pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0082481**
Facility Type	**Industrial**	APS ID	**1044083**
Major / Minor	**Minor**	Authorization ID	**1381339**

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

Applicant and Facility Information

Applicant Name	**Mifflin County Municipal Authority**	Facility Name	**Laurel Creek Filtration Plant**
Applicant Address	70 Chestnut Street	Facility Address	400 Filter Plant Road
	Lewistown, PA 17044-2216		Milroy, PA 17063-9410
Applicant Contact	Craig Bubb	Facility Contact	Craig Bubb
Applicant Phone	(717) 248-0165	Facility Phone	(717) 248-0165
Client ID	364439	Site ID	263195
SIC Code	4941	Municipality	Armagh Township
SIC Description	Trans. & Utilities - Water Supply	County	Mifflin
Date Application Received	January 6, 2022	EPA Waived?	Yes
Date Application Accepted	January 27, 2022	If No, Reason	

Purpose of Application: Permit renewal for discharge of treated industrial Wastewater

Summary of Review

1.0 General Discussion

This factsheet supports the renewal of an existing NPDES permit for a discharge of treated industrial wastewater from Laurel Creek water filtration plant. Mifflin County Municipal Authority owns and operates the water treatment plant that treats raw water withdrawn from Laurel Creek Reservoir and three Wells as back up to supply potable water to Armagh Township and surrounding communities. Ozone, Delpac 2020 and chlorine are used prior to filtration at the water treatment plant. The process wastewater consists of filter backwash water from the filters, sample sink and analyzer drains and filter to waste water. There are four 25 x 27 ft multimedia filters in use at the facility. One filter is backwashed per day. The backwash water and sample sink and analyzer drains flow to a 212,000-gallon holding tank for solids to settle. Supernatant from the tank overflows to two 314,000-gallon earthen lagoons for additional solids settlement. Effluent from the lagoons discharge to Laurel Creek through Outfall 001. The existing permit was based on a wastewater flow of 0.234mgd but has been revised to 0.320MGD for the current renewal based on average maximum daily discharge for the past 12 months of operation. Outfall 002 is located 250 yards downstream of outfall 001 and receives filter to waste water. Filter to waste is filtered potable water that does not meet turbidity requirement for safe drinking water and is discharged to Laurel Creek via outfall 002. During start-up of the facility, the filter to waste line runs for about 20mins until turbidity requirement is met. Filtered water also gets drained periodically to outfall 002 during filter inspections. The existing discharge for outfall 002 was based on a wastewater flow of 0.042mgd but was revised to 0.27MGD for the current renewal based on average maximum daily discharge for the past 12 months operation. Laurel Creek is classified as a High-Quality Cold-Water Fishery (HQ-CWF) and Migratory Fishery (MF). The facility is not covered by ELG but has technology-based treatment limits developed by the Department. See details at technology limits section of the report. Storm water runoff from the plant site is also conveyed to the receiving stream. The existing permit was issued to Lewistown Borough on June 1, 2017 with effective date of July 1, 2017 and expiration date of June 30, 2022 and was transferred to the current permittee Mifflin County Municipal Authority

Approve	Deny	Signatures	Date
X		*J. Pascal Kwedza* J. Pascal Kwedza, P.E. / Environmental Engineer	December 28, 2022
X		*Maria D. Bebenek for* Daniel W. Martin, P.E. / Environmental Engineer Manager	January 25, 2023
X		*Maria D. Bebenek* Maria D. Bebenek, P.E. / Program Manager	January 25, 2023

Summary of Review

on September 14, 2021. The permittee submitted a timely renewal application to the Department and has been operating under the conditions in the existing permit pending permit renewal. Topographical map showing discharge location is attached as attachment A and process flow schematic diagram is presented in attachment B

1.1 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.

1.2 Existing Effluent Limits for outfall 001

Discharge Parameter	Effluent Limitations					Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)			Monitoring Frequency	Required Sample Type
	Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	Inst Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	Continuously	Measured
pH (S.U.)	From 6.0 to 9.0					1/day	Grab
TRC	XXX	XXX	0.5	1.0	1.6	1/day	Grab
TSS	XXX	XXX	30.0	60.0	75	2/month	8-Hr Composite
Total Aluminum	XXX	XXX	2.8	5.6	7	2/month	8-Hr Composite
Total Iron	XXX	XXX	2.0	4.0	5	2/month	8-Hr Composite
Total Manganese	XXX	XXX	1.0	2.0	2.5	2/month	8-Hr Composite

