

Application Type Renewal
Facility Type Municipal
Major / Minor Major

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Application No. PA0023248
APS ID 1116486
Authorization ID 1489892

Applicant and Facility Information

Applicant Name <u>Berwick Area Joint Sewer Authority</u>	Facility Name <u>Berwick Area Joint Sewer Authority</u>
Applicant Address <u>1108 Freas Avenue</u>	Facility Address <u>383 S. Eaton Street</u>
<u>Berwick, PA 18603-1710</u>	<u>Berwick, PA 18603</u>
Applicant Contact <u>Gloria Bobersky</u>	Facility Contact <u>Gloria Bobersky</u>
Applicant Phone <u>(570) 752-8477</u>	Facility Phone <u>(570) 752-8477</u>
Client ID <u>142927</u>	Site ID <u>261505</u>
Ch 94 Load Status <u>Not Overloaded</u>	Municipality <u>Berwick Borough</u>
Connection Status <u>No Limitations</u>	County <u>Columbia</u>
Date Application Received <u>June 24, 2024</u>	EPA Waived? <u>No</u>
Date Application Accepted <u>June 26, 2024</u>	If No, Reason <u>Major Facility, Significant CB Discharge</u>
Purpose of Application <u>Renewal of a Major NPDES Permit</u>	

Summary of Review

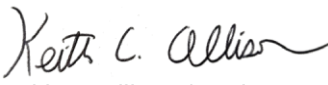
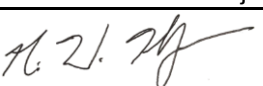
The subject facility is a major Publicly Owned Treatment Works (POTW) serving Berwick Borough and portions of Briar Creek Borough, Briar Creek Township, and Mifflin Township in Columbia County and Salem Township in Luzerne County.

A map of the discharge location is attached (Attachment A).

Sludge use and disposal description and location(s): The facility's dewatered sludge is disposed by landfill. Per the application 412.8 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 / Project Manager	March 5, 2025
✓		 Nicholas W. Hartranft, P.E. / Environmental Engineer Manager	March 5, 2025

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	2.2
Latitude	41° 2' 18.24"	Longitude	-76° 16' 5.48"
Quad Name	Mifflinville, PA	Quad Code	1035
Wastewater Description: Effluent			
Receiving Waters	Susquehanna River (WWF)	Stream Code	06685
NHD Com ID	65639551	RMI	159.09
Drainage Area	10,503 mi ²	Yield (cfs/mi ²)	0.0876
Q ₇₋₁₀ Flow (cfs)	919.5	Q ₇₋₁₀ Basis	Gage No. 01536500, Susquehanna River @ Wilkes-Barre, PA
Elevation (ft)	469	Slope (ft/ft)	0.000904
Watershed No.	5-D	Chapter 93 Class.	WWF
Existing Use	N/A	Existing Use Qualifier	N/A
Exceptions to Use	None	Exceptions to Criteria	None
Assessment Status	Impaired		
Cause(s) of Impairment	MERCURY, POLYCHLORINATED BIPHENYLS (PCBS), Aluminum, and Iron		
Source(s) of Impairment	SOURCE UNKNOWN and AMD		
TMDL Status	Final 03/12/1999	Name	Susquehanna River PCB
Nearest Downstream Public Water Supply Intake	Danville Municipal Water Authority		
PWS Waters	Susquehanna River	Flow at Intake (cfs)	1,120
PWS RMI	138.06	Distance from Outfall (mi)	21.03

Changes Since Last Permit Issuance: None. The existing stream and drainage characteristics are applicable.

Other Comments:

This discharge is not affecting the above-listed impairment for PCBs in the River and is not identified as a contributor to the impairment in the TMDL. The impairment to the River for PCBs is due to legacy contamination and is not reasonably expected to be discharged by BAJSA. No potential sources such as landfills or incineration activities contribute to the discharge. Per the TMDL "PCB present in the main stem of the Susquehanna River is believed to reside primarily in sediment due to historic use." Mercury was not detected at a detection level of 0.0932 µg/L which is less than the Target QL of 0.2 µg/L. Therefore, no additional monitoring will be required at this time related to these impairments.

The impairments from Aluminum and Iron are primarily attributed to AMD. The highest Aluminum level seen in application sampling was 1290 µg/L compared to an acute instream criterion of 750 µg/L and the highest Iron level was 22.2 µg/L compared to a chronic criterion of 1500 µg/L. Monitoring will be included in the permit for Total Aluminum. See under Develop of Effluent Limitations below for further on the proposed Aluminum monitoring.

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: Berwick Area Joint Sewer Authority				
WQM Permit No.	Issuance Date	Permit Coverage:		
1905402	A-2 – 9/16/16 A-1 – 5/21/07 Original – 2/21/06	Replacement of 4 existing blowers with new centrifugal blowers with VFDs Removal of Hydrosieve Simultaneous Nitrification and Denitrification Biological Nutrient Removal		
1905403	A-1 – 2/9/07 Original – 12/28/05	Martzville Road Pump Station 2 Various Pump Stations		
1906402	7/11/06	Sewer Extensions for Woodcrest, Briar Crest, and Foundryville		
1903401	4/3/03	Parallel Sewer Interceptor		
1901402	8/17/01	Headworks filter screen, raw sewage pumps, new effluent gates and spray headers in biological tanks, chlorination system, sludge thickening centrifuge, and sludge dewatering centrifuge.		
1998402	1/29/98	Transfer permit covering all collection/conveyance system at the time.		
1998401	2/4/98	Transfer permit covering all treatment processes at the time.		
Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary With Ammonia Reduction	Oxidation Ditch	Gas Chlorine	2.2
Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
3.28	15866	Not Overloaded	Aerobic Digestion	Landfill

Changes Since Last Permit Issuance: None.

Other Comments: The treatment facilities as permitted under WQM Permit 1905402 A-2 consist of mechanical bar screen, manual bar screen, influent wet well, grit chamber, two oxidation ditches, two secondary clarifiers, two phosphorus removal tanks, two gas chlorinators, three chlorine contact tanks, one Cannibal sludge system, two aerated sludge digesters, and one centrifuge/belt filter press.

Combined Sewer Overflows (CSOs)
The permittee no longer has CSOs. The two prior CSOs were eliminated in 2010 and 2012.

Stormwater Requirements
The facility has no identifiable stormwater outfalls. However, stormwater requirements will be included in the NPDES permit because any discharges from the facility meets the definition of a storm water discharges associated with industrial activity in 40 CFR §122.26(b)(14)(ix). Due to the absence of stormwater outfalls no specific monitoring will be required.

Industrial Users

The permittee is implementing an approved pretreatment program. The permittee has identified four industrial users in the application. The industrial users identified in the application include:

- K-FAB, Inc. (Significant, 2,600 gpd total)
- Patriot Metal Products, Inc. (Significant, 7,475 gpd total)
- Wise Foods, Inc. (Significant, 118,00 gpd total flow)
- Moxie Energy, LLC, (Non-significant, 2,500 gpd)

Hauled-In-Waste

The facility receives sewage sludge from other facilities and residential septage. Per the application, 2,955,050 gallons of sludge and septage were received in the previous year.

