Pennsylvania Department of Environmental Protection

Northcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0229172**
Facility Type	**Industrial**	APS ID	**1087675**
Major / Minor	**Minor**	Authorization ID	**1438281**

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

Applicant and Facility Information

Applicant Name	**Duncan Township Municipal Water Authority Tioga County**	Facility Name	**Duncan Township Municipal Water Authority Water System**
Applicant Address	42 Duncan Township Road	Facility Address	Village Of Antrim
	Wellsboro, PA 16901-8544		Wellsboro, PA 16901
Applicant Contact	Ron Johnson	Facility Contact	Richard Putman
Applicant Phone	(570) 353-7532	Facility Phone	(570) 353-7532
Client ID	34627	Site ID	316047
SIC Code	4941	Municipality	Duncan Township
SIC Description	Trans. & Utilities - Water Supply	County	Tioga
Date Application Received	May 1, 2023	EPA Waived?	Yes
Date Application Accepted	May 15, 2023	If No, Reason	
Purpose of Application	Renewal of a NPDES Permit		

Summary of Review

The subject facility is a municipal water treatment plant serving the area of the village of Antrim in Duncan Township, Tioga County. A map of the discharge location is attached.

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.

Approve	Deny	Signatures	Date
X		Keith C. Allison / Project Manager	December 19, 2024
X		Nicholas W. Hartranft, P.E. / Environmental Engineer Manager	December 19, 2024

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.0067
Latitude	41º 38' 31"	Longitude	-77º 16' 57"
Quad Name	Antrim, PA	Quad Code	
Wastewater Description:	Water Treatment Effluent		
Receiving Waters	Wilson Creek (CWF, MF)	Stream Code	21730
NHD Com ID	66537881	RMI	2.62
Drainage Area	18.91 mi^2	Yield (cfs/mi^2)	0.039
Q_{7-10} Flow (cfs)	0.074	Q_{7-10} Basis	USGS Gage 01548500, Pine Creek @ Cedar Run, PA
Elevation (ft)	1802 (@ UNT) 1198 (@ Wilson Creek)	Slope (ft/ft)	0.227
Watershed No.	9-A	Chapter 93 Class.	CWF, MF
Existing Use	N/A	Existing Use Qualifier	N/A
Exceptions to Use	None	Exceptions to Criteria	None
Assessment Status	Attaining Use(s)		
Nearest Downstream Public Water Supply Intake	Jersey Shore Area Joint Water Authority		
PWS Waters	Pine Creek	Flow at Intake (cfs)	38.6
PWS RMI	1.9	Distance from Outfall (mi)	Approx. 48

Comments: Discharge is to an intermittent unnamed tributary to Wilson Creek. The assumed Point of First Use (POFU) is the discharge into Wilson Creek. The tributary is apparently fed by AMD mine seeps. The above stream and drainage characteristics were determined for the previous review and remain applicable for the discharge into Wilson Creek.

No downstream water supply is expected to be affected by the discharge at this time with the limitations and monitoring proposed.

The discharge is within the greater Babb Creek watershed which has a TMDL addressing pH and metals from AMD. While the TMDL does not specifically identify this discharge it recommends pollutant reductions for particular subbasins. See under the Develop of Effluent Limitations section for limitations previously established to address the watershed impairments.

Treatment Facility Summary

Treatment Facility Name: Duncan Township Municipal Authority

The wastewater treatment consists of a settling pond and is permitted under WQM Permit No. 5902201.

Compliance History

DMR Data for Outfall 001 (from November 1, 2023 to October 31, 2024)

