

Application Type Renewal
Facility Type Municipal
Major / Minor Minor

**NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE**

Application No. PA0205869
APS ID 1024533
Authorization ID 1329255

Applicant and Facility Information

Applicant Name	<u>West Branch Sewer Authority</u>	Facility Name	<u>W Branch Sewer Authority STP</u>
Applicant Address	<u>901 Maple Avenue Suite 2</u> <u>Northern Cambria, PA 15714-1337</u>	Facility Address	<u>200 Charity Lane</u> <u>Northern Cambria, PA 15714</u>
Applicant Contact	<u>Joseph Kollar</u>	Facility Contact	<u>Keith Herman</u>
Applicant Phone	<u>(814) 948-4723</u>	Facility Phone	<u>814-948-4927</u>
Client ID	<u>44410</u>	Site ID	<u>237806</u>
Ch 94 Load Status	<u>Not Overloaded</u>	Municipality	<u>Susquehanna Township</u>
Connection Status	<u>No prohibition</u>	County	<u>Cambria</u>
Date Application Received	<u>October 2, 2020</u>	EPA Waived?	<u>No</u>
Date Application Accepted	<u>October 6, 2020</u>	If No, Reason	<u>Significant CB Discharge</u>
Purpose of Application	<u>NPDES permit renewal.</u>		

Summary of Review

The PA Department of Environmental Protection (PADEP/Department) received an NPDES permit renewal application from Stiffler-McGraw and Associates Inc. (Consultant) on October 2, 2020 on behalf of West Branch Sewer Authority (WBSA/Permittee) for permittee's W. Branch Sewer Authority STP (facility). The facility a minor STP with an average annual design flow of 0.9 MGD, Hydraulic design capacity of 2.5 MGD, and organic loading capacity of 2,109 lbs. BOD5/day. This is also a significant Phase II Chesapeake Bay Discharger. The treated effluent is discharged through Outfall 001 into West Branch Susquehanna River (WWF) at RMI 233.98 in state watershed 8-B. The existing permit was expired on March 31, 2021. The terms and conditions of the existing permit were automatically extended since the renewal application was received at least 180 days prior to expiration date. Renewal NPDES permit applications under Clean Water program are not covered by PADEP's PDG per 021-2100-001.


This fact sheet is developed in accordance with 40 CFR §124.56.

Changes in this renewal: Quarterly E. Coli monitoring added, CBOD5 mass limits more stringent, monitoring added for Total Copper, Total Lead, and Total Zinc. In addition, upstream hardness, pH, temperature; and discharge hardness and temperature are added for 12 months.

Sludge use and disposal description and location(s): Sludge is filter pressed, dewatered with aid of polymer, and landfilled at Laurel Highlands owned/operated by Waste Management.

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
√		Reza H. Chowdhury, E.I.T. / Project Manager 	December 21, 2021
X		Pravin Patel Pravin C. Patel, P.E. / Environmental Engineer Manager	12/21/2021

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	0.9
Latitude	40° 40' 33"	Longitude	-78° 48' 20"
Quad Name	Barnesboro	Quad Code	1315
Wastewater Description: Sewage Effluent			
Receiving Waters	West Branch Susquehanna River (WWF)	Stream Code	18668
NHD Com ID	61837133	RMI	234
Drainage Area	34.9	Yield (cfs/mi ²)	0.062
Q ₇₋₁₀ Flow (cfs)	2.18	Q ₇₋₁₀ Basis	Please see below
Elevation (ft)	1431	Slope (ft/ft)	
Watershed No.	8-B	Chapter 93 Class.	WWF
Existing Use	WWF	Existing Use Qualifier	Ch. 93
Exceptions to Use	None	Exceptions to Criteria	N/A
Assessment Status	Impaired		
Cause(s) of Impairment	METALS		
Source(s) of Impairment	ACID MINE DRAINAGE		
TMDL Status	Final, 12/03/2011	Name	West Branch Susquehanna River Watershed TMDL
Background/Ambient Data		Data Source	
pH (SU)	7.0		Default per 391-2000-013
Temperature (°C)	25		Default per 391-2000-007
Hardness (mg/L)	100		Default
Other:			
Nearest Downstream Public Water Supply Intake			PA American Water Company Milton Division
PWS Waters		Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	>100 mile

Changes Since Last Permit Issuance: None

Other Comments:

There is no nearby WQN Station or Streamgage from the discharge point. Therefore, USGS's web based watershed delineation tool StreamStats (accessible at <https://streamstats.usgs.gov/ss/>, accessed on September 29, 2021) was utilized to determine the drainage area and low flow statistics of the receiving stream at discharge point. The StreamStats delineation report shows a drainage area at the Outfall 001 to be 34.9 mi², Q₇₋₁₀ of 2.18 cfs, and Q₃₀₋₁₀ of 2.87 cfs.

Q₇₋₁₀ runoff rate (low flow yield): 2.18 cfs/34.9 mi² or 0.062 cfs/mi²

Q₃₀₋₁₀:Q₇₋₁₀: 2.87/2.18 or 1.32

Default Q₁₋₁₀:Q₇₋₁₀ of 0.64 will be used for modeling, if needed.

PWS Intake:

The nearby downstream PWS intake PA American Water Company Milton Division which is more than 100 miles downstream of discharge point.

Wastewater Characteristics:

A pH of 7.4 (median July- September 2020-2021), default temperature of 20°C (Default per 391-2000-007), and default Hardness value of 100 mg/l will be used for modeling, if needed.

Background data:

There is no nearby WQN station from the discharge point. In absence of site-specific data, a default pH of 7.0 S.U., default stream temperature of 25°C, and default hardness of 100 mg/l will be used, as appropriate.

West Branch Susquehanna River Watershed TMDL:

The West Branch Susquehanna River Watershed TMDL was prepared on December 3, 2011. The TMDL was prepared to address the impairments noted on the 1996 PA Section 303(d) list of impaired waters, required under the CWA, and cover three segments on that list. The stream segment is listed as impaired for metals and pH. All impairments result from drainage of abandoned coal mines. The TMDL addresses the three primary metals associated with abandoned mine drainage (iron, aluminum, and manganese) and acidity. There are few point sources in the TMDL with WLA, mainly coal mining permits, non-coal mining permits (industrial waste), and coal mining or otherwise. This facility doesn't have WLA, however, existing permit has quarterly monitoring requirements for those three metals to track contribution from this facility to the downstream impairment.

Antidegradation (93.4):

The effluent limits for this discharge have been developed to ensure that existing in-stream water uses and the level of water quality necessary to protect the existing uses are maintained and protected. The receiving streams are designated as Warm-Water Fishes (WWF). No High-Quality stream or Exceptional Value water is impacted by this discharge; therefore, no Antidegradation Analysis is performed for the discharge.

Class A Wild Trout Fisheries:

No Class A Wild Trout Fisheries are impacted by this discharge.