Compliance History

DMR Data for Outfall 001 (from February 1, 2024 to January 31, 2025)

Parameter	JAN-25	DEC-24	NOV-24	OCT-24	SEP-24	AUG-24	JUL-24	JUN-24	MAY-24	APR-24	MAR-24	FEB-24
Flow (MGD) Average Monthly	0.9912	1.0302	1.0319	0.9868	1.0538	1.1045	1.1994	1.2166	1.3669	1.4431	1.2963	1.0939
Flow (MGD) Daily Maximum	1.2872	2.2426	1.3418	1.1348	1.4689	1.6126	1.717	2.0481	1.8703	2.8176	1.9768	1.6081
pH (S.U.) Instantaneous Minimum	6.6	6.6	6.4	6.5	6.6	6.7	6.8	6.7	7.0	6.9	6.8	6.9
pH (S.U.) Instantaneous Maximum	7.4	7.5	7.4	8.2	7.6	8.4	7.6	8.7	7.6	8.4	7.4	7.5
DO (mg/L) Instantaneous Minimum	8.26	7.93	7.86	7.35	7.27	6.62	6.94	6.58	6.61	7.3	7.89	8.03
TRC (mg/L) Average Monthly	0.4	0.4	0.4	0.3	0.33	0.3	0.2	0.3	0.28	0.34	0.39	0.4
TRC (mg/L) Instantaneous Maximum	0.59	0.68	0.7	0.48	0.49	0.66	0.38	0.38	0.8	0.7	0.7	0.73
CBOD5 (lbs/day) Average Monthly	< 51	< 51	< 52	< 50	< 51	< 54	< 57	< 45	< 37	< 33	< 56	< 29
CBOD5 (lbs/day) Weekly Average	< 58	< 54	< 55	< 51	< 53	< 57	< 59	< 60	41	< 35	< 151	< 36
CBOD5 (mg/L) Average Monthly	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 5.0	< 3.0	< 3.0	< 5.0	< 3.0
CBOD5 (mg/L) Weekly Average	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 4.0	< 3.0	< 13.0	< 3.0
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	2132	2841	3026	3198	3593	3588	4890	3277	3091	2616	2283	3138
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	4436	3759	4518	9034	5992	6626	8207	5238	5665	3929	2773	4568
BOD5 (mg/L) Raw Sewage Influent Average Monthly	247	341	350	380	418	398	496	328	282	238	230	326
TSS (lbs/day) Average Monthly	< 59	< 43	< 51	< 41	< 43	< 45	< 49	< 40	< 48	72	68	52
TSS (lbs/day) Raw Sewage Influent Average Monthly	1204	2906	1827	2910	2418	1348	1586	1294	1529	872	1133	979
TSS (lbs/day) Raw Sewage Influent Daily Maximum	3316	5501	5816	4698	3632	2323	3205	3437	4879	1263	1573	1959
TSS (lbs/day) Weekly Average	74	< 45	66	< 43	< 46	< 47	< 54	< 51	< 54	97	127	60

NPDES Permit Fact Sheet
Berwick Area Joint Sewer Authority

NPDES Permit No. PA0023248

TSS (mg/L) Average Monthly	< 7.0	< 5.0	< 6.0	< 5.0	< 5.0	< 5.0	< 5.0	< 4.0	< 4.0	7.0	7.0	5.0
TSS (mg/L) Raw Sewage Influent Average Monthly	142	339	204	349	285	155	164	131	140	79	115	102
TSS (mg/L) Weekly Average	10.0	< 5.0	8.0	< 5.0	< 5.0	< 5.0	< 6.0	< 5.0	5.0	9.0	11.0	7.0
Fecal Coliform (No./100 ml) Geometric Mean	< 1	< 1	< 1	< 1	< 1	< 2	< 4	< 2	< 51	< 49	< 121	< 22
Fecal Coliform (No./100 ml) Instantaneous Maximum	1	2	1	4.1	3.1	870	2419.6	4.5	1600	1600	900	1600
Nitrate-Nitrite (mg/L) Average Monthly	5.309	5.103	5.343	6.104	5.945	6.770	6.600	4.650	< 3.215	< 3.415	3.673	4.677
Nitrate-Nitrite (lbs) Total Monthly	1384.0	1322.0	1373.3	1570.6	1519.0	1890	1976.6	1380.8	< 1098.6	< 1097.6	1159.2	1201.9
Total Nitrogen (mg/L) Average Monthly	< 6.631	6.715	6.84	< 7.144	< 7.028	< 7.891	< 8.118	< 5.760	< 4.472	< 4.1261	< 4.5059	< 5.3674
Total Nitrogen (lbs) Total Monthly	< 1728.0	1741.2	1756.1	< 1837.1	< 1793.8	< 2198.5	< 2430.9	< 1711.3	< 1523.6	< 1325.7	< 1424.7	< 1379.3
Ammonia (lbs/day) Average Monthly	47.64	47.61	40.96	< 21.87	< 15.89	< 29.81	< 27.53	39.24	< 33.76	< 11.67	< 38.29	< 10.77
Ammonia (mg/L) Average Monthly	0.559	0.712	0.587	< 0.262	< 0.233	< 0.415	< 0.284	0.493	< 0.310	< 0.1729	< 0.4327	< 0.148
Ammonia (lbs) Total Monthly	147.7	184.5	153.6	< 67.8	< 59.6	< 115.5	< 85.3	147.2	< 104.7	< 54.7	< 137	< 37.7
TKN (mg/L) Average Monthly	< 1.322	1.613	1.496	< 1.040	< 1.083	< 1.121	< 1.518	< 1.110	1.257	0.7138	< 0.8362	< 0.691
TKN (lbs) Total Monthly	< 344.0	419.2	382.8	< 266.5	< 274.8	< 308.5	< 454.3	< 330.5	425.0	228.2	< 265.6	< 177.4
Total Phosphorus (lbs/day) Average Monthly	51.24	114.30	176.65	78.22	112.34	139.07	487.2	54.95	151.56	28.11	49.08	25.22
Total Phosphorus (mg/L) Average Monthly	0.608	1.597	2.611	0.931	1.693	1.920	5.078	0.680	1.402	0.374	0.567	0.341
Total Phosphorus (lbs) Total Monthly	158.8	442.9	662.4	242.5	421.3	538.9	1510.3	206.1	469.8	119.7	175.4	88.3

Compliance History, Cont'd

Effluent Violations for Outfall 001, from: January 1, 2024 to December 31, 2024

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Fecal Coliform	07/31/24	IMAX	2419.6	No./100 ml	1000	No./100 ml
Fecal Coliform	05/31/24	IMAX	1600	No./100 ml	1000	No./100 ml

Compliance History, Cont'd

Summary of Inspections:	The facility has been inspected at least annually by the Department over the past permit term. The most recent full inspection of the facility on October 9, 2024 identified eDMR effluent violations but no operational violations at the time of inspection.
Other Comments:	There are no open violations in eFACTS for Berwick Area Joint Sewer 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 Inst Min	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	Report Inst Min	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)	459	734	XXX	25.0	40.0	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	550	826	XXX	30.0	45.0	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	Report	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Phosphorus	Report	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	8-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	1/month	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Net Total Nitrogen	XXX	66848*	XXX	XXX	XXX	XXX	1/year	Calculation
Net Total Phosphorus	XXX	8913	XXX	XXX	XXX	XXX	1/year	Calculation

* - The permittee is authorized to use 25,350 lbs/year as Total Nitrogen (TN) Offsets towards compliance with the Annual Net TN mass load limitation (Cap Load), in accordance with Part C of this permit. These Offsets may be applied throughout the Compliance Year or during the Truing Period. The application of Offsets must be reported to DEP as described in Part C. The Offsets are authorized for the following pollutant load reduction activities.

Development of Effluent Limitations

Outfall No. 001 Design Flow (MGD) 2.2
Latitude 41° 2' 21.61" Longitude -76° 16' 5.37"
Wastewater Description: 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 limitations are applicable and are included in the existing permit.

Water Quality-Based Limitations

DO, CBOD₅ and NH₃-N

The WQM7.0 model allows the Department to evaluate point source discharges of dissolved oxygen (DO), carbonaceous BOD (CBOD₅), and ammonia-nitrogen (NH₃-N) into free-flowing streams and rivers. To accomplish this, the model simulates two basic processes: the mixing and degradation of NH₃-N in the stream and the mixing and consumption of DO in the stream due to the degradation of CBOD₅ and NH₃-N. WQM7.0 modeling was performed (see Attachment B) for the discharge to the Susquehanna River and showed that no limitations are necessary for these parameters beyond the technology-based secondary treatment limits listed above.

