Cu)}$ X Q_S(MGD) X 8.34 =	2,360 lbs/Day
	$L_{D\text{-}MAX(Cu)}$ = Current Maximum Discharge Copper Loading exceeding criteria = ($C_{E(Cu)} - C_{E(Cu)}$) X Q_D(MGD) X 8.34 =	0 lbs/Day
	$\%_{E(Cu)}$ = Percent of Stream Capacity for Current Loading = $L_{D\text{-}MAX(Cu)}$ / $L_{S(Cu)}$ =	0% of Stream Capacity
	$L_{D(Cu)}$ = Proposed Discharge Cu Loading exceeding criteria after Treatment Facility Upgrades = ($C_{P(Cu)} - C_{P(Cu)}$) X Q_D(MGD) X 8.34 =	-625.5 lbs/Day
	$\%_{P(Cu)}$ = Percent of Stream Capacity for Proposed Loading = $L_{D(Cu)}$ / $L_{S(Cu)}$ =	-26.50% of Stream Capacity
	Proposed Area of Impact due to Copper* = ($\%_{P(Cu)}$ X W_S)^2 X 0.5 = * assuming equal flow across transect and 90° spread at discharge	81.87 m^2
Ammonia-Nitrogen (NH_3-N)	$L_{S(NH3\text{-}N)}$ = Available NH3-N Loading in Stream = $C_{C(NH3\text{-}N)} - C_{S(NH3\text{-}N)}$ X Q_S(MGD) X 8.34 =	410 lbs/Day
	$L_{D\text{-}MAX(NH3\text{-}N)}$ = Current Maximum Discharge NH3-N Loading = $C_{E(NH3\text{-}N)}$ X Q_D(MGD) X 8.34 =	109 lbs/Day
	$\%_{E(NH3\text{-}N)}$ = Percent of Stream Capacity for Current Loading = $L_{D\text{-}MAX(NH3\text{-}N)}$ / $L_{S(NH3\text{-}N)}$ =	27% of Stream Capacity
	$L_{D(NH3\text{-}N)}$ = Proposed Discharge NH3-N Loading after Treatment Facility Upgrades = $C_{P(NH3\text{-}N)} - C_{C(NH3\text{-}N)}$ X Q_D(MGD) X 8.34 =	-86 lbs/Day
	$\%_{P(NH3\text{-}N)}$ = Percent of Stream Capacity for Proposed Loading = $L_{D(NH3\text{-}N)}$ / $L_{S(NH3\text{-}N)}$ =	-20.98% of Stream Capacity
	Proposed Area of Impact due to NH3-N * = ($\%_{P(NH3\text{-}N)}$ X W_S)^2 X 0.5 = * assuming equal flow across transect and 90° spread at discharge	51.28 m^2

9/7/2025

Outfall 001

Facility:	Meadville				
Permit Number:	PA0026271	**Effective:**	2/1/2018	**Expiration:**	1/31/2023
Outfall No:	001				
Location:	Meadville City, Crawford County				
Discharge to:	French Creek				
Site Specific Mussel Survey Completed:	August 8 and 9, 2023				

Endangered Mussel Species Impact Area Calculations: (continued...)

Method 3 - Mass Balance Relationship of Stream Flow, Proposed Effluent Quality, and Mussel Protection Criteria

