pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0028681**
Facility Type	**Municipal**	APS ID	**1038238**
Major / Minor	**Major**	Authorization ID	**1353756**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Kelly Township Municipal Authority Union County**	Facility Name	**Kelly Township Municipal Authority Sewer System**
Applicant Address	405 Winter Farm Lane	Facility Address	405 Winter Farm Lane
	Lewisburg, PA 17837-6358		Lewisburg, PA 17837
Applicant Contact	Matthew Koch	Facility Contact	Matthew Koch
Applicant Phone	(570) 523-3843	Facility Phone	(570) 523-3843
Client ID	78499	Site ID	458712
Ch 94 Load Status	Not Overloaded	Municipality	Kelly Township
Connection Status	No Limitations	County	Union
Date Application Received	May 6, 2021	EPA Waived?	No
Date Application Accepted	May 20, 2021	If No, Reason	Major Facility, Significant CB Discharge
Purpose of Application	Renewal of a NDPES Permit		

Summary of Review

This facility is a municipal sewage treatment plant serving portions of Kelly Township and White Deer Township in Union County. A map indicating the discharge location is attached (Attachment A).

Sludge use and disposal description and location(s): The facility's dewatered sludge is disposed by landfill. According to the application approximately 352 dry tons were disposed in the previous year.

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
✓		*Keith C. Allison* Keith C. Allison / Project Manager	January 26, 2021
✓		*Nicholas W. Hartranft* Nicholas W. Hartranft, P.E. / Environmental Engineer Manager	January 27, 2021

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	3.75
Latitude	40º 58' 57.52"	Longitude	-76º 52' 28.77"
Quad Name	Lewisburg, PA	Quad Code	1130
Wastewater Description:	Sewage Effluent		
Receiving Waters	West Branch Susquehanna River (WWF, MF)	Stream Code	18668
NHD Com ID	66920359	RMI	8.77
Drainage Area	6690	Yield (cfs/mi^2)	0.122
Q_{7-10} Flow (cfs)	838	Q_{7-10} Basis	USGS Gage 01553500, West Branch Susquehanna R. @ Lewisburg
Elevation (ft)	434	Slope (ft/ft)	0.0003
Watershed No.	10-D	Chapter 93 Class.	WWF, MF
Existing Use	N/A	Existing Use Qualifier	N/A
Exceptions to Use	None	Exceptions to Criteria	None
Assessment Status	Impaired		
Cause(s) of Impairment	POLYCHLORINATED BIPHENYLS (PCBS)		
Source(s) of Impairment	SOURCE UNKNOWN		
TMDL Status	Final	Name	West Branch Susquehanna
Nearest Downstream Public Water Supply Intake	Sunbury Municipal Authority		
PWS Waters	Susquehanna River	Flow at Intake (cfs)	9.28
PWS RMI	108	Distance from Outfall (mi)	Approx. 12

Changes Since Last Permit Issuance: The above stream and drainage characteristics are from the previous review and remain adequate.

Other Comments:

This discharge is not expected to be a contributor to the above-listed impairment to the River by PCBs. In addition, the final TMDL for the West Branch Susquehanna River is for impairment upstream by AMD. Levels in the discharge for the three metals typically associated with AMD impairment (Aluminum, Iron, and Manganese) are all less than their respective instream criteria.

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

Treatment Facility Summary

Treatment Facility Name: Kelly Township Municipal Authority

WQM Permit No.	Issuance Date	Permit Covered:
6085403-A2	2/7/11	Phosphorus Removal
6085403-A1	9/14/07	Aeration System Upgrade
6085403	1/15/86	Additional Aeration Tank and Clarifier to upgrade the plant to 3.75 MGD

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Extended Aeration	Gas Chlorine	3.75

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
3.75	5630	Not Overloaded	Aerobic Digestion	Combination of methods

Changes Since Last Permit Issuance: None

Other Comments: The treatment system, as approved by WQM Permit No. 6085403 includes screening, aeration, Phosphorus removal, clarification, chlorination, aerobic digestion, and belt filter press.

Trucked-in Wastes

The facility typically only receives sewage sludge as hauled-in waste. The facility has also previously received Lycoming County Landfill leachate.

Stormwater Management

The facility has no defined stormwater conveyance system. Runoff is conveyed by sheet flow or infiltrated, ultimately draining to the West Branch Susquehanna River.

Stormwater requirements will be included in the NPDES permit because discharges from the facility meet the definition of a storm water discharge associated with industrial activity in 40 CFR §122.26(b)(14)(ix).

Compliance History

DMR Data for Outfall 001 (from December 1, 2020 to November 30, 2021)

Parameter	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21	APR-21	MAR-21	FEB-21	JAN-21	DEC-20
Flow (MGD) Average Monthly	1.159	1.304	1.775	1.252	1.325	0.911	0.966	1.179	1.291	0.979	1.038	1.074
Flow (MGD) Daily Maximum	2.127	3.322	4.147	3.047	2.72	1.501	1.486	2.392	2.522	2.288	1.845	3.635
pH (S.U.) Minimum	7.0	7.0	6.8	6.6	6.8	6.7	6.4	6.7	6.8	6.7	6.4	6.9
pH (S.U.) Maximum	7.4	7.3	7.3	7.3	7.3	7.0	7.3	7.1	7.5	7.8	7.2	7.5
DO (mg/L) Minimum	2.9	5.1	6.9	5.4	6.5	6.0	5.7	5.1	5.0	6.3	3.5	4.0
TRC (mg/L) Average Monthly	0.2	0.2	0.2	0.3	0.27	0.23	0.22	0.3	0.23	0.3	0.4	0.3
TRC (mg/L) Instantaneous Maximum	0.6	0.85	0.6	1.1	0.61	0.78	0.46	0.7	0.66	0.5	1.4	1.2
CBOD5 (lbs/day) Average Monthly	< 26	< 22	< 39	< 31	< 26	21	20	23	25	13	19	22
CBOD5 (lbs/day) Weekly Average	38	25	75	39	< 31	35	23	29	27	15	27	43
CBOD5 (mg/L) Average Monthly	< 2.9	< 2.3	< 2.6	3	< 2.3	2.7	2.4	2	2	1.8	2	2.3
CBOD5 (mg/L) Weekly Average	4.9	< 2.8	3	3	2.5	4.6	2.7	3	3	2.2	2	2.6
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	950	1223	1353	1164	1927	1285	1365	1344	1070	997	815	1240
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	1347	1864	3485	1700	2742	1892	1802	1849	2803	1798	1156	4955
BOD5 (mg/L) Raw Sewage Influent Average Monthly	102	132	92	122	168	201	169	146	94	139	98	121
TSS (lbs/day) Average Monthly	< 45	< 40	< 72	< 46	52	33	38	40	45	30	35	39
TSS (lbs/day) Raw Sewage Influent Average Monthly	837	945	1430	768	1504	1038	1165	1727	966	832	600	1208
TSS (lbs/day) Raw Sewage Influent Daily Maximum	147	1699	4629	1258	2625	1567	1408	5479	3209	1624	1050	5882

