pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0020567**
Facility Type	**Municipal**	APS ID	**1068718**
Major / Minor	**Major**	Authorization ID	**1405388**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Northumberland Borough, Northumberland County**	Facility Name	**Northumberland Sewer Authority WWTP**
Applicant Address	175 Orange Street	Facility Address	100 Water Street
	Northumberland, PA 17857-1669		Northumberland, PA 17857-1945
Applicant Contact	Jeremy Deitrick, Superintendent	Facility Contact	Jeremy Deitrick, Superintendent
Applicant Phone	(570) 473-1992	Facility Phone	(570) 473-1992
Client ID	61468	Site ID	459358
Ch 94 Load Status	Not Overloaded	Municipality	Northumberland Borough
Connection Status	No Limitations	County	Northumberland
Date Application Received	August 4, 2022	EPA Waived?	No
Date Application Accepted	August 17, 2022	If No, Reason	Major Facility, Significant CB Discharge

Purpose of Application: Renewal of a Major NPDES permit for a POTW

Summary of Review

The subject facility is a major Publicly Owned Treatment Works (POTW) serving Northumberland Borough and portions of Point and Upper August Townships in Northumberland 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 99.897 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	May 4, 2022
✓		*Nicholas W. Hartranft* Nicholas W. Hartranft, P.E. / Environmental Engineer Manager	May 5, 2022

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	1.125
Latitude	40º 52' 59.42"	Longitude	-76º 47' 40.55"
Quad Name	Northumberland, PA	Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Susquehanna River (WWF)	Stream Code	6685
NHD Com ID	65643397	RMI	125.7
Drainage Area	11,300 mi^2	Yield (cfs/mi^2)	0.0988
Q_{7-10} Flow (cfs)	1116	Q_{7-10} Basis	USGS Gage 01540500, Susquehanna R. @ Danville (1981-2008)
Elevation (ft)	430	Slope (ft/ft)	0.0009
Watershed No.	5-E	Chapter 93 Class.	WWF
Existing Use	N/A	Existing Use Qualifier	N/A
Exceptions to Use	None	Exceptions to Criteria	None
Assessment Status	Not attaining		
Cause(s) of Impairment	PCB and Mercury		
Source(s) of Impairment	Source Unknown		
TMDL Status	Final, 3/12/99	Name	Susquehanna River PCB TMDL
Nearest Downstream Public Water Supply Intake	Sunbury Municipal Authority		
PWS Waters	Susquehanna River	Distance from Outfall (mi)	1.8

Changes Since Last Permit Issuance: The above stream and drainage characteristics were determined for a previous review and remain adequate.

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 the Northumberland Borough. 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 0.16 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 discharge is not expected to affect any downstream water supply at this time with the limitations and monitoring proposed. It is noted that while this discharge is only 1.8 miles upstream from the Sunbury Water Authority withdrawal, the discharge is to the western side of the North Branch of the River and the Sunbury withdrawal is from the Eastern side of the combined River.

Treatment Facility Summary

Treatment Facility Name: Northumberland Borough STP

WQM Permit No.	Issuance Date	Permit For:
4913404	A-1 – 2/11/14	Amendment to increase size of VLRs, add two digesters, and move Chlorine contact tank and sludge pumping
	Original – 5/13/13	New treatment facilities including grit removal, 3 VLRs, 2 final clarifiers, phosphorus removal, and hypochlorite disinfection, modification to aerobic digesters, and upgrades to the Queen Street Pump Station.
4913402	4/14/13	Transfer from Northumberland Sewer Authority and consolidation of seven previous permits covering the Northumberland Borough conveyance system.
4913401	4/1/13	Transfer and consolidation of five previous permits covering the Northumberland Borough treatment system.

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Activated Sludge	Hypochlorite	1.125

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
1.125	2346	Not Overloaded	Aerobic Digestion	Landfill

Changes Since Last Permit Issuance: None.

Other Comments: Treatment consists of Bar Screen and mechanical screen at the Queen Street Pump Station and Grit removal, Vertical Loop Reactors, Alum addition, Secondary Clarifiers, Liquid hypochlorite disinfection, aerobic digesters, and sludge press.

Stormwater Requirements

The permittee has identified one stormwater outfall discharging from the facility, 002.

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

The requirements of the December 2022 PAG-03 Appendix J are appropriate for this discharge and will be included in this permit. The requirements include twice per year monitoring of stormwater outfalls for Total Nitrogen, Total Phosphorus, TSS, Oil and Grease, pH, and Chemical Oxygen Demand. Benchmark monitoring levels from the PAG-03 for TSS (100 mg/L), Oil and Grease (30 mg/L), pH (9), and COD (120 mg/L) will be included in the draft permit.

These stormwater discharges also are not expected to affect any downstream water supply at this time with the monitoring proposed.

Industrial Users
The facility does not have any significant industrial users. The industrial users identified in the application include: • Butter Krust Baking Co. (3042 GPD) • Keystone Forging Company (500 GPD) • River Run Foods (650 GPD)

Hauled-In-Waste
Per the application, the facility has not received any hauled-in wastes over the past three years and the Borough does not anticipate receiving any over the next permit term.

Compliance History

DMR Data for Outfall 001 (from February 1, 2022 to January 31, 2023)

Parameter	JAN-23	DEC-22	NOV-22	OCT-22	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22
Flow (MGD) Average Monthly	0.838	0.793	0.571	0.523	0.523	0.457	0.464	0.546	0.836	0.832	0.758	0.921
Flow (MGD) Daily Maximum	1.233	2.037	1.112	0.96	0.8	0.554	0.553	1.045	2.675	1.364	0.947	2.714
pH (S.U.) Minimum	6.5	6.6	6.5	6.4	6.6	6.4	6.8	6.7	6.9	6.9	6.6	6.7
pH (S.U.) Maximum	6.9	7.1	7.2	7.3	7.1	7.1	7.2	7.2	7.2	7.3	7.1	7.4
TRC (mg/L) Average Monthly	0.3	0.5	0.3	0.5	0.3	0.5	0.4	0.5	0.4	0.4	0.3	0.4
TRC (mg/L) Instantaneous Maximum	0.9	1.1	0.4	3.0	0.4	0.9	0.6	0.7	0.6	0.6	0.7	0.7
CBOD5 (lbs/day) Average Monthly	< 19	25	< 17	20	23	< 13	15	15	< 14	< 16	< 18	< 12
CBOD5 (lbs/day) Weekly Average	24	41	27	32	30	16	17	17	< 19	< 21	28	< 14
CBOD5 (mg/L) Average Monthly	< 3	4	< 4	4	5	< 3	4	4	< 2	< 2	< 3	< 2
CBOD5 (mg/L) Weekly Average	3.4	6.3	4.1	4.1	6.6	4.1	4.5	4.2	< 2.4	< 2.2	3.7	< 2.2
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	1052	1095	1192	1299	958	1553	1343	1370	1359	1493	1881	1412
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	1393	1805	2251	2110	1421	2763	3308	2104	1631	2704	6013	1808
BOD5 (mg/L) Raw Sewage Influent Average Monthly	161	195	266	268	213	398	349	322	233	225	325	263
TSS (lbs/day) Average Monthly	< 27	< 62	< 24	< 26	< 24	< 21	< 15	< 21	< 27	< 32	< 31	< 33
TSS (lbs/day) Raw Sewage Influent Average Monthly	1056	1736	736	847	914	1148	969	947	1012	1099	945	869