Treatment Facility Summary				
Treatment Facility Name: W Branch Sewer Authority STP				
WQM Permit No.		Issuance Date		
1110412		12/5/2012		
1194401		11/3/1995		
Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	SBR	UV Disinfection	0.9
Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
2.5	2,109	Not Overloaded	Belt Filtration	Landfill

Changes Since Last Permit Issuance: None

Treatment Plant Description

West Branch Wastewater Plant (WBWP) is a minor sewer facility (MISF2) with a design flow of 0.9 MGD, located in Susquehanna Township, Cambria County, and discharging into West Branch Susquehanna River through Outfall 001 at approximate RMI 234 miles. The facility is owned and operated by West Branch Sewer Authority (WBSA/permittee). WBWP provides preliminary cutting, grit removal, raw sewage pumping, and secondary treatment by Intermittent Cycle Extended Aeration System (ICEAS) SBR treatment process, and UV disinfection. Per PADEP's inspection report dated January 18, 2019, the treatment process includes the following treatment units:

1. One mechanical bar screen
2. Two grinders
3. One grit removal unit
4. Two SBRs
5. Two digesters
6. One UV disinfection
7. One belt filter press
8. One influent screen unit

9. One comminutor

The application indicated the WBWP receives flow from below contributors:

TRIBUTARY INFORMATION				
Municipalities Served	Flow Contribution (%)	Type of Sewer System		EDU-Population est.
		Separate (%)	Combined (%)	
Northern Cambria Borough	63	100		1846 edu – 3400 pop
Susquehanna Twp	12	100		332 edu - 700 pop
Barr Twp	10	100		302 edu – 600 pop
West Carroll Twp	15	100		450 edu- 900 pop

The treatment plant uses the following chemicals for treatment purpose:

Wastewater Treatment Chemical	Purpose	Maximum Usage Rate	Units
Polymer	Sludge Thickening	27	gal/month
Aluminum Chlorohydrate	Phosphorous Removal	7.5	gal/day

This facility is in Chesapeake Bay Watershed and is a Phase II Significant Discharger with Net TN and TP allocation. CB TMDL will be discussed in separate paragraph later on this report. The facility doesn't have any significant or categorical commercial or industrial users. There are some commercial non significant users contributing to the influent such as schools, nursing homes, office, hotel, car wash etc.

Biosolids Management:

Sludge from each of the SBR tanks is pumped to aerobic sludge digesters which are used to reduce sludge volume. Sludge is held in aerobic digester tanks for digestion and stabilization for 60 days. Sludge from the digester tanks is pumped to a belt filter press for dewatering. Grit is discharged onto the conveyor and mixes with the dewatered sludge for ultimate disposal at a landfill.

Summary of inspection:

May 4, 2020: ADMIN inspection done to go over the spreadsheets, CAP limits etc. 15 effluent violations were identified during the ADMIN review for the period of 2015-2019.

September 18, 2019: CEI conducted to go over the spreadsheets, CAP limits etc. No DMR effluent violations noted in 2019 thus far.

January 18, 2019: CEI conducted. No violation identified during the inspection.

A CACP was issued on January 17, 2017 for effluent violations during 2014-2016 period.

Compliance History

DMR Data for Outfall 001 (from August 1, 2020 to July 31, 2021)

Parameter	JUL-21	JUN-21	MAY-21	APR-21	MAR-21	FEB-21	JAN-21	DEC-20	NOV-20	OCT-20	SEP-20	AUG-20
Flow (MGD) Average Monthly	0.367	0.395	0.526	0.359	0.48	0.383	0.383	0.439	0.365	0.324	0.317	0.331
Flow (MGD) Daily Maximum	0.623	0.597	1.8	0.606	1.80	0.784	0.784	1.5	0.965	0.792	0.41	0.606
pH (S.U.) Minimum	8.2	8.0	7.8	7.8	7.6	7.8	7.8	6.5	6.5	6.4	6.5	6.5
pH (S.U.) Maximum	8.6	8.2	8.2	8.2	8.2	8.0	8.0	8.5	6.7	6.6	6.7	7.6
DO (mg/L) Minimum	4.0	4.2	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
CBOD5 (lbs/day) Average Monthly	21.2	< 21.7	40.1	18.9	76.7	< 30.0	< 30.0	30.1	< 8.6	< 7.5	< 8.0	< 13.4
CBOD5 (lbs/day) Weekly Average	23.6	44.2	70.1	24.9	276.3	52.1	< 52.1	65.6	10.0	< 8.0	< 8.5	19.3
CBOD5 (mg/L) Average Monthly	7.8	< 6.3	10.2	6.6	15.4	< 10.3	< 10.3	8.8	< 3.1	< 3.0	< 3.0	< 5.0
CBOD5 (mg/L) Weekly Average	9.0	9.0	18.0	9.0	43.2	20.0	20.0	15.0	3.0	3.0	< 3.0	8.0
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	604	604	521.0	648	553	885	885	714	657	687	486	674
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	822	929	750.0	821	646	1293	1293	1083	822	1166	883	871
BOD5 (mg/L) Raw Sewage Influent Average Monthly	215	175	133.0	230	156	276	276	215	231	268	182	234
TSS (lbs/day) Average Monthly	21.4	< 17.5	24.0	21.3	59.5	41.3	41.3	26.9	< 8.4	< 7.5	< 5.8	< 8.8
TSS (lbs/day) Raw Sewage Influent Average Monthly	340	496	419.0	433	442	657	657	494	399	492	310	708
TSS (lbs/day) Raw Sewage Influent Daily Maximum	388	913	530.0	604	544	872	872	937	512	841	598	934
TSS (lbs/day) Weekly Average	28.8	44.2	34.8	30.0	199.6	56.4	56.4	63.9	12.1	11.0	9.5	16.8
TSS (mg/L) Average Monthly	8.0	< 5.0	6.0	7.0	12	14	14	8.0	< 3.0	< 3.0	< 2.0	< 3.0