TSS (lbs/day) Weekly Average	69	< 48	200	< 79	69	38	60	48	52	37	45	73
TSS (mg/L) Average Monthly	< 5	< 4	< 4	< 4	< 4	4	4	4	4	4	4	4
TSS (mg/L) Raw Sewage Influent Average Monthly	91	101	91	81	135	162	145	188	85	117	72	108
TSS (mg/L) Weekly Average	7	< 5	8	< 5	< 5	6	6	5	4	4	5	4
Fecal Coliform (CFU/100 ml) Geometric Mean	3	< 2	11	< 4	7	124	15	14	68	20	55	23
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	11	16.1	276	17	201.4	> 2420	120	2420	770	127	649	2420
Nitrate-Nitrite (mg/L) Average Monthly	6.9	11.8	11	13	11.7	17	15	11	7	14	26	12.7
Nitrate-Nitrite (lbs) Total Monthly	2020	3523	4867	4124	4107	3952	3722	3018	2688	2953	6608	3773
Total Nitrogen (mg/L) Average Monthly	< 10.6	< 13.2	< 13.2	< 15	< 13.5	< 17.9	20	18	11	16	32	15.7
Total Nitrogen (lbs) Effluent Net Total Monthly	< 2998	< 3935	< 5746	< 4563	< 4758	< 4142	4932	5168	3912	3353	8323	4454
Total Nitrogen (lbs) Total Monthly	< 2998	< 3935	< 5746	< 4563	< 4758	< 4142	4932	5168	3912	3353	8323	4454
Ammonia (mg/L) Average Monthly	< 2.6	< 0.55	< 0.7	< 0.4	< 0.25	< 0.3	0.6	6	2	0.1	5	0.12
Ammonia (lbs) Total Monthly	< 681	< 157	< 347	< 155	< 90	< 76	154	1793	511	21	1328	34
TKN (mg/L) Average Monthly	< 3.7	< 1.4	< 2.1	< 1	< 1.8	< 1.7	5	8	3	2	6	2.9
TKN (lbs) Total Monthly	< 977	< 412	< 880	< 439	< 651	< 413	1210	2150	1224	400	1714	681
Total Phosphorus (mg/L) Average Monthly	2	1.63	1.5	3	1.8	2.8	2.2	2	1	1.3	1.4	1.5
Total Phosphorus (lbs) Effluent Net Total Monthly	579	488	693	886	627	664	543	421	345	271	366	437
Total Phosphorus (lbs) Total Monthly	579	488	693	886	627	664	543	421	345	271	366	437

Compliance History, Cont'd

Effluent Violations for Outfall 001, from: from December 1, 2020 to November 30, 2021

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Fecal Coliform	06/30/21	IMAX	> 2420	CFU/100 ml	1000	CFU/100 ml

Compliance History, Cont'd

Summary of Inspections:	The facility has been inspected at least annually over the past permit term. The most recent inspection on December 10, 2021 identified the Fecal Coliform effluent violation noted above but no other operation violations at the facility.
Other Comments	A query is WMS found no open violations in eFACTS for Kelly Township Municipal 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	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0	XXX	9.0 Max	XXX	1/day	Grab
Dissolved Oxygen	XXX	XXX	Report	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	782	1251	XXX	25	40	50	2/week	24-Hr Composite
Biochemical Oxygen Demand (BOD5) Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Suspended Solids	938	1407	XXX	30	45	60	2/week	24-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Fecal Coliform (CFU/100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/week	Grab
Fecal Coliform (CFU/100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/week	Grab
Ammonia-Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite

Existing Effluent Limitations and Monitoring Requirements – Chesapeake Bay								
Parameter	**Effluent Limitations**						**Monitoring Requirements**	
	Mass Units (lbs/day) (1)		**Concentrations (mg/L)**				**Minimum (2) Measurement Frequency**	**Required Sample Type**
	Monthly	**Annual**	**Monthly**	**Monthly Average**	**Maximum**	**Instant. Maximum**		
Ammonia--N	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Kjeldahl--N	Report	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Net Total Nitrogen	Report	68,492	XXX	XXX	XXX	XXX	1/month	Calculation
Net Total Phosphorus	Report	9,132	XXX	XXX	XXX	XXX	1/month	Calculation

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 3.75
Latitude 40º 59' 0.25" **Longitude** -76º 52' 34.43"
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 above requirements are applicable and included in the existing permit.

DO, CBOD5 and NH3-N

The WQM7.0 model allows the Department to evaluate point source discharges of dissolved oxygen (DO), carbonaceous BOD ($CBOD_5$), and ammonia-nitrogen (NH_3-N) into free-flowing streams and rivers. To accomplish this, the model simulates two basic processes: the mixing and degradation of NH_3-N in the stream and the mixing and consumption of DO in the stream due to the degradation of $CBOD_5$ and NH_3-N. WQM7.0 modeling was performed (see Attachment B) for the discharge to the West Branch Susquehanna River and showed that no limitations are necessary beyond the technology-based secondary treatment limits listed above.

Disinfection/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. TRC modeling was performed at this time and shows that the existing BAT limit of 0.5 mg/L is adequate to protect the receiving stream (see Attachment D).

Water Quality Toxics Management

A "Reasonable Potential Analysis" was performed to determine additional parameters with the potential to violate water quality standards (see the Toxics Management Spreadsheet in Attachment C). The Toxics Management Spreadsheet (TMS) is a mass-balance water quality analysis model that includes consideration for mixing and other factors to determine recommended water quality-based effluent limits. The model incorporates the water quality criteria in 25 Pa. Code §93.

The parameters listed below were determined by the TMS to be candidates for limitations or monitoring in the NPDES permit. The analysis recommended effluent limits for Hexachlorobutadiene and monitoring for 1,2,4-Trichlorobenzene because the monitoring was at reporting limits greater than the Department's Target Quantitation Limits listed in the application instructions. Also, monitoring for Total Copper, Total Zinc, and Bis (2-ethylhexyl) Phthalate were recommended because these were detected in the effluent in at least one sample at a sufficient level to warrant monitoring. Effluent limits are generally recommended for results greater than 50% of the WQBEL and monitoring is recommended for results greater than 25% of the WQBEL for non-conservative pollutants and 10% for conservative pollutants. The table below shows the permittee's initial sample results, the WQ-based monthly average limitation, the Target Quantitation Limits, and the Toxics Management Spreadsheet recommendation for the relevant parameters.