1.3 Existing Effluent Limits for outfall 002

Discharge Parameter	Effluent Limitations					Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)			Monitoring Frequency	Required Sample Type
	Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	Inst Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	Continuously	Measured
pH (S.U.)	From 6.0 to 9.0					1/day	Grab
TSS	XXX	XXX	30.0	60.0	75	2/month	8-Hr Composite

1.4 Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.32
Latitude	40º 43' 39"	Longitude	-77º 37' 38"
Quad Name	Barrville	Quad Code	1324
Wastewater Description:	Water Treatment filter backwash Effluent		
Receiving Waters	Laurel Creek (HQ-CWF, MF)	Stream Code	12462
NHD Com ID	66203435	RMI	5.33
Drainage Area	12.8 mi^2	Yield (cfs/mi^2)	--
Q_{7-10} Flow (cfs)	1.92	Q_{7-10} Basis	
Elevation (ft)	1,014	Slope (ft/ft)	
Watershed No.	12-A	Chapter 93 Class.	HQ-CWF, MF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status		Name	

Background/Ambient Data		Data Source
pH (SU)	7.0	Default
Temperature (°C)	20.0	Default
Hardness (mg/L)	100	Default
Other:		

Nearest Downstream Public Water Supply Intake	Mifflintown Borough Municipal Authority Juniata County		
PWS Waters	Juniata River	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	26.17

Changes Since Last Permit Issuance: None

1.4.1 Water Supply Intake

The closest water supply intake located downstream from the discharge is the Mifflintown Borough Municipal Authority Juniata County on Juniata River. The distance downstream from the discharge to the intake is approximately 26 miles. The discharge has no impact on the intake

1.5 Discharge, Receiving Waters and Water Supply Information

Outfall No.	002	Design Flow (MGD)	.27
Latitude	40º 43' 40"	Longitude	-77º 37' 32"
Quad Name		Quad Code	
Wastewater Description:	Water Treatment Effluent (filter to waste)		
Receiving Waters	Laurel Creek (HQ-CWF, MF)	Stream Code	
NHD Com ID	66203435	RMI	
Drainage Area		Yield (cfs/mi^2)	
Q_{7-10} Flow (cfs)		Q_{7-10} Basis	
Elevation (ft)		Slope (ft/ft)	
Watershed No.	12-A	Chapter 93 Class.	HQ-CWF, MF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status		Name	

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

Nearest Downstream Public Water Supply Intake			
PWS Waters		Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	

Changes Since Last Permit Issuance: None

1.5.1 Other Comments:

See section 3.3.8 of the report for details and permit requirements for outfall 002

2.0 Compliance History

2.1 DMR Data for Outfall 001 (from November 1, 2021 to October 31, 2022)

Parameter	OCT-22	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21
Flow (MGD) Average Monthly	0.176	0.179	0.192	0.192	0.188	0.185	0.174	0.196	0.190	0.188	0.246	0.294
Flow (MGD) Daily Maximum	0.332	0.293	0.335	0.315	0.269	0.272	0.270	0.272	0.280	0.326	0.408	0.452
pH (S.U.) Instantaneous Minimum	6.99	6.82	6.91	6.95	6.79	6.92	7.04	6.97	6.89	7.00	6.84	6.93
pH (S.U.) Instantaneous Maximum	7.35	7.13	7.55	7.25	7.18	7.34	7.43	7.49	7.44	7.62	7.55	7.48
TRC (mg/L) Average Monthly	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03
TRC (mg/L) Daily Maximum	0.04	0.06	0.04	0.05	0.05	0.04	0.04	0.06	0.07	0.09	0.08	0.05
TSS (mg/L) Average Monthly	< 2.6	< 1.60	4.60	< 2.6	3.8	2.4	< 2.40	5.60	4.0	5.00	< 2.40	6.00
TSS (mg/L) Daily Maximum	3.60	< 1.60	6.00	3.60	4.8	2.8	3.20	6.40	5.20	6.40	3.20	8.40
Total Aluminum (mg/L) Average Monthly	0.537	0.407	0.707	0.407	0.708	0.388	0.326	< 0.690	1.16	1.34	0.732	1.23
Total Aluminum (mg/L) Daily Maximum	0.640	0.416	0.713	0.525	0.746	0.400	0.390	1.28	1.18	1.70	0.829	1.67
Total Iron (mg/L) Average Monthly	< 0.200	< 0.2	< 0.200	< 0.20	< 0.2	< 0.200	< 0.2	< 0.200	< 0.20	< 0.200	< 0.200	< 0.200
Total Iron (mg/L) Daily Maximum	< 0.200	< 0.2	< 0.200	< 0.20	< 0.2	< 0.200	< 0.2	< 0.200	< 0.20	< 0.200	< 0.200	< 0.200
Total Manganese (mg/L) Average Monthly	0.309	0.173	0.220	0.07	0.059	0.035	0.029	< 0.029	0.053	0.069	0.093	0.181
Total Manganese (mg/L) Daily Maximum	0.313	0.178	0.309	0.079	0.063	0.037	0.029	0.038	0.059	0.075	0.114	0.249