Chloride (Cl)	$Q_{A(Cl)}C_{S(Cl)} + Q_DC_{P(Cl)} = Q_TC_{C(Cl)}$	
	$Q_{A(Cl)}$ = Assimilative Stream Flow Required to Achieve Criteria (cfs)	
	$Q_T = Q_S + Q_D$ (cfs)	
	$Q_{A(Cl)}C_{S(Cl)} + Q_DC_{P(Cl)} = (Q_D+Q_S)C_{C(Cl)}$	
	SOLVING FOR $Q_{A(Cl)} = [(Q_DC_{P(Cl)} / C_{C(Cl)}) - Q_D)] / (1 - C_{S(Cl)}/C_{C(Cl)})$ =	-15.3433932 cfs
	$\%_{P(Cl)}$ = Percent of Stream Width Required to Assimilate Chlorides to Criteria Concentration = $Q_{A(Cl)} / Q_S$ (cfs) =	-27.5465%
	$W_{I(Cl)}$ = Proposed Width of Stream required to Assimilate Chlorides to Criteria Concentration = $W_S \times \%_{P(Cl)}$	-13.299444 meters
	Proposed Area of Impact due to Chloride * = $(W_{I(Cl)})^2 \times 0.5$ = * assuming equal flow across transect and 90° spread at discharge	88.44 m^2
Nickel (Ni)	$Q_{A(Ni)}C_{S(Ni)} + Q_DC_{P(Ni)} = Q_TC_{C(Ni)}$	
	$Q_{A(Ni)}$ = Assimilative Stream Flow Required to Achieve Criteria (cfs)	
	$Q_T = Q_S + Q_D$ (cfs)	
	$Q_{A(Ni)}C_{S(Ni)} + Q_DC_{P(Ni)} = (Q_D+Q_S)C_{C(Ni)}$	
	SOLVING FOR $Q_{A(Ni)} = [(Q_DC_{P(Ni)} / C_{C(Ni)}) - Q_D)] / (1 - C_{S(Ni)}/C_{C(Ni)})$ =	-11.6059 cfs
	$\%_{P(Cl)}$ = Percent of Stream Width Required to Assimilate Nickel to Criteria Concentration = $Q_{A(Ni)} / Q_S$ (cfs) =	-20.8364%
	$W_{I(Ni)}$ = Proposed Width of Stream required to Assimilate Nickel to Criteria Concentration = $W_S \times \%_{P(Ni)}$	-10.059836 meters
	Proposed Area of Impact due to Nickel * = $(W_{I(Ni)})^2 \times 0.5$ = * assuming equal flow across transect and 90° spread at discharge	50.60 m^2
Zinc (Zn)	$Q_{A(Zn)}C_{S(Zn)} + Q_DC_{P(Zn)} = Q_TC_{C(Zn)}$	
	$Q_{A(Zn)}$ = Assimilative Stream Flow Required to Achieve Criteria (cfs)	
	$Q_T = Q_S + Q_D$ (cfs)	
	$Q_{A(Zn)}C_{S(Zn)} + Q_DC_{P(Zn)} = (Q_D+Q_S)C_{C(Zn)}$	
	SOLVING FOR $Q_{A(Zn)} = [(Q_DC_{PZn)} / C_{C(Zn)}) - Q_D)] / (1 - C_{S(Zn)}/C_{C(Zn)})$ =	-11.6059 cfs
	$\%_{P(Cl)}$ = Percent of Stream Width Required to Assimilate Zinc to Criteria Concentration = $Q_{A(Zn)} / Q_S$ (cfs) =	-20.8364%
	$W_{I(Zn)}$ = Proposed Width of Stream required to Assimilate Zinc to Criteria Concentration = $W_S \times \%_{PZn)}$	-10.059836 meters
	Proposed Area of Impact due to Zinc * = $(W_{IZn)})^2 \times 0.5$ = * assuming equal flow across transect and 90° spread at discharge	50.60 m^2
Copper (Cu)	$Q_{A(Cu)}C_{S(Cu)} + Q_DC_{P(Cu)} = Q_TC_{C(Cu)}$	
	$Q_{A(Cu)}$ = Assimilative Stream Flow Required to Achieve Criteria (cfs)	
	$Q_T = Q_S + Q_D$ (cfs)	
	$Q_{A(Cu)}C_{S(Cu)} + Q_DC_{P(Cu)} = (Q_D+Q_S)C_{C(Cu)}$	
	SOLVING FOR $Q_{A(Cu)} = [(Q_DC_{P(Cu)} / C_{C(Cu)}) - Q_D)] / (1 - C_{S(Cu)}/C_{C(Cu)})$ =	-14.7657761 cfs
	$\%_{P(Cu)}$ = Percent of Stream Width Required to Assimilate Copper to Criteria Concentration = $Q_{A(Cu)} / Q_S$ (cfs) =	-26.5095%
	$W_{I(Cu)}$ = Proposed Width of Stream required to Assimilate Copper to Criteria Concentration = $W_S \times \%_{P(Cu)}$	-12.798773 meters
	Proposed Area of Impact due to Copper * = $(W_{I(Cu)})^2 \times 0.5$ = * assuming equal flow across transect and 90° spread at discharge	81.90 m^2
Ammonia-Nitrogen (NH3-N)	$Q_{A(NH3\text{-}N)}C_{S(NH3\text{-}N)} + Q_DC_{P(NH3\text{-}N)} = Q_TC_{C(NH3\text{-}N)}$	
	$Q_{A(NH3\text{-}N)}$ = Assimilative Stream Flow Required to Achieve Criteria (cfs)	
	$Q_T = Q_S + Q_D$ (cfs)	
	$Q_{A(NH3\text{-}N)}C_{S(NH3\text{-}N)} + Q_DC_{P(NH3\text{-}N)} = (Q_D+Q_S)C_{C(NH3\text{-}N)}$	
	SOLVING FOR $Q_{A(NH3\text{-}N)} = [(Q_DC_{P(NH3\text{-}N)} / C_{C(NH3\text{-}N)}) - Q_D)] / (1 - C_{S(NH3\text{-}N)}/C_{C(NH3\text{-}N)})$ =	-11.605900 cfs
	$\%_{P(NH3\text{-}N)}$ = Percent of Stream Width Required to Assimilate NH3-N to Criteria Concentration = $Q_{A(NH3\text{-}N)} / Q_S$ (cfs) =	-20.8364%
	$W_{I(NH3\text{-}N)}$ = Proposed Width of Stream required to Assimilate NH3-N to Criteria Concentration = $W_S \times \%_{P(NH3\text{-}N)}$	-10.059836 meters
	Proposed Area of Impact due to NH3-N * = $(W_{I(NH3\text{-}N)})^2 \times 0.5$ = * assuming equal flow across transect and 90° spread at discharge	50.60 m^2