Pollutant	Sample Results (µg/L)	WQBEL (µg/L)	Target Quantitation Limit (µg/L)	TMS Recommendation
Total Copper	6.3	48.5	4	Report
Total Zinc	118	407	5	Report
Bis (2-Ethylhexyl) Phthalate	17	35.5	5	Report
Hexachlorobutadiene	< 0.59	1.11	0.5	Limitation
1,2,4-Trichlorobenzene	< 0.61	1.72	0.5	Report

The applicant will be given the option of conducting an additional sampling event for Hexachlorobutadiene and 1,2,4-Trichlorobenzene. If the additional samples meet their respective Target Quantitation Limits and are still not-detect then the Department will evaluate the results to consider removing the monitoring requirements for these two parameters from the final permit.

Chesapeake Bay/Nutrient Requirements

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. Kelly Township Municipal Authority is considered a Phase 2, Significant Chesapeake Bay discharger. Nutrient cap loadings have previously been established for this facility pursuant to the Phase III Watershed Implementation Plan.

The discharge's cap loadings as well as the actual Total Nitrogen and Total Phosphorus loadings for the past two cycle years are listed in the table below. The permittee has been transferring approximately 50 lbs of TP offsets to the Kelly Township Kelly Crossroads facility discharging under NPDES Permit No. PA0232513.

Nutrient	Total Nitrogen	Total Phosphorus
Nutrient Cap Loads for PA0028681	68,492	9,132
10/1/20 – 9/30/21 Net Loadings	< 56,514	6,511
10/1/20 – 9/30/21 Total Mass Load	< 56,514	6,461
10/1/19 – 9/30/20 Net Loadings	54,152	6,315
10/1/19 – 9/30/20 Total Mass Load	54,152	6,265

e. Coli

Consistent with changes to Chapter 93 of the Department's regulations published in August 2021 and Department policy e. Coli monitoring is now being required for domestic wastewater discharges. Therefore, this permit will now include monthly e. Coli monitoring.

Best Professional Judgment (BPJ) Limitations

Comments: None needed besides the technology and water quality-based limits noted above.

Anti-Backsliding

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

Whole Effluent Toxicity (WET)

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

For the permit renewal application (4 tests).
☐ Quarterly throughout the permit term.
☐ Quarterly throughout the permit term and a TIE/TRE was conducted.
☒ Other: **Because the permittee failed to conduct annual WET tests consistent with the existing permit, the permittee has conducted four WET tests starting in November 2019 for the renewal application as listed below.**

The dilution series used for the tests was: 100%, 60%, 30%, 4%, and 2%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: 4.

Summary of Four Most Recent Test Results

TST Data Analysis

Test Date	*Ceriodaphnia* Results (Pass/Fail)		*Pimephales* Results (Pass/Fail)	
	Survival	Reproduction	Survival	Growth
11/2019	Pass	Pass	Pass	Pass
08/2020	Pass	Pass	Pass	Pass
04/2021	Pass	Pass	Pass	Pass
12/2021	Pass	Pass	Pass	Pass

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

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

☐ **YES** ☒ **NO**

Comments: None

Evaluation of Test Type, IWC and Dilution Series for Renewed Permit

Acute Partial Mix Factor (PMFa): **0.023** Chronic Partial Mix Factor (PMFc): **0.164**

1. Determine IWC – Acute (IWCa):

$(Q_d \times 1.547) / ((Q_{7\text{-}10} \times PMFa) + (Q_d \times 1.547))$

[(3.75 MGD x 1.547) / ((838 cfs x 0.023) + (3.75 MGD x 1.547))] x 100 = **21.14%**

Is IWCa < 1%? ☐ **YES** ☒ **NO**

If the discharge is to the tidal portion of the Delaware River, indicate how the type of test was determined:

N/A

Type of Test for Permit Renewal: **Because the IWCa < 1%, the tests are Chronic**

2b. Determine Target IWCc (If Chronic Tests Required)

$(Q_d \times 1.547) / (Q_{7\text{-}10} \times PMFc) + (Q_d \times 1.547)$

[(3.75 MGD x 1.547) / ((838 cfs x 0.164) + (3.75 MGD x 1.547))] x 100 = **4%**

3. Determine Dilution Series

Dilution Series = 100%, 60%, 30%, 4%, and 2%.

WET Limits

Has reasonable potential been determined? ☐ YES ☒ NO

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

If WET limits will be established, identify the species and the limit values for the permit (TU).

N/A

If WET limits will not be established, but reasonable potential was determined, indicate the rationale for not establishing WET limits:

N/A

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	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0	XXX	9.0 Max	XXX	1/day	Grab
Dissolved Oxygen	XXX	XXX	Report	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	782	1251	XXX	25	40	50	2/week	24-Hr Composite
Biochemical Oxygen Demand (BOD5) Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Suspended Solids	938	1407	XXX	30	45	60	2/week	24-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/week	Grab
Ammonia-Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/month	Grab

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Copper, Total (ug/L)	XXX	Report	XXX	XXX	Report	XXX	1/month	24-Hr Composite
Zinc, Total (ug/L)	XXX	Report	XXX	XXX	Report	XXX	1/month	24-Hr Composite
1,2,4-Trichlorobenzene (ug/L)	XXX	Report	XXX	XXX	Report	XXX	1/month	24-Hr Composite
Bis(2-Ethylhexyl)Phthalate (ug/L)	XXX	Report	XXX	XXX	Report	XXX	1/month	24-Hr Composite
Hexachlorobutadiene (ug/L)	0.035	0.054	XXX	1.11	1.73	2.77	2/month	24-Hr Composite

Compliance Sampling Location: Outfall 001

Other Comments: Additional limits for Hexachlorobutadiene and monitoring for 1,2,4-Trichlorobenzene, Total Copper, Total Zinc, and Bis (2-ethylhexyl) Phthalate are new as mentioned above. Monthly E. Coli monitoring is now included in the permit as noted above consistent with 2021 changes to Chapter 93 of the Department's regulations and Department policy.

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, to comply with Pennsylvania's Chesapeake Bay Tributary Strategy.