2.2 DMR Data for Outfall 002 (from November 1, 2021 to October 31, 2022)

Parameter	OCT-22	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21
Flow (MGD) Average Monthly	0.179	0.176	0.174	0.177	0.180	0.178	0.178	0.182	0.178	0.183	0.215	0.233
Flow (MGD) Daily Maximum	0.204	0.213	0.213	0.210	0.294	0.249	0.256	0.258	0.247	0.271	0.355	0.428
pH (S.U.) Instantaneous Minimum	6.33	6.14	6.16	6.20	6.20	6.36	6.50	6.55	6.67	6.42	6.50	6.41
pH (S.U.) Instantaneous Maximum	7.02	6.52	7.25	6.43	6.38	6.78	6.89	6.83	6.94	7.22	7.13	6.82
TSS (mg/L) Average Monthly	< 1.60	< 1.6	< 2.00	< 1.60	< 2.60	< 2.2	< 1.6	< 1.60	< 1.60	< 2.40	< 1.20	< 1.20
TSS (mg/L) Daily Maximum	< 1.60	< 1.6	2.00	< 1.60	3.60	2.80	< 1.6	1.60	< 1.60	3.20	< 1.60	< 1.60

2.3 Summary of DMRs:

Discharge Monitoring Reports (DMRs) review for the facility for the last 12 months of operation presented on the table above indicate permit limits have been met consistently. No permit violation noted on DMRs during the period reviewed.

2.4 Summary of Inspections:

The facility was inspected a couple of times during the past permit cycle. Inspection reports review for the facility during the period indicate permit limits have been met consistently. The reports indicate good operation and maintenance of the treatment system. The facility has good compliance record.

3.0 Development of Effluent Limitations

Outfall No.	001	**Design Flow (MGD)**	.32
Latitude	40º 43' 39.00"	**Longitude**	-77º 37' 38.00"

Wastewater Description: Water Treatment Effluent

3.1 Basis for Effluent Limitations

In general, the Clean Water Act (AWA) requires that the effluent limits for a particular pollutant be the more stringent of either technology-based limits or water quality-based limits. Technology-based limits are set according to the level of treatment that is achievable using available technology. A water quality-based effluent limit (WQBEL) is designed to ensure that the water quality standards applicable to a waterbody are being met and may be more stringent than technology-based effluent limits.

3.2 Technology-Based Limitation for Outfall 001

Technology based (BPT) effluent limits for water treatment plant wastewater discharges are presented in the Department's October 1997 guidance document entitled "Technology-based control requirements for water treatment plant wastes DEP Document number 362-2183-003, 10-01-1997 as follows:

Parameter	Monthly Average (mg/l)	Daily Max (mg/l)
Suspended Solids	30	60
Iron (total)	2	4
Aluminum (total)	4	8
Manganese (total)	1	2
Flow	Monitor	
pH	6-9 at all time	
Total Residual Chlorine*	0.5	1.0

*See TRC section of the report for details

3.3 Water Quality-Based Limitations

Laurel Creek Dam is located about 365 yards upstream of the discharge point with a minimum release requirement of 1.24 MGD (1.24MGD*1.24 cfs/MGD = 1.92 cfs). There is no tributary between the dam and the discharge point therefore the minimum release is considered as the stream $Q_{7\text{-}10}$.