**NPDES Permit Fact Sheet
W Branch Sewer Authority STP**

NPDES Permit No. PA0205869

TSS (mg/L) Raw Sewage Influent Average Monthly	121	136	109.0	153	124	202	202	153	140	192	116	243
TSS (mg/L) Weekly Average	11.0	8.0	7.0	10.0	31	21	21	15.0	4.0	4.0	4.0	5.0
Fecal Coliform (CFU/100 ml) Geometric Mean	< 2	< 65.0	32.0	< 222	280	200	200	< 8.0	< 13.0	< 2.0	< 8.0	37
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	7.0	921.0	2419.6	2419.6	2419.6	648.8	648.8	78.9	240.0	12.1	461.1	727
UV Transmittance (%) Minimum	56.0	59.1	61.9	50.0	19.8	16.5	16.5	20.0	44.2	42.3	50.2	43.9
Nitrate-Nitrite (mg/L) Average Monthly	3.278	3.88	< 2.341	< 3.073	1.651	< 2.795	< 2.795	< 2.791	< 2.741	3.084	< 2.583	< 3.805
Nitrate-Nitrite (lbs) Total Monthly	292.0	418.0	< 256.0	< 273	196	< 280	< 280	< 281	< 268	< 253	< 211	< 310
Total Nitrogen (mg/L) Average Monthly	10.226	7.05	< 8.168	< 19.042	23.83	< 15.58	< 15.58	< 19.204	< 14.884	< 4.189	< 9.032	< 9.21
Total Nitrogen (lbs) Effluent Net Total Monthly	868	823	< 916.0	< 1705	2762	< 1450	< 1450	< 1946	< 1489	< 343	< 744	< 754
Total Nitrogen (lbs) Total Monthly	868	27.0	< 916.0	< 1705	2762	< 1450	< 1450	< 1946	< 1489	< 343	< 744	< 754
Total Nitrogen (lbs) Effluent Net Total Annual											< 9066	
Total Nitrogen (lbs) Total Annual											< 9066	
Ammonia (lbs/day) Average Monthly	< 13	< 12.0	18.0	43	64	31	31	37	< 32.0	< 0.4	< 14.0	< 10.0
Ammonia (mg/L) Average Monthly	< 4.98	< 2.61	4.961	13.947	16.92	10.526	10.526	11.144	< 8.96	< 0.149	< 5.145	< 3.676
Ammonia (lbs) Total Monthly	< 405	< 350	570.0	1279	1993	970	970	1138	< 950	< 12	< 211	< 304.0
Ammonia (lbs) Total Annual											< 2461	
TKN (mg/L) Average Monthly	6.95	3.16	< 5.828	< 15.97	22.37	< 12.785	< 12.875	< 16.41	< 12.143	< 1.106	< 6.445	< 5.704
TKN (lbs) Total Monthly	576	405	< 660.0	< 1433	2584	< 1171	< 1171	< 1665	< 1221	< 90	< 533	< 471
Total Phosphorus (mg/L) Average Monthly	1.58	2.6	1.611	3.83	3.23	2.4	< 2.4	1.83	1.58	3.17	2.82	2.22
Total Phosphorus (lbs) Effluent Net Total Monthly	141	287	186.0	351	374	223	223	191	176	259	229	180
Total Phosphorus (lbs) Total Monthly	141	287	186.0	351	374	223	223	191	176	259	229	180
Total Phosphorus (lbs) Effluent Net Total Annual											2166	

**NPDES Permit Fact Sheet
W Branch Sewer Authority STP**

NPDES Permit No. PA0205869

Total Phosphorus (lbs) Total Annual											2166	
Total Aluminum (mg/L) Daily Maximum		0.011			< 0.1			< 0.1			< 0.1	
Total Iron (mg/L) Daily Maximum		0.102			< 0.2			< 0.2			< 0.2	
Total Manganese (mg/L) Daily Maximum		0.184			0.173			0.164			0.0502	

Compliance History

Effluent Violations for Outfall 001, from: September 1, 2020 To: July 31, 2021

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
CBOD5	03/31/21	Wkly Avg	43.2	mg/L	37.5	mg/L
Fecal Coliform	05/31/21	IMAX	2419.6	CFU/100 ml	1000	CFU/100 ml

Other Comments: A Non-compliance report was submitted for March 2021 violation that didn't provide any explanation of the cause of violation or corrective action taken. Another Non-compliance report was submitted for May 2021 violation that also didn't provide any explanation of the cause of violation or corrective action.

Existing Effluent Limitations and Monitoring Requirements

The table below summarizes effluent limitations and monitoring requirements specified in the existing final NPDES permit that was in effect between July 1, 2016 to March 31, 2021 at Outfall 001.

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	Recorded
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	4.0	XXX	XXX	XXX	1/day	Grab
CBOD5	187.8	281.6 Wkly Avg	XXX	25	37.5 Wkly Avg	50	1/week	8-Hr Composite
BOD5 Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	1/week	8-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	1/week	8-Hr Composite
Total Suspended Solids	225.3	338.0 Wkly Avg	XXX	30	45 Wkly Avg	60	1/week	8-Hr Composite
Fecal Coliform (CFU/100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	1/week	Grab
Fecal Coliform (CFU/100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	1/week	Grab
UV Transmittance (%)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Recorded
Ammonia-Nitrogen	Report	XXX	XXX	Report	XXX	XXX	2/week	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	2/week	8-Hr Composite
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	2/week	Calculation
Total Aluminum	XXX	XXX	XXX	XXX	Report	XXX	1/quarter	8-Hr Composite
Total Iron	XXX	XXX	XXX	XXX	Report	XXX	1/quarter	8-Hr Composite
Total Manganese	XXX	XXX	XXX	XXX	Report	XXX	1/quarter	8-Hr Composite

The following limits were applied for CB TMDL at Outfall 001:

Parameter ⁽¹⁾	Effluent Limitations					Monitoring Requirements	
	Mass Units (lbs)		Concentrations (mg/L)			Minimum ⁽²⁾ Measurement Frequency	Required Sample Type
	Monthly	Annual	Minimum	Monthly Average	Maximum		
Ammonia---N	Report	Report		Report		2/week	8-Hr Composite
Kjeldahl---N	Report			Report		2/week	8-Hr Composite
Nitrate-Nitrite as N	Report			Report		2/week	8-Hr Composite
Total Nitrogen	Report	Report		Report		2/week	Calculation
Total Phosphorus	Report	Report		Report		2/week	8-Hr Composite
Net Total Nitrogen	Report	16,438				1/month	Calculation
Net Total Phosphorus	Report	2,192				1/month	Calculation

Footnotes:

- (1) See Part C for Chesapeake Bay Requirements.
- (2) This is the minimum number of sampling events required. Permittees are encouraged, and it may be advantageous in demonstrating compliance, to perform more than the minimum number of sampling events required.
- (3) The permittee is authorized to use 8,125 lbs/year as Total Nitrogen (TN) Offsets toward compliance with the Annual Net TN mass load limitations (Cap Loads), 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 254 wildcat and 71 on-lot disposal systems to the public sewer system after January 1, 2003, in which 25 lbs/year of TN offsets are granted per connection.
- (4) The permittee is authorized to use 762 lbs/year as Total Phosphorus (TP) Offsets toward compliance with the Annual Net TP mass load limitations (Cap Loads), 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 254 wildcat sewers to the public sewer system after January 1, 2003, in which 3 lbs/year of TP offsets are granted per connection.