TSS (lbs/day) Raw Sewage Influent Daily Maximum	2288	5466	1117	1521	1900	2090	2020	1639	1330	2606	1922	1134
TSS (lbs/day) Weekly Average	< 34	177	43	< 39	37	34	< 16	34	< 32	< 38	49	40
TSS (mg/L) Average Monthly	< 4	< 10	< 5	< 6	< 5	< 5	< 4	< 5	< 5	< 5	< 5	< 6
TSS (mg/L) Raw Sewage Influent Average Monthly	167	298	164	178	206	294	253	223	175	165	158	166
TSS (mg/L) Weekly Average	< 4	26	7	< 7	7	9	< 4	7	< 6	< 6	7	< 8
Fecal Coliform (CFU/100 ml) Geometric Mean	14	< 21	23	< 92	15	6	11	4	< 4	< 30	< 269	< 3
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	461.1	6294	1046.2	1986.3	98	12	23.5	40.8	10.9	866.4	4611	26.9
Nitrate-Nitrite (mg/L) Average Monthly	2.62	3	3.51	3.5	3.58	4.63	4.55	4.43	1.37	1.34	2.38	2.22
Nitrate-Nitrite (lbs) Total Monthly	534	528.8	522.4	510.8	530.6	557.3	539.4	566.1	230.7	276.1	447.9	310
Total Nitrogen (mg/L) Average Monthly	< 3.76	< 5.88	< 5.68	< 5.2	5.11	6.76	5.96	< 6.74	< 2.67	< 2.68	5.04	5.6
Total Nitrogen (lbs) Total Monthly	< 775.7	< 1076.8	< 913.8	< 756.5	761.6	811.6	706.8	< 863.1	< 463	< 557.2	1009.8	819.6
Ammonia (mg/L) Average Monthly	< 0.16	< 1.02	< 0.17	< 0.11	< 0.13	0.28	< 0.1	< 0.1	< 0.1	< 0.11	< 0.63	2.11
Ammonia (lbs) Total Monthly	< 35.4	< 184.6	< 24.3	< 16.6	< 20.8	33	< 12.3	< 13.2	< 18.8	< 24.9	< 143.1	323.5
TKN (mg/L) Average Monthly	< 1.1	< 2.9	< 2.2	< 1.7	1.5	2.1	1.4	< 2.3	< 1.3	< 1.3	2.7	3.4
TKN (lbs) Total Monthly	< 241.7	< 548	< 391.4	< 245.7	< 231	254.3	167.3	< 297	< 232.4	< 281.1	561.9	509.6
Total Phosphorus (mg/L) Average Monthly	1.09	2.7	2.3	3.5	2.6	7.03	3.79	4.02	2.44	0.5	0.99	0.62
Total Phosphorus (lbs) Total Monthly	226	493.3	327.7	496.9	361.7	843.7	449.7	522.7	420.1	105.7	195.3	95.7

Compliance History, Cont'd

Effluent Violations for Outfall 001, from: February 1, 2022 to January 31, 2023

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
TRC	10/31/22	IMAX	3.0	mg/L	1.6	mg/L

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 31, 2022 identified an eDMR effluent violation. A Chesapeake Bay inspection on November 22, 2022 did not identify any violations.
Other Comments:	A query in WMS found open violations in eFACTS for Northumberland Borough for effluent violations.

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	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0	XXX	9.0 Max	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	234	375 Wkly Avg	XXX	25	40 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	281	422 Wkly Avg	XXX	30	45 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	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**		
Total Nitrogen (lbs) Effluent Net	XXX	20,548 Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Total Nitrogen (lbs)	XXX	Report Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Ammonia (lbs)	XXX	Report Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Total Phosphorus (lbs) Effluent Net	XXX	2,740 Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Total Phosphorus (lbs)	XXX	Report Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 1.125
Latitude 40º 53' 3.20" **Longitude** -76º 47' 43.10"
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 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 ($CBOD_5$), 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 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.

The parameters listed below were determined by a 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. The Toxics Management Spreadsheet applies the Department's instream criteria from 25 PA Code

93 accounting for available instream dilution.

Because all sampling for these parameters below were below detection, the lowest of the non-detectable values for each are included in this table.

Pollutant	Sample Results (µg/L)	WQBEL (µg/L)	Target Quantitation Limit (µg/L)	TMS Result
Pentachlorophenol	<14.7	16.1	10	Limit
Benzo(a)anthracene	<7.5	0.54	2.5	Limit
Benzo(a)pyrene	<7.5	0.054	2.5	Limit
3,4-Benzofluoranthene or benzo(b)fluoranthene	<7.2	0.54	2.5	Limit
Benzo(k)Fluoranthene	<7.0	5.36	2.5	Limit
Bis(2-Chloroethyl)Ether	<5.2	16.1	5	Monitor
Butyl Benzyl Phthalate	<15.7	12.2	5	Limit
Dibenzo(a,h)Anthracene	<7.4	0.054	2.5	Limit
3,3-Dichlorobenzidine	<8.1	26.8	5	Monitor
Hexachlorobenzene	<6.6	0.043	5	Limit
Indeno(1,2,3-cd)Pyrene	<6.8	0.54	2.5	Limit
n-Nitrosodi-n-Propylamine	<5.8	2.68	5	Limit

Should Northumberland Borough conduct an additional round of sampling during the draft comment period that shows that levels of the above parameters 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.

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. Northumberland Borough is considered a Phase 3, 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 5,950 lbs/yr of TN offsets.