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
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Ammonia--N	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Kjeldahl--N	Report	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Net Total Nitrogen	XXX	68492	XXX	XXX	XXX	XXX	1/year	Calculation
Net Total Phosphorus	XXX	9132	XXX	XXX	XXX	XXX	1/year	Calculation

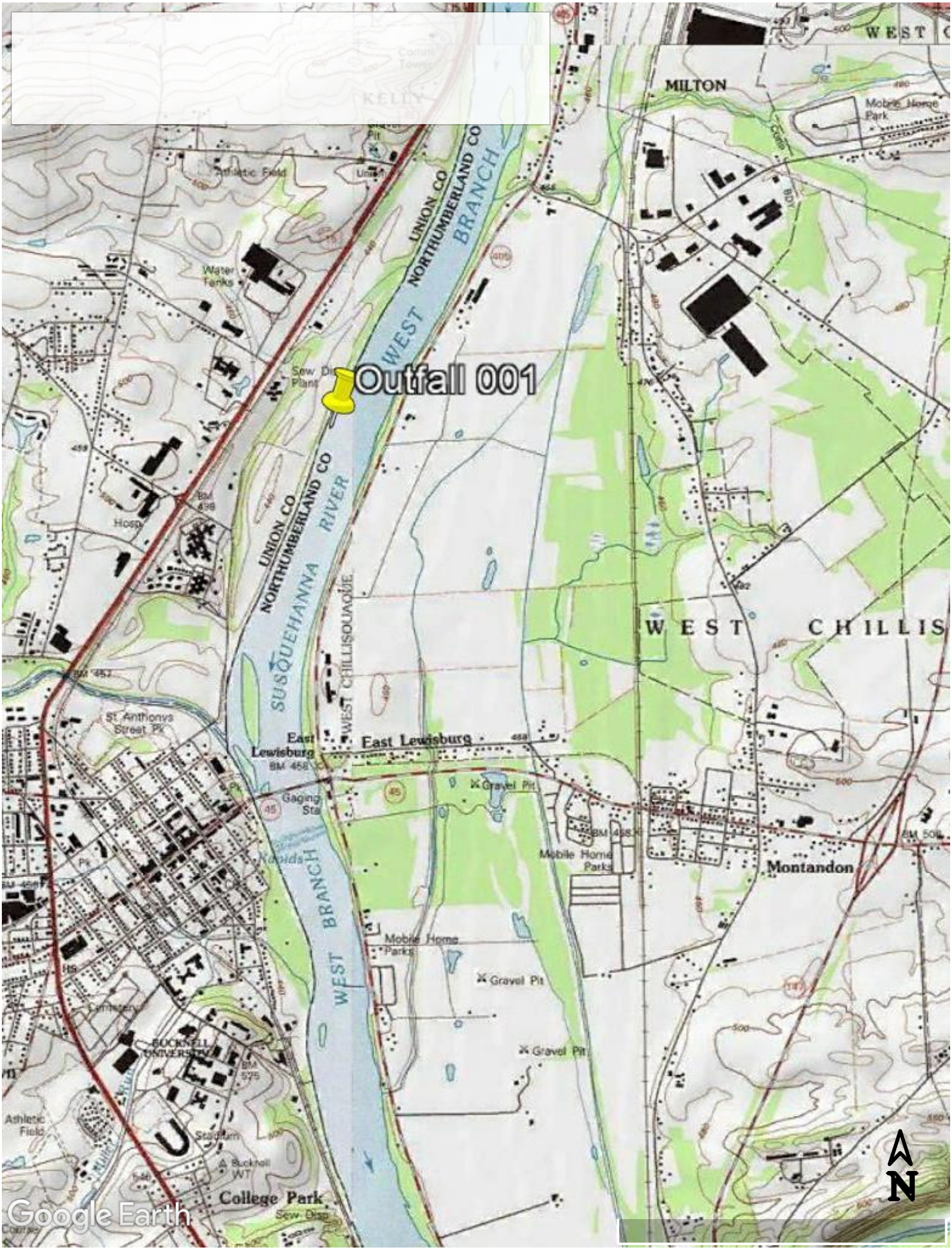
Compliance Sampling Location: Outfall 001

Other Comments: Consistent with current requirements for Chesapeake Bay Dischargers the Monthly Net Total Nitrogen and Total Phosphorus monitoring have been removed due to changes to annual Chesapeake Bay Reports.

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment **C**)
☒	Toxics Management Spreadsheet (see Attachment **B**)
☒	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 Limitations for Individual Sewage Permits, rev. 3/24/21; Whole Effluent Toxicity (WET), rev. 8/7/13.
☐	Other:

Attachments:

A. Discharge Location Map
B. WQM7.0
C. Toxics Management Spreadsheet
D. TRC Model


Outfall 001
MILTON
WEST
WEST CHILLIS
UNION CO
NORTHUMBERLAND CO
WEST BRANCH
SUSQUEHANNA RIVER
WEST CHILLISQUAQUE
East Lewisburg
East Lewisburg
BM 458
Gaging Sta
Gravel Pit
Mobile Home Park
Montandon
Mobile Home Parks
Gravel Pit
Gravel Pit
St. Anthonys Street Pk
Athletic Field
Water Tanks
Sew Disp Plant
Hosp
BM 452
BUCKNELL UNIVERSITY
Athletic Field
Stadium
College Park
Sew. Disp.
Cemetery
Rapids
N
Google Earth

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
10D	18668	WEST BRANCH SUSQUEHANNA RI	**8.770**	434.00	6690.00	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	0.122	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Kelly Twp MA	PA0028681	3.7500	0.0000	0.0000	0.000	25.00	7.00

Parameter Data

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

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
10D	18668	WEST BRANCH SUSQUEHANNA RI	**6.230**	430.60	6855.00	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	0.122	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

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

Parameter Data

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

WQM 7.0 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 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
10D	18668	WEST BRANCH SUSQUEHANNA RIVER

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 (ºC)	Analysis pH
Q7-10 Flow												
8.770	816.18	0.00	816.18	5.8012	0.00025	1.155	610.77	528.84	1.17	0.133	20.04	7.00
Q1-10 Flow												
8.770	522.36	0.00	522.36	5.8012	0.00025	NA	NA	NA	0.91	0.171	20.05	7.00
Q30-10 Flow												
8.770	1110.00	0.00	1110.00	5.8012	0.00025	NA	NA	NA	1.38	0.112	20.03	7.00

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
10D	18668	WEST BRANCH SUSQUEHANNA RIVER

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
8.770	3.750	20.035	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
610.765	1.155	528.841	1.165
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.16	0.112	0.18	0.702
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.206	1.379	Tsivoglou	5
Reach Travel Time (days)			
0.133			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.013	2.16	0.17	8.21
0.027	2.16	0.17	8.22
0.040	2.15	0.17	8.22
0.053	2.15	0.17	8.23
0.067	2.15	0.17	8.23
0.080	2.14	0.17	8.24
0.093	2.14	0.17	8.24
0.107	2.14	0.16	8.24
0.120	2.13	0.16	8.24
0.133	2.13	0.16	8.24