Total Residual Chlorine

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

Water Quality Toxics Management

A "Reasonable Potential Analysis" was performed to determine additional parameters with the reasonable potential to violate water quality standards (see the Toxics Management Spreadsheet, Attachment D). 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 of 25 Pa.Code §93 accounting for available instream dilution.

The parameters listed below were determined by the reasonable potential analysis, based on sampling provided in the application, to be candidates for monitoring or limitations in the draft permit. The Reasonable Potential Analysis recommends limits when the highest sampling result is greater than 50% of the WQBEL and recommends monitoring when the result is greater than 10% of the WQBEL for conservative pollutants, consistent with the Department's SOPs. The Department assumes that results for pollutants at detection levels higher than the Department's Target Quantitation Limits (TQLs) are potentially present at concentrations near the higher detection level. The table below shows the permittee's sample results, the WQ-based monthly average limitation, and the Target Quantitation Limit for each parameter.

Recommended Monitoring/Limitations

Pollutant	Sample Results (µg/L)	WQBEL (µg/L)	Target Quantitation Limit (µg/L)	TMS Result
Total Aluminum	1,290	4,526		Monitor
alpha-BHC	< 0.61	0.11	0.05	Limit
Chlordane	< 1.25	0.08	1	Limit
Heptachlor	0.0555	0.002	0.05	Limit
Toxaphene	< 10.4	0.012	0.5	Limit

The draft permit will therefore include monthly monitoring for Total Aluminum and a limitation with twice per month monitoring for alpha-BHC, Chlordane, Heptachlor, and Toxaphene.

Should BAJSA conduct an additional round of sampling during the draft comment period that shows that levels of alpha-BHC, Chlordane, and Toxaphene in the effluent are undetectable at or below the Department's TQL then the Department will consider removing the monitoring/limitations for these from the final permit.

The heptachlor limitation is included in the draft permit due to a detectable result occurring in the application sampling. Because the sample result has been above the WQBEL and due to limited available data a fifty-nine-month compliance schedule will be included in the permit as noted below.

PROPOSED SCHEDULE OF COMPLIANCE

- A. *The permittee shall achieve compliance with final effluent limitations or terminate this discharge in accordance with the following schedule:*

- | | |
|---|---|
| 1. Feasibility study completion | <u>One Year after Permit Effective Date</u> |
| 2. Final plan completion | <u>Two Years after Permit Effective Date</u> |
| 3. Start construction | <u>Three Years after Permit Effective Date</u> |
| 4. Construction progress report(s) | <u>Forty-Two Months after Permit Effective Date</u> |
| 5. End construction | <u>Four Years after Permit Effective Date</u> |
| 6. Compliance with effluent limitations | <u>59 Months after Permit Effective Date</u> |

- B. *No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit to DEP a written notice of compliance or non-compliance with the specific schedule requirement. Each notice of non-compliance shall include the following information:*

- A short description of the non-compliance.*
- A description of any actions taken or proposed by the permittee to comply with the elapsed schedule requirement.*
- A description of any factors which tend to explain or mitigate the non-compliance.*
- An estimate of the date that compliance with the elapsed schedule requirement will be achieved and an assessment of the probability that the next scheduled requirement will be met on time.*

Per- and Polyfluoroalkyl Substances (PFAS)

The Department has begun increased evaluation of Per- and polyfluoroalkyl substances (PFAS) due to these parameters being pollutants of concern to the Department and EPA. The current version of the NPDES Major Sewage Discharge application (December 2023) requires monitoring in Group 1 for the four PFAS of concern – Perfluorooctanoic Acid

(PFOA), Perfluorobutanesulfonic Acid (PFBS), and Hexafluoropropylene oxide dimer acid (HFPO-DA). Because no information is available for PFAS for this discharge quarterly monitoring will be included in the draft permit. Also included is a footnote allowing the permittee to cease monitoring for these compounds if four consecutive events have non-detectable results at the Department's Target Quantitation Limits as listed in the table below.

PFAS Substances Monitored	Target Quantitation Limit (ng/L)
Perfluorooctanoic Acid (PFOA)	4.0
Perfluorooctanesulfonic Acid (PFOS)	3.7
Perfluorobutanesulfonic Acid (PFBS)	3.5
Hexafluoropropylene oxide dimer acid (HFPO-DA)	6.4

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 in order to reduce the total nutrient load to the Bay and meet State of Maryland Water Quality Standards. BAJSA is considered a Phase 1, Significant Chesapeake Bay discharger. Nutrient cap loads have previously been established for this facility pursuant to the Phase III Watershed Implementation Plan. The permittee generates 25,350 lbs/yr of TN offsets from the connection of on-lot systems.

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.

Nutrient	Total Nitrogen (lbs)	Total Phosphorus (lbs)
Nutrient Cap Loads for PA0020567	66,848	8,913
10/1/22 – 9/30/23 Net Loadings	<21,318	<5,635
10/1/22 – 9/30/23 Offsets Used	25,350	-
10/1/22 – 9/30/23 Total Mass Load	0	<5,635
10/1/23 – 9/30/24 Net Loadings	<19,591	5,059
10/1/23 – 9/30/24 Offsets Used	-	-
10/1/23 – 9/30/24 Total Mass Load	<19,591	5,059

Best Professional Judgment (BPJ) Limitations

Comments: No additional BPJ limitations are necessary at this time beyond the technology and water quality-based limitations noted above.

Anti-Backsliding

No proposed limitations have been made less stringent consistent with the Anti-degradation requirements 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: **Annually over the permit term**

The dilution series used for the tests was: 100%, 60%, 30%, 2%, and 1%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: 1.0.

Summary of Four Most Recent Test Results¹

¹ The permittee has submitted an additional WETT result since application submittal which is included in the table

TST Data Analysis

Test Date	Ceriodaphnia Results (Pass/Fail)		Pimephales Results (Pass/Fail)	
	Survival	Reproduction	Survival	Growth
August 2020	Pass	Pass	Pass	Pass
May 2021	Pass	Pass	Pass	Pass
May 2022	Pass	Pass	Pass	Pass
May 2023	Pass	Pass	Pass	Pass
August 2024	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?

☐ YES ☒ NO

Comments: Reasonable potential has not been established.

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

Acute Partial Mix Factor (PMFa): **0.031**

Chronic Partial Mix Factor (PMFc): **0.215**

1. Determine IWC – Acute (IWCa):

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

$$[(2.2 \text{ MGD} \times 1.547) / ((919.5 \text{ cfs} \times 0.031) + (2.2 \text{ MGD} \times 1.547))] \times 100 = \mathbf{10.64\%}$$

Is IWCa < 1%? ☐ YES ☒ NO

Therefore, type of Test for Permit Renewal: Chronic Test

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

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

$$[(2.2 \text{ MGD} \times 1.547) / ((919.5 \text{ cfs} \times 0.215) + (2.2 \text{ MGD} \times 1.547))] \times 100 = \mathbf{1.69\%} \Rightarrow \mathbf{TIWCc = 1}$$

3. Determine Dilution Series

Dilution Series = 100%, 60%, 30%, 2%, and 1%.

WET Limits

Has reasonable potential been determined? ☐ YES ☒ NO

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

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (362-0400-001), SOPs and/or BPJ.