Chloride eDMR Data

Monitoring Period Begin Date	Monitoring Period End Date	DMR Received Date	Parameter Name	DMR Value	Permit Limit	Units	Statistical Base Code
07/01/2022	07/31/2022	08/25/2022	Chloride	280	Monitor and Report	mg/L	Average Monthly
08/01/2022	08/31/2022	09/23/2022	Chloride	255	Monitor and Report	mg/L	Average Monthly
09/01/2022	09/30/2022	10/25/2022	Chloride	228	Monitor and Report	mg/L	Average Monthly
10/01/2022	10/31/2022	11/22/2022	Chloride	208	Monitor and Report	mg/L	Average Monthly
11/01/2022	11/30/2022	12/14/2022	Chloride	217	Monitor and Report	mg/L	Average Monthly
12/01/2022	12/31/2022	01/19/2023	Chloride	229	Monitor and Report	mg/L	Average Monthly
01/01/2023	01/31/2023	02/27/2023	Chloride	236	Monitor and Report	mg/L	Average Monthly
02/01/2023	02/28/2023	03/17/2023	Chloride	232	Monitor and Report	mg/L	Average Monthly
03/01/2023	03/31/2023	04/24/2023	Chloride	240	Monitor and Report	mg/L	Average Monthly
04/01/2023	04/30/2023	05/25/2023	Chloride	214	Monitor and Report	mg/L	Average Monthly
05/01/2023	05/31/2023	06/14/2023	Chloride	205	Monitor and Report	mg/L	Average Monthly
06/01/2023	06/30/2023	07/11/2023	Chloride	242	Monitor and Report	mg/L	Average Monthly
07/01/2023	07/31/2023	08/17/2023	Chloride	212	Monitor and Report	mg/L	Average Monthly
08/01/2023	08/31/2023	09/15/2023	Chloride	239	Monitor and Report	mg/L	Average Monthly
09/01/2023	09/30/2023	10/25/2023	Chloride	251	Monitor and Report	mg/L	Average Monthly
10/01/2023	10/31/2023	11/20/2023	Chloride	235	Monitor and Report	mg/L	Average Monthly
11/01/2023	11/30/2023	12/27/2023	Chloride	227	Monitor and Report	mg/L	Average Monthly