3.3.1 The following input data were used for TMS model:

- Discharge pH = 6.9 (DMR median July – Sept.)
- Discharge Temperature = 25 º C (Default)
- Stream pH = 7.0 (Default)
- Stream Temperature = 20 º C (Default)
- Discharge Hardness = 100 mg/l
- Stream Hardness = 100 mg/l

3.3.2 Toxics

A reasonable potential (RP) analysis was done for pollutant Groups 1 and 2 submitted with the application. All pollutants that were presented in the application sampling data were entered into the Toxics Management Spreadsheet (TMS) to calculate WQBELs. WQBELs recommended by the TMS are presented in attachment C. The results of the TMS indicate discharge levels for all pollutants except Total Aluminum, Total Zinc and Total Silver are well below DEP's target quantitation limits and the calculated WQBELs, therefore, no monitoring or limitation was recommended. Monitoring was recommended for Total Zinc and Total Silver and limitation was recommended for Total Aluminum. Total Silver was reported as non-detect but use a less sensitive method for analysis. The permittee had an opportunity to re-sample Total Silver using a more sensitive method. The permit will be drafted requiring monitoring for Total Silver. If the results of the

re-sampled data are non-detect using DEP's target QL for analysis, the monitoring requirement will be dropped from the final permit. The existing technology limit on Total Iron and Total Manganese and the recommended water quality-based limit of 2.35 mg/l monthly average and 4.7 mg/l daily maximum for Total Aluminum will apply to the current permit. Mass load will be established for water-quality base limits and reported for technology-based limits following DEP permit writer's manual No. 362-0400-001 Table 5-2, 10/1/97 Edition. Mass-based limits are expressed in pounds per day and are calculated as follows: Mass based limit (lb/day) = concentration limit (mg/L) × design flow (mgd) × 8.34.

The recommended limitations follow the logic presented in DEPs SOP, to establish limits in the permit where the maximum reported concentration exceeds 50% of the WQBEL, or for non-conservative pollutants to establish monitoring requirements where the maximum reported concentration is between 25% - 50% of the WQBEL, or to establish monitoring requirements for conservative pollutants where the maximum reported concentration is between 10% - 50% of the WQBEL.

3.3.3 Total Residual Chlorine

The attached TRC result utilizes the equations and calculations as presented in the Department's May 1, 2003 Implementation Guidance for Total Residual Chlorine (TRC) (ID No. 391-2000-015) for developing chlorine limitations. The Guidance references Chapter 92a, Section 92a.48 (b) which establishes a standard BAT limit of 0.5 mg/l unless a facility-specific BAT has been developed. The attached results presented in attachment D indicates a technology limit of 0.5 mg/l and 1.6mg/l IMAX would be needed to prevent toxicity concerns. In addition, the BPT TBEL referenced in section 3.2 requires a Daily Maximum TRC of 1.0 mg/l. Therefore, it is recommended that a TRC limit of 0.5 mg/l monthly average and 1.0 mg/l as daily maximum limit and 1.6mg/l IMAX be applied for this permit cycle with minimum monitoring frequency of 1/day. This recommendation is consistent with the existing permit.

Total Suspended Solids (TSS):

There is no water quality criteria for TSS. The existing BPT TBEL referenced in section 3.2 will remain in the permit with a monitoring frequency of 2/month.

Instantaneous Maximum:

The existing IMAX limitations in the permit determined using multiplier of 2.5 will be carried forward.

3.3.6 Chesapeake Bay Strategy:

In 2003, EPA established state-wide cap loads for Total Nitrogen and Total Phosphorus for Pennsylvania that are needed to ensure compliance with new water quality standards enacted to restore the water quality of the Chesapeake Bay. DEP released Pennsylvania's Chesapeake Bay Tributary Strategy (CBTS) in January of 2005 to guide Pennsylvania's efforts to meet those cap loads and revised the Strategy in 2006-2007 following a stakeholder process. Industrial discharges have been prioritized by Central Office based on their delivered TN and TP loadings to the Bay. Significant industrial wastewater dischargers are facilities that discharge more than 75 lbs/day of TN or 25 lbs/day of TP on an average annual basis and the rest are classified as non-significant dischargers. DEP developed Chesapeake Bay IW monitoring plan for all industrial facilities that discharge to the Chesapeake Bay. This facility is classified as a non-significant discharger with little or no potential to introduce nutrients to the receiving stream and is not subject to the requirements of the Chesapeake Bay monitoring at this time.

3.3.7 Limitation for Outfall 002 based on Best Professional Judgement (BPJ)

The main source of wastewater to this outfall is filter to waste, which is filtered potable water that does not meet turbidity requirement for safe drinking water and is discharged. TSS is the pollutant of concern in the discharge and a limitation of 30 mg/l monthly average and 60mg/l daily maximum and has been established in the existing permit based on the BPJ. These limits are protective of the water quality of the stream and will be carried over in the current permit. No further water quality analysis was done. The existing permit also has flow monitoring and pH limits which will remain in the permit.