Development of Effluent Limitations

Outfall No. <u>001</u>	Design Flow (MGD) <u>0.9</u>
Latitude <u>40° 40' 32.00"</u>	Longitude <u>-78° 48' 21.00"</u>
Wastewater Description: <u>Sewage Effluent</u>	

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: none

Water Quality-Based Limitations

WQM 7.0:

WQM 7.0 is a water quality model designed to assist DEP to determine appropriate permit requirements for CBOD₅, NH₃-N and DO. DEP's guidance no. 391-2000-007 provides the technical methods contained in WQM 7.0 for conducting wasteload allocation and for determining recommended NPDES effluent limits for point source discharges. DEP recently updated this model (ver. 1.1) to include new ammonia criteria that has been approved by US EPA as part of the 2017 Triennial Review. The model was utilized for this permit renewal by using updated Q₇₋₁₀ and historic background water quality levels of the river. The following data were used in the attached computer model of the stream:

- Discharge pH 7.4 (median Jul-Sep, 2020-2021, eDMR data)
- Discharge Temperature 20°C (Default per 391-2000-007)
- Discharge Hardness 100 mg/l (Default data)
- Stream pH 7.0 (Default per 391-2000-013)
- Stream Temperature 25°C (Default per 391-2000-013, WWF)
- Stream Hardness 100 mg/l (Application data)

The following nodes were considered in modeling:

- Node 1: WBSA WWTP (PA0205869) Outfall 001 at W. Br. Susquehanna River (18668)
 Elevation: 1431 ft (USGS National Map viewer, 09/16/2021)
 Drainage Area: 34.9 mi² (StreamStat Version 3.0, 09/16/2021)
 River Mile Index: 234 (PA DEP eMapPA)
 Low Flow Yield: 0.062 cfs/mi²
 Discharge Flow: 0.9 MGD
- Node 2: At confluence with Douglas Run (27241) at W. Br. Susquehanna River (18668)
 Elevation: 1385.7 ft (USGS National Map viewer, 09/16/2021)
 Drainage Area: 38.4 mi² (StreamStat Version 3.0, 09/16/2021)
 River Mile Index: 231.89 (PA DEP eMapPA)
 Low Flow Yield: 0.062 cfs/mi²
 Discharge Flow: 0.0 MGD

Pre-Draft survey:

Based on the Reasonable Potential (RP) analysis, a few pollutants were identified with new or more stringent WQBELs. PADEP's SOP titled "*Establishing Water Quality-Based Effluent Limitations (WQBELs) and Permit Conditions for Toxic Pollutants in NPDES Permits for Existing Dischargers (SOP No. BCW-PMT-037, revised May 20, 2021)*", the permittee were provided a pre-draft survey on December 2, 2021. The survey was returned on December 12, 2021. The returned survey indicated that the facility is unaware of the source, hasn't completed any studies in the past to control or treat the pollutants, uncertain if it can achieve the proposed WQBELs now, and uncertain by when they can achieve the proposed WQBELs. Their responses were taken into consideration for each of the pollutants in the development in effluent limitations, as discussed below where applicable.

NH₃-N:

WQM 7.0 suggested NH₃-N limit of 4.34 mg/l as monthly average and 8.68 mg/l as IMAX limit during summer to protect water quality standards. Current permit has monitoring only requirements. The average monthly mass loading is calculated to be 32.58 lbs./day. The winter season average monthly and IMAX limits are calculated to be 13.02 mg/l and 26.04 mg/l, respectively, and corresponding average monthly mass loading is 97.73 lbs./day. Recent DMR data show that the plant may not meet these limits immediately. Therefore, this pollutant was included in the pre-draft survey. Based on their returned response, the SOP suggests a compliance period of 3 years from permit effective date. In addition, the permittee will be required to collect additional data during this period to refine the WQM model input values, such as upstream hardness, temperature, pH, discharge hardness, and discharge temperature for first 12 months. Even though all these data aren't necessary for WQM 7 model, they will be used for other metals (discussed later in the report). The permit will be amended after 12 months to evaluate ammonia toxicity and determine the need of limit. A schedule may be provided at that time, if warranted.

CBOD₅:

The WQM 7.0 model suggests a monthly average CBOD₅ limit of 25 mg/l. The average monthly and average weekly mass loadings were calculated as 187.65 lbs/day and 281.48 lbs/day respectively. The concentration-based limits are the same as current permit, whereas the mass-based limits are a little stringent. Recalculated limits will be applied.

Dissolved Oxygen (DO):

The existing permit has a minimum DO of 4.0 mg/l. Per Pa Code 25 Ch.93.7, a minimum DO of 5.0 is required for WWF. This is also supported by WQM 7.0 output. However, the model also shows no adverse effects on the receiving stream at 4.0 mg/l. The SOP BCW-PMT-033 recommends a minimum DO limit of 4.0 mg/l based on BPJ to ensure adequate operation and maintenance where there is no water quality concerns. It is recommended that the existing limit will be carried over.

Toxics:

Based on the available data, PADEP utilizes Toxics Management Spreadsheet (TMS) to (1) evaluate reasonable potential for toxic pollutants to cause or contribute to an excursion above the water quality standards and (2) develop WQBELs for those such toxic pollutants (i.e., 40 CFR § 122.44(d)(1)(i)). It is noteworthy that some of these pollutants that may be reported as "non-detect", but still exceeded the criteria, were determined to be candidates for modeling because the method detection levels used to analyze those pollutants were higher than target QLs and/or the most stringent Chapter 93 criteria. The model then recommended the appropriate action for the Pollutants of Concerns based on the following logic:

1. In general, establish limits in the draft permit where the effluent concentration determined in B.1 or B.2 equals or exceeds 50% of the WQBEL (i.e., RP is demonstrated). Use the average monthly, maximum daily and instantaneous maximum (IMAX) limits for the permit as recommended by the TMS (or, if appropriate, use a multiplier of 2 times the average monthly limit for the maximum daily limit and 2.5 times the average monthly limit for IMAX).
2. For non-conservative pollutants, in general, establish monitoring requirements where the effluent concentration determined in B.1 or B.2 is between 25% - 50% of the WQBEL.
3. For conservative pollutants, in general, establish monitoring requirements where the effluent concentration determined in B.1 or B.2 is between 10% - 50% of the WQBEL.

NOTE 4 – If the effluent concentration determined in B.1 or B.2 is "non-detect" at or below the target quantitation limit (TQL) for the pollutant as specified in the TMS and permit application, the pollutant may be eliminated as a candidate for WQBELs or monitoring requirements unless 1) a more sensitive analytical method is available for the pollutant under 40 CFR Part 136 where the quantitation limit for the method is less than the applicable water quality criterion and 2) a

detection at the more sensitive method may lead to a determination that an effluent limitation is necessary, considering available dilution at design conditions.

NOTE 5 – If the effluent concentration determined in B.1 or B.2 is a detection below the TQL but above or equal to the applicable water quality criterion, WQBELs or monitoring may be established for the pollutant.

4. Application managers may, on a site- and pollutant-specific basis, deviate from these guidelines where there is specific rationale that is documented in the fact sheet.

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 Copper	0.17	0.27	22.9	35.8	57.3	µg/L	22.9	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Lead	0.061	0.095	8.13	12.7	20.3	µg/L	8.13	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Manganese	Report	Report	Report	Report	Report	µg/L	2,554	THH	Discharge Conc > 10% WQBEL (no RP)
Total Zinc	Report	Report	Report	Report	Report	µg/L	196	AFC	Discharge Conc > 10% WQBEL (no RP)

Each of the parameters are discussed below:

Total Copper:

The application provided a maximum Total Copper concentration of 0.012 mg/l out of 3 sample results. TMS suggests the limit requirements as shown in above table. This is a new parameter that needs limits requirement; therefore, it was included in the pre-draft survey. Since only three (3) sample results were submitted and some of the model input values were default, it was decided that a monitoring only requirement will be added for the interim period at a frequency of 2/month with limits effective at the end of compliance period. The permit will be amended after 12 months to analyze the data and conduct another RP analysis.