12/01/2023	12/31/2023	01/19/2024	Chloride	218	Monitor and Report	mg/L	Average Monthly
01/01/2024	01/31/2024	02/23/2024	Chloride	274	Monitor and Report	mg/L	Average Monthly
02/01/2024	02/29/2024	03/26/2024	Chloride	286	Monitor and Report	mg/L	Average Monthly
03/01/2024	03/31/2024	04/19/2024	Chloride	233	Monitor and Report	mg/L	Average Monthly
04/01/2024	04/30/2024	05/21/2024	Chloride	214	Monitor and Report	mg/L	Average Monthly
05/01/2024	05/31/2024	06/27/2024	Chloride	223	Monitor and Report	mg/L	Average Monthly
06/01/2024	06/30/2024	07/16/2024	Chloride	231	Monitor and Report	mg/L	Average Monthly
07/01/2024	07/31/2024	08/26/2024	Chloride	247	Monitor and Report	mg/L	Average Monthly
08/01/2024	08/31/2024	09/13/2024	Chloride	224	Monitor and Report	mg/L	Average Monthly
09/01/2024	09/30/2024	10/23/2024	Chloride	209	Monitor and Report	mg/L	Average Monthly
10/01/2024	10/31/2024	12/01/2024	Chloride	213	Monitor and Report	mg/L	Average Monthly
11/01/2024	11/30/2024	12/20/2024	Chloride	224	Monitor and Report	mg/L	Average Monthly
12/01/2024	12/31/2024	01/27/2025	Chloride	273	Monitor and Report	mg/L	Average Monthly
01/01/2025	01/31/2025	02/19/2025	Chloride	322	Monitor and Report	mg/L	Average Monthly
02/01/2025	02/28/2025	03/28/2025	Chloride	412	Monitor and Report	mg/L	Average Monthly
03/01/2025	03/31/2025	04/22/2025	Chloride	287	Monitor and Report	mg/L	Average Monthly
04/01/2025	04/30/2025	05/23/2025	Chloride	234	Monitor and Report	mg/L	Average Monthly
05/01/2025	05/31/2025	06/26/2025	Chloride	222	Monitor and Report	mg/L	Average Monthly

06/01/2025	06/30/2025	07/23/2025	Chloride	219	Monitor and Report	mg/L	Average Monthly
			Count	36			
			Minimum	205			
			Maximum	412			
			Average	242.0833			

Nickel eDMR Data

Monitoring Period Begin Date	Monitoring Period End Date	DMR Received Date	Parameter Name	DMR Value	Permit Limit	Units	Statistical Base Code
07/01/2022	09/30/2022	10/12/2022	Nickel, Total	< 0.005	Monitor and Report	mg/L	Average Quarterly
10/01/2022	12/31/2022	12/14/2022	Nickel, Total	< 0.005	Monitor and Report	mg/L	Average Quarterly
01/01/2023	03/31/2023	04/24/2023	Nickel, Total	< 0.005	Monitor and Report	mg/L	Average Quarterly
04/01/2023	06/30/2023	07/11/2023	Nickel, Total	< 0.005	Monitor and Report	mg/L	Average Quarterly
07/01/2023	09/30/2023	10/12/2023	Nickel, Total	< 0.005	Monitor and Report	mg/L	Average Quarterly
10/01/2023	12/31/2023	01/19/2024	Nickel, Total	< 0.005	Monitor and Report	mg/L	Average Quarterly
01/01/2024	03/31/2024	04/02/2024	Nickel, Total	< 0.005	Monitor and Report	mg/L	Average Quarterly
04/01/2024	06/30/2024	07/16/2024	Nickel, Total	< 0.005	Monitor and Report	mg/L	Average Quarterly
07/01/2024	09/30/2024	10/23/2024	Nickel, Total	< 0.005	Monitor and Report	mg/L	Average Quarterly
10/01/2024	12/31/2024	12/20/2024	Nickel, Total	< 0.005	Monitor and Report	mg/L	Average Quarterly
01/01/2025	03/31/2025	04/18/2025	Nickel, Total	< 0.005	Monitor and Report	mg/L	Average Quarterly
04/01/2025	06/30/2025	07/23/2025	Nickel, Total	< 0.005	Monitor and Report	mg/L	Average Quarterly

