pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0096601**
Facility Type	**Municipal**	APS ID	**813026**
Major / Minor	**Minor**	Authorization ID	**1264029**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Lower Ten Mile Joint Sewer Authority**	Facility Name	**Williamstown STP**
Applicant Address	144 Chartiers Road	Facility Address	Sr 2039 Main Street
	Jefferson, PA 15344-4115		Jefferson, PA 15344
Applicant Contact	Mr. Kenneth Frameli	Facility Contact	Mr. Bruce Howard
Applicant Phone	724.883.2743	Facility Phone	724.883.2743
Client ID	63436	Site ID	253753
Ch 94 Load Status	Existing Hydraulic Overload	Municipality	East Bethlehem Township
Connection Status	No Limitations	County	Washington
Date Application Received	March 4, 2019	EPA Waived?	Yes
Date Application Accepted	March 6, 2019	If No, Reason	

Purpose of Application: Application for renewal of an NPDES permit for the discharge of treated Sewage.

Summary of Review

The applicant has applied for a renewal of an existing NPDES Permit No. PA0096601, which was previously issued by the Department on October 27, 2014. That permit expired on October 31, 2019.

The receiving stream, Tenmile Creek, is currently classified as a WWF and is located in State Watershed No. 19-B.

WQM Permit No. 3086402 authorized the construction of the plant to treat an annual average design flow of 0.185 MGD. The existing treatment process consists of influent pump station, mechanical fine screening, a vortex grit separation system, four aerated lagoons, and chlorine disinfection. The design organic capacity is 405 lbs/day.

As reported in the 2017 Chapter 94 Municipal Wasteload Management Report, the STP exceeded its permitted hydraulic design capacity resulting in a hydraulic overload condition. In a letter dated June 11, 2018, the Department required the Authority to submit a CAP to reduce the overload condition at the STP. On august 16, 2018, The Authority submitted the CAP to the Department which consisted of preforming a Re-rating Study to determine the flows and loadings each unit can handle while remaining in compliance with their NPDES Permit. The Department approved the CAP on October 25, 2018, with a requirement of biannual progress reports.

The Re-rate Study was submitted to the Department on December 23, 2019 and was later approved on October 6, 2022. The facility Design Flow/Hydraulic Design Capacity used to prepare the annual Chapter 94 Municipal Wasteload Management Report will be increased from 0.185 MGD to 0.299 MGD. The organic design capacity will remain unchanged at 405 lbs. BOD_5 per day.

Approve	Deny	Signatures	Date
X		William C. Mitchell, E.I.T. / Project Manager	October 17, 2022
X		Mahbuba Iasmin, Ph.D., P.E. / Environmental Engineering Manager	November 14, 2022

Summary of Review

Conditions of the Re-rate Study approval were as followed:

- The Authority will submit a revised NPDES Permit Renewal Application to the Department prior to finalizing the draft permit.
- Submission of a WQM Permit Amendment Application, which includes the Williams STP Engineers Re-rate Report, to the Department within 90 day of the Re-rate Study Approval.

Act 537 Planning Approval is not required, as the increase in design flow is wet weather related.

The applicant has complied with Act 14 Notifications and no comments were received. The application states that the STP receives no IW wastewater contributions and does not receive hauled-in wastes. Application data indicates that there is a total of 17 commercial establishments connected to the collection system.

Sludge use and disposal description and location(s): Sewage sludge or biosolids produced by this facility are currently being managed under beneficial use permit PAG086112. The 2021 Chapter 94 Report states that no sludge was hauled from this facility for land application in 2021. Application data indicates that biosolids have been land applied at Watters Farm, Whitley Township, Greene County in 2017.