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
10D	18668	WEST BRANCH SUSQUEHANNA RIVER

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
8.770	Kelly Twp MA	9.63	50	9.63	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
8.770	Kelly Twp MA	1.91	25	1.91	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)		
8.77	Kelly Twp MA	25	25	25	25	3	3	0	0

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
10D	18668	WEST BRANCH SUSQUEHANNA RIVER

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)
8.770	Kelly Twp MA	PA0028681	3.750	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			3

Discharge Information

Instructions | Discharge | Stream

Facility: **Kelly Township Municipal Authority** NPDES Permit No.: **PA0028681** Outfall No.: **001**

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

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
3.75	206	7.3						

					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		688									
	Chloride (PWS)	mg/L		287									
	Bromide	mg/L		0.037									
	Sulfate (PWS)	mg/L		44.6									
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L		21.7									
	Total Antimony	µg/L	<	7.2									
	Total Arsenic	µg/L	<	0.195									
	Total Barium	µg/L		120									
	Total Beryllium	µg/L	<	0.201									
	Total Boron	µg/L		83.1									
	Total Cadmium	µg/L	<	0.16									
	Total Chromium (III)	µg/L		0.5									
	Hexavalent Chromium	µg/L	<	0.1									
	Total Cobalt	µg/L	<	0.142									
	Total Copper	µg/L		6.3									
	Free Cyanide	µg/L		7									
	Total Cyanide	µg/L		42.3									
	Dissolved Iron	µg/L		12									
	Total Iron	µg/L		12									
	Total Lead	µg/L	<	0.513									
	Total Manganese	µg/L		18.7									
	Total Mercury	µg/L	<	0.1									
	Total Nickel	µg/L		3.6									
	Total Phenols (Phenolics) (PWS)	µg/L	<	0.3									
	Total Selenium	µg/L	<	0.4									
	Total Silver	µg/L	<	0.1									
	Total Thallium	µg/L	<	0.2									
	Total Zinc	µg/L		118									
	Total Molybdenum	µg/L	<	0.841									
	Acrolein	µg/L	<	1.8									
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<	0.58									
	Benzene	µg/L	<	0.41									
	Bromoform	µg/L	<	0.2									
	Carbon Tetrachloride	µg/L	<	0.1									

Group 3	Chlorobenzene	µg/L	<	0.19									
	Chlorodibromomethane	µg/L	<	1.8									
	Chloroethane	µg/L	<	0.06									
	2-Chloroethyl Vinyl Ether	µg/L	<	0.34									
	Chloroform	µg/L		10.3									
	Dichlorobromomethane	µg/L		1.8									
	1,1-Dichloroethane	µg/L	<	0.26									
	1,2-Dichloroethane	µg/L	<	0.35									
	1,1-Dichloroethylene	µg/L	<	0.28									
	1,2-Dichloropropane	µg/L	<	0.3									
	1,3-Dichloropropylene	µg/L	<	0.06									
	1,4-Dioxane	µg/L	<	0.42									
	Ethylbenzene	µg/L	<	0.31									
	Methyl Bromide	µg/L	<	0.1									
	Methyl Chloride	µg/L	<	0.34									
	Methylene Chloride	µg/L	<	0.1									
	1,1,2,2-Tetrachloroethane	µg/L	<	0.24									
	Tetrachloroethylene	µg/L	<	0.3									
	Toluene	µg/L	<	0.24									
	1,2-trans-Dichloroethylene	µg/L	<	0.33									
	1,1,1-Trichloroethane	µg/L	<	0.43									
	1,1,2-Trichloroethane	µg/L	<	0.21									
	Trichloroethylene	µg/L	<	0.33									
	Vinyl Chloride	µg/L	<	0.28									
Group 4	2-Chlorophenol	µg/L	<	0.62									
	2,4-Dichlorophenol	µg/L	<	0.65									
	2,4-Dimethylphenol	µg/L	<	0.69									
	4,6-Dinitro-o-Cresol	µg/L	<	0.83									
	2,4-Dinitrophenol	µg/L	<	0.83									
	2-Nitrophenol	µg/L	<	0.72									
	4-Nitrophenol	µg/L	<	0.38									
	p-Chloro-m-Cresol	µg/L	<	0.67									
	Pentachlorophenol	µg/L	<	1.6									
	Phenol	µg/L	<	0.27									
	2,4,6-Trichlorophenol	µg/L	<	0.63									
Group 5	Acenaphthene	µg/L	<	0.64									
	Acenaphthylene	µg/L	<	0.68									
	Anthracene	µg/L	<	0.7									
	Benzidine	µg/L	<	1.8									
	Benzo(a)Anthracene	µg/L	<	0.82									
	Benzo(a)Pyrene	µg/L	<	0.81									
	3,4-Benzofluoranthene	µg/L	<	0.78									
	Benzo(ghi)Perylene	µg/L	<	0.85									
	Benzo(k)Fluoranthene	µg/L	<	0.76									
	Bis(2-Chloroethoxy)Methane	µg/L	<	0.62									
	Bis(2-Chloroethyl)Ether	µg/L	<	0.57									
	Bis(2-Chloroisopropyl)Ether	µg/L	<	0.66									
	Bis(2-Ethylhexyl)Phthalate	µg/L		17									
	4-Bromophenyl Phenyl Ether	µg/L	<	0.72									
	Butyl Benzyl Phthalate	µg/L	<	1.7									
	2-Chloronaphthalene	µg/L	<	0.7									
	4-Chlorophenyl Phenyl Ether	µg/L	<	0.64									
	Chrysene	µg/L	<	0.85									
	Dibenzo(a,h)Anthrancene	µg/L	<	0.81									
	1,2-Dichlorobenzene	µg/L	<	0.26									
	1,3-Dichlorobenzene	µg/L	<	0.23									
	1,4-Dichlorobenzene	µg/L	<	0.26									
	3,3-Dichlorobenzidine	µg/L	<	0.86									
	Diethyl Phthalate	µg/L	<	0.68									
	Dimethyl Phthalate	µg/L	<	0.68									
	Di-n-Butyl Phthalate	µg/L		0.86									
	2,4-Dinitrotoluene	µg/L	<	0.49									
	2,6-Dinitrotoluene	µg/L	<	0.59									