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	20,548	2,740
10/1/20 – 9/30/21 Net Loadings	<4,890	2,711
10/1/20 – 9/30/21 Offsets Used	1,258	-
10/1/20 – 9/30/21 Credits Purchased	-	1,353
10/1/20 – 9/30/21 Total Mass Load	<9,582	4,064
10/1/21 – 9/30/22 Net Loadings	<4,509	2,712
10/1/21 – 9/30/22 Offsets Used	2,765	-
10/1/21 – 9/30/22 Credits Purchased	-	1,261
10/1/21 – 9/30/22 Total Mass Load	<7,694	3,973

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(I).

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.

Summary of Four Most Recent Test Results

(NOTE – Enter results into one table, depending on which data analysis method was used).

NOEC/LC50 Data Analysis

Test Date	*Ceriodaphnia* Results (% Effluent)			*Pimephales* Results (% Effluent)			Pass? *
	NOEC Survival	NOEC Reproduction	LC50	NOEC Survival	NOEC Growth	LC50	
Sept 2019	>100	>100	100	>100	>100	100	Pass
April 2020	>100	>100	100	>100	>100	100	Pass
January 2021	>100	>100	100	>100	>100	100	Pass
March 2022	>100	>100	100	>100	>100	100	Pass

***** *A "passing" result is that which is greater than or equal to the TIWC 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: The Department notes that the application also includes WET results from December 2019 for which the P. Promelas tests passed but the C. dubia tests were invalid for Test Acceptability Criteria not being met.

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

Acute Partial Mix Factor (PMFa): **0.027** Chronic Partial Mix Factor (PMFc): **0.187**

1. Determine IWC – Acute (IWCa):

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

[(1.125 MGD x 1.547) / ((1116 cfs x 0.027) + (1.125 MGD x 1.547))] x 100 = **5.46%**

Is IWCa < 1%? ☐ **YES** ☒ **NO**

Type of Test for Permit Renewal: **Chronic**

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

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

[(1.125 MGD x 1.547) / ((1116 cfs x 0.187) + (1.125 MGD x 1.547))] x 100 = **0.83% => TIWCc = 1**

3. Determine Dilution Series

(NOTE – check Attachment C of WET SOP for dilution series based on TIWCa or TIWCc, whichever applies).

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	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0	XXX	9.0 Max	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
Dissolved Oxygen	XXX	XXX	Report	XXX	XXX	XXX	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	234	375 Wkly Avg	XXX	25	40 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	281	422 Wkly Avg	XXX	30	45 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
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	Report	XXX	1/month	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

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		
3,3-Dichlorobenzidine (ug/L)	Report	Report	XXX	Report	Report	XXX	2/month	24-Hr Composite
Pentachlorophenol (ug/L)	0.15	0.24	XXX	16.1	25.1	40.2	2/month	24-Hr Composite
Hexachlorobenzene (ug/L)	0.0004	0.0006	XXX	0.043	0.067	0.11	2/month	24-Hr Composite
Benzo(a)Anthracene (ug/L)	0.005	0.008	XXX	0.54	0.84	1.34	2/month	24-Hr Composite
Benzo(a)Pyrene (ug/L)	0.0005	0.0008	XXX	0.054	0.084	0.13	2/month	24-Hr Composite
Benzo(k)Fluoranthene (ug/L)	0.05	0.078	XXX	5.36	8.36	13.4	2/month	24-Hr Composite
3,4-Benzofluoranthene (ug/L)	0.005	0.008	XXX	0.54	0.84	1.34	2/month	24-Hr Composite
Butyl Benzyl Phthalate (ug/L)	0.11	0.18	XXX	12.2	19.0	30.4	2/month	24-Hr Composite
Bis(2-Chloroethyl)Ether (ug/L)	Report	Report	XXX	Report	Report	XXX	2/month	24-Hr Composite
Dibenzo(a,h)Anthracene (ug/L)	0.0005	0.0008	XXX	0.054	0.084	0.13	2/month	24-Hr Composite
Indeno(1,2,3-cd)Pyrene (ug/L)	0.005	0.008	XXX	0.54	0.84	1.34	2/month	24-Hr Composite
N-Nitrosodi-N-Propylamine (ug/L)	0.025	0.039	XXX	2.68	4.18	6.7	2/month	24-Hr Composite

Compliance Sampling Location: Outfall 001

Other Comments: E. coli monitoring is new consistent with recent changes to Chapter 93 of the Department's regulations and current Department policy. Dissolved Oxygen monitoring is also new consistent with Department policy for WWTP discharges. New monitoring and limitations are included for twelve toxic parameters.

Proposed Effluent Limitations and Monitoring Requirements

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

Outfall 002, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Chemical Oxygen Demand (COD)	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Calculation
Total Phosphorus	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab

Compliance Sampling Location: Outfall 002

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		
Total Nitrogen (lbs) Effluent Net	XXX	20,548(3) Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Total Nitrogen (lbs)	XXX	Report Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Ammonia (lbs)	XXX	Report Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Total Phosphorus (lbs) Effluent Net	XXX	2,740 Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Total Phosphorus (lbs)	XXX	Report Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation

Compliance Sampling Location: Outfall 001

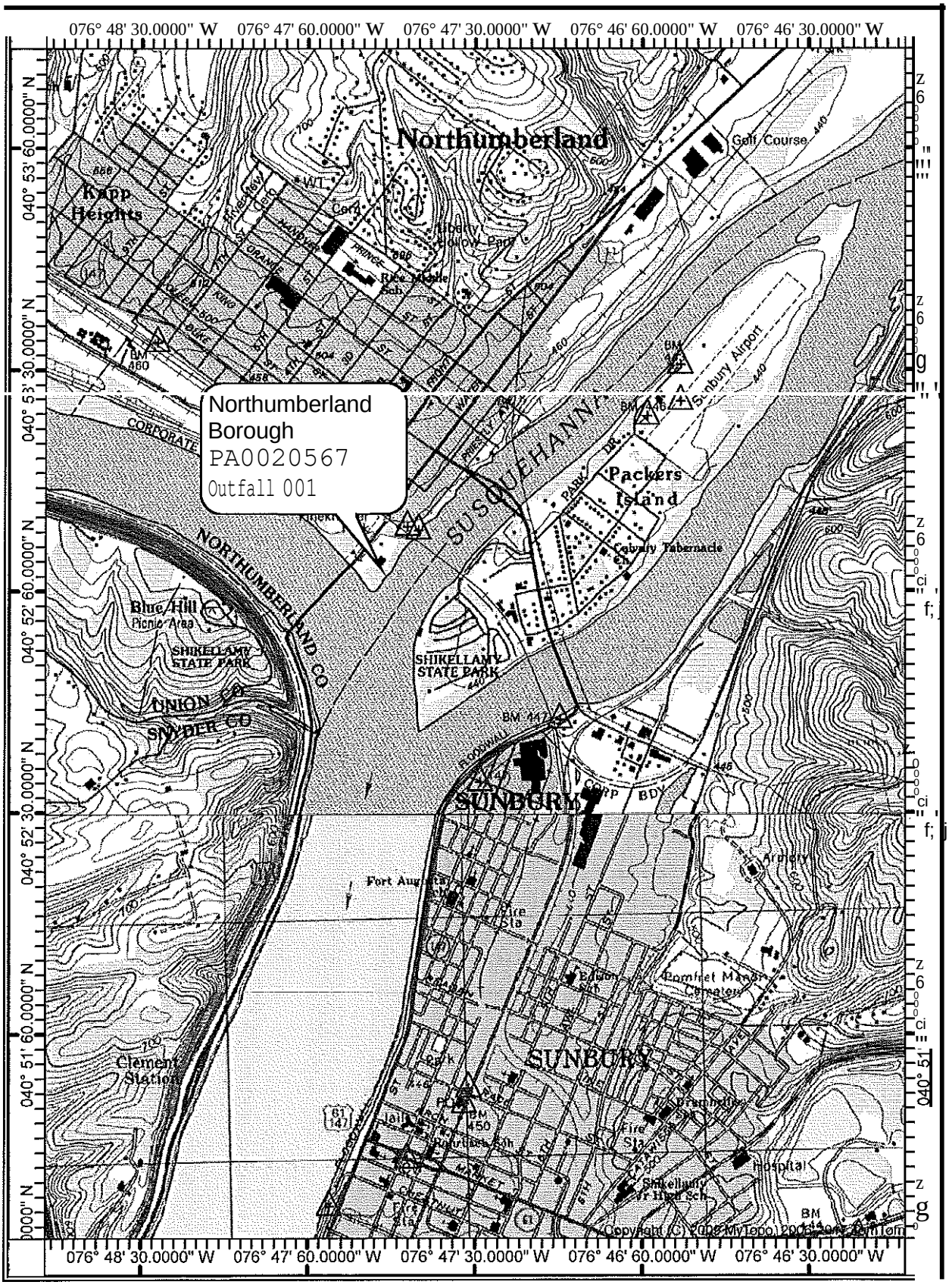
(3) The permittee is authorized to use 5,950 lbs/year of Total Nitrogen (TN) Offsets towards compliance with the Annual Net TN mass load limitations (Cap Load) in accordance with Part C of this permit. These offsets may be applied throughout the Compliance Year or during the Truing Period. The application of Offsets must be reported to DEP as described in Part C. The Offsets are authorized for the following pollutant load reduction activities:

- Connection of 238 on-lot sewage disposal systems to the public sewers after January 1, 2003 in which 25 lbs/year of TN offsets are granted per connection.

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, 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.
☒	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(s): Establishing Effluent Limitations for Individual Industrial Permits, 9/10/13, Establishing WQBELs for Toxic Pollutants and Permit Conditions for Toxic Pollutants, 5/20/21
☐	Other:

Attachments:

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



SCALE 1:24000

0 1000 2000 3000 4000 5000 6000

Feet

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	**125.700**	440.00	11300.00	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	0.099	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
Northumberland	PA0020567	1.1250	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	**125.500**	439.00	18300.00	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	0.099	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
07K	6685	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												
125.700	1118.70	0.00	1118.70	1.7404	0.00095	1.109	733.58	661.62	1.38	0.009	20.01	7.00
Q1-10 Flow												
125.700	715.97	0.00	715.97	1.7404	0.00095	NA	NA	NA	1.07	0.011	20.01	7.00
Q30-10 Flow												
125.700	1521.43	0.00	1521.43	1.7404	0.00095	NA	NA	NA	1.64	0.007	20.01	7.00

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
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
125.700	Northumberland	16.74	50	16.74	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
125.700	Northumberland	1.89	25	1.89	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)		
125.70	Northumberland	25	25	25	25	3	3	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07K	6685	SUSQUEHANNA RIVER

RMI	Total Discharge Flow (mgd)	Analysis Temperature (ºC)	Analysis pH
125.700	1.125	20.008	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
733.579	1.109	661.621	1.378
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.04	0.028	0.04	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.235	6.086	Tsivoglou	5
Reach Travel Time (days)			
0.009			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.001	2.04	0.04	8.24
0.002	2.04	0.04	8.24
0.003	2.04	0.04	8.24
0.004	2.04	0.04	8.24
0.004	2.04	0.04	8.24
0.005	2.04	0.04	8.24
0.006	2.04	0.04	8.24
0.007	2.04	0.04	8.24
0.008	2.04	0.04	8.24
0.009	2.04	0.04	8.24

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
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)
125.700	Northumberland	PA0020567	1.125	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			3

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

1116	= Q stream (cfs)	0.5	= CV Daily
1.125	= 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 = 204.575	1.3.2.iii	WLA cfc = 199.437
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 76.229	5.1d	LTA_cfc = 115.943

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: **Northumberland Borough** NPDES Permit No.: **PA0020567** 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
1.125	144	7.4						

					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		412									
	Chloride (PWS)	mg/L		96									
	Bromide	mg/L	<	0.09									
	Sulfate (PWS)	mg/L		74									
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L	<	0.42									
	Total Antimony	µg/L	<	0.5									
	Total Arsenic	µg/L	<	0.5									
	Total Barium	µg/L		34.2									
	Total Beryllium	µg/L	<	0.2									
	Total Boron	µg/L		221									
	Total Cadmium	µg/L	<	0.1									
	Total Chromium (III)	µg/L	<	0.6									
	Hexavalent Chromium	µg/L		2									
	Total Cobalt	µg/L	<	0.35									
	Total Copper	µg/L	<	2.1									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L	<	16									
	Dissolved Iron	µg/L		45.3									
	Total Iron	µg/L		61.4									
	Total Lead	µg/L	<	0.5									
	Total Manganese	µg/L		42.4									
	Total Mercury	µg/L	<	0.2									
	Total Nickel	µg/L	<	1.5									
	Total Phenols (Phenolics) (PWS)	µg/L	<	0.2									
	Total Selenium	µg/L	<	0.8									
	Total Silver	µg/L		0.5									
	Total Thallium	µg/L	<	0.1									
	Total Zinc	µg/L		65.6									
	Total Molybdenum	µg/L	<	1.1									
	Acrolein	µg/L		4									
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<	1.4									
	Benzene	µg/L	<	0.41									
	Bromoform	µg/L		1.5									
	Carbon Tetrachloride	µg/L		0.52									