Public Participation

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

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.299
Latitude	39º 58' 46.00"	Longitude	-80º 02' 02.00"
Quad Name	Mather	Quad Code	1905
Wastewater Description:	Sewage Effluent		
Receiving Waters	Tenmile Creek (WWF)	Stream Code	40285
NHD Com ID	99413130	RMI	2.63
Drainage Area	334	Yield (cfs/mi^2)	0.031736
Q_{7-10} Flow (cfs)	10.6	Q_{7-10} Basis	USGS StreamStats Version 1.2.22 (Attachment # 1)
Elevation (ft)	766	Slope (ft/ft)	0.0003
Watershed No.	19-B	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use	NONE	Exceptions to Criteria	NONE
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		Tri-County Joint Municipal Authority	
PWS Waters	Monongahela River	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	

Changes Since Last Permit Issuance: Plant Re-rate approved, and the facility Design Flow/Hydraulic Design Capacity used to prepare the annual Chapter 94 Municipal Wasteload Management Report has increased from 0.185 MGD to 0.299 MGD. The organic design capacity will remain unchanged at 405 lbs. BOD_5 per day.

Other Comments: N/A

Treatment Facility Summary

Treatment Facility Name: Williamstown STP

WQM Permit No.	Issuance Date
3086402	08/25/1987
3086402 A-1	02/14/2012

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary with Ammonia Reduction	Stabilization Lagoon	Chlorine	0.249 (2018)

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.299	405	Existing Hydraulic Overload	Sludge Lagoon	Biosolids were land applied at the Watters Farm, Whitley Township, Green County

Changes Since Last Permit Issuance: Plant Re-rate approved, and the facility Design Flow/Hydraulic Design Capacity used to prepare the annual Chapter 94 Municipal Wasteload Management Report has increased from 0.185 MGD to 0.299 MGD. The organic design capacity will remain unchanged at 405 lbs. BOD_5 per day.

Other Comments: WQM Permit No. 3086402 authorized the construction of the plant to treat an annual average design flow of 0.185 MGD. The existing treatment process consists of influent pump station, mechanical fine screening, a vortex grit separation system, four aerated lagoons, and chlorine disinfection.

Conditions of the Re-rate Study approval are as followed:

- The Authority will submit a revised NPDES Permit Renewal Application and GIF to the Department prior to finalizing the draft permit.
- Submission of a WQM Permit Amendment Application, which includes the Williams STP Engineers Re-rate Report, within 90 day of the Re-rate Study Approval.

Compliance History

Operations Compliance Check Summary Report

Facility: Williamstown STP

NPDES Permit No.: PA0096601

Compliance Review Period: 8/2017-8/2022

Inspection Summary:

INSPECTED DATE	INSP TYPE	AGENCY	INSPECTION RESULT DESC
07/16/2021	Biosolids Processor Compliance Eval Insp	PA Dept of Environmental Protection	No Violations Noted
07/16/2021	Compliance Evaluation	PA Dept of Environmental Protection	No Violations Noted
07/16/2021	Administrative/File Review	PA Dept of Environmental Protection	No Violations Noted

Violation Summary:

No violations noted

Open Violations by Client ID:

No open violations for Client ID 63436

Enforcement Summary:

No enforcements executed during review period

Effluent Violation Summary:

Mon Pd End	OUTFALL	PARAMETER	SAMPLE	PERMIT	UNIT	STAT_BASE_CODE
2/28/2019	1	Total Suspended Solids	53.4	46	lbs/day	Average Monthly

Compliance Status: Facility is currently in compliance with no open violations or pending enforcements, but a CAP is in effect due to hydraulic overload. Review of CAP to follow with summary to follow in a separate email.

Completed by: Amanda Schmidt

Completed date: 9/13/22

Compliance History

DMR Data for Outfall 001 (from August 1, 2021 to July 31, 2022)