Total Lead:

The maximum reported concentration from the application is 8 ug/l and TMS suggests the limit requirements as shown in above table. Like Total Copper, Total Lead was included in the pre-draft survey and will be added in the permit with schedule with a frequency of 2/month. The permit will be amended after 12 months to analyze the data and conduct another RP analysis.

Total Manganese:

TMS suggests monitoring only requirement for Total Manganese. This is the facility's current requirement and will be carried over.

Total Zinc:

TMS suggests monitoring only requirement for Total Zinc. This is a new parameter and was included in the pre-draft survey, and similar to Total Copper and Total Lead, the limit will be added with compliance schedule with a frequency of 2/month. The permit will be amended after 12 months to analyze the data and conduct another RP analysis.

Total Aluminum:

TMS didn't recommend monitoring requirement for Total Aluminum. However, due to the receiving stream being impaired for Total Aluminum, the existing monitoring requirement will be carried over.

Total Iron:

TMS didn't recommend monitoring requirement for Total Iron. However, due to the receiving stream being impaired for Total Iron, the existing monitoring requirement will be carried over.

Additional Considerations

Fecal Coliform:

The recent coliform guidance in 25 Pa. code § 92a.47.(a)(4) requires a summer technology limit of 200/100 ml as a geometric mean and an instantaneous maximum not greater than 1,000/100ml and § 92a.47.(a)(5) requires a winter limit of 2,000/100ml as a geometric mean and an instantaneous maximum not greater than 10,000/100ml. These are the existing limits that will be carried over in this renewal.

E. Coli:

DEP’s SOP titled “Establishing Effluent Limitations for Individual Sewage Permits (BCW-PMT-033, revised March 24, 2021) recommends quarterly E. Coli monitoring for sewage dischargers with a design flow of ≥ 0.05 MGD and < 1.0 MGD. This requirement will be applied from this permit term.

pH:

The TBEL for pH is above 6.0 and below 9.0 S.U. (40 CFR §133.102(c) and Pa Code 25 § 95.2(1)) which are existing limits and will be carried over.

Total Suspended Solids (TSS):

There is no water quality criterion for TSS. The existing limits of 30 mg/L average monthly, 45 mg/l average weekly, and 60 mg/L instantaneous maximum will remain in the permit based on the minimum level of effluent quality attainable by secondary treatment, 25 Pa. Code § 92a.47 and 40CFR 133.102(b). The mass based average monthly and weekly average limits are calculated to be 225.18 lbs./day and 337.77 lbs./day respectively, which are a little stringent compared to current permit. More stringent mass loading will be applied.

UV Disinfection:

PADEP’s SOP BCW-PMT-033 recommends UV parameter monitoring where UV is used as a method of disinfection, with the same frequency as would be if Chlorine is used for disinfection. The current permit has UV Transmittance monitoring in %, which will be carried over in this renewal.

Flow and Influent BOD₅ and TSS Monitoring Requirement:

The requirement to monitor the volume of effluent will remain in the draft permit per 40 CFR § 122.44(i)(1)(ii). Influent BOD₅ and TSS monitoring requirements are established in the permit per the requirements set in Pa Code 25 Chapter 94.

Best Professional Judgement (BPJ):

Total Phosphorus:

Existing monthly monitoring requirement will be carried over in this renewal, per BCW-PMT-033.

Monitoring Frequency and Sample Types:

Otherwise specified above, the monitoring frequency and sample type of compliance monitoring for existing parameters are recommended by DEP’s SOP and Permit Writers Manual and/or on a case-by-case basis using best professional judgment (BPJ).

Total Nitrogen:

PADEP’s SOP BCW-PMT-033 suggests monitoring requirement, at a minimum, for facilities with design flow greater than 2,000 GPD. This requirement is applied for all facilities meeting the flow criteria. This is an existing requirement which will be carried over.

Chesapeake Bay TMDL

On March 30, 2012, DEP finalized Pennsylvania’s Chesapeake Watershed Implementation Plan Phase 2 (i.e., Phase 2 WIP) to address U.S EPA’s expectations for the Chesapeake Bay TMDL. The Chesapeake Bay TMDL identifies the necessary pollution reductions from major sources of nitrogen, phosphorus and sediment across the Bay jurisdictions and sets pollution limits necessary to meet water quality standards. The Phase 2 WIP is an update to the Pennsylvania’s Chesapeake Bay TMDL Strategy (2004) and the Chesapeake WIP Phase I (2011). In August 2019, DEP finalized Phase 3 Chesapeake Bay Watershed Implementation Plan (revised September 13, 2021) to provide the plans in place by 2025 to further achieve the nutrient and sediment reduction targets. The more details on the TMDL are available at www.dep.pa.gov.

As part of the Phase 3 WIP process, a Supplement to the Phase 3 WIP was developed, providing an update on TMDL implementation for point sources and a discussion of adjustments to the permitting strategy as a result of implementation experience. According to this document, WBSA WWTP is a Phase 2 significant discharger located within the Chesapeake Bay watershed. The following Cap Loads specified in the current Supplement to the Phase 3 WIP will be continued in the draft permit:

NPDES Permit No.	Phase	Facility	Latest Permit	Permit Expiration Date	Cap Load Compliance Start Date	TN Cap	TN Offsets Included	TP Cap	TN Delivery Ratio	TP Delivery Ratio

			Issuance Date			Load (lbs/yr)	in Cap Load (lbs/yr)	Load (lbs/yr)		
PA0205869	2	West Branch Sewer Authority	03/01/2016	03/31/2021	10/1/2012	16,438	-	2,192	0.836	0.436

Anti-Backsliding

The proposed limits are at least as stringent as are in existing permit, unless otherwise stated; therefore, anti-backsliding is not applicable.

DRAFT

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 End of Interim Period 2.

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		
Ammonia-Nitrogen	Report	XXX	XXX	Report	Report	XXX	2/week	8-Hr Composite
Copper, Total	Report	Report	XXX	Report	Report	XXX	2/month	8-Hr Composite
Lead, Total	Report	Report	XXX	Report	Report	XXX	2/month	8-Hr Composite

Compliance Sampling Location: At Outfall 001

Other Comments: None

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 , Continued (from Permit Effective Date through End of Interim Period 1)

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.) Upstream Monitoring	XXX	XXX	XXX	Report	Report	XXX	2/month	Grab
Temperature (deg C) (°C) Upstream Monitoring	XXX	XXX	XXX	Report	Report	XXX	2/month	I-S
Discharge Temperature (deg C) (°C)	XXX	XXX	XXX	Report	Report	XXX	2/month	I-S
Discharge Hardness, Total (as CaCO3)	XXX	XXX	XXX	Report	Report	XXX	2/month	Grab
Hardness, Total (as CaCO3) Upstream Monitoring	XXX	XXX	XXX	Report	Report	XXX	2/month	Grab

Compliance Sampling Location: Discharge samples be taken at Outfall 001, upstream samples shall be taken at upstream of Outfall 001.