Parameter	OCT-24	SEP-24	AUG-24	JUL-24	JUN-24	MAY-24	APR-24	MAR-24	FEB-24	JAN-24	DEC-23	NOV-23
Flow (MGD) Average Monthly	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Flow (MGD) Daily Maximum	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
pH (S.U.) Instantaneous Minimum	7.32	7.21	7.04	7.04	7.10	6.91	7.16	7.26	7.18	7.21	7.11	7.46
pH (S.U.) Instantaneous Maximum	7.66	7.58	7.41	7.28	7.41	7.44	7.57	7.63	7.49	7.58	7.72	7.73
TRC (mg/L) Average Monthly	0.04	0.07	0.10	0.08	0.15	0.17	0.25	0.24	0.13	0.12	0.12	0.05
TRC (mg/L) Instantaneous Maximum	0.08	0.11	0.29	0.37	0.48	0.37	0.45	0.44	0.18	0.15	0.33	0.16
TSS (mg/L) Average Monthly	< 4.0	1.0	< 4.0	1.0	< 4.0	1.0	1.8	1.5	< 4.0	0.80	1.0	3.5
TSS (mg/L) Instantaneous Maximum	< 4.0	5.0	< 4.0	5.0	< 4.0	5.0	5.0	6.0	< 4.0	4.0	5.0	5.0
Total Aluminum (mg/L) Average Monthly	< 0.02	0.08	0.005	0.02	0.03	0.005	0.03	0.07	0.05	0.12	0.20	0.01
Total Aluminum (mg/L) Instantaneous Maximum	< 0.02	0.32	0.02	0.03	1.20	0.02	0.11	0.19	0.07	0.31	0.35	0.04
Total Iron (mg/L) Average Monthly	0.16	0.41	0.60	0.57	0.49	0.13	0.15	0.22	0.10	0.18	0.20	0.05
Total Iron (mg/L) Instantaneous Maximum	0.41	1.00	1.20	1.20	0.74	0.22	0.38	0.32	0.11	0.32	0.29	0.22
Total Manganese (mg/L) Average Monthly	0.07	0.13	0.58	1.32	1.03	0.58	0.13	0.10	0.03	0.09	0.055	0.11
Total Manganese (mg/L) Instantaneous Maximum	0.09	0.21	1.10	4.40	1.60	1.50	0.44	0.27	0.08	0.22	0.08	0.39

Compliance History, continued

Effluent Violations for Outfall 001, from: November 1, 2023 to October 31, 2024

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Total Manganese	06/30/24	Avg Mo	1.03	mg/L	1.00	mg/L
Total Manganese	07/31/24	Avg Mo	1.32	mg/L	1.00	mg/L
Total Manganese	07/31/24	IMAX	4.40	mg/L	2.00	mg/L

Compliance History, continued

Summary of Inspections:	The wastewater facilities have been inspected approximately annually by the Department over the past permit term. The most recent inspection on November 21, 2024 identified eDMR effluent violations but no operational violations at the time of inspection.
Other Comments:	No open violations have been identified in eFACTS for Duncan Township Municipal Water Authority.

Existing Effluent Limitations and Monitoring Requirements

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
TSS	XXX	XXX	XXX	30.0	XXX	60.0	1/week	Grab
Total Aluminum	XXX	XXX	XXX	0.75	XXX	1.50	1/week	Grab
Total Iron	XXX	XXX	XXX	1.50	XXX	3.00	1/week	Grab
Total Manganese	XXX	XXX	XXX	1.00	XXX	2.00	1/week	Grab

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.0067
Latitude 41º 38' 30.78" **Longitude** -77º 16' 56.89"
Wastewater Description: Water Treatment Effluent

Technology-Based Limitations

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

Parameter	Limit (mg/l)	SBC
Total Suspended Solids	30	Average Monthly
	60	Daily Max
Total Iron	2	Average Monthly
	4	Daily Max
Total Aluminum	4	Average Monthly
	8	Daily Max
Total Manganese	1	Average Monthly
	2	Daily Max
TRC	0.5	Average Monthly
pH	6.0 – 9.0 S.U.	Min – Max

Comments: The above limits have been determined by the Department to be applicable to filter backwash, waste sludges and other related water treatment plant wastes as listed in the Department's *Technology-Based Control Requirements for Water Treatment Plant Wastes* guidance document *(Doc. ID 362-2183-003)*. More stringent limitations have been implemented for the discharge pursuant to BPJ for Total Iron and Total Aluminum as further discussed below.

Water Quality-Based Limitations

A "Reasonable Potential Analysis" determined that no additional water quality-based limitations are necessary for the discharge.

Total Residual Chlorine

The Department uses a modeling spreadsheet to analyze the toxicity of a discharge's TRC in a receiving stream, accounting for available dilution. The attached results of the TRC spreadsheet (see Attachment C) show that the existing technology-based limit of 0.5 mg/l is adequate to protect the receiving stream.

Best Professional Judgment (BPJ) Limitations

Comments: The discharge has existing limitations for Total Aluminum, Total Iron, and Total Manganese established pursuant to BPJ as listed in the following table to address the instream impairments from AMD. These were based on Chapter 93 criteria and the Aluminum and Manganese limits are more stringent than the technology-based limits listed above.