Parameter	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21
Flow (MGD) Average Monthly	0.12	0.17	0.212	0.234	0.233	0.282	0.236	0.151	0.129	0.102	0.155	0.132
Flow (MGD) Daily Maximum	0.14	0.77	0.246	1.34	0.41	0.350	0.410	0.250	0.200	0.203	0.210	0.190
pH (S.U.) Minimum	6.8	6.8	6.7	7.4	7.2	7.4	7.3	7.3	7.1	6.4	6.5	6.7
pH (S.U.) Maximum	7.0	7.2	7.8	7.8	8.0	7.9	7.9	7.7	7.5	7.2	7.3	7.1
DO (mg/L) Minimum	7.2	6.7	8.0	8.1	8.20	9.1	8.4	8.9	9.3	6.1	7.4	7.1
TRC (mg/L) Average Monthly	0.24	0.24	0.3	0.26	0.3	0.2	0.3	0.3	0.3	0.3	0.2	0.2
TRC (mg/L) Instantaneous Maximum	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4
CBOD5 (lbs/day) Average Monthly	2.4	10.7	5.1	7.1	5.0	5	5	4	3.0	2.3	4.6	2.3
CBOD5 (lbs/day) Weekly Average	2.4	10.7	5.1	7.1	5.0	5	5	4	3.0	2.3	4.6	2.3
CBOD5 (mg/L) Average Monthly	2.3	5	3.0	3.3	2.3	2.3	2.5	2.9	3.2	2.2	3.8	2
CBOD5 (mg/L) Weekly Average	2.3	5	3.0	3.3	2.3	2.3	2.5	2.9	3.2	2.2	3.8	2
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	125	233	135	627	51	151	80	66.9	115	82	94	100
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	214	510	170	2216	92	245.8	136	80.7	206	89	158	114
BOD5 (mg/L) Raw Sewage Influent Average Monthly	126	146	107	75	32	80.5	58.4	49.9	112	77.6	72	69
BOD5 (mg/L) Raw Sewage Influent Weekly Average	126	146	107	75	32	80.5	58.4	49.9	112	77.6	72	69

TSS (lbs/day) Average Monthly	5.4	4.7	8.6	8.8	10.6	10.2	10.4	7.0	5.9	6	11.8	5.8
TSS (lbs/day) Raw Sewage Influent Average Monthly	143	196	131	595	55	251.4	187	84.9	169	121	33	169
TSS (lbs/day) Raw Sewage Influent Daily Maximum	240	382	178	1996	82	487.7	210	198.1	346	168	36	245
TSS (lbs/day) Weekly Average	5.4	4.7	8.6	8.8	10.6	10.2	10.4	7.0	5.9	6	11.8	5.8
TSS (mg/L) Average Monthly	5.2	5.0	5.0	5.0	5	5	5	5	5	5.7	9	5
TSS (mg/L) Raw Sewage Influent Average Monthly	145	127	95	80	34	122	101	55	134	115	27	132
TSS (mg/L) Raw Sewage Influent Weekly Average	145	127	95	80	34	122	101	55	134	115	27	132
TSS (mg/L) Weekly Average	5.2	5.0	5.0	5.0	5	5	5	5	5	5.7	9	5
Fecal Coliform (CFU/100 ml) Geometric Mean	1.3	6.0	6.7	1.1	14.5	12.7	353	90.2	19.9	9.4	42	5.8
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	193	64	98	2	54	122	930	194	252	124	189	96
Total Nitrogen (mg/L) Daily Maximum								59.5				
Ammonia (lbs/day) Average Monthly	0.7	0.11	4.0	20.1	17.5	28.9	34	27.4	11.6	0.5	2.2	0.2
Ammonia (lbs/day) Weekly Average	0.7	0.11	4.0	20.1	17.5	28.9	34	27.4	11.6	0.5	2.2	0.2
Ammonia (mg/L) Average Monthly	0.7	0.1	4.8	9.0	5	14	15.7	19	10.2	0.4	1.4	0.2
Ammonia (mg/L) Weekly Average	0.7	0.1	4.8	9.0	5	14	15.7	19	10.2	0.4	1.4	0.2
Total Phosphorus (mg/L) Daily Maximum								3.29				

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.299
Latitude 39º 58' 46.00" **Longitude** -80º 02' 02.00"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

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

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
$CBOD_5$	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	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)
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)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)

Comments: The discharge was evaluated using WQM 7.0 Version 1.1 & TRC_CALC (Attachments 2, 3, and 5) to evaluate $CBOD_5$, Ammonia Nitrogen, Dissolved Oxygen, and TRC parameters. The modeling results show the above technology based effluent limitations for $CBOD_5$ and TRC are appropriate.

Water Quality-Based Limitations

A “Reasonable Potential Analysis” (TMS Version 1.3) was conducted.