Other Comments: none

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: End of Interim Period 2 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		
Ammonia-Nitrogen Nov 1 - Apr 30	32.58	XXX	XXX	4.34	8.68	XXX	2/week	8-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	97.73	XXX	XXX	13.02	26.04	XXX	2/week	8-Hr Composite
Copper, Total	0.17 Wkly Avg	0.27	XXX	0.0229	0.0358	0.0573	2/month	8-Hr Composite
Lead, Total	0.061	0.095	XXX	0.0081	0.0127	0.0203	2/month	8-Hr Composite

Compliance Sampling Location: At Outfall 001

Other Comments: None

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 , 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		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Recorded
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0 Daily Max	XXX	1/day	Grab
Dissolved Oxygen	XXX	XXX	4.0 Daily Min	XXX	XXX	XXX	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	187.65	281.48	XXX	25.0	37.5	50	1/week	8-Hr Composite
Biochemical Oxygen Demand (BOD5) Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	8-Hr Composite
Total Suspended Solids Raw Sewage Influent	225.18	337.77	XXX	30.0	45.0	60	1/week	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	8-Hr Composite
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
Total Phosphorus	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
Aluminum, Total	XXX	XXX	XXX	Report	XXX	XXX	2/week	8-Hr Composite
Iron, Total	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	8-Hr Composite
Manganese, Total	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	8-Hr Composite
Zinc, Total	Report	Report Daily Max	XXX	XXX	Report Daily Max	XXX	2/month	8-Hr Composite

Compliance Sampling Location: At Outfall 001

Proposed Effluent Limitations and Monitoring Requirements

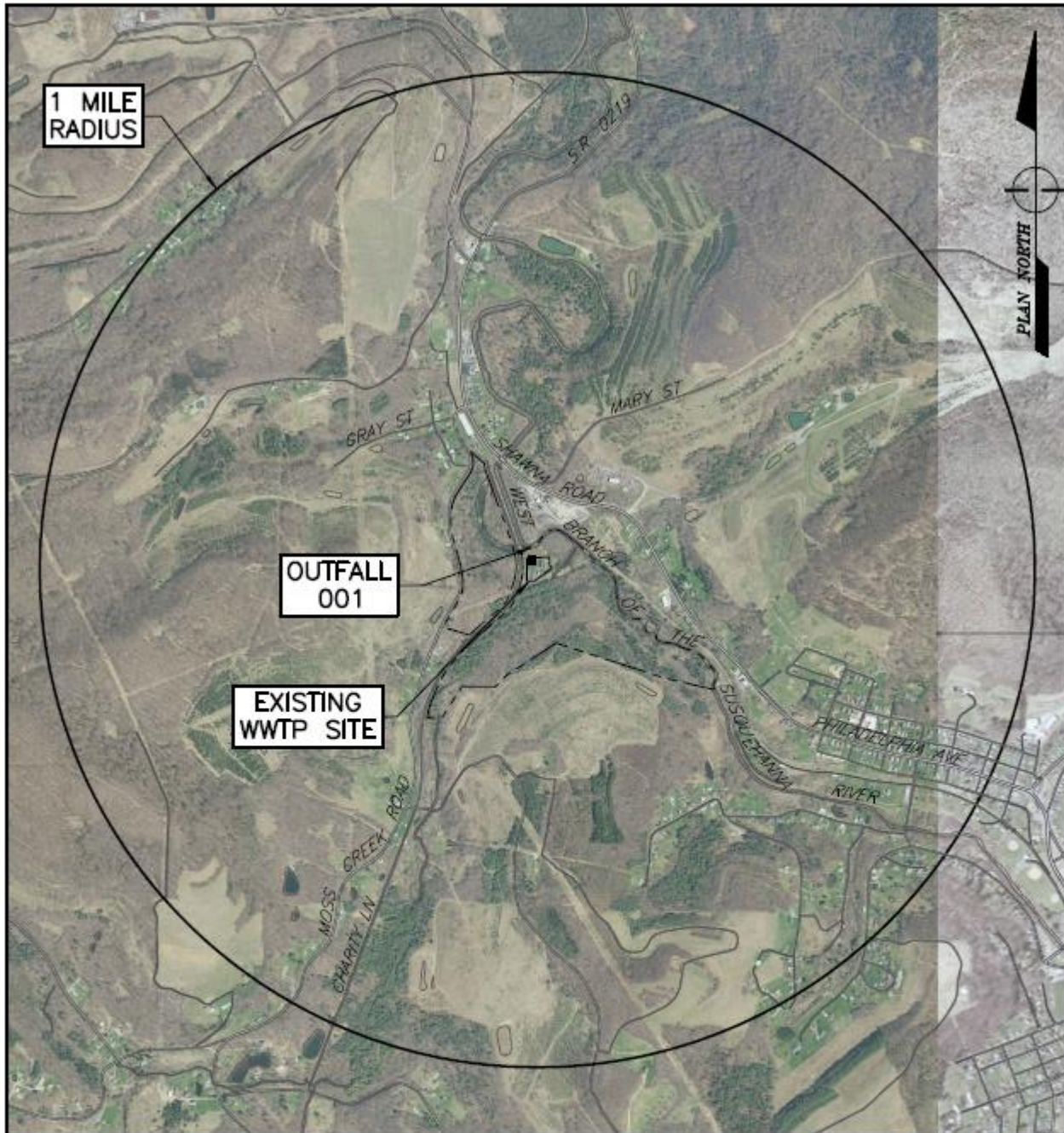
The limitations and monitoring requirements specified below are proposed for the draft permit, to comply with Pennsylvania's Chesapeake Bay Tributary Strategy.

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					
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	8-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	XXX	2/week	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	2/week	8-Hr Composite
Net Total Nitrogen	Report	16438	XXX	XXX	XXX	XXX	1/month	Calculation
Net Total Phosphorus	Report	2192	XXX	XXX	XXX	XXX	1/month	Calculation