	Di-n-Octyl Phthalate	µg/L	<	1.2									
	1,2-Diphenylhydrazine	µg/L	<	0.69									
	Fluoranthene	µg/L	<	0.75									
	Fluorene	µg/L	<	0.65									
	Hexachlorobenzene	µg/L	<	0.72									
	Hexachlorobutadiene	µg/L	<	0.59									
	Hexachlorocyclopentadiene	µg/L	<	0.61									
	Hexachloroethane	µg/L	<	0.61									
	Indeno(1,2,3-cd)Pyrene	µg/L	<	0.74									
	Isophorone	µg/L	<	0.64									
	Naphthalene	µg/L		0.044									
	Nitrobenzene	µg/L	<	0.63									
	n-Nitrosodimethylamine	µg/L	<	0.36									
	n-Nitrosodi-n-Propylamine	µg/L	<	0.61									
	n-Nitrosodiphenylamine	µg/L	<	0.72									
	Phenanthrene	µg/L	<	0.7									
	Pyrene	µg/L	<	0.8									
	1,2,4-Trichlorobenzene	µg/L	<	0.61									
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											

Stream / Surface Water Information

Kelly Township Municipal Authority, NPDES Permit No. PA0028681, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **West Branch Susquehanna River**

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	018668	8.77	434	6690			Yes
End of Reach 1	018668	6.23	430.6	6855			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	8.77	0.122										100	7		
End of Reach 1	6.23	0.122													

***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	8.77														
End of Reach 1	6.23														

Model Results

Kelly Township Municipal Authority, NPDES Permit No. PA0028681, 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)
8.77	816.18		816.18	5.801	0.00025	1.155	610.765	528.841	1.165	0.133	25509.113
6.23	836.31		836.31								

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)
8.77	2605.49		2605.49	5.801	0.00025	1.921	610.765	318.015	2.226	0.07	12011.566
6.23	2661.57		2661.57								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.024 Analysis Hardness (mg/l): 124.03 Analysis pH: 7.05

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	750	750	3,309	
Total Antimony	0	0		0	1,100	1,100	4,853	
Total Arsenic	0	0		0	340	340	1,500	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	92,644	
Total Boron	0	0		0	8,100	8,100	35,734	
Total Cadmium	0	0		0	2.483	2.66	11.7	Chem Translator of 0.935 applied
Total Chromium (III)	0	0		0	679.650	2,151	9,489	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	71.9	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	419	
Total Copper	0	0		0	16.462	17.1	75.7	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	22	22.0	97.1	

Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	81.579	107	474	Chem Translator of 0.76 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	7.27	Chem Translator of 0.85 applied
Total Nickel	0	0		0	561.798	563	2,483	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	4.659	5.48	24.2	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	287	
Total Zinc	0	0		0	140.635	144	634	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	13.2	
Acrylonitrile	0	0		0	650	650	2,868	
Benzene	0	0		0	640	640	2,823	
Bromoform	0	0		0	1,800	1,800	7,941	
Carbon Tetrachloride	0	0		0	2,800	2,800	12,353	
Chlorobenzene	0	0		0	1,200	1,200	5,294	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	79,409	
Chloroform	0	0		0	1,900	1,900	8,382	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	15,000	15,000	66,174	
1,1-Dichloroethylene	0	0		0	7,500	7,500	33,087	
1,2-Dichloropropane	0	0		0	11,000	11,000	48,528	
1,3-Dichloropropylene	0	0		0	310	310	1,368	
Ethylbenzene	0	0		0	2,900	2,900	12,794	
Methyl Bromide	0	0		0	550	550	2,426	
Methyl Chloride	0	0		0	28,000	28,000	123,526	
Methylene Chloride	0	0		0	12,000	12,000	52,940	
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	4,412	
Tetrachloroethylene	0	0		0	700	700	3,088	
Toluene	0	0		0	1,700	1,700	7,500	
1,2-trans-Dichloroethylene	0	0		0	6,800	6,800	29,999	
1,1,1-Trichloroethane	0	0		0	3,000	3,000	13,235	
1,1,2-Trichloroethane	0	0		0	3,400	3,400	15,000	
Trichloroethylene	0	0		0	2,300	2,300	10,147	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	560	560	2,471	
2,4-Dichlorophenol	0	0		0	1,700	1,700	7,500	
2,4-Dimethylphenol	0	0		0	660	660	2,912	
4,6-Dinitro-o-Cresol	0	0		0	80	80.0	353	
2,4-Dinitrophenol	0	0		0	660	660	2,912	
2-Nitrophenol	0	0		0	8,000	8,000	35,293	
4-Nitrophenol	0	0		0	2,300	2,300	10,147	
p-Chloro-m-Cresol	0	0		0	160	160	706	
Pentachlorophenol	0	0		0	9.192	9.19	40.6	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	460	460	2,029	

Acenaphthene	0	0		0	83	83.0	366	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	300	300	1,323	
Benzo(a)Anthracene	0	0		0	0.5	0.5	2.21	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	30,000	30,000	132,349	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	19,852	
4-Bromophenyl Phenyl Ether	0	0		0	270	270	1,191	
Butyl Benzyl Phthalate	0	0		0	140	140	618	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	820	820	3,618	
1,3-Dichlorobenzene	0	0		0	350	350	1,544	
1,4-Dichlorobenzene	0	0		0	730	730	3,220	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	4,000	4,000	17,647	
Dimethyl Phthalate	0	0		0	2,500	2,500	11,029	
Di-n-Butyl Phthalate	0	0		0	110	110	485	
2,4-Dinitrotoluene	0	0		0	1,600	1,600	7,059	
2,6-Dinitrotoluene	0	0		0	990	990	4,368	
1,2-Diphenylhydrazine	0	0		0	15	15.0	66.2	
Fluoranthene	0	0		0	200	200	882	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	10	10.0	44.1	
Hexachlorocyclopentadiene	0	0		0	5	5.0	22.1	
Hexachloroethane	0	0		0	60	60.0	265	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	10,000	10,000	44,116	
Naphthalene	0	0		0	140	140	618	
Nitrobenzene	0	0		0	4,000	4,000	17,647	
n-Nitrosodimethylamine	0	0		0	17,000	17,000	74,998	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	300	300	1,323	
Phenanthrene	0	0		0	5	5.0	22.1	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	130	130	574	

☑ ***CFC*** CCT (min): 720 PMF: 0.168 Analysis Hardness (mg/l): 104.3 Analysis pH: 7.01