The following limitations were determined through water quality modeling for the facility (Attachments 2, 3, and 4):

Parameter	Limit (mg/l)	SBC	Model
Ammonia-Nitrogen (Nov 1 to Apr 30)	25.0	Average Monthly	WQM 7.0 Version 1.1
Ammonia-Nitrogen (May 1 to Oct 31)	11.0	Average Monthly	WQM 7.0 Version 1.1

Comments: DMR data above confirms that the applicant can comply with the revised ammonia-nitrogen limits, which are based upon updated criteria and StreamStat data (Attachment 1).

The TMS recommended monitoring for total copper because the discharge concentration is greater than 10% of the WQBEL.

Best Professional Judgment (BPJ) Limitations

Comments: A minimum Dissolved Oxygen (DO) limit of 4.0 mg/L should be established based on BPJ to ensure adequate operation and maintenance (Section I.A, Note 6, SOP for Clean Water Program, Establishing Effluent Limitations for Individual Sewage Permits, Final November 9, 2012, Revised March 24, 2021, Version 1.9)

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.

The facility is not seeking to revise the previously permitted effluent limits.

Additional Considerations

Monitoring frequency for the proposed effluent limits are based upon Table 6-3, Self-Monitoring Requirements for Sewage Dischargers, from the Departments Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits (Document No. 362-0400-001).

For POTWs, mass loading limits will be established for CBOD5, TSS, NH3-N, and where necessary Total P and Total N. In general, average monthly mass loading limits will be established for CBOD5, TSS, NH3-N, and where necessary Total P and Total N, and average weekly mass loading limits will be established for CBOD5 and TSS (Section IV, SOP for Clean Water Program, Establishing Effluent Limitations for Individual Sewage Permits, Final November 9, 2012, Revised March 24, 2021, Version 1.9)

For POTWs with design flows greater than 2,000 GPD and for non-municipal sewage facilities that service municipalities or portions thereof, the application manager will establish influent BOD5 and TSS monitoring in the permit using the same frequency and sample type as is used for other effluent parameters (Section IV.E.8, SOP for Clean Water Program, New and Reissuance Sewage Individual NPDES Permit Applications, Final November 9, 2012, Revised February 3, 2022, Version 2.0).

Sewage discharges will include monitoring, at a minimum, for *E. Coli*, in new and reissued permits, with a monitoring frequency of 1/quarter for facilities with design flows of >= 0.05 MGD and < 1.0 MGD per Chapter 92a.61.

Nutrient monitoring is required to establish the nutrient load from the wastewater treatment facility and the impacts that load may have on the quality of the receiving stream(s). A 1/year monitoring requirement for Total Nitrogen & Total Phosphorus has been added to the permit per Chapter 92a.61.

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	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	1/week	Metered
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	4.0 Inst Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	60.0	95.0	XXX	25.0	40.0	50	1/week	8-Hr Composite
BOD5 Raw Sewage Influent	Report	Report	XXX	Report	Report	XXX	1/week	8-Hr Composite
TSS Raw Sewage Influent	Report	Report	XXX	Report	Report	XXX	1/week	8-Hr Composite
TSS	70.0	110.0	XXX	30.0	45.0	60	1/week	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	8-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	62.3	XXX	XXX	25.0	XXX	50	1/week	8-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	27.4	XXX	XXX	11.0	XXX	22	1/week	8-Hr Composite

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	Weekly Average	Instant. Maximum		
Total Phosphorus	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	8-Hr Composite
Total Copper	Report	XXX	XXX	Report	Report Daily Max	XXX	1/week	24-Hr Composite