Compliance Sampling Location: At Outfall 001

Tools and References Used to Develop Permit	
<input checked="" type="checkbox"/>	WQM for Windows Model (see Attachment [redacted])
<input checked="" type="checkbox"/>	Toxics Management Spreadsheet (see Attachment [redacted])
<input type="checkbox"/>	TRC Model Spreadsheet (see Attachment [redacted])
<input type="checkbox"/>	Temperature Model Spreadsheet (see Attachment [redacted])
<input type="checkbox"/>	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
<input type="checkbox"/>	Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001, 10/97.
<input type="checkbox"/>	Policy for Permitting Surface Water Diversions, 362-2000-003, 3/98.
<input type="checkbox"/>	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 362-2000-008, 11/96.
<input type="checkbox"/>	Technology-Based Control Requirements for Water Treatment Plant Wastes, 362-2183-003, 10/97.
<input type="checkbox"/>	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 362-2183-004, 12/97.
<input type="checkbox"/>	Pennsylvania CSO Policy, 385-2000-011, 9/08.
<input type="checkbox"/>	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
<input type="checkbox"/>	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 391-2000-002, 4/97.
<input type="checkbox"/>	Determining Water Quality-Based Effluent Limits, 391-2000-003, 12/97.
<input type="checkbox"/>	Implementation Guidance Design Conditions, 391-2000-006, 9/97.
<input type="checkbox"/>	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.
<input type="checkbox"/>	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 391-2000-008, 10/1997.
<input type="checkbox"/>	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 391-2000-010, 3/99.
<input type="checkbox"/>	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 391-2000-011, 5/2004.
<input type="checkbox"/>	Implementation Guidance for Section 93.7 Ammonia Criteria, 391-2000-013, 11/97.
<input type="checkbox"/>	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 391-2000-014, 4/2008.
<input type="checkbox"/>	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 391-2000-015, 11/1994.
<input type="checkbox"/>	Implementation Guidance for Temperature Criteria, 391-2000-017, 4/09.
<input type="checkbox"/>	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 391-2000-018, 10/97.
<input type="checkbox"/>	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.
<input type="checkbox"/>	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 391-2000-021, 3/99.
<input type="checkbox"/>	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.
<input type="checkbox"/>	Design Stream Flows, 391-2000-023, 9/98.
<input type="checkbox"/>	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.
<input type="checkbox"/>	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 391-3200-013, 6/97.
<input checked="" type="checkbox"/>	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
<input checked="" type="checkbox"/>	SOP: BCW-PMT-033
<input type="checkbox"/>	Other: [redacted]



1731 N. Juniata Street
Hollidaysburg, PA 16648
Phone: 814.696.6280 Fax: 814.696.6240

PROJECT LOCATION MAP

WEST BRANCH SEWER AUTHORITY
NPDES PERMIT RENEWAL
PA 0205869

SUSQUEHANNA TOWNSHIP
CAMBRIA COUNTY, PENNSYLVANIA
SCALE: 1" = 1500' 97-0051.155

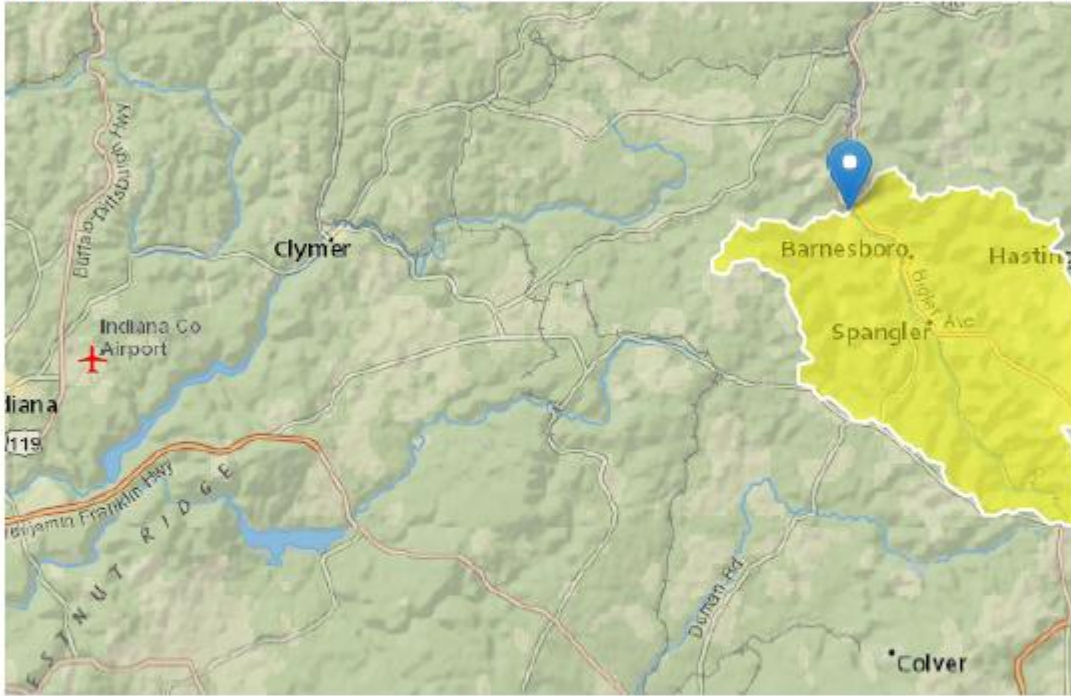
PA0205869 at 001

Region ID: PA

Workspace ID: PA20210917023340969000

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Time: 2021-09-16 22:33:59 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	34.9	square miles
ELEV	Mean Basin Elevation	1795	feet
PRECIP	Mean Annual Precipitation	44	inches

Low-Flow Statistics Parameters [Low Flow Region 3]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	34.9	square miles	2.33	1720
ELEV	Mean Basin Elevation	1795	feet	898	2700
PRECIP	Mean Annual Precipitation	44	inches	38.7	47.9

Low-Flow Statistics Flow Report [Low Flow Region 3]

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

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	4.43	ft ³ /s	43	43
30 Day 2 Year Low Flow	6.16	ft ³ /s	38	38
7 Day 10 Year Low Flow	2.18	ft ³ /s	54	54
30 Day 10 Year Low Flow	2.87	ft ³ /s	49	49
90 Day 10 Year Low Flow	4.13	ft ³ /s	41	41

Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (<http://pubs.usgs.gov/sir/2006/5130/>)

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StreamStats at node 2

Region ID: PA

Workspace ID: PA20210917023700309000

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Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	38.4	square miles
ELEV	Mean Basin Elevation	1784	feet
PRECIP	Mean Annual Precipitation	44	inches

Low-Flow Statistics Parameters [Low Flow Region 3]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	38.4	square miles	2.33	1720
ELEV	Mean Basin Elevation	1784	feet	898	2700
PRECIP	Mean Annual Precipitation	44	inches	38.7	47.9

Low-Flow Statistics Flow Report [Low Flow Region 3]

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

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	4.87	ft ³ /s	43	43
30 Day 2 Year Low Flow	6.75	ft ³ /s	38	38
7 Day 10 Year Low Flow	2.4	ft ³ /s	54	54
30 Day 10 Year Low Flow	3.16	ft ³ /s	49	49
90 Day 10 Year Low Flow	4.55	ft ³ /s	41	41

Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (<http://pubs.usgs.gov/sir/2006/5130/>)

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Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
10D	18668	WEST BRANCH SUSQUEHANNA RI	234.000	1431.00	34.90	0.00000	0.00	<input checked="" type="checkbox"/>

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary Temp	pH	Stream Temp	pH
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	(°C)		(°C)	
Q7-10	0.062	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
WBSA WWTP	PA0205869	0.9000	0.9000	0.9000	0.000	20.00	7.40

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	5.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
10D	18668	WEST BRANCH SUSQUEHANNA RI	231.890	1385.70	38.40	0.00000	0.00	<input checked="" type="checkbox"/>