Ammonia Nitrogen eDMR Data

Monitoring Period Begin Date	Monitoring Period End Date	DMR Received Date	Parameter Name	DMR Value	Permit Limit	Units	Statistical Base Code
05/01/2022	05/31/2022	06/16/2022	Ammonia-Nitrogen	3.95	6	mg/L	Average Monthly
06/01/2022	06/30/2022	07/27/2022	Ammonia-Nitrogen	0.95	6	mg/L	Average Monthly
07/01/2022	07/31/2022	08/25/2022	Ammonia-Nitrogen	0.2	6	mg/L	Average Monthly
08/01/2022	08/31/2022	09/23/2022	Ammonia-Nitrogen	0.2	6	mg/L	Average Monthly
09/01/2022	09/30/2022	10/25/2022	Ammonia-Nitrogen	0.13	6	mg/L	Average Monthly
10/01/2022	10/31/2022	11/22/2022	Ammonia-Nitrogen	0.08	6	mg/L	Average Monthly
11/01/2022	11/30/2022	12/14/2022	Ammonia-Nitrogen	0.6	18	mg/L	Average Monthly
12/01/2022	12/31/2022	01/19/2023	Ammonia-Nitrogen	1.4	18	mg/L	Average Monthly
01/01/2023	01/31/2023	02/27/2023	Ammonia-Nitrogen	1.3	18	mg/L	Average Monthly
02/01/2023	02/28/2023	03/17/2023	Ammonia-Nitrogen	4.2	18	mg/L	Average Monthly
03/01/2023	03/31/2023	04/24/2023	Ammonia-Nitrogen	3.7	18	mg/L	Average Monthly
04/01/2023	04/30/2023	05/25/2023	Ammonia-Nitrogen	6.5	18	mg/L	Average Monthly
05/01/2023	05/31/2023	06/14/2023	Ammonia-Nitrogen	4.9	6	mg/L	Average Monthly
06/01/2023	06/30/2023	07/11/2023	Ammonia-Nitrogen	0.2	6	mg/L	Average Monthly
07/01/2023	07/31/2023	08/17/2023	Ammonia-Nitrogen	0.06	6	mg/L	Average Monthly
08/01/2023	08/31/2023	09/15/2023	Ammonia-Nitrogen	0.14	6	mg/L	Average Monthly
09/01/2023	09/30/2023	10/25/2023	Ammonia-Nitrogen	0.18	6	mg/L	Average Monthly

10/01/2023	10/31/2023	11/20/2023	Ammonia-Nitrogen	0.1	6	mg/L	Average Monthly
11/01/2023	11/30/2023	12/27/2023	Ammonia-Nitrogen	0.6	18	mg/L	Average Monthly
12/01/2023	12/31/2023	01/19/2024	Ammonia-Nitrogen	0.7	18	mg/L	Average Monthly
01/01/2024	01/31/2024	02/23/2024	Ammonia-Nitrogen	1.5	18	mg/L	Average Monthly
02/01/2024	02/29/2024	03/26/2024	Ammonia-Nitrogen	4.8	18	mg/L	Average Monthly
03/01/2024	03/31/2024	04/19/2024	Ammonia-Nitrogen	2.2	18	mg/L	Average Monthly
04/01/2024	04/30/2024	05/21/2024	Ammonia-Nitrogen	1.7	18	mg/L	Average Monthly
05/01/2024	05/31/2024	06/27/2024	Ammonia-Nitrogen	0.4	6	mg/L	Average Monthly
06/01/2024	06/30/2024	07/16/2024	Ammonia-Nitrogen	0.2	6	mg/L	Average Monthly
07/01/2024	07/31/2024	08/26/2024	Ammonia-Nitrogen	< 0.04	6	mg/L	Average Monthly
08/01/2024	08/31/2024	09/13/2024	Ammonia-Nitrogen	< 0.2	6	mg/L	Average Monthly
09/01/2024	09/30/2024	10/23/2024	Ammonia-Nitrogen	0.4	6	mg/L	Average Monthly
10/01/2024	10/31/2024	12/01/2024	Ammonia-Nitrogen	0.3	6	mg/L	Average Monthly
11/01/2024	11/30/2024	12/20/2024	Ammonia-Nitrogen	2.6	18	mg/L	Average Monthly
12/01/2024	12/31/2024	01/27/2025	Ammonia-Nitrogen	2.2	18	mg/L	Average Monthly
01/01/2025	01/31/2025	02/19/2025	Ammonia-Nitrogen	1.8	18	mg/L	Average Monthly
02/01/2025	02/28/2025	03/28/2025	Ammonia-Nitrogen	5.3	18	mg/L	Average Monthly
03/01/2025	03/31/2025	04/22/2025	Ammonia-Nitrogen	4.5	18	mg/L	Average Monthly

04/01/2025	04/30/2025	05/23/2025	Ammonia-Nitrogen	3.6	18	mg/L	Average Monthly
05/01/2025	05/31/2025	06/26/2025	Ammonia-Nitrogen	0.7	6	mg/L	Average Monthly
06/01/2025	06/30/2025	07/23/2025	Ammonia-Nitrogen	0.4	6	mg/L	Average Monthly
			Count	36			
			Minimum	0.06			
			Maximum	6.5			
			Average	1.741389			