4.0 Other Requirements

4.1 Anti-backsliding

Not applicable to this permit

4.3 Cleaning of Sedimentation Tanks/Lagoons

The lagoons are cleaned typically 2/year, and the solids are pumped to drying beds prior to hauling off-site for disposal. Conditions and reporting requirements prior and during lagoons cleaning can be found in PART C. II of the permit.

4.4 Anti-Degradation (93.4)

The effluent limits for this discharge have been developed to ensure that existing instream water uses and the level of water quality necessary to protect the existing uses are maintained and protected. The facility discharge to a stream segment designated as High-Quality Waters. The discharge is not expected to impact the stream negatively. No Exceptional Value Waters are impacted by this discharge.

4.5 Class A Wild Trout Fisheries

No Class A Wild Trout Fisheries are impacted by this discharge.

4.6 303d Listed Streams

The discharge is not located on a 303d listed stream segment.

4.7 Basis for Effluent and Surface Water Monitoring

Section 308 of the CWA and federal regulation 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality. The permittee is responsible for conducting the monitoring and for reporting results on Discharge Monitoring Reports (DMRs).

4.8 Effluent Monitoring

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Permittees have the option of taking more frequent samples than are required under the permit. These samples can be used for averaging if they are conducted using EPA-approved test methods (generally found in 40 CFR 136) and if the Method Detection Limits are less than the effluent limits. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

5.0 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" (362-0400-001), 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) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	1.0	1.6	1/day	Grab
Total Suspended Solids	Report	Report	XXX	30.0	60.0	75	2/month	8-Hr Composite
Aluminum, Total	6.27	12.54	XXX	2.35	4.70	5.88	2/month	8-Hr Composite
Iron, Total	Report	Report	XXX	2.0	4.0	5	2/month	8-Hr Composite
Manganese, Total	Report	Report	XXX	1.0	2.0	2.5	2/month	8-Hr Composite
Silver, Total	Report	Report	XXX	Report	Report	XXX	2/month	8-Hr Composite
Zinc, Total	Report	Report	XXX	Report	Report	XXX	2/month	8-Hr Composite

Compliance Sampling Location: At Outfall 001

5.1 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" (362-0400-001), SOPs and/or BPJ.

Outfall 002, Effective Period: 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	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
Total Suspended Solids	Report	Report	XXX	30.0	60.0	75	2/month	Grab

Compliance Sampling Location: At Outfall 002

	6.0 Tools and References Used to Develop Permit
☐	WQM for Windows Model (see Attachment)
☒	Toxics Management Spreadsheet (see Attachment **C**)
☒	TRC Model Spreadsheet (see Attachment D)
☐	Temperature Model Spreadsheet (see Attachment)
☒	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☐	Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 362-2000-003, 3/98.
☒	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 362-2000-008, 11/96.
☒	Technology-Based Control Requirements for Water Treatment Plant Wastes, 362-2183-003, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 362-2183-004, 12/97.
☐	Pennsylvania CSO Policy, 385-2000-011, 9/08.
☒	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 391-2000-002, 4/97.
☒	Determining Water Quality-Based Effluent Limits, 391-2000-003, 12/97.
☐	Implementation Guidance Design Conditions, 391-2000-006, 9/97.
☐	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 391-2000-007, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 391-2000-008, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 391-2000-010, 3/99.
☐	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 391-2000-011, 5/2004.
☐	Implementation Guidance for Section 93.7 Ammonia Criteria, 391-2000-013, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 391-2000-014, 4/2008.
☐	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 391-2000-015, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 391-2000-017, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 391-2000-018, 10/97.
☐	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 391-2000-019, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 391-2000-021, 3/99.
☐	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 391-2000-022, 3/1999.
☐	Design Stream Flows, 391-2000-023, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 391-2000-024, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 391-3200-013, 6/97.
☒	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☒	SOP: Establishing effluent limitation for individual industrial wate
☐	Other:

Attachments

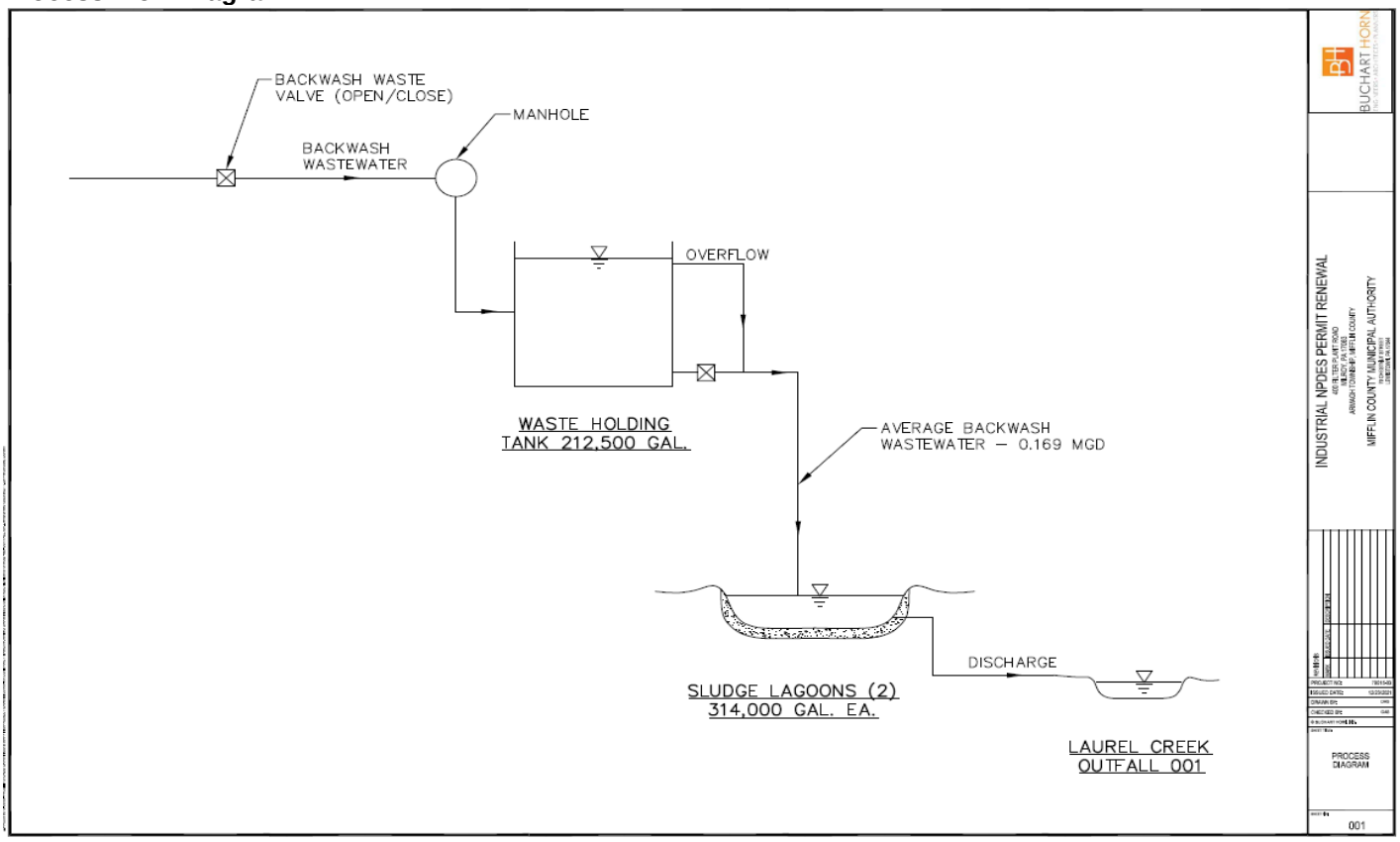
A. Topographical Map

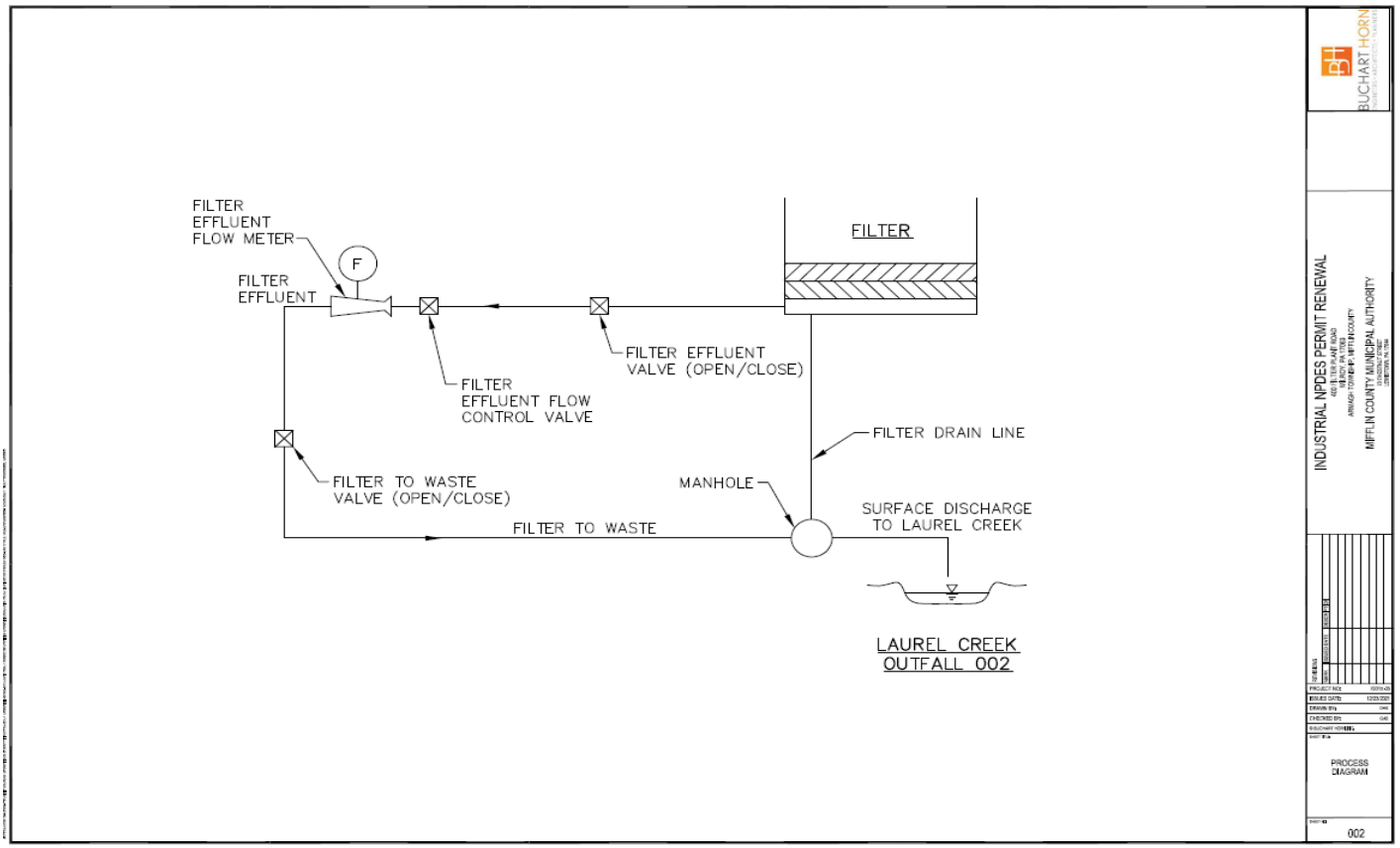
December 20, 2022

1:18,056
0 0.1 0.2 0.4 mi
0 0.17 0.35 0.7 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand),

B. Process Flow Diagram





C. TMS Model Results

Instructions | Discharge | Stream

Facility: **Laurel Creek Filtration Plant** NPDES Permit No.: **PA0082481** Outfall No.: **001**

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

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
0.32	100	6.9						

					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		60									
	Chloride (PWS)	mg/L		16.7									
	Bromide	mg/L		0.072									
	Sulfate (PWS)	mg/L		6.23									
	Fluoride (PWS)	mg/L		0.575									
Group 2	Total Aluminum	µg/L		1810									
	Total Antimony	µg/L		0.348									
	Total Arsenic	µg/L		0.0005									
	Total Barium	µg/L		17.1									
	Total Beryllium	µg/L		0.676									
	Total Boron	µg/L		0.0565									
	Total Cadmium	µg/L	<	0.123									
	Total Chromium (III)	µg/L		0.002									
	Hexavalent Chromium	µg/L		0.00006									
	Total Cobalt	µg/L		0.236									
	Total Copper	µg/L		2.72									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L		0.006									
	Dissolved Iron	µg/L		0.14									
	Total Iron	µg/L		0.02									
	Total Lead	µg/L		0.172									
	Total Manganese	µg/L		92.1									
	Total Mercury	µg/L		0.0001									
	Total Nickel	µg/L		1.44									
	Total Phenols (Phenolics) (PWS)	µg/L		0.002									
	Total Selenium	µg/L	<	1.67									
	Total Silver	µg/L	<	1.37									
	Total Thallium	µg/L	<	0.068									
	Total Zinc	µg/L		56.9									
	Total Molybdenum	µg/L		0.2									
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