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

Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	220	220	5,420	
Total Arsenic	0	0		0	150	150	3,695	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	101,010	
Total Boron	0	0		0	1,600	1,600	39,418	
Total Cadmium	0	0		0	0.253	0.28	6.88	Chem Translator of 0.907 applied
Total Chromium (III)	0	0		0	76.716	89.2	2,198	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	256	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	468	
Total Copper	0	0		0	9.284	9.67	238	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	5.2	5.2	128	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	212,536	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2.635	3.36	82.7	Chem Translator of 0.785 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	22.3	Chem Translator of 0.85 applied
Total Nickel	0	0		0	53.893	54.1	1,332	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	123	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	320	
Total Zinc	0	0		0	122.432	124	3,059	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	73.9	
Acrylonitrile	0	0		0	130	130	3,203	
Benzene	0	0		0	130	130	3,203	
Bromoform	0	0		0	370	370	9,116	
Carbon Tetrachloride	0	0		0	560	560	13,796	
Chlorobenzene	0	0		0	240	240	5,913	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	86,228	
Chloroform	0	0		0	390	390	9,608	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	3,100	3,100	76,373	
1,1-Dichloroethylene	0	0		0	1,500	1,500	36,955	
1,2-Dichloropropane	0	0		0	2,200	2,200	54,200	
1,3-Dichloropropylene	0	0		0	61	61.0	1,503	
Ethylbenzene	0	0		0	580	580	14,289	
Methyl Bromide	0	0		0	110	110	2,710	
Methyl Chloride	0	0		0	5,500	5,500	135,501	
Methylene Chloride	0	0		0	2,400	2,400	59,128	
1,1,2,2-Tetrachloroethane	0	0		0	210	210	5,174	
Tetrachloroethylene	0	0		0	140	140	3,449	
Toluene	0	0		0	330	330	8,130	

1,2-trans-Dichloroethylene	0	0		0	1,400	1,400	34,491	
1,1,1-Trichloroethane	0	0		0	610	610	15,028	
1,1,2-Trichloroethane	0	0		0	680	680	16,753	
Trichloroethylene	0	0		0	450	450	11,086	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	110	110	2,710	
2,4-Dichlorophenol	0	0		0	340	340	8,376	
2,4-Dimethylphenol	0	0		0	130	130	3,203	
4,6-Dinitro-o-Cresol	0	0		0	16	16.0	394	
2,4-Dinitrophenol	0	0		0	130	130	3,203	
2-Nitrophenol	0	0		0	1,600	1,600	39,418	
4-Nitrophenol	0	0		0	470	470	11,579	
p-Chloro-m-Cresol	0	0		0	500	500	12,318	
Pentachlorophenol	0	0		0	7.052	7.05	174	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	91	91.0	2,242	
Acenaphthene	0	0		0	17	17.0	419	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	59	59.0	1,454	
Benzo(a)Anthracene	0	0		0	0.1	0.1	2.46	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	6,000	6,000	147,819	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	910	910	22,419	
4-Bromophenyl Phenyl Ether	0	0		0	54	54.0	1,330	
Butyl Benzyl Phthalate	0	0		0	35	35.0	862	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	160	160	3,942	
1,3-Dichlorobenzene	0	0		0	69	69.0	1,700	
1,4-Dichlorobenzene	0	0		0	150	150	3,695	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	800	800	19,709	
Dimethyl Phthalate	0	0		0	500	500	12,318	
Di-n-Butyl Phthalate	0	0		0	21	21.0	517	
2,4-Dinitrotoluene	0	0		0	320	320	7,884	
2,6-Dinitrotoluene	0	0		0	200	200	4,927	
1,2-Diphenylhydrazine	0	0		0	3	3.0	73.9	
Fluoranthene	0	0		0	40	40.0	985	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	2	2.0	49.3	

Hexachlorocyclopentadiene	0	0		0	1	1.0	24.6	
Hexachloroethane	0	0		0	12	12.0	296	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	2,100	2,100	51,737	
Naphthalene	0	0		0	43	43.0	1,059	
Nitrobenzene	0	0		0	810	810	19,956	
n-Nitrosodimethylamine	0	0		0	3,400	3,400	83,764	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	59	59.0	1,454	
Phenanthrene	0	0		0	1	1.0	24.6	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	26	26.0	641	

☑ ***THH*** CCT (min): 720 PMF: 0.168 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	N/A	
Chloride (PWS)	0	0		0	250,000	250,000	N/A	
Sulfate (PWS)	0	0		0	250,000	250,000	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	5.6	5.6	138	
Total Arsenic	0	0		0	10	10.0	246	
Total Barium	0	0		0	2,400	2,400	59,128	
Total Boron	0	0		0	3,100	3,100	76,373	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Free Cyanide	0	0		0	4	4.0	98.5	
Dissolved Iron	0	0		0	300	300	7,391	
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	24,636	
Total Mercury	0	0		0	0.050	0.05	1.23	
Total Nickel	0	0		0	610	610	15,028	
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	5.91	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	3	3.0	73.9	
Acrylonitrile	0	0		0	N/A	N/A	N/A	
Benzene	0	0		0	N/A	N/A	N/A	

Bromoform	0	0		0	N/A	N/A	N/A	
Carbon Tetrachloride	0	0		0	N/A	N/A	N/A	
Chlorobenzene	0	0		0	100	100.0	2,464	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	N/A	N/A	N/A	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	N/A	N/A	N/A	
1,1-Dichloroethylene	0	0		0	33	33.0	813	
1,2-Dichloropropane	0	0		0	N/A	N/A	N/A	
1,3-Dichloropropylene	0	0		0	N/A	N/A	N/A	
Ethylbenzene	0	0		0	68	68.0	1,675	
Methyl Bromide	0	0		0	100	100.0	2,464	
Methyl Chloride	0	0		0	N/A	N/A	N/A	
Methylene Chloride	0	0		0	N/A	N/A	N/A	
1,1,2,2-Tetrachloroethane	0	0		0	N/A	N/A	N/A	
Tetrachloroethylene	0	0		0	N/A	N/A	N/A	
Toluene	0	0		0	57	57.0	1,404	
1,2-trans-Dichloroethylene	0	0		0	100	100.0	2,464	
1,1,1-Trichloroethane	0	0		0	10,000	10,000	246,365	
1,1,2-Trichloroethane	0	0		0	N/A	N/A	N/A	
Trichloroethylene	0	0		0	N/A	N/A	N/A	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	30	30.0	739	
2,4-Dichlorophenol	0	0		0	10	10.0	246	
2,4-Dimethylphenol	0	0		0	100	100.0	2,464	
4,6-Dinitro-o-Cresol	0	0		0	2	2.0	49.3	
2,4-Dinitrophenol	0	0		0	10	10.0	246	
2-Nitrophenol	0	0		0	N/A	N/A	N/A	
4-Nitrophenol	0	0		0	N/A	N/A	N/A	
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A	
Pentachlorophenol	0	0		0	N/A	N/A	N/A	
Phenol	0	0		0	4,000	4,000	98,546	
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A	
Acenaphthene	0	0		0	70	70.0	1,725	
Anthracene	0	0		0	300	300	7,391	
Benzidine	0	0		0	N/A	N/A	N/A	
Benzo(a)Anthracene	0	0		0	N/A	N/A	N/A	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroisopropyl)Ether	0	0		0	200	200	4,927	
Bis(2-Ethylhexyl)Phthalate	0	0		0	N/A	N/A	N/A	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	