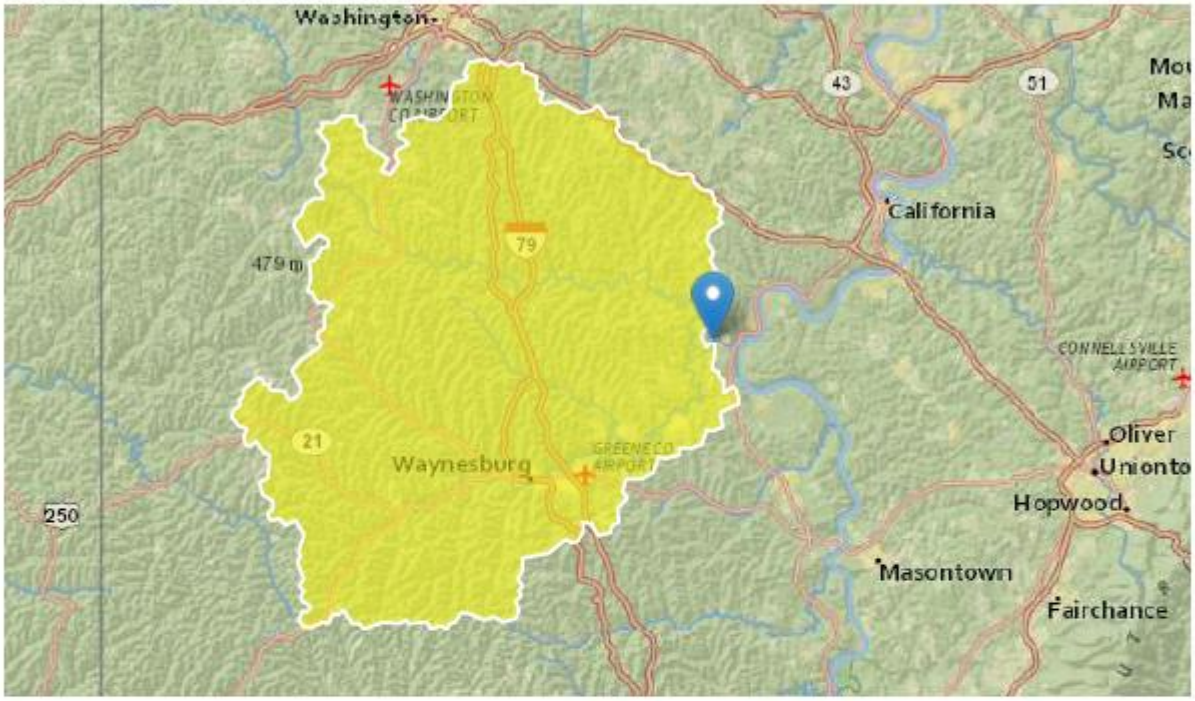
Compliance Sampling Location: Outfall 001

Other Comments: N/A

Attachment 1 – USGS StreamStats Report

StreamStats Report - PA0096601

Region ID: PA
Workspace ID: PA20220831140938968000
Clicked Point (Latitude, Longitude): 39.98006, -80.03302
Time: 2022-08-31 10:10:02 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	334	square miles
ELEV	Mean Basin Elevation	1184	feet

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 4]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	334	square miles	2.26	1400
ELEV	Mean Basin Elevation	1184	feet	1050	2580

Low-Flow Statistics Flow Report [Low Flow Region 4]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	20.8	ft^3/s	43	43
30 Day 2 Year Low Flow	30.6	ft^3/s	38	38
7 Day 10 Year Low Flow	10.6	ft^3/s	66	66
30 Day 10 Year Low Flow	14.6	ft^3/s	54	54
90 Day 10 Year Low Flow	22.4	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: 4.10.1
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