Group 3	Chlorobenzene	µg/L	<	0.42									
	Chlorodibromomethane	µg/L	<	0.8									
	Chloroethane	µg/L		0.75									
	2-Chloroethyl Vinyl Ether	µg/L	<	0.34									
	Chloroform	µg/L		20.1									
	Dichlorobromomethane	µg/L	<	5									
	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		0.66									
	1,4-Dioxane	µg/L	<	0.09									
	Ethylbenzene	µg/L	<	0.31									
	Methyl Bromide	µg/L		2.5									
	Methyl Chloride	µg/L	<	0.34									
	Methylene Chloride	µg/L		0.75									
	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	<	0.46									
	Trichloroethylene	µg/L	<	0.33									
	Vinyl Chloride	µg/L	<	0.28									
Group 4	2-Chlorophenol	µg/L	<	6									
	2,4-Dichlorophenol	µg/L	<	6.3									
	2,4-Dimethylphenol	µg/L	<	6.6									
	4,6-Dinitro-o-Cresol	µg/L	<	8.1									
	2,4-Dinitrophenol	µg/L	<	8.1									
	2-Nitrophenol	µg/L	<	6.9									
	4-Nitrophenol	µg/L	<	3.6									
	p-Chloro-m-Cresol	µg/L	<	9.1									
	Pentachlorophenol	µg/L		15.7									
	Phenol	µg/L	<	2.6									
	2,4,6-Trichlorophenol	µg/L	<	6.1									
Group 5	Acenaphthene	µg/L		6.2									
	Acenaphthylene	µg/L		6.5									
	Anthracene	µg/L		6.8									
	Benzidine	µg/L	<	17.8									
	Benzo(a)Anthracene	µg/L		7.8									
	Benzo(a)Pyrene	µg/L		7.8									
	3,4-Benzofluoranthene	µg/L		7.7									
	Benzo(ghi)Perylene	µg/L		8.2									
	Benzo(k)Fluoranthene	µg/L		7.4									
	Bis(2-Chloroethoxy)Methane	µg/L		6									
	Bis(2-Chloroethyl)Ether	µg/L		5.5									
	Bis(2-Chloroisopropyl)Ether	µg/L		6.4									
	Bis(2-Ethylhexyl)Phthalate	µg/L		15.1									
	4-Bromophenyl Phenyl Ether	µg/L		7									
	Butyl Benzyl Phthalate	µg/L		16.7									
	2-Chloronaphthalene	µg/L		6.8									
	4-Chlorophenyl Phenyl Ether	µg/L		6.2									
	Chrysene	µg/L		8.2									
	Dibenzo(a,h)Anthrancene	µg/L		7.8									
	1,2-Dichlorobenzene	µg/L	<	0.26									
	1,3-Dichlorobenzene	µg/L	<	0.5									
	1,4-Dichlorobenzene	µg/L	<	0.3									
	3,3-Dichlorobenzidine	µg/L	<	8.4									
	Diethyl Phthalate	µg/L		6.5									
	Dimethyl Phthalate	µg/L		6.5									
	Di-n-Butyl Phthalate	µg/L		8.3									
	2,4-Dinitrotoluene	µg/L	<	4.8									
	2,6-Dinitrotoluene	µg/L		5.7									

	Di-n-Octyl Phthalate	µg/L		33.1										
	1,2-Diphenylhydrazine	µg/L	<	6.7										
	Fluoranthene	µg/L		7.3										
	Fluorene	µg/L		6.3										
	Hexachlorobenzene	µg/L		7										
	Hexachlorobutadiene	µg/L		0.98										
	Hexachlorocyclopentadiene	µg/L		5.9										
	Hexachloroethane	µg/L		5.9										
	Indeno(1,2,3-cd)Pyrene	µg/L		7.2										
	Isophorone	µg/L		6.2										
	Naphthalene	µg/L		2.2										
	Nitrobenzene	µg/L		6.1										
	n-Nitrosodimethylamine	µg/L	<	3.5										
	n-Nitrosodi-n-Propylamine	µg/L		6										
	n-Nitrosodiphenylamine	µg/L		7										
	Phenanthrene	µg/L		6.8										
	Pyrene	µg/L		7.8										
	1,2,4-Trichlorobenzene	µg/L		0.76										
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

Northumberland Borough, NPDES Permit No. PA0020567, 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 (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	006685	125.7	440	11300			Yes
End of Reach 1	006685	125.5	439	18300			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	125.7	0.099										100	7		
End of Reach 1	125.5	0.099													

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	125.7														
End of Reach 1	125.5														

Model Results

Northumberland Borough, NPDES Permit No. PA0020567, 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)
125.7	1118.70		1118.70	1.74	0.00095	1.109	733.579	661.622	1.378	0.009	20466.696
125.5	1811.70		1811.7								

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)
125.7	3432.14		3432.14	1.74	0.00095	1.815	733.579	404.199	2.579	0.005	9793.464
125.5	5230.657		5230.66								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 12.776 PMF: 0.027 Analysis Hardness (mg/l): 102.39 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	750	750	13,801	
Total Antimony	0	0		0	1,100	1,100	20,242	
Total Arsenic	0	0		0	340	340	6,257	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	386,436	
Total Boron	0	0		0	8,100	8,100	149,054	
Total Cadmium	0	0		0	2.061	2.19	40.2	Chem Translator of 0.943 applied
Total Chromium (III)	0	0		0	580.897	1,838	33,828	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	300	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	1,748	
Total Copper	0	0		0	13.742	14.3	263	Chem Translator of 0.96 applied
Dissolved Iron	0	0		0	N/A	N/A	N/A	

Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	66.264	84.1	1,548	Chem Translator of 0.788 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	30.3	Chem Translator of 0.85 applied
Total Nickel	0	0		0	477.690	479	8,808	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	3.350	3.94	72.5	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	1,196	
Total Zinc	0	0		0	119.550	122	2,249	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	55.2	
Acrylonitrile	0	0		0	650	650	11,961	
Benzene	0	0		0	640	640	11,777	
Bromoform	0	0		0	1,800	1,800	33,123	
Carbon Tetrachloride	0	0		0	2,800	2,800	51,525	
Chlorobenzene	0	0		0	1,200	1,200	22,082	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	331,231	
Chloroform	0	0		0	1,900	1,900	34,963	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	15,000	15,000	276,026	
1,1-Dichloroethylene	0	0		0	7,500	7,500	138,013	
1,2-Dichloropropane	0	0		0	11,000	11,000	202,419	
1,3-Dichloropropylene	0	0		0	310	310	5,705	
Ethylbenzene	0	0		0	2,900	2,900	53,365	
Methyl Bromide	0	0		0	550	550	10,121	
Methyl Chloride	0	0		0	28,000	28,000	515,249	
Methylene Chloride	0	0		0	12,000	12,000	220,821	
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	18,402	
Tetrachloroethylene	0	0		0	700	700	12,881	
Toluene	0	0		0	1,700	1,700	31,283	
1,2-trans-Dichloroethylene	0	0		0	6,800	6,800	125,132	
1,1,1-Trichloroethane	0	0		0	3,000	3,000	55,205	
1,1,2-Trichloroethane	0	0		0	3,400	3,400	62,566	
Trichloroethylene	0	0		0	2,300	2,300	42,324	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	560	560	10,305	
2,4-Dichlorophenol	0	0		0	1,700	1,700	31,283	
2,4-Dimethylphenol	0	0		0	660	660	12,145	
4,6-Dinitro-o-Cresol	0	0		0	80	80.0	1,472	
2,4-Dinitrophenol	0	0		0	660	660	12,145	
2-Nitrophenol	0	0		0	8,000	8,000	147,214	
4-Nitrophenol	0	0		0	2,300	2,300	42,324	
p-Chloro-m-Cresol	0	0		0	160	160	2,944	
Pentachlorophenol	0	0		0	8.851	8.85	163	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	460	460	8,465	
Acenaphthene	0	0		0	83	83.0	1,527	

Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	300	300	5,521	
Benzo(a)Anthracene	0	0		0	0.5	0.5	9.2	
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	552,052	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	82,808	
4-Bromophenyl Phenyl Ether	0	0		0	270	270	4,968	
Butyl Benzyl Phthalate	0	0		0	140	140	2,576	
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	15,089	
1,3-Dichlorobenzene	0	0		0	350	350	6,441	
1,4-Dichlorobenzene	0	0		0	730	730	13,433	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	4,000	4,000	73,607	
Dimethyl Phthalate	0	0		0	2,500	2,500	46,004	
Di-n-Butyl Phthalate	0	0		0	110	110	2,024	
2,4-Dinitrotoluene	0	0		0	1,600	1,600	29,443	
2,6-Dinitrotoluene	0	0		0	990	990	18,218	
1,2-Diphenylhydrazine	0	0		0	15	15.0	276	
Fluoranthene	0	0		0	200	200	3,680	
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	184	
Hexachlorocyclopentadiene	0	0		0	5	5.0	92.0	
Hexachloroethane	0	0		0	60	60.0	1,104	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	10,000	10,000	184,017	
Naphthalene	0	0		0	140	140	2,576	
Nitrobenzene	0	0		0	4,000	4,000	73,607	
n-Nitrosodimethylamine	0	0		0	17,000	17,000	312,829	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	300	300	5,521	
Phenanthrene	0	0		0	5	5.0	92.0	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	130	130	2,392	

☑ ***CFC*** CCT (min): 720 PMF: 0.188 Analysis Hardness (mg/l): 100.36 Analysis pH: 7.00

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

Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	220	220	26,744	
Total Arsenic	0	0		0	150	150	18,234	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	498,407	
Total Boron	0	0		0	1,600	1,600	194,500	
Total Cadmium	0	0		0	0.247	0.27	33.0	Chem Translator of 0.909 applied
Total Chromium (III)	0	0		0	74.334	86.4	10,507	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	1,264	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	2,310	
Total Copper	0	0		0	8.983	9.36	1,138	Chem Translator of 0.96 applied
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	965,689	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2.527	3.2	389	Chem Translator of 0.79 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	110	Chem Translator of 0.85 applied
Total Nickel	0	0		0	52.166	52.3	6,360	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	606	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	1,580	
Total Zinc	0	0		0	118.501	120	14,610	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	365	
Acrylonitrile	0	0		0	130	130	15,803	
Benzene	0	0		0	130	130	15,803	
Bromoform	0	0		0	370	370	44,978	
Carbon Tetrachloride	0	0		0	560	560	68,075	
Chlorobenzene	0	0		0	240	240	29,175	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	425,470	
Chloroform	0	0		0	390	390	47,409	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	3,100	3,100	376,845	
1,1-Dichloroethylene	0	0		0	1,500	1,500	182,344	
1,2-Dichloropropane	0	0		0	2,200	2,200	267,438	
1,3-Dichloropropylene	0	0		0	61	61.0	7,415	
Ethylbenzene	0	0		0	580	580	70,506	
Methyl Bromide	0	0		0	110	110	13,372	
Methyl Chloride	0	0		0	5,500	5,500	668,595	
Methylene Chloride	0	0		0	2,400	2,400	291,751	
1,1,2,2-Tetrachloroethane	0	0		0	210	210	25,528	
Tetrachloroethylene	0	0		0	140	140	17,019	
Toluene	0	0		0	330	330	40,116	
1,2-trans-Dichloroethylene	0	0		0	1,400	1,400	170,188	
1,1,1-Trichloroethane	0	0		0	610	610	74,153	

1,1,2-Trichloroethane	0	0		0	680	680	82,663	
Trichloroethylene	0	0		0	450	450	54,703	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	110	110	13,372	
2,4-Dichlorophenol	0	0		0	340	340	41,331	
2,4-Dimethylphenol	0	0		0	130	130	15,803	
4,6-Dinitro-o-Cresol	0	0		0	16	16.0	1,945	
2,4-Dinitrophenol	0	0		0	130	130	15,803	
2-Nitrophenol	0	0		0	1,600	1,600	194,500	
4-Nitrophenol	0	0		0	470	470	57,134	
p-Chloro-m-Cresol	0	0		0	500	500	60,781	
Pentachlorophenol	0	0		0	6.790	6.79	825	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	91	91.0	11,062	
Acenaphthene	0	0		0	17	17.0	2,067	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	59	59.0	7,172	
Benzo(a)Anthracene	0	0		0	0.1	0.1	12.2	
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	729,377	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	910	910	110,622	
4-Bromophenyl Phenyl Ether	0	0		0	54	54.0	6,564	
Butyl Benzyl Phthalate	0	0		0	35	35.0	4,255	
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	19,450	
1,3-Dichlorobenzene	0	0		0	69	69.0	8,388	
1,4-Dichlorobenzene	0	0		0	150	150	18,234	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	800	800	97,250	
Dimethyl Phthalate	0	0		0	500	500	60,781	
Di-n-Butyl Phthalate	0	0		0	21	21.0	2,553	
2,4-Dinitrotoluene	0	0		0	320	320	38,900	
2,6-Dinitrotoluene	0	0		0	200	200	24,313	
1,2-Diphenylhydrazine	0	0		0	3	3.0	365	
Fluoranthene	0	0		0	40	40.0	4,863	
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	243	
Hexachlorocyclopentadiene	0	0		0	1	1.0	122	
Hexachloroethane	0	0		0	12	12.0	1,459	

Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	2,100	2,100	255,282	
Naphthalene	0	0		0	43	43.0	5,227	
Nitrobenzene	0	0		0	810	810	98,466	
n-Nitrosodimethylamine	0	0		0	3,400	3,400	413,313	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	59	59.0	7,172	
Phenanthrene	0	0		0	1	1.0	122	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	26	26.0	3,161	

☑ ***THH*** CCT (min): 720 PMF: 0.188 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	681	
Total Arsenic	0	0		0	10	10.0	1,216	
Total Barium	0	0		0	2,400	2,400	291,751	
Total Boron	0	0		0	3,100	3,100	376,845	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	300	300	36,469	
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	121,563	
Total Mercury	0	0		0	0.050	0.05	6.08	
Total Nickel	0	0		0	610	610	74,153	
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	29.2	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	3	3.0	365	
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	12,156	

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	693	
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	4,012	
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	8,266	
Methyl Bromide	0	0		0	100	100.0	12,156	
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	6,929	
1,2-trans-Dichloroethylene	0	0		0	100	100.0	12,156	
1,1,1-Trichloroethane	0	0		0	10,000	10,000	1,215,628	
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	3,647	
2,4-Dichlorophenol	0	0		0	10	10.0	1,216	
2,4-Dimethylphenol	0	0		0	100	100.0	12,156	
4,6-Dinitro-o-Cresol	0	0		0	2	2.0	243	
2,4-Dinitrophenol	0	0		0	10	10.0	1,216	
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	486,251	
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A	
Acenaphthene	0	0		0	70	70.0	8,509	
Anthracene	0	0		0	300	300	36,469	
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	24,313	
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	12.2	
2-Chloronaphthalene	0	0		0	800	800	97,250	
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	121,563	
1,3-Dichlorobenzene	0	0		0	7	7.0	851	
1,4-Dichlorobenzene	0	0		0	300	300	36,469	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	600	600	72,938	
Dimethyl Phthalate	0	0		0	2,000	2,000	243,126	
Di-n-Butyl Phthalate	0	0		0	20	20.0	2,431	
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	2,431	
Fluorene	0	0		0	50	50.0	6,078	
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	486	
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	4,133	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	1,216	
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	2,431	
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	8.51	

☑ ***CRL*** CCT (min): 720 PMF: 0.271 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	

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	32.1	
Benzene	0	0		0	0.58	0.58	311	
Bromoform	0	0		0	7	7.0	3,750	
Carbon Tetrachloride	0	0		0	0.4	0.4	214	
Chlorobenzene	0	0		0	N/A	N/A	N/A	
Chlorodibromomethane	0	0		0	0.8	0.8	429	
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	509	
1,2-Dichloroethane	0	0		0	9.9	9.9	5,304	
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,2-Dichloropropane	0	0		0	0.9	0.9	482	
1,3-Dichloropropylene	0	0		0	0.27	0.27	145	
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	10,714	
1,1,2,2-Tetrachloroethane	0	0		0	0.2	0.2	107	
Tetrachloroethylene	0	0		0	10	10.0	5,357	
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	295	
Trichloroethylene	0	0		0	0.6	0.6	321	
Vinyl Chloride	0	0		0	0.02	0.02	10.7	
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	16.1	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	1.5	1.5	804	
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	0.054	
Benzo(a)Anthracene	0	0		0	0.001	0.001	0.54	
Benzo(a)Pyrene	0	0		0	0.0001	0.0001	0.054	
3,4-Benzofluoranthene	0	0		0	0.001	0.001	0.54	
Benzo(k)Fluoranthene	0	0		0	0.01	0.01	5.36	
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	16.1	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	171	
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	64.3	
Dibenzo(a,h)Anthrancene	0	0		0	0.0001	0.0001	0.054	
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	26.8	
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	26.8	
2,6-Dinitrotoluene	0	0		0	0.05	0.05	26.8	
1,2-Diphenylhydrazine	0	0		0	0.03	0.03	16.1	
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	0.043	
Hexachlorobutadiene	0	0		0	0.01	0.01	5.36	
Hexachlorocyclopentadiene	0	0		0	N/A	N/A	N/A	
Hexachloroethane	0	0		0	0.1	0.1	53.6	
Indeno(1,2,3-cd)Pyrene	0	0		0	0.001	0.001	0.54	
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	0.37	
n-Nitrosodi-n-Propylamine	0	0		0	0.005	0.005	2.68	
n-Nitrosodiphenylamine	0	0		0	3.3	3.3	1,768	
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
Pentachlorophenol	0.15	0.24	16.1	25.1	40.2	µg/L	16.1	CRL	Discharge Conc ≥ 50% WQBEL (RP)
Benzo(a)Anthracene	0.005	0.008	0.54	0.84	1.34	µg/L	0.54	CRL	Discharge Conc ≥ 50% WQBEL (RP)
Benzo(a)Pyrene	0.0005	0.0008	0.054	0.084	0.13	µg/L	0.054	CRL	Discharge Conc ≥ 50% WQBEL (RP)
3,4-Benzofluoranthene	0.005	0.008	0.54	0.84	1.34	µg/L	0.54	CRL	Discharge Conc ≥ 50% WQBEL (RP)
Benzo(k)Fluoranthene	0.05	0.078	5.36	8.36	13.4	µg/L	5.36	CRL	Discharge Conc ≥ 50% WQBEL (RP)
Bis(2-Chloroethyl)Ether	Report	Report	Report	Report	Report	µg/L	16.1	CRL	Discharge Conc > 25% WQBEL (no RP)
Butyl Benzyl Phthalate	0.11	0.18	12.2	19.0	30.4	µg/L	12.2	THH	Discharge Conc ≥ 50% WQBEL (RP)
Dibenzo(a,h)Anthrancene	0.0005	0.0008	0.054	0.084	0.13	µg/L	0.054	CRL	Discharge Conc ≥ 50% WQBEL (RP)
3,3-Dichlorobenzidine	Report	Report	Report	Report	Report	µg/L	26.8	CRL	Discharge Conc > 25% WQBEL (no RP)
Hexachlorobenzene	0.0004	0.0006	0.043	0.067	0.11	µg/L	0.043	CRL	Discharge Conc ≥ 50% WQBEL (RP)
Indeno(1,2,3-cd)Pyrene	0.005	0.008	0.54	0.84	1.34	µg/L	0.54	CRL	Discharge Conc ≥ 50% WQBEL (RP)
n-Nitrosodi-n-Propylamine	0.025	0.039	2.68	4.18	6.7	µg/L	2.68	CRL	Discharge Conc ≥ 50% WQBEL (RP)

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

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Ceriodaphnia
Endpoint	Survival
TIWC (decimal)	0.01
No. Per Replicate	1
TST b value	0.75
TST alpha value	0.2

Facility Name

Northumberland Borough WWTP

Permit No.