Parameter	WQ Criteria	Regulation
Total Aluminum	0.75	25 PA § 93.8c
Total Iron	1.50	25 PA § 93.7
Total Manganese	1.00	25 PA §93.7

Chesapeake Bay Nutrient Limitations

A portion of the Chesapeake Bay and many of its tidal tributaries have been listed as impaired under Section 303(d) of the Water Pollution Control Act, 33 U.S.C. §1313(d). Total Nitrogen and Total Phosphorus cap loads have been established for significant dischargers in Pennsylvania to reduce the total nutrient load to the Bay and meet State of Maryland Water Quality Standards. The Duncan Township Municipal Water Authority facility is not a Chesapeake Bay Significant Industrial Wastewater discharger. No net nutrient loadings are expected in discharge and therefore, no additional monitoring is being required at this time.

Anti-Backsliding

Consistent with the anti-backsliding requirements of the Clean Water Act and 40 CFR 122.44(l) no proposed limitations have been made less stringent.

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) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
TSS	XXX	XXX	XXX	30.0	XXX	60.0	1/week	Grab
Total Aluminum	XXX	XXX	XXX	0.75	XXX	1.50	1/week	Grab
Total Iron	XXX	XXX	XXX	1.50	XXX	3.00	1/week	Grab
Total Manganese	XXX	XXX	XXX	1.00	XXX	2.00	1/week	Grab

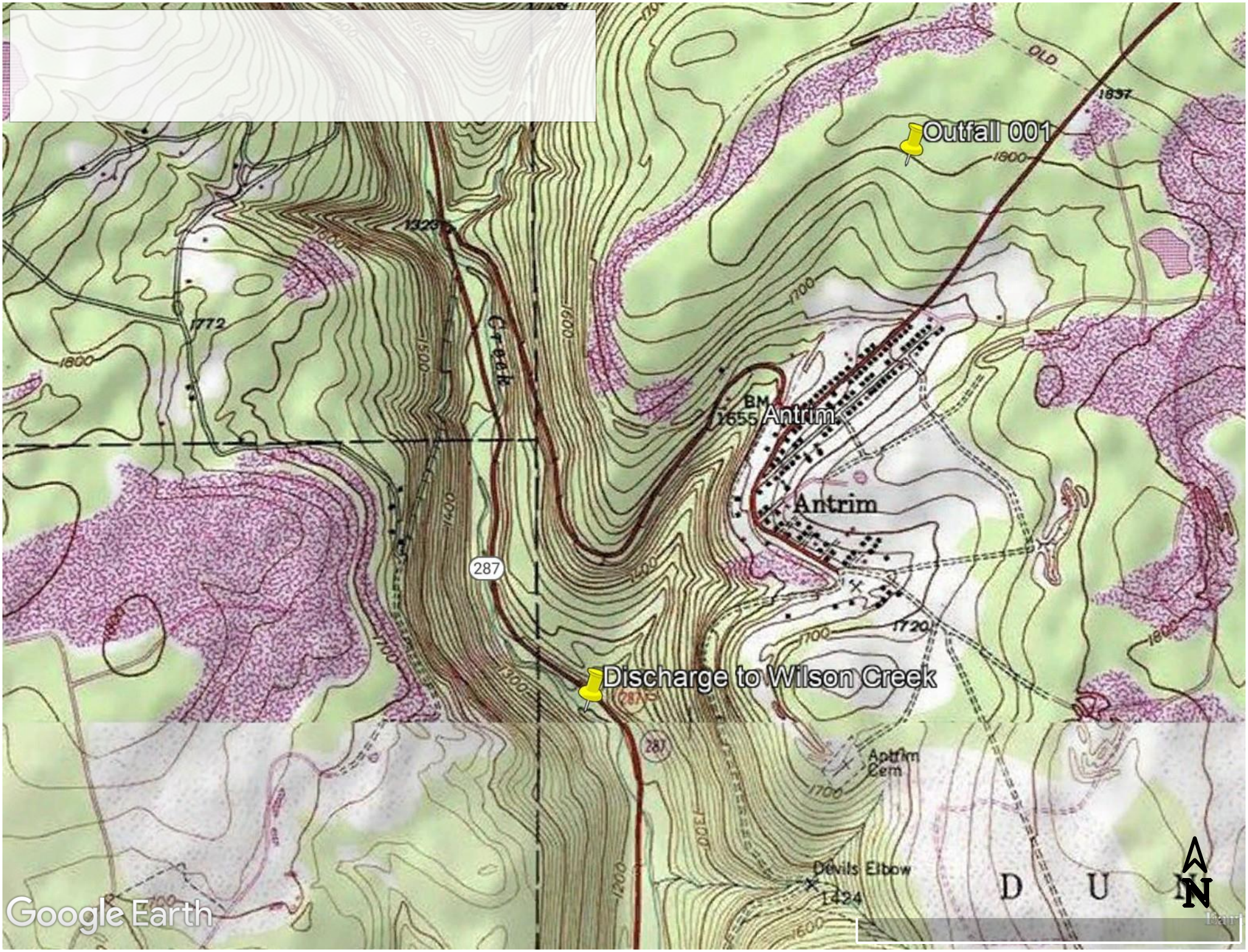
Compliance Sampling Location: Outfall 001

Other Comments: The above limitations and monitoring are unchanged from the current permit.