ATTACHMENT I

WETT Test Results and Summary

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Ceriodaphnia
Endpoint	Survival
TIWC (decimal)	0.16
No. Per Replicate	1
TST b value	0.75
TST alpha value	0.2

Facility Name: Meadville Area STP

Permit No.: PA0026271

Test Completion Date: 11/2/2021

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		
Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	10	10

T-Test Result
Deg. of Freedom
Critical T Value
Pass or Fail: **PASS**

Test Completion Date: 10/10/2022

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	0
4	0	1
5	1	1
6	1	1
7	0	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		
Mean	0.800	0.900
Std Dev.	0.422	0.316
# Replicates	10	10

T-Test Result
Deg. of Freedom
Critical T Value
Pass or Fail: **PASS**

Test Completion Date: 11/13/2023

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		
Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	10	10

T-Test Result
Deg. of Freedom
Critical T Value
Pass or Fail: **PASS**

Test Completion Date: 11/18/2024

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	0	1
8	1	1
9	1	1
10	0	1
11		
12		
13		
14		
15		
Mean	0.800	1.000
Std Dev.	0.422	0.000
# Replicates	10	10

T-Test Result
Deg. of Freedom
Critical T Value
Pass or Fail: **PASS**

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Ceriodaphnia
Endpoint	Reproduction
TIWC (decimal)	0.16
No. Per Replicate	1
TST b value	0.75
TST alpha value	0.2

Facility Name: Meadville Area STP

Permit No.: PA0026271

Test Completion Date: 11/2/2021

Replicate No.	Control	TIWC
1	31	27
2	26	32
3	19	22
4	22	21
5	28	25
6	26	27
7	27	24
8	31	23
9	24	30
10	30	28
11		
12		
13		
14		
15		
Mean	26.400	25.900
Std Dev.	3.921	3.542
# Replicates	10	10

T-Test Result	4.1900
Deg. of Freedom	17
Critical T Value	0.8633
Pass or Fail	PASS

Test Completion Date: 10/10/2022

Replicate No.	Control	TIWC
1	29	33
2	23	34
3	17	0
4	2	27
5	28	18
6	28	21
7	2	15
8	12	14
9	26	33
10	28	34
11		
12		
13		
14		
15		
Mean	19.500	22.900
Std Dev.	10.732	11.357
# Replicates	10	10

T-Test Result	1.8799
Deg. of Freedom	16
Critical T Value	0.8647
Pass or Fail	PASS

Test Completion Date: 11/13/2023

Replicate No.	Control	TIWC
1	29	24
2	30	25
3	28	29
4	29	30
5	29	26
6	24	27
7	28	28
8	26	31
9	27	29
10	29	26
11		
12		
13		
14		
15		
Mean	27.900	27.500
Std Dev.	1.792	2.273
# Replicates	10	10

T-Test Result	7.8739
Deg. of Freedom	15
Critical T Value	0.8662
Pass or Fail	PASS

Test Completion Date: 11/26/2024

Replicate No.	Control	TIWC
1	22	22
2	23	25
3	24	25
4	22	24
5	23	26
6	20	23
7	22	23
8	22	22
9	21	22
10	18	24
11		
12		
13		
14		
15		
Mean	21.700	23.600
Std Dev.	1.703	1.430
# Replicates	10	10

T-Test Result	12.0820
Deg. of Freedom	17
Critical T Value	0.8633
Pass or Fail	PASS

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Survival
TIWC (decimal)	0.16
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Facility Name: Meadville Area STP

Permit No.: PA0026271

Test Completion Date: 11/2/2021

Replicate No.	Control	TIWC
1	1	0.9
2	0.9	0.8
3	0.8	0.6
4	0.9	0.9
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.900	0.800
Std Dev.	0.082	0.141
# Replicates	4	4

T-Test Result	3.9643
Deg. of Freedom	4
Critical T Value	0.7407
Pass or Fail	PASS

Test Completion Date: 11/2/2022

Replicate No.	Control	TIWC
1	1	1
2	1	0.9
3	0.9	1
4	1	1
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.975	0.975
Std Dev.	0.050	0.050
# Replicates	4	4

T-Test Result	14.8898
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

Test Completion Date: 11/14/2023

Replicate No.	Control	TIWC
1	1	1
2	1	0.9
3	1	0.9
4	1	1
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	1.000	0.950
Std Dev.	0.000	0.058
# Replicates	4	4