PA0020567

Test Completion Date 9/23/2019

Replicate 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 5/4/2020

Replicate 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 1/11/2021

Replicate 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 3/28/2022

Replicate 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)	0.01
No. Per Replicate	1
TST b value	0.75
TST alpha value	0.2

Facility Name

Northumberland Borough WWTP

Permit No.

PA0020567

Test Completion Date

Replicate No.	9/23/2019 Control	9/23/2019 TIWC
1	32	36
2	40	39
3	21	15
4	30	34
5	35	28
6	24	30
7	32	34
8	36	39
9	37	34
10	16	36
11		
12		
13		
14		
15		
Mean	30.300	32.500
Std Dev.	7.675	7.059
# Replicates	10	10

T-Test Result	3.3937
Deg. of Freedom	17
Critical T Value	0.8633
Pass or Fail	PASS

Test Completion Date

Replicate No.	5/4/2020 Control	5/4/2020 TIWC
1	24	36
2	36	30
3	36	34
4	34	25
5	40	19
6	36	17
7	32	31
8	27	37
9	33	36
10	34	32
11		
12		
13		
14		
15		
Mean	33.200	29.700
Std Dev.	4.662	7.119
# Replicates	10	10

T-Test Result	1.9138
Deg. of Freedom	14
Critical T Value	0.8681
Pass or Fail	PASS

Test Completion Date

Replicate No.	1/11/2021 Control	1/11/2021 TIWC
1	34	28
2	32	23
3	14	37
4	31	19
5	29	29
6	18	33
7	26	36
8	19	36
9	20	31
10	25	19
11		
12		
13		
14		
15		
Mean	24.800	29.100
Std Dev.	6.779	6.822
# Replicates	10	10

T-Test Result	3.9024
Deg. of Freedom	16
Critical T Value	0.8647
Pass or Fail	PASS

Test Completion Date

Replicate No.	3/28/2022 Control	3/28/2022 TIWC
1	27	27
2	21	29
3	23	22
4	26	30
5	31	27
6	29	29
7	30	33
8	27	29
9	15	23
10	25	15
11		
12		
13		
14		
15		
Mean	25.400	26.400
Std Dev.	4.766	5.147
# Replicates	10	10

T-Test Result	3.7093
Deg. of Freedom	16
Critical T Value	0.8647
Pass or Fail	PASS

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Survival
TIWC (decimal)	0.01
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Facility Name

Northumberland Borough WWTP

Permit No.

PA0020567

Test Completion Date

Replicate No.	9/24/2019 Control	9/24/2019 TIWC
1	10	10
2	10	9
3	10	10
4	10	10
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	10.000	9.750
Std Dev.	0.000	0.500
# Replicates	4	4

T-Test Result	7.6643
Deg. of Freedom	3
Critical T Value	0.7649
Pass or Fail	PASS

Test Completion Date

Replicate No.	5/5/2020 Control	5/5/2020 TIWC
1	9	9
2	10	10
3	10	10
4	9	9
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	9.500	9.500
Std Dev.	0.577	0.577
# Replicates	4	4

T-Test Result	5.6564
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

Test Completion Date

Replicate No.	1/12/2021 Control	1/12/2021 TIWC
1	10	10
2	10	10
3	10	10
4	10	10
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	10.000	10.000
Std Dev.	0.000	0.000
# Replicates	4	4

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

Test Completion Date

Replicate No.	3/29/2022 Control	3/29/2022 TIWC
1	8	10
2	6	9
3	9	9
4	9	6
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	8.000	8.500
Std Dev.	1.414	1.732
# Replicates	4	4

T-Test Result	2.7794
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Growth
TIWC (decimal)	0.01
No. Per Replicate	4
TST b value	0.75
TST alpha value	0.25

Facility Name

Northumberland Borough WWTP

Permit No.

PA0020567

Test Completion Date 9/24/2019

Replicate No.	Control	TIWC
1	0.716	0.538
2	0.68	0.584
3	0.487	0.692
4	0.496	0.66
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.595	0.619
Std Dev.	0.120	0.070
# Replicates	4	4

T-Test Result	3.0182
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

Test Completion Date 5/5/2020

Replicate No.	Control	TIWC
1	0.643	0.578
2	0.49	0.67
3	0.558	0.633
4	0.494	0.528
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.546	0.602
Std Dev.	0.072	0.062
# Replicates	4	4

T-Test Result	4.6824
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

Test Completion Date 1/12/2021

Replicate No.	Control	TIWC
1	0.36	0.374
2	0.343	0.315
3	0.325	0.324
4	0.286	0.285
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.329	0.325
Std Dev.	0.032	0.037
# Replicates	4	4

T-Test Result	3.5535
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

Test Completion Date 3/29/2022

Replicate No.	Control	TIWC
1	0.443	0.507
2	0.305	0.472
3	0.503	0.487
4	0.558	0.439
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.452	0.476
Std Dev.	0.109	0.029
# Replicates	4	4

T-Test Result	3.1688
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

WET Summary and Evaluation

Facility Name	Northumberland Borough WWTP
Permit No.	PA0020567
Design Flow (MGD)	1.125
Q_{7-10} Flow (cfs)	1116
PMF_a	0.027
PMF_c	0.187

		Test Results (Pass/Fail)			
		Test Date	**Test Date**	**Test Date**	**Test Date**
Species	**Endpoint**	9/23/19	5/4/20	1/11/21	3/28/22
Ceriodaphnia	Survival	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	**Test Date**	**Test Date**	**Test Date**
Species	**Endpoint**	9/23/19	5/4/20	1/11/21	3/28/22
Ceriodaphnia	Reproduction	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	**Test Date**	**Test Date**	**Test Date**
Species	**Endpoint**	9/24/19	5/5/20	1/12/21	3/29/22
Pimephales	Survival	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	**Test Date**	**Test Date**	**Test Date**
Species	**Endpoint**	9/24/19	5/5/20	1/12/21	3/29/22
Pimephales	Growth	PASS	PASS	PASS	PASS

Reasonable Potential? NO

Permit Recommendations

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