Butyl Benzyl Phthalate	0	0		0	0.1	0.1	2.46	
2-Chloronaphthalene	0	0		0	800	800	19,709	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	1,000	1,000	24,636	
1,3-Dichlorobenzene	0	0		0	7	7.0	172	
1,4-Dichlorobenzene	0	0		0	300	300	7,391	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	600	600	14,782	
Dimethyl Phthalate	0	0		0	2,000	2,000	49,273	
Di-n-Butyl Phthalate	0	0		0	20	20.0	493	
2,4-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
2,6-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
1,2-Diphenylhydrazine	0	0		0	N/A	N/A	N/A	
Fluoranthene	0	0		0	20	20.0	493	
Fluorene	0	0		0	50	50.0	1,232	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	N/A	N/A	N/A	
Hexachlorocyclopentadiene	0	0		0	4	4.0	98.5	
Hexachloroethane	0	0		0	N/A	N/A	N/A	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	34	34.0	838	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	246	
n-Nitrosodimethylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	N/A	N/A	N/A	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	20	20.0	493	
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	1.72	

☑ ***CRL*** CCT (min): 720 PMF: 0.245 Analysis Hardness (mg/l): N/A Analysis pH: N/A

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

Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Free Cyanide	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	N/A	N/A	N/A	
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	N/A	N/A	N/A	
Acrylonitrile	0	0		0	0.06	0.06	6.66	
Benzene	0	0		0	0.58	0.58	64.4	
Bromoform	0	0		0	7	7.0	777	
Carbon Tetrachloride	0	0		0	0.4	0.4	44.4	
Chlorobenzene	0	0		0	N/A	N/A	N/A	
Chlorodibromomethane	0	0		0	0.8	0.8	88.8	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	5.7	5.7	632	
Dichlorobromomethane	0	0		0	0.95	0.95	105	
1,2-Dichloroethane	0	0		0	9.9	9.9	1,099	
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,2-Dichloropropane	0	0		0	0.9	0.9	99.9	
1,3-Dichloropropylene	0	0		0	0.27	0.27	30.0	
Ethylbenzene	0	0		0	N/A	N/A	N/A	
Methyl Bromide	0	0		0	N/A	N/A	N/A	
Methyl Chloride	0	0		0	N/A	N/A	N/A	
Methylene Chloride	0	0		0	20	20.0	2,219	
1,1,2,2-Tetrachloroethane	0	0		0	0.2	0.2	22.2	
Tetrachloroethylene	0	0		0	10	10.0	1,110	
Toluene	0	0		0	N/A	N/A	N/A	
1,2-trans-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,1,1-Trichloroethane	0	0		0	N/A	N/A	N/A	
1,1,2-Trichloroethane	0	0		0	0.55	0.55	61.0	
Trichloroethylene	0	0		0	0.6	0.6	66.6	
Vinyl Chloride	0	0		0	0.02	0.02	2.22	
2-Chlorophenol	0	0		0	N/A	N/A	N/A	
2,4-Dichlorophenol	0	0		0	N/A	N/A	N/A	
2,4-Dimethylphenol	0	0		0	N/A	N/A	N/A	
4,6-Dinitro-o-Cresol	0	0		0	N/A	N/A	N/A	

2,4-Dinitrophenol	0	0		0	N/A	N/A	N/A	
2-Nitrophenol	0	0		0	N/A	N/A	N/A	
4-Nitrophenol	0	0		0	N/A	N/A	N/A	
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A	
Pentachlorophenol	0	0		0	0.030	0.03	3.33	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	1.5	1.5	166	
Acenaphthene	0	0		0	N/A	N/A	N/A	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	0.0001	0.0001	0.011	
Benzo(a)Anthracene	0	0		0	0.001	0.001	0.11	
Benzo(a)Pyrene	0	0		0	0.0001	0.0001	0.011	
3,4-Benzofluoranthene	0	0		0	0.001	0.001	0.11	
Benzo(k)Fluoranthene	0	0		0	0.01	0.01	1.11	
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	3.33	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	35.5	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0		0	N/A	N/A	N/A	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	0.12	0.12	13.3	
Dibenzo(a,h)Anthrancene	0	0		0	0.0001	0.0001	0.011	
1,2-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,3-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,4-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
3,3-Dichlorobenzidine	0	0		0	0.05	0.05	5.55	
Diethyl Phthalate	0	0		0	N/A	N/A	N/A	
Dimethyl Phthalate	0	0		0	N/A	N/A	N/A	
Di-n-Butyl Phthalate	0	0		0	N/A	N/A	N/A	
2,4-Dinitrotoluene	0	0		0	0.05	0.05	5.55	
2,6-Dinitrotoluene	0	0		0	0.05	0.05	5.55	
1,2-Diphenylhydrazine	0	0		0	0.03	0.03	3.33	
Fluoranthene	0	0		0	N/A	N/A	N/A	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	0.00008	0.00008	0.009	
Hexachlorobutadiene	0	0		0	0.01	0.01	1.11	
Hexachlorocyclopentadiene	0	0		0	N/A	N/A	N/A	
Hexachloroethane	0	0		0	0.1	0.1	11.1	
Indeno(1,2,3-cd)Pyrene	0	0		0	0.001	0.001	0.11	
Isophorone	0	0		0	N/A	N/A	N/A	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	N/A	N/A	N/A	
n-Nitrosodimethylamine	0	0		0	0.0007	0.0007	0.078	
n-Nitrosodi-n-Propylamine	0	0		0	0.005	0.005	0.55	
n-Nitrosodiphenylamine	0	0		0	3.3	3.3	366	

Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	N/A	N/A	N/A	

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

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Copper	Report	Report	Report	Report	Report	µg/L	48.5	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Zinc	Report	Report	Report	Report	Report	µg/L	407	AFC	Discharge Conc > 10% WQBEL (no RP)
Bis(2-Ethylhexyl)Phthalate	Report	Report	Report	Report	Report	µg/L	35.5	CRL	Discharge Conc > 25% WQBEL (no RP)
Hexachlorobutadiene	0.035	0.054	1.11	1.73	2.77	µg/L	1.11	CRL	Discharge Conc ≥ 50% WQBEL (RP)
1,2,4-Trichlorobenzene	Report	Report	Report	Report	Report	µg/L	1.72	THH	Discharge Conc > 25% WQBEL (no RP)

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

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

838	= Q stream (cfs)	0.5	= CV Daily
3.75	= 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 = 46.099	1.3.2.iii	WLA cfc = 44.935
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 17.178	5.1d	LTA_cfc = 26.123

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)