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) ⁽¹⁾		Concentrations (mg/L)				Minimum ⁽²⁾ Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	Report Inst Min	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)	459	734 Wkly Avg	XXX	25.0	40.0 Wkly Avg	50	2/week	24-Hr Composite
Biochemical Oxygen Demand (BOD5) Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Suspended Solids	550	826 Wkly Avg	XXX	30.0	45.0 Wkly Avg	60	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	Report	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Phosphorus	Report	XXX	XXX	Report	XXX	XXX	2/week	24-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	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Aluminum, Total	Report	Report	XXX	Report	Report	XXX	1/month	24-Hr Composite
alpha-BHC (ug/L)	0.002	0.003	XXX	0.11	0.17	0.27	2/month	24-Hr Composite
Chlordane (ug/L)	0.001	0.002	XXX	0.08	0.13	0.2	2/month	24-Hr Composite
Toxaphene (ug/L)	0.0002	0.0003	XXX	0.012	0.019	0.03	2/month	24-Hr Composite
PFOA (ng/L)	XXX	XXX	XXX	XXX	Report	XXX	1/quarter	Grab
PFOS (ng/L)	XXX	XXX	XXX	XXX	Report	XXX	1/quarter	Grab
PFBS (ng/L)	XXX	XXX	XXX	XXX	Report	XXX	1/quarter	Grab
HFPO-DA (ng/L)	XXX	XXX	XXX	XXX	Report	XXX	1/quarter	Grab
Heptachlor (ug/L) - Interim	Report	Report	XXX	Report	Report	XXX	2/month	24-Hr Composite
Heptachlor (ug/L) - Final	0.00003	0.00005	XXX	0.002	0.003	0.004	2/month	24-Hr Composite

Compliance Sampling Location: Outfall 001

Other Comments: Monitoring for Aluminum, alpha-BHC, Chlordane, Toxaphene, Heptachlor, PFOA, PFOS, PFBS, and HFPO-DA are new as noted above.

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	1/month	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Net Total Nitrogen	XXX	66848*	XXX	XXX	XXX	XXX	1/year	Calculation
Net Total Phosphorus	XXX	8913	XXX	XXX	XXX	XXX	1/year	Calculation

Compliance Sampling Location: Outfall 001

* - The permittee is authorized to use 25,350 lbs/year as Total Nitrogen (TN) Offsets towards compliance with the Annual Net TN mass load limitation (Cap Load), in accordance with Part C of this permit. These Offsets may be applied throughout the Compliance Year or during the Truing Period. The application of Offsets must be reported to DEP as described in Part C. The Offsets are authorized for the following pollutant load reduction activities.

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment B)
☒	Toxics Management Spreadsheet (see Attachment D)
☒	TRC Model Spreadsheet (see Attachment C)
☐	Temperature Model Spreadsheet (see Attachment)
☐	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☒	Technical Guidance for the Development and Specification of Effluent Limitations, 386-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 386-2000-019, 3/98.
☒	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 386-2000-018, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 386-2183-001, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 386-2183-002, 12/97.
☒	Pennsylvania CSO Policy, 386-2000-002, 9/08.
☐	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 386-2000-008, 4/97.
☒	Determining Water Quality-Based Effluent Limits, 386-2000-004, 12/97.
☒	Implementation Guidance Design Conditions, 386-2000-007, 9/97.
☒	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 386-2000-016, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 386-2000-012, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 386-2000-009, 3/99.
☒	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 386-2000-015, 5/2004.
☒	Implementation Guidance for Section 93.7 Ammonia Criteria, 386-2000-022, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 386-2000-013, 4/2008.
☒	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 386-2000-011, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 386-2000-001, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 386-2000-021, 10/97.
☐	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 386-2000-020, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 386-2000-005, 3/99.
☐	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 386-2000-010, 3/1999.
☒	Design Stream Flows, 386-2000-003, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 386-2000-006, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 386-3200-001, 6/97.
☒	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☐	SOP:
☐	Other:

Attachments:

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



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
	07K	6685	SUSQUEHANNA RIVER	159.090	469.00	10503.00	0.00090	0.00	☒

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Stream pH	Temp (°C)	pH
	(cfsm)	(cfs)	(cfs)									
Q7-10	0.088	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	Permitted	Design	Reserve Factor	Disc	Disc
		Disc Flow (mgd)	Disc Flow (mgd)	Disc Flow (mgd)		Temp (°C)	pH
BAJSA	PA0023248	2.2000	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
	07K	6685	SUSQUEHANNA RIVER	158.260	465.06	10505.86	0.00090	0.00	☒

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Stream pH Temp (°C)	Stream pH
	(cfsm)	(cfs)	(cfs)								
Q7-10	0.088	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	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

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						
07K		6685				SUSQUEHANNA RIVER						
RMI	Stream Flow	PWS With	Net Stream Flow	Disc Analysis Flow	Reach Slope	Depth	Width	W/D Ratio	Velocity	Reach Trav Time	Analysis Temp	Analysis pH
	(cfs)	(cfs)	(cfs)	(cfs)	(ft/ft)	(ft)	(ft)		(fps)	(days)	(°C)	
Q7-10 Flow												
159.090	920.06	0.00	920.06	3.4034	0.00090	1.145	647.33	565.53	1.25	0.041	20.02	7.00
Q1-10 Flow												
159.090	588.84	0.00	588.84	3.4034	0.00090	NA	NA	NA	0.97	0.052	20.03	7.00
Q30-10 Flow												
159.090	1251.29	0.00	1251.29	3.4034	0.00090	NA	NA	NA	1.48	0.034	20.01	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 D.O.Simulation

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>		
07K	6685	SUSQUEHANNA RIVER		
<u>RMi</u>	<u>Total Discharge Flow (mgd)</u>	<u>Analysis Temperature (°C)</u>	<u>Analysis pH</u>	
159.090	2.200	20.018	7.000	
<u>Reach Width (ft)</u>	<u>Reach Depth (ft)</u>	<u>Reach WDRatio</u>	<u>Reach Velocity (fps)</u>	
647.327	1.145	565.534	1.246	
<u>Reach CBOD5 (mg/L)</u>	<u>Reach Kc (1/days)</u>	<u>Reach NH3-N (mg/L)</u>	<u>Reach Kn (1/days)</u>	
2.08	0.064	0.09	0.701	
<u>Reach DO (mg/L)</u>	<u>Reach Kr (1/days)</u>	<u>Kr Equation</u>	<u>Reach DO Goal (mg/L)</u>	
8.224	5.234	Tsivoglou	5	
<u>Reach Travel Time (days)</u>	Subreach Results			
0.041	TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
	0.004	2.08	0.09	8.24
	0.008	2.08	0.09	8.24
	0.012	2.08	0.09	8.24
	0.016	2.08	0.09	8.24
	0.020	2.08	0.09	8.24
	0.024	2.08	0.09	8.24
	0.028	2.08	0.09	8.24
	0.033	2.08	0.09	8.24
	0.037	2.08	0.09	8.24
	0.041	2.08	0.09	8.24

WQM 7.0 Wasteload Allocations

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>
07K	6685	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
159.090	BAJSA	16.72	50	16.72	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
159.090	BAJSA	1.89	25	1.89	25	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	<u>CBOD5</u>		<u>NH3-N</u>		<u>Dissolved Oxygen</u>		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
159.09	BAJSA	25	25	25	25	3	3	0	0

WQM 7.0 Effluent Limits

<u>SWP Basin</u>		<u>Stream Code</u>	<u>Stream Name</u>				
07K		6685	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)
159.090	BAJSA	PA0023248	2.200	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			3

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

919.5	= Q stream (cfs)	0.5	= CV Daily
2.2	= Q discharge (MGD)	0.5	= CV Hourly
30	= no. samples	0.031	= AFC_Partial Mix Factor
0.3	= Chlorine Demand of Stream	0.215	= CFC_Partial Mix Factor
0	= Chlorine Demand of Discharge	15	= AFC_Criteria Compliance Time (min)
0.5	= BAT/BPJ Value	720	= CFC_Criteria Compliance Time (min)
0	= % Factor of Safety (FOS)		=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 2.691	1.3.2.iii	WLA cfc = 18.076
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 1.003	5.1d	LTA_cfc = 10.509