Attachment 2 – WQM 7.0 Version 1.1 – Warmer Period

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
19B	40285	TENMILE CREEK	2.630	767.00	334.00	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	0.032	0.00	0.00	0.000	0.000	0.0	130.20	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
Williamstown TP	PA0096601	0.2990	0.2990	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	25.00	2.00	0.00	1.50
Dissolved Oxygen	4.00	8.24	0.00	0.00
NH3-N	11.00	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
19B	40285	TENMILE CREEK	2.000	766.00	334.30	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	0.032	0.00	0.00	0.000	0.000	0.0	225.78	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
		0.0000	0.0000	0.0000	0.000	0.00	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
19B	40285	TENMILE 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												
2.630	10.60	0.00	10.60	.4626	0.00030	.477	130.2	272.76	0.18	0.216	24.79	7.00
Q1-10 Flow												
2.630	6.78	0.00	6.78	.4626	0.00030	NA	NA	NA	0.14	0.274	24.68	7.00
Q30-10 Flow												
2.630	14.42	0.00	14.42	.4626	0.00030	NA	NA	NA	0.21	0.183	24.84	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
19B	40285	TENMILE 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
2.630	Williamstown TP	11.37	22	11.37	22	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
2.630	Williamstown TP	1.38	11	1.38	11	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)		
2.63	Williamstown TP	25	25	11	11	4	4	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
19B	40285	TENMILE CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
2.630	0.299	24.791	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
130.200	0.477	272.761	0.178
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.96	0.463	0.46	1.012
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.063	0.365	Tsivoglou	5
Reach Travel Time (days)			
0.216			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.022	2.92	0.45	7.57
0.043	2.89	0.44	7.57
0.065	2.85	0.43	7.57
0.087	2.82	0.42	7.57
0.108	2.78	0.41	7.57
0.130	2.75	0.40	7.51
0.151	2.71	0.39	7.43
0.173	2.68	0.39	7.35
0.195	2.65	0.38	7.27
0.216	2.61	0.37	7.19

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
19B	40285	TENMILE 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)
2.630	Williamstown TP	PA0096601	0.299	CBOD5	25		
				NH3-N	11	22	
				Dissolved Oxygen			4

Attachment 3 – WQM 7.0 Version 1.1 – Colder Period

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
19B	40285	TENMILE CREEK	2.630	767.00	334.00	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	0.063	0.00	0.00	0.000	0.000	0.0	130.20	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
Williamstown TP	PA0096601	0.2990	0.2990	0.0000	0.000	15.00	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	4.00	12.51	0.00	0.00
NH3-N	25.00	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
19B	40285	TENMILE CREEK	2.000	766.00	334.30	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	0.063	0.00	0.00	0.000	0.000	0.0	225.78	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
		0.0000	0.0000	0.0000	0.000	0.00	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
19B	40285	TENMILE 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												
2.630	21.20	0.00	21.20	.4626	0.00030	.642	130.2	202.94	0.26	0.148	5.21	7.00
Q1-10 Flow												
2.630	13.57	0.00	13.57	.4626	0.00030	NA	NA	NA	0.20	0.189	5.33	7.00
Q30-10 Flow												
2.630	28.83	0.00	28.83	.4626	0.00030	NA	NA	NA	0.31	0.125	5.16	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
19B	40285	TENMILE 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
2.630	Williamstown TP	24.1	50	24.1	50	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
2.630	Williamstown TP	4.36	25	4.36	25	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)		
2.63	Williamstown TP	25	25	25	25	4	4	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
19B	40285	TENMILE CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
2.630	0.299	5.214	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
130.200	0.642	202.939	0.259
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.49	0.307	0.53	0.224
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
12.328	0.532	Tsivoglou	5
Reach Travel Time (days)			
0.148			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.015	2.49	0.53	11.39
0.030	2.48	0.53	11.39
0.045	2.47	0.53	11.39
0.059	2.47	0.53	11.39
0.074	2.46	0.53	11.39
0.089	2.46	0.52	11.39
0.104	2.45	0.52	11.39
0.119	2.45	0.52	11.39
0.134	2.44	0.52	11.39
0.148	2.43	0.52	11.39

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
19B	40285	TENMILE 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)
2.630	Williamstown TP	PA0096601	0.299	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			4

Attachment 4 – TMS Version 1.3

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Williamstown STP** NPDES Permit No.: **pa0096601** Outfall No.: **001**