Laurel Creek Filtration Plant, NPDES Permit No. PA0082481, 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)
5.33	1.92		1.92	0.495	0.005	0.585	21.156	36.188	0.195	0.166	12.727
4.8	1.99		1.99								

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)
5.33	13.14		13.14	0.495	0.005	1.252	21.156	16.897	0.515	0.063	5.966
4.8	13.558		13.56								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 12.727 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 6.98

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	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	750	750	3,659	
Total Antimony	0	0		0	1,100	1,100	5,366	
Total Arsenic	0	0		0	340	340	1,659	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	102,448	
Total Boron	0	0		0	8,100	8,100	39,516	
Total Cadmium	0	0		0	2.014	2.13	10.4	Chem Translator of 0.944 applied
Total Chromium (III)	0	0		0	569.763	1,803	8,796	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	79.5	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	463	
Total Copper	0	0		0	13.439	14.0	68.3	Chem Translator of 0.96 applied

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	64.581	81.6	398	Chem Translator of 0.791 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	8.04	Chem Translator of 0.85 applied
Total Nickel	0	0		0	468.236	469	2,289	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	3.217	3.78	18.5	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	317	
Total Zinc	0	0		0	117.180	120	585	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): 12.727 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 6.98

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	
Fluoride (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	1,073	
Total Arsenic	0	0		0	150	150	732	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	20,002	
Total Boron	0	0		0	1,600	1,600	7,806	
Total Cadmium	0	0		0	0.246	0.27	1.32	Chem Translator of 0.909 applied
Total Chromium (III)	0	0		0	74.115	86.2	420	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	50.7	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	92.7	
Total Copper	0	0		0	8.956	9.33	45.5	Chem Translator of 0.96 applied
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	7,318	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2.517	3.18	15.5	Chem Translator of 0.791 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	4.42	Chem Translator of 0.85 applied
Total Nickel	0	0		0	52.007	52.2	254	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	24.3	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	63.4	
Total Zinc	0	0		0	118.139	120	585	Chem Translator of 0.986 applied

☑ ***THH*** CCT (min): 12.727 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	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	
Fluoride (PWS)	0	0		0	2,000	2,000	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	5.6	5.6	27.3	
Total Arsenic	0	0		0	10	10.0	48.8	
Total Barium	0	0		0	2,400	2,400	11,708	
Total Boron	0	0		0	3,100	3,100	15,123	
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	
Dissolved Iron	0	0		0	300	300	1,464	
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	4,878	
Total Mercury	0	0		0	0.050	0.05	0.24	
Total Nickel	0	0		0	610	610	2,976	
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	1.17	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***CRL*** CCT (min): 5.966 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	
Fluoride (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	
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	

☑ ***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 Aluminum	6.26	9.76	2,345	3,659	5,863	µg/L	2,345	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Silver	Report	Report	Report	Report	Report	µg/L	11.8	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Zinc	Report	Report	Report	Report	Report	µg/L	375	AFC	Discharge Conc > 10% WQBEL (no RP)

☐ ***Other Pollutants without Limits or Monitoring***

D. TRC Calculations

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

1.92	= Q stream (cfs)	0.5	= CV Daily
0.32	= Q discharge (MGD)	0.5	= CV Hourly
30	= no. samples	1	= AFC_Partial Mix Factor
0.3	= Chlorine Demand of Stream	1	= CFC_Partial Mix Factor
0	= Chlorine Demand of Discharge	15	= AFC_Criteria Compliance Time (min)
0.5	= BAT/BPJ Value	720	= CFC_Criteria Compliance Time (min)
0	= % Factor of Safety (FOS)	0	=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 1.256	1.3.2.iii	WLA cfc = 1.217
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.468	5.1d	LTA_cfc = 0.708

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500	BAT/BPJ
		INST MAX LIMIT (mg/l) = 1.635	

WLA afc	**(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))...** **...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)**
LTAMULT afc	EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5)
LTA_afc	wla_afc*LTAMULT_afc
WLA_cfc	**(.011/e(-k*CFC_tc) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))...** **...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)**
LTAMULT_cfc	EXP((0.5*LN(cvd^2/no_samples+1))-2.326*LN(cvd^2/no_samples+1)^0.5)
LTA_cfc	wla_cfc*LTAMULT_cfc
AML MULT	EXP(2.326*LN((cvd^2/no_samples+1)^0.5)-0.5*LN(cvd^2/no_samples+1))
AVG MON LIMIT	MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT)
INST MAX LIMIT	**1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc)**