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	$1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc)$

Discharge Information

Instructions

Discharge

Stream

Facility: **Berwick Area Joint Sewer Authority**

NPDES Permit No.: **PA0023248**

Outfall No.: **001**

Evaluation Type **Major Sewage / Industrial Waste**

Wastewater Description: **Domestic 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
2.2	189.7	7						

	Discharge Pollutant	Units	Max Discharge Conc	0 if left blank		0.5 if left blank		0 if left blank		1 if left blank		
				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	480									
	Chloride (PWS)	mg/L	123									
	Bromide	mg/L	0.036									
	Sulfate (PWS)	mg/L										
	Fluoride (PWS)	mg/L										
Group 2	Total Aluminum	µg/L	1290									
	Total Antimony	µg/L	< 0.348									
	Total Arsenic	µg/L	2.5									
	Total Barium	µg/L	26.6									
	Total Beryllium	µg/L	< 0.676									
	Total Boron	µg/L	0.247									
	Total Cadmium	µg/L	0.123									
	Total Chromium (III)	µg/L	< 1.9									
	Hexavalent Chromium	µg/L	5									
	Total Cobalt	µg/L	2.91									
	Total Copper	µg/L	8.74									
	Free Cyanide	µg/L	8									
	Total Cyanide	µg/L	13									
	Dissolved Iron	µg/L	21.4									
	Total Iron	µg/L	22.2									
	Total Lead	µg/L	1.81									
	Total Manganese	µg/L	15.2									
	Total Mercury	µg/L	< 0.0932									
	Total Nickel	µg/L	1.78									
	Total Phenols (Phenolics) (PWS)	µg/L	< 0.25									
	Total Selenium	µg/L	2.5									
	Total Silver	µg/L	< 1.37									
	Total Thallium	µg/L	< 0.068									
	Total Zinc	µg/L	74.1									
	Total Molybdenum	µg/L	0.541									
	Acrolein	µg/L	1.95									
	Acrylamide	µg/L	<									
	Acrylonitrile	µg/L	< 0.51									
	Benzene	µg/L	< 4.3									
	Bromoform	µg/L	< 0.34									
	Carbon Tetrachloride	µg/L	< 0.51									

[illegible]

	Di-n-Octyl Phthalate	µg/L	<	0.28															
	1,2-Diphenylhydrazine	µg/L	<	0.2															
	Fluoranthene	µg/L	<	0.35															
	Fluorene	µg/L	<	0.25															
	Hexachlorobenzene	µg/L	<	0.25															
	Hexachlorobutadiene	µg/L		0.54															
	Hexachlorocyclopentadiene	µg/L	<	0.22															
	Hexachloroethane	µg/L		0.73															
	Indeno(1,2,3-cd)Pyrene	µg/L	<	0.25															
	Isophorone	µg/L		0.25															
	Naphthalene	µg/L		0.53															
	Nitrobenzene	µg/L		0.54															
	n-Nitrosodimethylamine	µg/L	<	0.4															
	n-Nitrosodi-n-Propylamine	µg/L	<	0.31															
	n-Nitrosodiphenylamine	µg/L	<	0.27															
	Phenanthrene	µg/L	<	0.21															
	Pyrene	µg/L	<	0.16															
	1,2,4-Trichlorobenzene	µg/L		0.62															
Group 6	Aldrin	µg/L	<	0.035															
	alpha-BHC	µg/L	<	0.61															
	beta-BHC	µg/L	<	0.113															
	gamma-BHC	µg/L	<	0.027															
	delta BHC	µg/L	<	0.0605															
	Chlordane	µg/L	<	1.25															
	4,4-DDT	µg/L	<	0.033															
	4,4-DDE	µg/L	<	0.049															
	4,4-DDD	µg/L	<	0.033															
	Dieldrin	µg/L	<	0.036															
	alpha-Endosulfan	µg/L	<	0.168															
	beta-Endosulfan	µg/L	<	0.017															
	Endosulfan Sulfate	µg/L	<	0.037															
	Endrin	µg/L	<	0.062															
	Endrin Aldehyde	µg/L	<	0.13															
	Heptachlor	µg/L		0.0555															
	Heptachlor Epoxide	µg/L	<	0.0265															
	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	<	10.4															
	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

Berwick Area Joint Sewer Authority, NPDES Permit No. PA0023248, Outfall 001

Instructions Discharge **Stream**

Receiving Surface Water Name: **Susquehanna River**

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	006685	159.09	469	10503			Yes
End of Reach 1	006685	158.26	465.056	10505.86			Yes

Q₇₋₁₀

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	159.09	0.088										100	7		
End of Reach 1	158.26	0.088													

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	159.09														
End of Reach 1	158.26														

Model Results

Berwick Area Joint Sewer Authority, NPDES Permit No. PA0023248, 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)
159.09	924.26		924.26	3.403	0.0009	1.144	649.116	567.527	1.249	0.041	15622.968
158.26	924.52		924.51568								

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)
159.09	2904.65		2904.65	3.403	0.0009	1.891	649.116	343.284	2.369	0.021	7386.518
158.26	2905.346		2905.35								

☒ **Wasteload Allocations**

☒ **AFC**

CCT (min):

PMF:

Analysis Hardness (mg/l):

Analysis pH:

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	
Total Aluminum	0	0		0	750	750	7,061	
Total Antimony	0	0		0	1,100	1,100	10,356	
Total Arsenic	0	0		0	340	340	3,201	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	197,712	
Total Boron	0	0		0	8,100	8,100	76,260	
Total Cadmium	0	0		0	2.200	2.34	22.0	Chem Translator of 0.94 applied
Total Chromium (III)	0	0		0	613.853	1,943	18,289	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	153	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	894	
Total Copper	0	0		0	14.642	15.3	144	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	22	22.0	207	
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	71.298	91.7	863	Chem Translator of 0.778 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	15.5	Chem Translator of 0.85 applied
Total Nickel	0	0		0	505.710	507	4,771	Chem Translator of 0.998 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	Chem Translator of 0.922 applied
Total Silver	0	0		0	3.762	4.43	41.7	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	612	
Total Zinc	0	0		0	126.574	129	1,218	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	28.2	
Acrylonitrile	0	0		0	650	650	6,120	
Benzene	0	0		0	640	640	6,026	
Bromoform	0	0		0	1,800	1,800	16,947	
Carbon Tetrachloride	0	0		0	2,800	2,800	26,362	
Chlorobenzene	0	0		0	1,200	1,200	11,298	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	169,467	
Chloroform	0	0		0	1,900	1,900	17,888	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	15,000	15,000	141,223	
1,1-Dichloroethylene	0	0		0	7,500	7,500	70,611	
1,2-Dichloropropane	0	0		0	11,000	11,000	103,563	
1,3-Dichloropropylene	0	0		0	310	310	2,919	
Ethylbenzene	0	0		0	2,900	2,900	27,303	
Methyl Bromide	0	0		0	550	550	5,178	
Methyl Chloride	0	0		0	28,000	28,000	263,616	
Methylene Chloride	0	0		0	12,000	12,000	112,978	
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	9,415	
Tetrachloroethylene	0	0		0	700	700	6,590	
Toluene	0	0		0	1,700	1,700	16,005	
1,2-trans-Dichloroethylene	0	0		0	6,800	6,800	64,021	
1,1,1-Trichloroethane	0	0		0	3,000	3,000	28,245	
1,1,2-Trichloroethane	0	0		0	3,400	3,400	32,011	
Trichloroethylene	0	0		0	2,300	2,300	21,654	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	560	560	5,272	
2,4-Dichlorophenol	0	0		0	1,700	1,700	16,005	
2,4-Dimethylphenol	0	0		0	660	660	6,214	
4,6-Dinitro-o-Cresol	0	0		0	80	80.0	753	
2,4-Dinitrophenol	0	0		0	660	660	6,214	
2-Nitrophenol	0	0		0	8,000	8,000	75,319	
4-Nitrophenol	0	0		0	2,300	2,300	21,654	
p-Chloro-m-Cresol	0	0		0	160	160	1,506	
Pentachlorophenol	0	0		0	8.723	8.72	82.1	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	460	460	4,331	
Acenaphthene	0	0		0	83	83.0	781	

Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	300	300	2,824	
Benzo(a)Anthracene	0	0		0	0.5	0.5	4.71	
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	282,446	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	42,367	
4-Bromophenyl Phenyl Ether	0	0		0	270	270	2,542	
Butyl Benzyl Phthalate	0	0		0	140	140	1,318	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthracene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	820	820	7,720	
1,3-Dichlorobenzene	0	0		0	350	350	3,295	
1,4-Dichlorobenzene	0	0		0	730	730	6,873	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	4,000	4,000	37,659	
Dimethyl Phthalate	0	0		0	2,500	2,500	23,537	
Di-n-Butyl Phthalate	0	0		0	110	110	1,036	
2,4-Dinitrotoluene	0	0		0	1,600	1,600	15,064	
2,6-Dinitrotoluene	0	0		0	990	990	9,321	
1,2-Diphenylhydrazine	0	0		0	15	15.0	141	
Fluoranthene	0	0		0	200	200	1,883	
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	94.1	
Hexachlorocyclopentadiene	0	0		0	5	5.0	47.1	
Hexachloroethane	0	0		0	60	60.0	565	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	10,000	10,000	94,149	
Naphthalene	0	0		0	140	140	1,318	
Nitrobenzene	0	0		0	4,000	4,000	37,659	
n-Nitrosodimethylamine	0	0		0	17,000	17,000	160,053	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	300	300	2,824	
Phenanthrene	0	0		0	5	5.0	47.1	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	130	130	1,224	
Aldrin	0	0		0	3	3.0	28.2	
alpha-BHC	0	0		0	N/A	N/A	N/A	
beta-BHC	0	0		0	N/A	N/A	N/A	
gamma-BHC	0	0		0	0.95	0.95	8.94	
Chlordane	0	0		0	2.4	2.4	22.6	
4,4-DDT	0	0		0	1.1	1.1	10.4	
4,4-DDE	0	0		0	1.1	1.1	10.4	
4,4-DDD	0	0		0	1.1	1.1	10.4	

Dieldrin	0	0		0	0.24	0.24	2.26	
alpha-Endosulfan	0	0		0	0.22	0.22	2.07	
beta-Endosulfan	0	0		0	0.22	0.22	2.07	
Endosulfan Sulfate	0	0		0	N/A	N/A	N/A	
Endrin	0	0		0	0.086	0.086	0.81	
Endrin Aldehyde	0	0		0	N/A	N/A	N/A	
Heptachlor	0	0		0	0.52	0.52	4.9	
Heptachlor Epoxide	0	0		0	0.5	0.5	4.71	
Toxaphene	0	0		0	0.73	0.73	6.87	

☒ **CFC**

CCT (min): 720

PMF: 0.215

Analysis Hardness (mg/l): 101.51

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	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	220	220	13,046	
Total Arsenic	0	0		0	150	150	8,895	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	243,129	
Total Boron	0	0		0	1,600	1,600	94,880	
Total Cadmium	0	0		0	0.249	0.27	16.2	Chem Translator of 0.908 applied
Total Chromium (III)	0	0		0	75.031	87.2	5,174	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	616	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	1,127	
Total Copper	0	0		0	9.071	9.45	560	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	5.2	5.2	308	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	408,856	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2.558	3.24	192	Chem Translator of 0.789 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	53.7	Chem Translator of 0.85 applied
Total Nickel	0	0		0	52.671	52.8	3,133	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	296	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	771	
Total Zinc	0	0		0	119.651	121	7,196	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	178	
Acrylonitrile	0	0		0	130	130	7,709	
Benzene	0	0		0	130	130	7,709	
Bromoform	0	0		0	370	370	21,941	
Carbon Tetrachloride	0	0		0	560	560	33,208	
Chlorobenzene	0	0		0	240	240	14,232	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	207,550	

Chloroform	0	0		0	390	390	23,127	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	3,100	3,100	183,830	
1,1-Dichloroethylene	0	0		0	1,500	1,500	88,950	
1,2-Dichloropropane	0	0		0	2,200	2,200	130,460	
1,3-Dichloropropylene	0	0		0	61	61.0	3,617	
Ethylbenzene	0	0		0	580	580	34,394	
Methyl Bromide	0	0		0	110	110	6,523	
Methyl Chloride	0	0		0	5,500	5,500	326,149	
Methylene Chloride	0	0		0	2,400	2,400	142,320	
1,1,2,2-Tetrachloroethane	0	0		0	210	210	12,453	
Tetrachloroethylene	0	0		0	140	140	8,302	
Toluene	0	0		0	330	330	19,569	
1,2-trans-Dichloroethylene	0	0		0	1,400	1,400	83,020	
1,1,1-Trichloroethane	0	0		0	610	610	36,173	
1,1,2-Trichloroethane	0	0		0	680	680	40,324	
Trichloroethylene	0	0		0	450	450	26,685	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	110	110	6,523	
2,4-Dichlorophenol	0	0		0	340	340	20,162	
2,4-Dimethylphenol	0	0		0	130	130	7,709	
4,6-Dinitro-o-Cresol	0	0		0	16	16.0	949	
2,4-Dinitrophenol	0	0		0	130	130	7,709	
2-Nitrophenol	0	0		0	1,600	1,600	94,880	
4-Nitrophenol	0	0		0	470	470	27,871	
p-Chloro-m-Cresol	0	0		0	500	500	29,650	
Pentachlorophenol	0	0		0	6.693	6.69	397	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	91	91.0	5,396	
Acenaphthene	0	0		0	17	17.0	1,008	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	59	59.0	3,499	
Benzo(a)Anthracene	0	0		0	0.1	0.1	5.93	
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	355,799	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	910	910	53,963	
4-Bromophenyl Phenyl Ether	0	0		0	54	54.0	3,202	
Butyl Benzyl Phthalate	0	0		0	35	35.0	2,075	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthracene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	160	160	9,488	

1,3-Dichlorobenzene	0	0		0	69	69.0	4,092	
1,4-Dichlorobenzene	0	0		0	150	150	8,895	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	800	800	47,440	
Dimethyl Phthalate	0	0		0	500	500	29,650	
Di-n-Butyl Phthalate	0	0		0	21	21.0	1,245	
2,4-Dinitrotoluene	0	0		0	320	320	18,976	
2,6-Dinitrotoluene	0	0		0	200	200	11,860	
1,2-Diphenylhydrazine	0	0		0	3	3.0	178	
Fluoranthene	0	0		0	40	40.0	2,372	
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	119	
Hexachlorocyclopentadiene	0	0		0	1	1.0	59.3	
Hexachloroethane	0	0		0	12	12.0	712	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	2,100	2,100	124,530	
Naphthalene	0	0		0	43	43.0	2,550	
Nitrobenzene	0	0		0	810	810	48,033	
n-Nitrosodimethylamine	0	0		0	3,400	3,400	201,620	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	59	59.0	3,499	
Phenanthrene	0	0		0	1	1.0	59.3	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	26	26.0	1,542	
Aldrin	0	0		0	0.1	0.1	5.93	
alpha-BHC	0	0		0	N/A	N/A	N/A	
beta-BHC	0	0		0	N/A	N/A	N/A	
gamma-BHC	0	0		0	N/A	N/A	N/A	
Chlordane	0	0		0	0.0043	0.004	0.25	
4,4-DDT	0	0		0	0.001	0.001	0.059	
4,4-DDE	0	0		0	0.001	0.001	0.059	
4,4-DDD	0	0		0	0.001	0.001	0.059	
Dieldrin	0	0		0	0.056	0.056	3.32	
alpha-Endosulfan	0	0		0	0.056	0.056	3.32	
beta-Endosulfan	0	0		0	0.056	0.056	3.32	
Endosulfan Sulfate	0	0		0	N/A	N/A	N/A	
Endrin	0	0		0	0.036	0.036	2.13	
Endrin Aldehyde	0	0		0	N/A	N/A	N/A	
Heptachlor	0	0		0	0.0038	0.004	0.23	
Heptachlor Epoxide	0	0		0	0.0038	0.004	0.23	
Toxaphene	0	0		0	0.0002	0.0002	0.012	