T-Test Result	14.6031
Deg. of Freedom	3
Critical T Value	0.7649
Pass or Fail	PASS

Test Completion Date: 11/26/2024

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	4	4

T-Test Result	
Deg. of Freedom	
Critical T Value	
Pass or Fail	PASS

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Growth
TIWC (decimal)	0.16
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Facility Name: Meadville Area STP

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Test Completion Date: 11/2/2021

Replicate No.	Control	TIWC
1	0.348	0.393
2	0.379	0.375
3	0.334	0.32
4	0.327	0.385
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.347	0.368
Std Dev.	0.023	0.033
# Replicates	4	4

T-Test Result	5.7982
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

Test Completion Date: 10/11/2022

Replicate No.	Control	TIWC
1	0.368	0.39
2	0.333	0.386
3	0.207	0.405
4	0.322	0.424
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.308	0.401
Std Dev.	0.070	0.017
# Replicates	4	4

T-Test Result	6.1909
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

Test Completion Date: 11/14/2023

Replicate No.	Control	TIWC
1	0.232	0.257
2	0.228	0.267
3	0.31	0.3
4	0.26	0.332
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.258	0.289
Std Dev.	0.038	0.034
# Replicates	4	4

T-Test Result	4.3285
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

Test Completion Date: 11/26/2024

Replicate No.	Control	TIWC
1	0.46	0.432
2	0.445	0.3611
3	0.389	0.361
4	0.378	0.365
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.418	0.380
Std Dev.	0.041	0.035
# Replicates	4	4

T-Test Result	2.8648
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

WET Summary and Evaluation

Facility Name	Meadville Area STP
Permit No.	PA0026271
Design Flow (MGD)	7.5
Q_{7-10} Flow (cfs)	55.7
PMF_a	0.928
PMF_c	1

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	11/2/21	10/10/22	11/13/23	11/18/24
Ceriodaphnia	Survival	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	11/2/21	10/10/22	11/13/23	11/26/24
Ceriodaphnia	Reproduction	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	11/2/21	11/2/22	11/14/23	11/26/24
Pimephales	Survival	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	11/2/21	10/11/22	11/14/23	11/26/24
Pimephales	Growth	PASS	PASS	PASS	PASS

Reasonable Potential? NO

Permit Recommendations

Test Type	**Chronic**
TIWC	**17** % Effluent
Dilution Series	**4, 9, 17, 59, 100** % Effluent
Permit Limit	**None**
Permit Limit Species	

Whole Effluent Toxicity (WET)

For Outfall 001, ☐ **Acute** ☒ **Chronic** WET Testing was completed:

☐ For the permit renewal application (4 tests).
☐ Quarterly throughout the permit term.
☐ Quarterly throughout the permit term and a TIE/TRE was conducted.
☒ Other: **Annually Throughout the Permit Term**

The dilution series used for the tests was: 100%, 58%, 16%, 8%, and 4%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: 16%.

Summary of Four Most Recent Test Results

(NOTE – Enter results into one table, depending on which data analysis method was used).

TST Data Analysis

(NOTE – In lieu of recording information below, the application manager may attach the DEP WET Analysis Spreadsheet).

Test Date	***Ceriodaphnia* Results (Pass/Fail)**		***Pimephales* Results (Pass/Fail)**	
	Survival	**Reproduction**	**Survival**	**Growth**
11/2/21	PASS	PASS	PASS	PASS
10/10/22, 10/11/22, and 11/2/22	PASS	PASS	PASS	PASS
11/13/23 and 11/14/23	PASS	PASS	PASS	PASS
11/18/24 and 11/26/24	PASS	PASS	PASS	PASS

***** *A "passing" result is that in which the replicate data for the TIWC is not statistically significant from the control condition. This is exhibited when the calculated t value ("T-Test Result") is greater than the critical t value. A "failing" result is exhibited when the calculated t value ("T-Test Result") is less than the critical t value.*

Is there reasonable potential for an excursion above water quality standards based on the results of these tests? (*NOTE – In general, reasonable potential is determined anytime there is at least one test failure in the previous four tests).*

☐ **YES** ☒ **NO**

Comments:

WET Limits

Has reasonable potential been determined? ☐ YES ☒ NO

Will WET limits be established in the permit? ☐ YES ☒ NO