Tools and References Used to Develop Permit	
☐	WQM for Windows Model (see Attachment)
☒	Toxics Management Spreadsheet (see Attachment **B**)
☒	TRC Model Spreadsheet (see Attachment **C**)
☐	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, 386-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 386-2000-019, 3/98.
☒	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 386-2000-018, 11/96.
☒	Technology-Based Control Requirements for Water Treatment Plant Wastes, 386-2183-001, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 386-2183-002, 12/97.
☐	Pennsylvania CSO Policy, 386-2000-002, 9/08.
☐	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 386-2000-008, 4/97.
☒	Determining Water Quality-Based Effluent Limits, 386-2000-004, 12/97.
☒	Implementation Guidance Design Conditions, 386-2000-007, 9/97.
☐	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 386-2000-016, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 386-2000-012, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 386-2000-009, 3/99.
☒	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 386-2000-015, 5/2004.
☐	Implementation Guidance for Section 93.7 Ammonia Criteria, 386-2000-022, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 386-2000-013, 4/2008.
☐	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 386-2000-011, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 386-2000-001, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 386-2000-021, 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, 386-2000-020, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 386-2000-005, 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, 386-2000-010, 3/1999.
☐	Design Stream Flows, 386-2000-003, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 386-2000-006, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 386-3200-001, 6/97.
☒	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☐	SOP:
☐	Other:

Attachment(s):

- Discharge Location Map
- Toxics Management Spreadsheet
- TRC Model


Outfall 001
Discharge to Wilson Creek
Antrim
BM 1655
Antrim
Creek
287
Antrim Cem
Devils Elbow
1424
OLD
1837
1772
1720
D U
N
Google Earth

Discharge Information

Instructions | Discharge | Stream

Facility: **Duncan Twp WTP** NPDES Permit No.: **PA0229172** Outfall No.: **001**

Evaluation Type **Custom / Additives** Wastewater Description: **Water Treatment Wastewater**

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
0.0067	100	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
Total Aluminum	mg/L		2.5									
Total Iron	mg/L		3									
Total Manganese	mg/L		2.6									

Stream / Surface Water Information

Duncan Twp WTP, NPDES Permit No. PA0229172, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Wilson Creek**

No. Reaches to Model: **1**

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

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	021730	2.62	1198	18.91			Yes
End of Reach 1	021730	2.6	1174	19			Yes

***Q* 7-10**

Location	RMI	LFY (cfs/mi²)*	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	2.62	0.039										100	7		
End of Reach 1	2.6	0.039													

***Q* h**

Location	RMI	LFY (cfs/mi²)	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	2.62														
End of Reach 1	2.6														

Model Results

Duncan Twp WTP, NPDES Permit No. PA0229172, 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)
2.62	0.74		0.74	0.01	0.227	1.001	5.822	5.817	0.128	0.01	0.095
2.6	0.74		0.741								

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)
2.62	5.69		5.69	0.01	0.227	2.447	5.822	2.38	0.4	0.003	0.025
2.6	5.718		5.72								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 0.095 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 7.00

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 Aluminum	0	0		0	750	750	54,114	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	

☑ ***CFC*** CCT (min): 0.095 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 7.00

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 Aluminum	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	108,229	WQC = 30 day average; PMF = 1
Total Manganese	0	0		0	N/A	N/A	N/A	

☑ ***THH*** CCT (min): 0.095 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 Aluminum	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	1,000	1,000	72,153	

☑ ***CRL*** CCT (min): 0.025 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 Aluminum	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Manganese	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

☑ ***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 Aluminum	34.7	mg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	108,229	µg/L	Discharge Conc ≤ 10% WQBEL
Total Manganese	72,153	µg/L	Discharge Conc ≤ 10% WQBEL

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.07	= Q stream (cfs)	0.5	= CV Daily
0.0067	= 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)		=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 2.173	1.3.2.iii	WLA cfc = 2.111
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.810	5.1d	LTA_cfc = 1.227

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)