☒ **THH**

CCT (min): 720

PMF: 0.215

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	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	5.6	5.6	332	
Total Arsenic	0	0		0	10	10.0	593	
Total Barium	0	0		0	2,400	2,400	142,320	
Total Boron	0	0		0	3,100	3,100	183,830	
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	237	
Dissolved Iron	0	0		0	300	300	17,790	
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	59,300	
Total Mercury	0	0		0	0.050	0.05	2.96	
Total Nickel	0	0		0	610	610	36,173	
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	14.2	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	3	3.0	178	
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	5,930	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	5.7	5.7	338	
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	1,957	
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	4,032	
Methyl Bromide	0	0		0	100	100.0	5,930	
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	3,380	
1,2-trans-Dichloroethylene	0	0		0	100	100.0	5,930	
1,1,1-Trichloroethane	0	0		0	10,000	10,000	592,999	
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	1,779	
2,4-Dichlorophenol	0	0		0	10	10.0	593	
2,4-Dimethylphenol	0	0		0	100	100.0	5,930	
4,6-Dinitro-o-Cresol	0	0		0	2	2.0	119	
2,4-Dinitrophenol	0	0		0	10	10.0	593	
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	237,199	
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A	
Acenaphthene	0	0		0	70	70.0	4,151	
Anthracene	0	0		0	300	300	17,790	
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	11,860	
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	5.93	
2-Chloronaphthalene	0	0		0	800	800	47,440	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthracene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	1,000	1,000	59,300	
1,3-Dichlorobenzene	0	0		0	7	7.0	415	
1,4-Dichlorobenzene	0	0		0	300	300	17,790	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	600	600	35,580	
Dimethyl Phthalate	0	0		0	2,000	2,000	118,600	
Di-n-Butyl Phthalate	0	0		0	20	20.0	1,186	
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	1,186	
Fluorene	0	0		0	50	50.0	2,965	

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	237	
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	2,016	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	593	
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	1,186	
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	4.15	
Aldrin	0	0		0	N/A	N/A	N/A	
alpha-BHC	0	0		0	N/A	N/A	N/A	
beta-BHC	0	0		0	N/A	N/A	N/A	
gamma-BHC	0	0		0	4.2	4.2	249	
Chlordane	0	0		0	N/A	N/A	N/A	
4,4-DDT	0	0		0	N/A	N/A	N/A	
4,4-DDE	0	0		0	N/A	N/A	N/A	
4,4-DDD	0	0		0	N/A	N/A	N/A	
Dieldrin	0	0		0	N/A	N/A	N/A	
alpha-Endosulfan	0	0		0	20	20.0	1,186	
beta-Endosulfan	0	0		0	20	20.0	1,186	
Endosulfan Sulfate	0	0		0	20	20.0	1,186	
Endrin	0	0		0	0.03	0.03	1.78	
Endrin Aldehyde	0	0		0	1	1.0	59.3	
Heptachlor	0	0		0	N/A	N/A	N/A	
Heptachlor Epoxide	0	0		0	N/A	N/A	N/A	
Toxaphene	0	0		0	N/A	N/A	N/A	

☒ **CRL**

CCT (min):

PMF:

Analysis Hardness (mg/l):

Analysis pH:

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	
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	16.0	
Benzene	0	0		0	0.58	0.58	155	
Bromoform	0	0		0	7	7.0	1,872	
Carbon Tetrachloride	0	0		0	0.4	0.4	107	
Chlorobenzene	0	0		0	N/A	N/A	N/A	
Chlorodibromomethane	0	0		0	0.8	0.8	214	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	N/A	N/A	N/A	
Dichlorobromomethane	0	0		0	0.95	0.95	254	
1,2-Dichloroethane	0	0		0	9.9	9.9	2,648	
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,2-Dichloropropane	0	0		0	0.9	0.9	241	
1,3-Dichloropropylene	0	0		0	0.27	0.27	72.2	
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	5,349	
1,1,2,2-Tetrachloroethane	0	0		0	0.2	0.2	53.5	
Tetrachloroethylene	0	0		0	10	10.0	2,675	
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	147	
Trichloroethylene	0	0		0	0.6	0.6	160	
Vinyl Chloride	0	0		0	0.02	0.02	5.35	
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	8.02	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	1.5	1.5	401	
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	0.027	
Benzo(a)Anthracene	0	0		0	0.001	0.001	0.27	
Benzo(a)Pyrene	0	0		0	0.0001	0.0001	0.027	
3,4-Benzofluoranthene	0	0		0	0.001	0.001	0.27	
Benzo(k)Fluoranthene	0	0		0	0.01	0.01	2.67	
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	8.02	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	85.6	
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	32.1	
Dibenzo(a,h)Anthracene	0	0		0	0.0001	0.0001	0.027	
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	13.4	
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	13.4	
2,6-Dinitrotoluene	0	0		0	0.05	0.05	13.4	
1,2-Diphenylhydrazine	0	0		0	0.03	0.03	8.02	
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	0.021	
Hexachlorobutadiene	0	0		0	0.01	0.01	2.67	
Hexachlorocyclopentadiene	0	0		0	N/A	N/A	N/A	
Hexachloroethane	0	0		0	0.1	0.1	26.7	
Indeno(1,2,3-cd)Pyrene	0	0		0	0.001	0.001	0.27	
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	0.19	
n-Nitrosodi-n-Propylamine	0	0		0	0.005	0.005	1.34	
n-Nitrosodiphenylamine	0	0		0	3.3	3.3	883	

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	
Aldrin	0	0		0	0.0000008	8.00E-07	0.0002	
alpha-BHC	0	0		0	0.0004	0.0004	0.11	
beta-BHC	0	0		0	0.008	0.008	2.14	
gamma-BHC	0	0		0	N/A	N/A	N/A	
Chlordane	0	0		0	0.0003	0.0003	0.08	
4,4-DDT	0	0		0	0.00003	0.00003	0.008	
4,4-DDE	0	0		0	0.00002	0.00002	0.005	
4,4-DDD	0	0		0	0.0001	0.0001	0.027	
Dieldrin	0	0		0	0.000001	0.000001	0.0003	
alpha-Endosulfan	0	0		0	N/A	N/A	N/A	
beta-Endosulfan	0	0		0	N/A	N/A	N/A	
Endosulfan Sulfate	0	0		0	N/A	N/A	N/A	
Endrin	0	0		0	N/A	N/A	N/A	
Endrin Aldehyde	0	0		0	N/A	N/A	N/A	
Heptachlor	0	0		0	0.000006	0.000006	0.002	
Heptachlor Epoxide	0	0		0	0.00003	0.00003	0.008	
Toxaphene	0	0		0	0.0007	0.0007	0.19	