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

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
0.299	100	7						

	Discharge Pollutant	Units	Max Discharge Conc		0 if left blank: Trib Conc	0 if left blank: Stream Conc	0.5 if left blank: Daily CV	0.5 if left blank: Hourly CV	0 if left blank: Stream CV	0 if left blank: Fate Coeff	0 if left blank: FOS	1 if left blank: Criteria Mod	1 if left blank: Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L		330									
	Chloride (PWS)	mg/L		34									
	Bromide	mg/L	<	0.6									
	Sulfate (PWS)	mg/L		63.3									
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L											
	Total Antimony	µg/L											
	Total Arsenic	µg/L											
	Total Barium	µg/L											
	Total Beryllium	µg/L											
	Total Boron	µg/L											
	Total Cadmium	µg/L											
	Total Chromium (III)	µg/L											
	Hexavalent Chromium	µg/L											
	Total Cobalt	µg/L											
	Total Copper	µg/L	<	10									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L											
	Total Iron	µg/L											
	Total Lead	µg/L	<	0.5									
	Total Manganese	µg/L											
	Total Mercury	µg/L											
	Total Nickel	µg/L											
	Total Phenols (Phenolics) (PWS)	µg/L											
	Total Selenium	µg/L											
	Total Silver	µg/L											
	Total Thallium	µg/L											
	Total Zinc	µg/L	<	10									
	Total Molybdenum	µg/L											
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										

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

	2,6-Dinitrotoluene	µg/L	<											
	Di-n-Octyl Phthalate	µg/L	<											
	1,2-Diphenylhydrazine	µg/L	<											
	Fluoranthene	µg/L	<											
	Fluorene	µg/L	<											
	Hexachlorobenzene	µg/L	<											
	Hexachlorobutadiene	µg/L	<											
	Hexachlorocyclopentadiene	µg/L	<											
	Hexachloroethane	µg/L	<											
	Indeno(1,2,3-cd)Pyrene	µg/L	<											
	Isophorone	µg/L	<											
	Naphthalene	µg/L	<											
	Nitrobenzene	µg/L	<											
	n-Nitrosodimethylamine	µg/L	<											
	n-Nitrosodi-n-Propylamine	µg/L	<											
	n-Nitrosodiphenylamine	µg/L	<											
	Phenanthrene	µg/L	<											
	Pyrene	µg/L	<											
	1,2,4-Trichlorobenzene	µg/L	<											
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 1.3, March 2021

Stream / Surface Water Information

Williamstown STP, NPDES Permit No. pa0096601, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Tenmile 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	040285	2.63	767	334	0.0003		Yes
End of Reach 1	040285	2	766	334.3			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	2.63	0.031736				130.2						100	7		
End of Reach 1	2	0.031736				225.78									

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	2.63														
End of Reach 1	2														

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

Williamstown STP, NPDES Permit No. pa0096601, Outfall 001

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

☑ ***Hydrodynamics***

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

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)
2.63	10.60		10.60	0.463	0.0003	0.477	130.2	74.727	0.178	0.216	3733.642
2	10.61		10.6093448								

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)
2.63	58.49		58.49	0.463	0.0003	0.997	130.2	130.608	0.454	0.085	1326.743
2	58.538		58.54								

☑ ***Wasteload Allocations***

☑ *AFC* CCT (min): 15 PMF: 0.063 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 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 Copper	0	0		0	13.439	14.0	34.3	Chem Translator of 0.96 applied
Total Lead	0	0		0	64.581	81.6	200	Chem Translator of 0.791 applied
Total Zinc	0	0		0	117.180	120	294	Chem Translator of 0.978 applied

☑ *CFC* CCT (min): 720 PMF: 0.439 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 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 Copper	0	0		0	8.956	9.33	103	Chem Translator of 0.96 applied
Total Lead	0	0		0	2.517	3.18	35.2	Chem Translator of 0.791 applied
Total Zinc	0	0		0	118.139	120	1,326	Chem Translator of 0.986 applied

☑ ***THH*** CCT (min): 720 PMF: 0.439 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 Copper	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***CRL*** CCT (min): 720 PMF: 0.737 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 Copper	0	0		0	N/A	N/A	N/A	
Total Lead	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 Copper	Report	Report	Report	Report	Report	µg/L	22.0	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 Lead	N/A	N/A	Discharge Conc < TQL
Total Zinc	188	µg/L	Discharge Conc ≤ 10% WQBEL

Attachment 5 – TRC_CALC

Copy of TRC_CALC

TRC EVALUATION

10.6	= Q stream (cfs)	0.5	= CV Daily
0.299	= 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)
	= % Factor of Safety (FOS)		=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 7.329	1.3.2.iii	WLA cfc = 7.138
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 2.731	5.1d	LTA_cfc = 4.150

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)**