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)	pH	Stream Temp (°C)	pH
	Q7-10	0.062	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	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	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	<input checked="" type="checkbox"/>
WLA Method	EMPR	Use Inputted W/D Ratio	<input type="checkbox"/>
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	<input type="checkbox"/>
Q30-10/Q7-10 Ratio	1.32	Temperature Adjust Kr	<input checked="" type="checkbox"/>
D.O. Saturation	90.00%	Use Balanced Technology	<input checked="" type="checkbox"/>
D.O. Goal	5		

WQM 7.0 Hydrodynamic Outputs

<u>SWP Basin</u>		<u>Stream Code</u>		<u>Stream Name</u>								
10D		18668		WEST BRANCH 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												
234.000	2.16	0.00	2.16	1.3923	0.00407	.643	28.77	44.77	0.19	0.670	23.04	7.12
Q1-10 Flow												
234.000	1.38	0.00	1.38	1.3923	0.00407	NA	NA	NA	0.17	0.770	22.49	7.16
Q30-10 Flow												
234.000	2.86	0.00	2.86	1.3923	0.00407	NA	NA	NA	0.21	0.607	23.36	7.10

WQM 7.0 Wasteload Allocations

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>
10D	18668	WEST BRANCH SUSQUEHANNA RIVER

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
234.000	WBSA WWTP	7.16	14.29	7.16	14.29	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
234.000	WBSA WWTP	1.42	4.34	1.42	4.34	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)		
234.00	WBSA WWTP	25	25	4.34	4.34	5	5	0	0

WQM 7.0 D.O. Simulation

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>		
10D	18668	WEST BRANCH SUSQUEHANNA RIVER		
<u>RM1</u>	<u>Total Discharge Flow (mgd)</u>	<u>Analysis Temperature (°C)</u>		<u>Analysis pH</u>
234.000	0.900	23.042		7.117
<u>Reach Width (ft)</u>	<u>Reach Depth (ft)</u>	<u>Reach WDRatio</u>		<u>Reach Velocity (fps)</u>
28.770	0.643	44.771		0.192
<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>
11.01	1.220	1.70		0.885
<u>Reach DO (mg/L)</u>	<u>Reach Kr (1/days)</u>	<u>Kr Equation</u>		<u>Reach DO Goal (mg/L)</u>
6.973	7.988	Tsivoglou		5
<u>Reach Travel Time (days)</u>	<u>Subreach Results</u>			
0.670	<u>TravTime (days)</u>	<u>CBOD5 (mg/L)</u>	<u>NH3-N (mg/L)</u>	<u>D.O. (mg/L)</u>
	0.067	10.02	1.60	6.19
	0.134	9.12	1.51	5.85
	0.201	8.30	1.42	5.76
	0.268	7.55	1.34	5.82
	0.335	6.88	1.26	5.94
	0.402	6.26	1.19	6.10
	0.469	5.70	1.12	6.27
	0.536	5.19	1.06	6.44
	0.603	4.72	1.00	6.61
	0.670	4.30	0.94	6.77

WQM 7.0 Effluent Limits

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>					
10D	18668	WEST BRANCH SUSQUEHANNA RIVER					
RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
234.000	WBSA WWTP	PA0205869	0.900	CBOD5	25		
				NH3-N	4.34	8.68	
				Dissolved Oxygen			5

Discharge Information

Instructions Discharge Stream

Facility: **West Branch Sewer Authority STP** NPDES Permit No.: **PA0205869** 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
0.9	100	7.4						

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	456									
Chloride (PWS)	mg/L	120									
Bromide	mg/L	< 2									
Sulfate (PWS)	mg/L	117									
Fluoride (PWS)	mg/L										
Group 2											
Total Aluminum	µg/L	< 100									
Total Antimony	µg/L										
Total Arsenic	µg/L										
Total Barium	µg/L										
Total Beryllium	µg/L										
Total Boron	µg/L										
Total Cadmium	µg/L										
Total Chromium (III)	µg/L										
Hexavalent Chromium	µg/L										
Total Cobalt	µg/L										
Total Copper	µg/L	12									
Free Cyanide	µg/L										
Total Cyanide	µg/L										
Dissolved Iron	µg/L										
Total Iron	µg/L	< 200									
Total Lead	µg/L	8									
Total Manganese	µg/L	260									
Total Mercury	µg/L										
Total Nickel	µg/L										
Total Phenols (Phenolics) (PWS)	µg/L										
Total Selenium	µg/L										
Total Silver	µg/L										
Total Thallium	µg/L										
Total Zinc	µg/L	74.3									
Total Molybdenum	µg/L										
Acrolein	µg/L	<									
Acrylamide	µg/L	<									
Acrylonitrile	µg/L	<									
Benzene	µg/L	<									
Bromoform	µg/L	<									



Stream / Surface Water Information

West Branch Sewer Authority STP, NPDES Permit No. PA0205869, Outfall 001

Instructions Discharge **Stream**

Receiving Surface Water Name: W. Branch 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	018668	234	1431	34.9			Yes
End of Reach 1	018668	231.89	1385.7	38.4			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	234	0.062										100	7		
End of Reach 1	231.89	0.062													

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	234														
End of Reach 1	231.89														

Model Results

West Branch Sewer Authority STP, NPDES Permit No. PA0205869, Outfall 001

Instructions

Results

RETURN TO INPUTS

SAVE AS PDF

PRINT

All

Inputs

Results

Limits

Hydrodynamics

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	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	750	750	1,916	
Total Copper	0	0		0	13.439	14.0	35.8	Chem Translator of 0.96 applied
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	64.581	81.6	209	Chem Translator of 0.791 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	117.180	120	306	Chem Translator of 0.978 applied

CFC

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	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	8.956	9.33	23.8	Chem Translator of 0.96 applied
Total Iron	0	0		0	1,500	1,500	3,831	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2.517	3.18	8.13	Chem Translator of 0.791 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	118.139	120	306	Chem Translator of 0.986 applied

THH

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	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 Copper	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	1,000	1,000	2,554	
Total Zinc	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	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Copper	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 Zinc	0	0		0	N/A	N/A	N/A	

Recommended WQBELs & Monitoring Requirements

No. Samples/Month:

Pollutants	Mass Limits		Concentration Limits				Governing WQBEL	WQBEL Basis	Comments
	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units			
Total Copper	0.17	0.27	22.9	35.8	57.3	µg/L	22.9	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Lead	0.081	0.095	8.13	12.7	20.3	µg/L	8.13	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Manganese	Report	Report	Report	Report	Report	µg/L	2,554	THH	Discharge Conc > 10% WQBEL (no RP)
Total Zinc	Report	Report	Report	Report	Report	µg/L	196	AFC	Discharge Conc > 10% WQBEL (no RP)

Other Pollutants without Limits or Monitoring

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments

Total Dissolved Solids (PWS)	N/A	N/A	PWS Not Applicable
Chloride (PWS)	N/A	N/A	PWS Not Applicable
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	N/A	N/A	PWS Not Applicable
Total Aluminum	1,228	µg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	3,831	µg/L	Discharge Conc ≤ 10% WQBEL