☒ **Recommended WQBELs & Monitoring Requirements**

No. Samples/Month: 4

Pollutants	Mass Limits		Concentration Limits				Governing WQBEL	WQBEL Basis	Comments
	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units			
Total Aluminum	Report	Report	Report	Report	Report	µg/L	4,526	AFC	Discharge Conc > 10% WQBEL (no RP)
alpha-BHC	0.002	0.003	0.11	0.17	0.27	µg/L	0.11	CRL	Discharge Conc ≥ 50% WQBEL (RP)
Chlordane	0.001	0.002	0.08	0.13	0.2	µg/L	0.08	CRL	Discharge Conc ≥ 50% WQBEL (RP)
Heptachlor	0.00003	0.00005	0.002	0.003	0.004	µg/L	0.002	CRL	Discharge Conc ≥ 50% WQBEL (RP)
Toxaphene	0.0002	0.0003	0.012	0.019	0.03	µg/L	0.012	CFC	Discharge Conc ≥ 50% WQBEL (RP)

☐ **Other Pollutants without Limits or Monitoring**

WET Summary and Evaluation

Facility Name	Berwick Area Joint Sewer Authority
Permit No.	PA0023248
Design Flow (MGD)	2.2
Q₇₋₁₀ Flow (cfs)	919.5
PMF_a	0.0311
PMF_c	0.2158

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Ceriodaphnia	Survival	5/18/21	5/23/22	5/22/23	8/6/24
		PASS	PASS	PASS	PASS

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Ceriodaphnia	Reproduction	5/18/21	5/23/22	5/22/23	8/6/24
		PASS	PASS	PASS	PASS

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Pimephales	Survival	5/18/21	5/24/22	5/22/23	8/6/24
		PASS	PASS	PASS	PASS

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Pimephales	Growth	5/18/21	5/24/22	5/22/23	8/6/24
		PASS	PASS	PASS	PASS

Reasonable Potential? NO

Permit Recommendations

Test Type	Chronic
TIWC	2 % Effluent
Dilution Series	1, 2, 30, 60, 100 % Effluent
Permit Limit	None
Permit Limit Species	

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test
Species Tested
Endpoint
TIWC (decimal)
No. Per Replicate
TST b value
TST alpha value

Chronic
Ceriodaphnia
Survival
0.02
1
0.75
0.2

Facility Name

Berwick Area Joint Sewer Authority

Permit No.

PA0023248

Test Completion Date

Replicate	5/18/2021	
No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		

Mean 1.000 1.000
Std Dev. 0.000 0.000
Replicates 10 10

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

PASS

Test Completion Date

Replicate	5/23/2022	
No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		

Mean 1.000 1.000
Std Dev. 0.000 0.000
Replicates 10 10

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

PASS

Test Completion Date

Replicate	5/22/2023	
No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		

Mean 1.000 1.000
Std Dev. 0.000 0.000
Replicates 10 10

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

PASS

Test Completion Date

Replicate	8/6/2024	
No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		

Mean 1.000 1.000
Std Dev. 0.000 0.000
Replicates 10 10

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

PASS

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test Chronic
Species Tested Ceriodaphnia
Endpoint Reproduction
TIWC (decimal) 0.02
No. Per Replicate 1
TST b value 0.75
TST alpha value 0.2

Facility Name

Berwick Area Joint Sewer Authority

Permit No.

PA0023248

Test Completion Date

Replicate	5/18/2021	
No.	Control	TIWC
1	29	29
2	33	28
3	24	38
4	39	34
5	25	32
6	34	22
7	30	32
8	26	28
9	30	26
10	36	36
11		
12		
13		
14		
15		

Mean 30.600 30.500
Std Dev. 4.904 4.836
Replicates 10 10

T-Test Result 3.9296
Deg. of Freedom 16
Critical T Value 0.8647
Pass or Fail **PASS**

Test Completion Date

Replicate	5/23/2022	
No.	Control	TIWC
1	37	26
2	40	43
3	36	24
4	40	38
5	39	38
6	39	43
7	33	32
8	38	42
9	39	40
10	39	39
11		
12		
13		
14		
15		

Mean 38.000 36.500
Std Dev. 2.160 6.868
Replicates 10 10

T-Test Result 3.5852
Deg. of Freedom 12
Critical T Value 0.8726
Pass or Fail **PASS**

Test Completion Date

Replicate	5/22/2023	
No.	Control	TIWC
1	32	40
2	46	41
3	45	43
4	39	48
5	38	46
6	36	44
7	34	40
8	34	33
9	44	42
10	43	41
11		
12		
13		
14		
15		

Mean 39.100 41.800
Std Dev. 5.109 4.050
Replicates 10 10

T-Test Result 7.0761
Deg. of Freedom 17
Critical T Value 0.8633
Pass or Fail **PASS**

Test Completion Date

Replicate	8/6/2024	
No.	Control	TIWC
1	40	38
2	40	39
3	41	33
4	35	36
5	40	38
6	33	33
7	33	44
8	34	37
9	42	40
10	27	39
11		
12		
13		
14		
15		

Mean 36.500 37.700
Std Dev. 4.836 3.268
Replicates 10 10

T-Test Result 6.6879
Deg. of Freedom 17
Critical T Value 0.8633
Pass or Fail **PASS**

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Survival
TIWC (decimal)	0.02
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Facility Name
Berwick Area Joint Sewer Authority

Permit No.
PA0023248

Test Completion Date		
Replicate	5/18/2021	
No.	Control	TIWC
1	10	10
2	9	10
3	10	10
4	10	9
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Mean	9.750	9.750
Std Dev.	0.500	0.500
# Replicates	4	4

T-Test Result	6.7314
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

Test Completion Date		
Replicate	5/24/2022	
No.	Control	TIWC
1	10	10
2	10	10
3	9	9
4	10	10
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Mean	9.750	9.750
Std Dev.	0.500	0.500
# Replicates	4	4

T-Test Result	6.7314
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

Test Completion Date		
Replicate	5/22/2023	
No.	Control	TIWC
1	9	10
2	10	10
3	10	9
4	10	10
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Mean	9.750	9.750
Std Dev.	0.500	0.500
# Replicates	4	4

T-Test Result	6.7314
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

Test Completion Date		
Replicate	8/6/2024	
No.	Control	TIWC
1	9	10
2	10	10
3	10	10
4	10	10
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Mean	9.750	10.000
Std Dev.	0.500	0.000
# Replicates	4	4

T-Test Result	12.5523
Deg. of Freedom	3
Critical T Value	0.7649
Pass or Fail	PASS

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Growth
TIWC (decimal)	0.02
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Facility Name
Berwick Area Joint Sewer Authority

Permit No.
PA0023248

Test Completion Date		
Replicate	5/18/2021	
No.	Control	TIWC
1	0.266	0.279
2	0.267	0.289
3	0.254	0.282
4	0.238	0.228
5		
6		
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14		
15		

Mean	0.256	0.270
Std Dev.	0.014	0.028
# Replicates	4	4

T-Test Result	5.1950
Deg. of Freedom	4
Critical T Value	0.7407
Pass or Fail	PASS

Test Completion Date		
Replicate	5/24/2022	
No.	Control	TIWC
1	0.285	0.29
2	0.311	0.32
3	0.31	0.413
4	0.343	0.37
5		
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14		
15		

Mean	0.312	0.348
Std Dev.	0.024	0.054
# Replicates	4	4

T-Test Result	3.9893
Deg. of Freedom	4
Critical T Value	0.7407
Pass or Fail	PASS

Test Completion Date		
Replicate	5/22/2023	
No.	Control	TIWC
1	0.444	0.472
2	0.453	0.445
3	0.424	0.385
4	0.43	0.534
5		
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Mean	0.438	0.459
Std Dev.	0.013	0.062
# Replicates	4	4

T-Test Result	4.1749
Deg. of Freedom	3
Critical T Value	0.7649
Pass or Fail	PASS

Test Completion Date		
Replicate	8/6/2024	
No.	Control	TIWC
1	0.386	0.39
2	0.389	0.406
3	0.446	0.418
4	0.396	0.408
5		
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14		
15		

Mean	0.404	0.406
Std Dev.	0.028	0.012
# Replicates	4	4

T-Test Result	8.4968
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS